NHDES-W-06-012

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

WETLANDS PERMIT APPLICATION

Water Division/ Wetlands Bureau
Land Resources Management

Check the status of your application: www.des.nh.gov/onestop

RSA/Rule: RSA 482-A/ Env-Wt 100-900

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.
			Check No.:
			Amount:
			Initials:

1. REVIEW TIME: Indicate your Review Time below. To determine review time, refer to Guidance Document A for instructions.

☒ Standard Review (Minimum, Minor or Major Impact) ☐ Expedited Review (Minimum Impact only)

2. MITIGATION REQUIREMENT:

If mitigation is required a Mitigation-Pre Application meeting must occur prior to submitting this Wetlands Permit Application. To determine if Mitigation is Required, please refer to the Determine if Mitigation is Required Frequently Asked Question.

Mitigation Pre-Application Meeting Date: Month: 11 Day: 15 Year: 2017

☐ N/A - Mitigation is not required

3. PROJECT LOCATION:

Separate wetland permit applications must be submitted for each municipality that wetland impacts occur within.

ADDRESS: **Junction of route 123A to 123 & 12A**			TOWN/CITY: **Alstead**
TAX MAP: **10**	BLOCK: **n/a**	LOT: **6, 7, 12, 13**	UNIT:
USGS TOPO MAP WATERBODY NAME: **Warren Brook** ☐ NA		STREAM WATERSHED SIZE: **12.5 sq miles** ☐ NA	

LOCATION COORDINATES (If known): **x 801860 y 238300 lat 43.12103 long -72.34856**

4. PROJECT DESCRIPTION:

Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.

The proposed project will replace Bridge 073/163, which carries NH Route 123A over Warren Brook. The existing single span structure measures 23' from abutment to abutment with a 170 square foot opening and will be replaced with a structure measuring 57' from abutment to abutment with a 275 square foot opening, see additional sheet.

5. SHORELINE FRONTAGE:

☒ NA This does not have shoreline frontage. SHORELINE FRONTAGE:

Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

6. RELATED NHDES LAND RESOURCES MANAGEMENT PERMIT APPLICATIONS ASSOCIATED WITH THIS PROJECT:

Please indicate if any of the following permit applications are required and, if required, the status of the application.

To determine if other Land Resources Management Permits are required, refer to the Land Resources Management Web Page.

Permit Type	Permit Required	File Number	Permit Application Status
Alteration of Terrain Permit Per RSA 485-A:17	☐ YES ☐ NO		☐ APPROVED ☐ PENDING ☐ DENIED
Individual Sewerage Disposal per RSA 485-A:2	☐ YES ☐ NO		☐ APPROVED ☐ PENDING ☐ DENIED
Subdivision Approval Per RSA 485-A	☐ YES ☐ NO		☐ APPROVED ☐ PENDING ☐ DENIED
Shoreland Permit Per RSA 483-B	☒ YES ☐ NO	N/A	☐ APPROVED ☐ PENDING ☐ DENIED

7. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:

See the Instructions & Required Attachments document for instructions to complete a & b below.

a. Natural Heritage Bureau File ID: NHB 17 - 2517 .

b. ☒ Designated River the project is in ¼ miles of: **Cold River** ; and date a copy of the application was sent to the Local River Management Advisory Committee: Month: __ Day: __ Year: ____

☐ N/A

8. APPLICANT INFORMATION (Desired permit holder)

LAST NAME, FIRST NAME, M.I.: **Landry, Robert, PE**			
TRUST / COMPANY NAME: **NHDOT**	MAILING ADDRESS: **7 Hazen Drive**		
TOWN/CITY: **Concord**		STATE: **NH**	ZIP CODE: **03302**
EMAIL or FAX: **Robert.Landry@dot.nh.gov**	PHONE: **(603) 271-2731**		
ELECTRONIC COMMUNICATION: By initialing here: LRL, I hereby authorize NHDES to communicate all matters relative to this application electronically			

9. PROPERTY OWNER INFORMATION (If different than applicant)

LAST NAME, FIRST NAME, M.I.:			
TRUST / COMPANY NAME:	MAILING ADDRESS:		
TOWN/CITY:		STATE:	ZIP CODE:
EMAIL or FAX:	PHONE:		
ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically			

10. AUTHORIZED AGENT INFORMATION

LAST NAME, FIRST NAME, M.I.:	COMPANY NAME:		
MAILING ADDRESS:			
TOWN/CITY:		STATE:	ZIP CODE:
EMAIL or FAX:	PHONE:		
ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically			

11. PROPERTY OWNER SIGNATURE:

See the Instructions & Required Attachments document for clarification of the below statements

By signing the application, I am certifying that:

1. I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application.
2. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document.
3. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900.
4. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type.
5. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative.
6. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47.
7. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance.
8. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project.
9. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate.
10. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action.
11. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining.
12. The mailing addresses I have provided are up to date and appropriate for receipt of NHDES correspondence. NHDES will not forward returned mail.

Property Owner Signature	Print name legibly	Date
⇨ [signature]	L. Robert Landry	4/16/2018

MUNICIPAL SIGNATURES

12. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.

⇨	Print name legibly	Date

DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review ONLY requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will reviewed in the standard review time frame.

13. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

⇨ Town/City Clerk Signature	Print name legibly	Town/City	Date

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. IMMEDIATELY sign the original application form and four copies in the signature space provided above;
3. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
4. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, original permit application form bearing the signature of the Town/ City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery.

14. IMPACT AREA:
For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact
Permanent: impacts that will remain after the project is complete.
Temporary: impacts not intended to remain (and will be restored to pre-construction conditions) after the project is complete.

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.		TEMPORARY Sq. Ft. / Lin. Ft.	
Forested wetland		☐ ATF		☐ ATF
Scrub-shrub wetland		☐ ATF		☐ ATF
Emergent wetland		☐ ATF		☐ ATF
Wet meadow		☐ ATF		☐ ATF
Intermittent stream		☐ ATF		☐ ATF
Perennial Stream / River	1,132 sf / 105 ft	☐ ATF	1,805 sf / 70 ft	☐ ATF
Lake / Pond	/	☐ ATF	/	☐ ATF
Bank - Intermittent stream	/	☐ ATF	/	☐ ATF
Bank - Perennial stream / River	968 sf / 105 ft	☐ ATF	0 / 0	☐ ATF
Bank - Lake / Pond	/	☐ ATF	/	☐ ATF
Tidal water	/	☐ ATF	/	☐ ATF
Salt marsh		☐ ATF		☐ ATF
Sand dune		☐ ATF		☐ ATF
Prime wetland		☐ ATF		☐ ATF
Prime wetland buffer		☐ ATF		☐ ATF
Undeveloped Tidal Buffer Zone (TBZ)		☐ ATF		☐ ATF
Previously-developed upland in TBZ		☐ ATF		☐ ATF
Docking - Lake / Pond		☐ ATF		☐ ATF
Docking - River		☐ ATF		☐ ATF
Docking - Tidal Water		☐ ATF		☐ ATF
TOTAL	2100 / 210		1805 / 70	

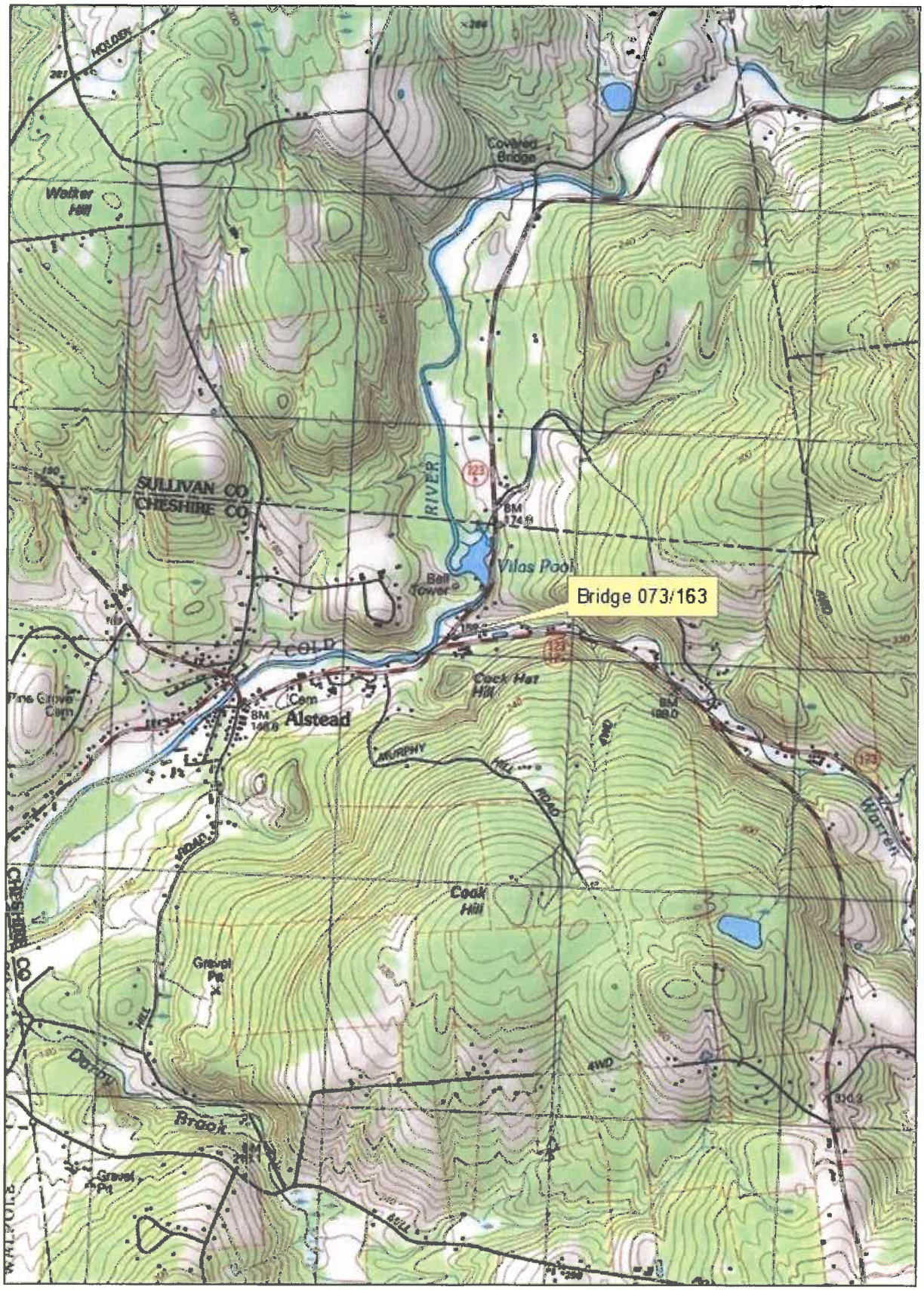
15. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

☐ Minimum Impact Fee: Flat fee of $ 200
☒ Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking)	**3905** sq. ft.	X	$0.20 =	**$ 781**
Temporary (seasonal) docking structure:	**0** sq. ft.	X	$1.00 =	**$ 0**
Permanent docking structure:	**0** sq. ft.	X	$2.00 =	**$ 0**
Projects proposing shoreline structures (including docks) add $200 =				**$ 0**
Total =				**$ 781**
The Application Fee is the above calculated Total or $200, whichever is greater =				**$ 781**

Alstead, X-A002(091), 20817

North



1 inch = 2,000 feet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

WETLANDS PERMIT APPLICATION – ATTACHMENT A
MINOR AND MAJOR - 20 QUESTIONS

Land Resources Management
Wetlands Bureau

Check the Status of your application: www.des.nh.gov/onestop

RSA/ Rule: RSA 482-A, Env-Wt 100-900

Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

The existing 1935 bridge is comprised of a concrete "T" beam super structure and a mass concrete substructure. The inspection report list the bridge as structurally deficient with a serious ranking for the deck. This bridge is currently posted as "C-1" and has been on the states red list since 2002 with a current ranking of #60. During the 2005 flood, debris filled the bridge opening washing out the road and may have contributed to the scour on the SW corner where now the top of the footing is exposed. As this bridge's superstructure is comprised of just three "T" beams there is limited structural redundancy. Also underside inspection shows salt has worked its way completely through the deck causing serious deterioration. This is a greater concern with "T" beams because the deck is critical part of the structural element of the beam. For these reason repairs to "T" are particularly difficult. The 1935 square reinforcing is a lower strength and showing signs of section loss.

Due the structural deficiencies of the existing bridge, the current safety risk to the traveling public, the existing insufficient crossing size, the proposed project will improve safety and access of the crossing over Warren Brook as well as increase the hydrologic capacity of the crossing.

Construction of the fully compliant single span structure will result in a permanent impact when we remove thr 1960's concrete streambed slab and 1935's abutment & fill to expose the natural streambed and the restore banks.

2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.

Alternatives considered include:

1) Do nothing - This would allow continued deterioration and an eventual bridge closure with a 23 mile detour

2) Rehabilitation – "T" beam repairs are particularly problematic and if made, could temporarily arrest the deterioration, but would not address, steam crossing, hydraulics, natural stream bottom or provide additional strength. The scour could be addressed with pressure grouting and rip rap, but due to the shallow footing elevations the stream bed concrete slab could not be remove to return the stream to its natural state.

3) Replacement

a) Full roadway closure with accelerated bridge construction was proposed to the Town but was rejected due to the length of the detour

b) West shifted phased construction with alternating one way traffic was rejected because of greater impacts and poor intersection alignment

c) East shifted phased construction with alternating one way traffic was chosen as the best alternative. It was clear that the "do nothing" and "rehabilitation" alternatives would not fully address the needs of the project. The east shift was selected over the west shift alternative because it more closely matched the existing location and required fewer total wetland impacts and allowed for avoidance of cultural resources. There will be impacts to the channel and banks, however, the existing concete streambed slab will be removed exposing the natural stream bottom and the 1935 abutments and fill will be removed returing the channel to it's pre 1935 condition. Recreation of the pre 1935 banks & existing banks immediatley adjacent to the proposed bridge will be stablized, to improve the overall stablity of the channel and banks in the project area.

3. The type and classification of the wetlands involved.

R3UBH - Riverine, Upper Perenial, Unconsolidated Bottom, Permantly Flooded

BANK

These impacts result from regrading the stream bank back to natural conditions once existing bridge is removed and removal of concrete reviver bottom slab.

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

The proposed project is located on Warren brook appoximately 100' east of its confluence with the Cold River.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

The wetlands proposed to be impacted are all common wetland types typical of this part of New Hampshire.

6. The surface area of the wetlands that will be impacted.

The project as proposed will include 1,805 sf of temporary impacts to the channel and 2,100 sf of permanent impacts, including 968 sf of permanent bank impact and 1,132 sf of permanent channel impact. 874 sf of the 1,132 sf of permanent impacts is due to the removal of the existing concrete streambed slab that will expose the natural streambed.

7. The impact on plants, fish and wildlife including, but not limited to:
   a. Rare, special concern species;
   b. State and federally listed threatened and endangered species;
   c. Species at the extremities of their ranges;
   d. Migratory fish and wildlife;
   e. Exemplary natural communities identified by the DRED-NHB; and
   f. Vernal pools.

a. There are no anticipated impacts to any rare species or species of special concern as a result of the proposed work.

b. The project area is located in the range of the federally threatened northern long-eared bat (NLEB) and is in a town with a known record of an NLEB hibernacula. This project qualifies under the USFWS/FHWA Biological Opinion and was reviewed by the USFWS. The work is not located in the vicinity of the hibernacula, however, the project has been given a May Affect, Likely to Adversly Affect due to the need to clear trees during the NLEB active season. All necessary Avoidance and Minimization Measures will be implemented during construction.

c. No species at the extremities of their ranges have been identified in the project area.

d. No migrantory fish or wildlife that may use the project area as a travel corridor have been identified.

e. NHNHB did not identify any known records of exemplary natural communities in the project area.

f. No vernal pools were identifed during field visits and wetland delineations in the project area.

8. The impact of the proposed project on public commerce, navigation and recreation.

The proposed project will address the decreasing structural integrity of this crossing. The crossing is used by residents, businesses and emergency transport vehicles, with the closest detour totaling 23 miles. Replacing the deficient bridge will result in increased safety and accessibility for the traveling public which will allow public commerce, navigation and recreation to continue.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

The replacement of the existing deteriorated bridge will likely be seen as an improvement to the aesthetics by the general public. This is due impart to the minimalistic approach to the wing layout and the ability to grade in keeping with the natural stream because of the proposed bridges longer length.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

There are no long-term interferences with public rights of passage or access. Roadway traffic will be restricted to one lane during construction, however this impact will be temporary and was indicated as the preferred alternative by the Town of Alstead. The proposed bridge will widen the crossing opening from 170 sf to 275 sf and will widen the channel, which will increase passage and access on Warren Brook.

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

The impact to abutting property owners will be minimal. Impacts to abutting properties are necessary to grade the river banks to match the upstream & downstream cross-sections. Most of this work occurs inside the existing DOT ROW to match the existing contours upstream and downstream, however, the private property owners of the abutting parcels indicated that their preference was to continue the grading onto their properties in order to fully match the countours fo the existing channel and banks outside of the project area.

12. The benefit of a project to the health, safety, and well being of the general public.

The project will improve health, safety, and well-being of the general public by providing a bridge with improved alignment, strength, transitions and a guard rail system that meets current standards.

13. The impact of a proposed project on quantity or quality of surface and groundwater. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

There will be no impact to ground water as a result of the proposed work. The proposed projeect will increase quality of the surface water by widening the channel to match the up and downstream characteristics of Warren Brook and also by removing an existing concrete slab under the crossing which will be expose the natural streambed material. There will be a small increase in impervious surface area, all resulting increases in stormwater runoff will be appropriately treated before entering the brook.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

This project will not cause an increase in flooding, erosion, or sedimentation. The proposed bridge will increase the waterway opening from 170 sf to 275 sf which more accurately matches the upstream and downstream characteristics and the upstream crossings. The proposed structure will remove the current restriction on the stream channel which will reuslt in a decrease in the likelihood of erosion and sedimentation. The increased opening will also allow the crossing to more adequatly accommodate flooding conditions, which have cuased damage to the existing structure during previous events.

There is no risk of sedimentation during construction as all standard erosion and sedimentation controls will be installed and maintained throughout construction.

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

The proposed design is not anticipated to reflect or redirect current wave energy.

16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.

Private property owners located up stream and downstream from the crossing are unlikely to propose construction of bridges over Warren Brook, especially one of the same size and impact as is required by the Department for the purpose of conveying vehicular traffic over the brook.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

The project will improve wildlife habitat along the Warren brook by providing a natural stream bed, natural stream banks and a full stream crossing opening to allow wildlife passage, as well as improve hydraulics.

18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

There are no sites included in, or eligible for inclusion in, the National Register of Natural Landmarks within the project area.

19. The impact upon the value of areas named in acts of Congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

There are no areas such as those described above located in the project area.

20. The degree to which a project redirects water from one watershed to another.

The proposed project will not redirect water from the current watershed to any other watershed.

Additional comments

The three key points are

1) Very little change to the site and impervious areas

2) Able to move the abutments back to create a natural bank rather that a concrete wall

3) Removal of the concrete stream bed slab to expose the natural steam bottom.

BUREAU OF ENVIRONMENT
CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: January 21, 2015
LOCATION OF CONFERENCE: John O. Morton Building
ATTENDED BY:

NHDOT
Christine Perron
Ron Crickard
Marc Laurin
Matt Urban
Rebecca Martin
John Sargent
Bill Saffian
Mark Hemmerlein
David Scott
Dustan Eurieck
Tim Mallette
Jim Kirouac
Steve Liakos
Ron Grandmaison
Bob Davis
Kevin Nyhan
Jill Edelmann
Carol Niewola
Rita Hunt
Nancy Mayville
Lou Barker

Army Corps of Engineers
Michael Hicks

EPA
Mark Kern

NHDES
Gino Infascelli
Lori Sommer

NH Fish & Game
Carol Henderson

NH Natural Heritage Bureau
Melissa Coppola

CMA Engineers
Owen Krauss
Britt Audet

The Smart Associates
Jennifer Riordan

Town of Hooksett
Leo Lessard
Kathie Northup
JoAnn Duffy

HDR Engineering
John Weston
Ronald O'Blenis

Normandeau Associates
Mark Hutchins

(When viewing these minutes online, click on an attendee to send an e-mail)

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH:
(minutes on subsequent pages)

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

NOTES ON CONFERENCE:

Finalization of November Meeting Minutes

The November 19, 2014 meeting minutes were finalized.

Alstead, X-A002(091), 20817

Bill Saffian provided an overview of the project, which will address the bridge that carries NH Route 123A over Warren Brook. The bridge is located just north of the intersection of NH Route 123A with NH Routes 123/12A. The bridge was damaged during the flood event that occurred in 2005. Flood damage was repaired; however the bridge is still in poor condition. In addition, the hydraulic opening of the bridge is not sufficient. For these reasons, bridge replacement is proposed.

The bridge is a concrete T-Beam structure that was built in 1935. The width of the bridge is 29'. The span from abutment to abutment along the center line of the roadway is 30'. The span perpendicular to the opening is 24', creating a waterway opening of 170 square feet. The crossing recommended by the NH Stream Crossing Guidelines, based on the estimated bankfull width, is 54'. The proposed bridge would have a span of 68' perpendicular to the channel, with a waterway opening of 250 square feet. The next bridge upstream has a 52' span and 138 square foot opening. A hydraulic study has not yet been completed; however it is anticipated that the proposed design will not present any hydraulic concerns.

The stream banks upstream and downstream from the current bridge are steep; these will be continued through the proposed structure. Due to the steep slopes, no wildlife shelf is proposed. An existing concrete slab in the channel will be removed to create a natural stream bottom. A fluvial geomorphic assessment, completed in 2006 for the Alstead area, recommended spanning the bankfull width at this crossing or providing overflow structures. Overflow structures do not work at this location. However, the proposed bridge does span the bankfull width.

Mike Hicks asked if there would be impacts in the river channel. B. Saffian replied that some impacts would be necessary during construction, including the removal of the concrete slab in the channel. Christine Perron noted that it is early in the design process and that the project would be reviewed again at a future meeting once proposed impacts were better defined.

Gino Infascelli asked if one way traffic would be maintained during construction. B. Saffian said that was the desire, but there is a concern with the intersection being in close proximity to the bridge, so a temporary turn lane may be needed. This is currently under study. Traffic volumes are low in this area, which will help facilitate traffic control during construction.

Carol Henderson asked for more information on the project schedule. B. Saffian noted that the project is currently on-shelf to advertise in September 2016 if funds are available at that time.

C. Henderson noted that NH Fish & Game has a stream restoration project approximately 900' upstream from the bridge, and she recommended coordinating with John Magee.

This project has not been previously discussed at a Monthly Natural Resource Agency Coordination Meeting.

North Hampton, non-federal, 16060

BUREAU OF ENVIRONMENT
CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: November 15, 2017
LOCATION OF CONFERENCE: John O. Morton Building
ATTENDED BY:

NHDOT
Matt Urban
Sarah Large
Ron Crickard
Mark Hemmerlein
Marc Laurin
Don Lyford
Bill Saffian
David Scott
Meli Dube
John Sargent
Jennifer Reczek
Kathy Corliss
Matt Healey
Kevin Daigle

ACOE
Mike Hicks

EPA
Mark Kern

NHDES
Gino Infascelli
Lori Sommer

NHF&G
Carol Henderson
John Magee

NH Natural Heritage Bureau
Amy Lamb

Consultants/Public Participants
Christine Perron

(When viewing these minutes online, click on an attendee to send an e-mail)

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH:
(minutes on subsequent pages)

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

Consultation on Essential Fish Habitat is no longer required for Atlantic salmon in the Connecticut River. Input on State fisheries concerns is needed from NH Fish & Game and VT Fish & Wildlife, especially regarding the desire for any time of year restrictions. The duration of construction may be up to 4 years, and any restrictions on in-water work due to concerns with disturbance, noise, or vibrations could extend this duration further and would need to be identified as soon as possible. Carol Henderson said that she would follow up with C. Perron regarding potential concerns.

C. Henderson noted that the project should consider impacts to bald eagles, primarily from tree clearing.

C. Henderson commented that the project will eliminate vehicular access to the NH Fish & Game boat launch located on the island in the river, and she asked how this would be addressed. Don Lyford noted that the current access to the boat launch is very rough for vehicles. Ownership and maintenance of the boat launch needs to be confirmed. If it is determined that the boat launch is actively used, the enhancement of another boat launch downstream could be investigated. C. Henderson noted that NH Fish & Game would like to promote boat access where possible.

This project has been previously discussed at the 1/22/1998 and 5/20/2009 Monthly Natural Resource Agency Coordination Meetings.

Alstead, #20817 (X-A002(091))

John Sargent, NHDOT Bureau of Bridge Design, gave an overview of proposed project, which will replace the existing bridge carrying NH Route 123A over Warren Brook in Alstead just east of the junction with the Cold River. The original concrete T-beam structure was constructed in 1935 with upgrades in the 1970s. This bridge withstood the major flood event in 2005, which significantly altered the stream characteristics upstream of the crossing. Repairs to the abutments and wing walls were made in 2007. The existing bridge measures 23 feet from face of abutment to face of abutment with a 170 square foot opening. The proposed design measures 57 feet from face of abutment to face of abutment with a 275 square foot opening. There is an existing concrete pad connecting the abutments, which will be removed and replaced with natural stream bottom material. Because the new abutments will be pulled back above the top of bank, stone fill will be placed in the area where the abutments and roadway fill currently exist to protect the new abutments and armor the slope of the new bank, which will be graded to tie in the contours of the existing banks upstream and downstream of the crossing to create a bank connectivity through the crossing. During construction, water will be directed to one side of the crossing while work is completed on the opposite side. The proposed alternative will shift the alignment of the road and widen slightly to the east, with alternating 1-lane traffic remaining open. The widening and alignment shift is necessary due to the need to keep two T-beams intact to support vehicular traffic during construction. The Town of Alstead indicated a strong preference for keeping the road open during construction and opted for this shift-to-the-east alternative over an Accelerated Bridge Construction alternative, which would have kept the new structure almost exactly within the existing alignment but would have required closing the road.

Carol Henderson, NHFG, asked if there will be a shelf provided on the bank under the bridge for wildlife going through the crossing. J. Sargent replied that it had been discussed but that the current proposal does not specifically provide a wildlife shelf; however, the proposed bank will mimic the

condition of the bank upstream and downstream of the crossing to provide connectivity through the crossing.

C. Henderson noted that the existing concrete pad is perched at the outlet and asked if this will be repaired as part of the removal. J. Sargent indicated that the natural stream bed material will be graded to address this drop off gradually.

Mark Hemmerlein, NHDOT Bureau of Environment, asked about the roadway tie-ins. J. Sargent explained that the pavement will extend to an existing joint to the north of the project and will tie in just before the intersection with NH Route 123 to the south of the project, with an increase in impervious surface of approximately 1000 square feet.

Matt Urban, NHDOT Bureau of Environment, indicated that since we are proposing a structure size that is compliant with the stream crossing rules, creates bank connectivity under the bridge and an open natural stream bottom, we do not anticipate mitigation for this project. Lori Sommer, NHDES Wetlands Bureau, concurred that no mitigation would be necessary for the compliant structure. Gino Infascelli, NHDES Wetlands Bureau, asked for clarification on how the design meets stream crossing rules and expressed confusion that bank full width was not represented on the plans. J. Sargent, M. Urban, Bill Saffian, NHDOT Bureau of Bridge Design, and Meli Dube, NHDOT Bureau of Environment, explained that the bank full width based on the stream characteristics is 43'. Using the regional curve calculation, this requires a 54' span structure from face of abutment to face of abutment. The proposed crossing is 57' which exceeds the length required for stream crossing rule compliance and there is no fill proposed in the streambed.

John Magee, NHFG, asked if the banks upstream and downstream are stable, noting that the banks further upstream outside of the project area are very unstable. M. Dube and J. Sargent replied that the banks are currently well vegetated and seemingly stable and showed pictures to demonstrate the current condition. J. Magee also expressed concern for higher velocities, such as during storms, causing scour at the outlet and suggested placing boulders downstream to serve as grade control. J. Sargent replied that normal velocities should not be high enough to cause that kind of erosion but that there are existing granite blocks in the channel immediately downstream of the concrete slab that could be moved during construction to serve as grade control instead of boulders.

M. Dube noted that the Cold River is a designated river. The Cold River Local Advisory Committee has been contacted and expressed a concern for a drop off at the junction of the Cold River and Warren Brook. M. Dube and J. Sargent did not observe a drop off at the actual junction of the two waterways located just west of the project area; it is assumed this drop off references the existing perch at the outlet of the concrete pad. This will be addressed during construction, as noted above.

Mike Hicks, USACOE, asked why the bridge needs to be replaced. J. Sargent explained that deterioration of the T-beams and corrosion has made continued maintenance/rehab untenable and replacement is now the best option. David Scott, NHDOT Bureau of Bridge Design, noted that this bridge is red listed, approximately #60 in the state.

M. Hicks inquired about the status of Section 106 review. M. Dube provided an update on the NEPA review, including Section 106. The project area is adjacent to the Alstead Village Historic District in the southwest quadrant, however we are not intending to impact the District and an Individual Inventory of the bridge confirmed that it is not included in the District and is not individually eligible for listing on the National Register for Historic Places so the project has been found to have no effect on historic properties by FHWA and NHDHR. Coordination with the Office of Strategic Initiatives regarding flood resources is ongoing, however, it is anticipated that the proposed design will have a positive impact on flood capacity due to the increased opening. There are no conservation lands in the vicinity of the project area. Japanese knotweed is the only invasive species, and it is common throughout the project. Appropriate BMPs will be employed during construction. Options for permanent stormwater treatment are being reviewed to treat as much of the additional runoff as possible from the proposed approximately 1000 square feet of increased impervious surface. Amy Lamb, NHNHB, confirmed that there are no known records of protected species or habitats in the project area. M. Dube stated that the project has been reviewed by the US Fish and Wildlife Service (USFWS) and is located in the range of the northern long-eared bat (NLEB). Because this project is designed to be constructed in one season, all bridge work and minor tree clearing will occur during the NLEB active season. This project meets the requirements of the FHWA/USFWS Programmatic Biological Opinion and consultation has been initiated with a May Affect, Likely to Adversely Affect finding due to the work during the active season.

This project has been previously discussed at the 1/21/2015 Monthly Natural Resource Agency Coordination Meeting.

Ellsworth, #40874 (X-A004(514))

Matt Healey, NHDOT Highway Design, provided an overview of the project area and scope, which involves paving the existing gravel travel way on Stinson Lake Road in Ellsworth. The project area begins just north of the bridge over Sucker Brook near the intersection of Ranch Road and extends northerly approximately 4200 ft, ending just past the existing turnaround north of Brown Brook bridge . This project is funded through the FHWA Federal Lands Access Program (FLAP) and was originally initiated by NHDOT Maintenance District 2. The existing gravel roadway has steep side slopes and deteriorated or undersized drainage structures in many locations and is susceptible to washouts and erosion during storm events. Additionally, this segment of Stinson Lake Road is maintained by NHDOT Maintenance crews during the winter, but the gravel segment requires a separate truck for the application of sand instead of salt which is applied on the paved roadway to the south of the project. The intent of the project is to pave the road to make winter maintenance easier and upgrade the drainage structures, ditch lines, embankment slopes and guardrail to make the roadway more stable, reduce erosion and sedimentation of nearby wetland systems, and increase safety and accessibility for the traveling public. The proposed design includes an 18' wide paved roadway with intersecting roadway and driveway tie-ins, 1' gravel shoulders, construction and stabilization of ditch lines, slope flattening and stabilization with rip-rap, replacement and upsizing of culverts where necessary, and replacement and extension of guardrail at the northern end of the project.

Meli Dube, NHDOT Bureau of Environment, provided an update on the NEPA review. The project area passes through the White Mountain National Forest at two locations, both of which have

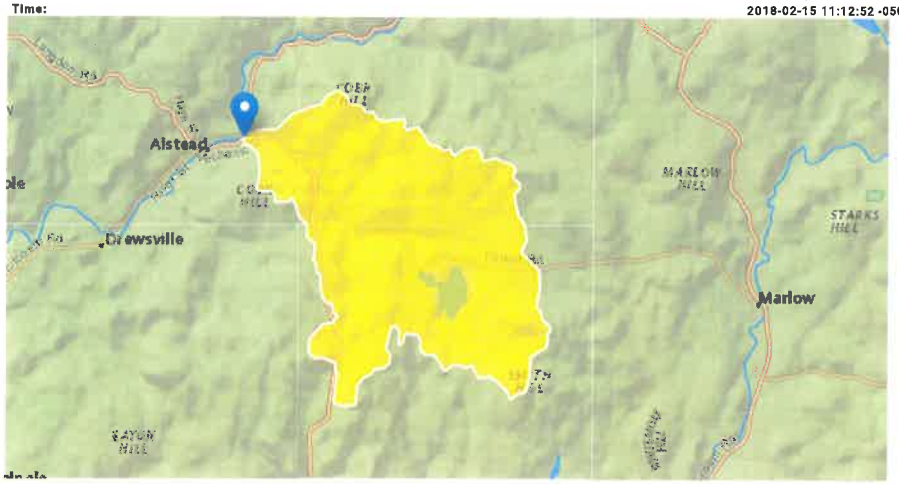
March 12, 2018

NHDOT Alstead 20817
NHDES Wetlands Bureau Standard Dredge and Fill Application
Mitigation Discussion

Warren Brook incurred significant damage and erosion during the large flooding event in 2005 which affected many of the water courses in the Town of Alstead and the surrounding area. The crossing of NH Route 123A over Warren Brook was included in the 2007 Cold River Restoration Master Plan Fluvial Geomorphic Assessment. At that time, the bank full width of the crossing was determined to be 38' based on measurements taken in the damaged stream bed. NHDOT employees completed a new assessment in August, 2015 after the restoration of Warren Brook was complete and determined that the current bank full width is 43'. The crossing of NH Route 123A over Warren Brook is a Tier 3 stream crossing, as defined in NHDES Wetlands Rules Env-Wt 904.04, as the contributing watershed of Warren Brook at the project location is 12.52 square miles. Env-Wt 904.05 details requirements for compliant replacements of Tier 3 stream crossings. A stream with a bank full width of 43' requires a structure with a 54' span from abutment to abutment in order for the structure to be compliant with Env-Wt 904.05. The proposed structure has been designed to be in compliance with requirements set forth in Env-Wt 904.05 and will measure 57' in span from abutment to abutment. This and other criteria, such as presence of natural stream bottom, are discussed in the appropriate stream crossing forms located elsewhere in this proposal package. As all impacts to the banks and channel of Warren Brook are necessary for the removal of the non-compliant structure and the installation of the 57' span compliant bridge, there is no mitigation required for this work. This approach was discussed during the November 15, 2017 Natural Resource Agency Meeting where Lori Sommer, NHDES Wetlands Bureau, confirmed that compliant structures do not require mitigation.

Alstead 20817 StreamStats Report

Region ID:	NH
Workspace ID:	NH20180215161238095000
Clicked Point (Latitude, Longitude):	43.15183, -72.35012
Time:	2018-02-15 11:12:52 -0500



12.52 square miles = 8,012.8 acres = Tier 3 Stream Crossing

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	12.52	square miles

NH Department of Transportation
Bureau of Bridge Design (#18)
Alstead 20817

Env-Wt 904.05 Design Criteria for Tier 2 and Tier 3 Stream Crossings
New & Replacement Tier 3 Crossings

Please describe how the project meets the following criteria:

(a) The crossing shall be designed in accordance with the NH Stream Crossing Guidelines.

The proposed project is compliant with the stream crossing rules. It's length perpendicular to the stream is 57' which exceeds the required 54'. The new structure will not alter the natural stream alignment. Special consideration will be given to any rare, threatened or endangered species during construction of the project. Currently the only know potential species is the long eared bat an inspections to date have not found signs of it at the project location.

(b) The design shall include bed forms and stream bed characteristics necessary to cause water depths and velocities within the crossing at a variety of flows to be comparable to those found in the natural channel upstream and downstream of the crossing.

The proposed project will remove a concrete steam bed slab exposing the natural stream bed. The two existing abutments that sit at the edge of low water line well be removed and the contours upstream and downstream of the bridge will be blended returning the banks to a natural configuration.

(c) There shall be vegetated banks upstream and downstream of the crossing.

The river banks will remain vegetated upstream and downstream of the crossing, except for where rip-rap will be placed to protect the abutment, piles and wings. Any disturbed areas that are not identified to be armored with rip rap will be planted with a stabilizing seed mix.

(d) The natural alignment and gradient of the stream channel shall be preserved so as to accommodate natural flow regimes and the functioning of the natural floodplain.

The proposed project does not alter the stream alignment or gradient of the river and returns it back to a pre 1935 configuration. The project also results in a larger hydraulic opening.

(e) The 100-year flood frequency shall be accommodated to ensure that there is (1) no increase in flood stages on abutting properties and (2) flow and sediment transport characteristics will not be affected in a manner that could adversely affect channel stability.

The proposed project does not have the potential to cause or increase, erosion, sedimentation or chance of flooding. The hydrology & hydraulics study that was performed determined that the proposed bridge will increase the waterway opening from 170 sf to 275 sf and provide 2'-0" of free board while passing the Q100. This is due primarily to removing the constriction caused by the existing abutments and increasing the perpendicular stream crossing length from 23 ½' to 57'.

(f) A natural stream channel shall be simulated through the structure.

A water diversion structure will be used when removing the existing abutments from the edge of the stream. The proposed project will also remove the concrete steam bed slab to expose the natural stream bed. Finally upstream and downstream topography will be blended under the proposed bridge, returning the banks to their natural configuration. The final configuration should mimic the pre 1935 habitat.

(g) Sediment transport competence shall not be altered. **Sediment transport competence will not be altered by the proposed project. The project results in a larger hydraulic opening and reduced stream velocity. The normal bank full flows will not be affected by the project and not alter sediment transport.**

A Tier 2 stream crossing shall be a span structure, pipe arch embedded with stream simulation, open-bottom culvert with stream simulation, or closed-bottom culvert embedded with stream simulation.

A Tier 3 stream crossing shall be a span structure or an open-bottom culvert with stream simulation.

If any of the above criteria cannot be met, approval for an alternative design must be requested and a technical report (Env-Wt 904.09) must be included with the application package.

New Hampshire Natural Heritage Bureau

To: Melilotus Dube
7 Hazen Drive
Concord, NH 03301

Date: 8/14/2017

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 8/14/2017

NHB File ID: NHB17-2517

Applicant: Melilotus Dube

Location: Tax Map(s)/Lot(s):
Alstead

Project Description: NHDOT Alstead 20817. The proposed project will replace the existing bridge carrying NH Route 123A over Warren Brook. NH Route 123A will be widened and the new bridge will be shifted to the east slightly in order to allow for a more adequate turning radius at the intersection of NH Route 123/12A just south of the bridge.

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

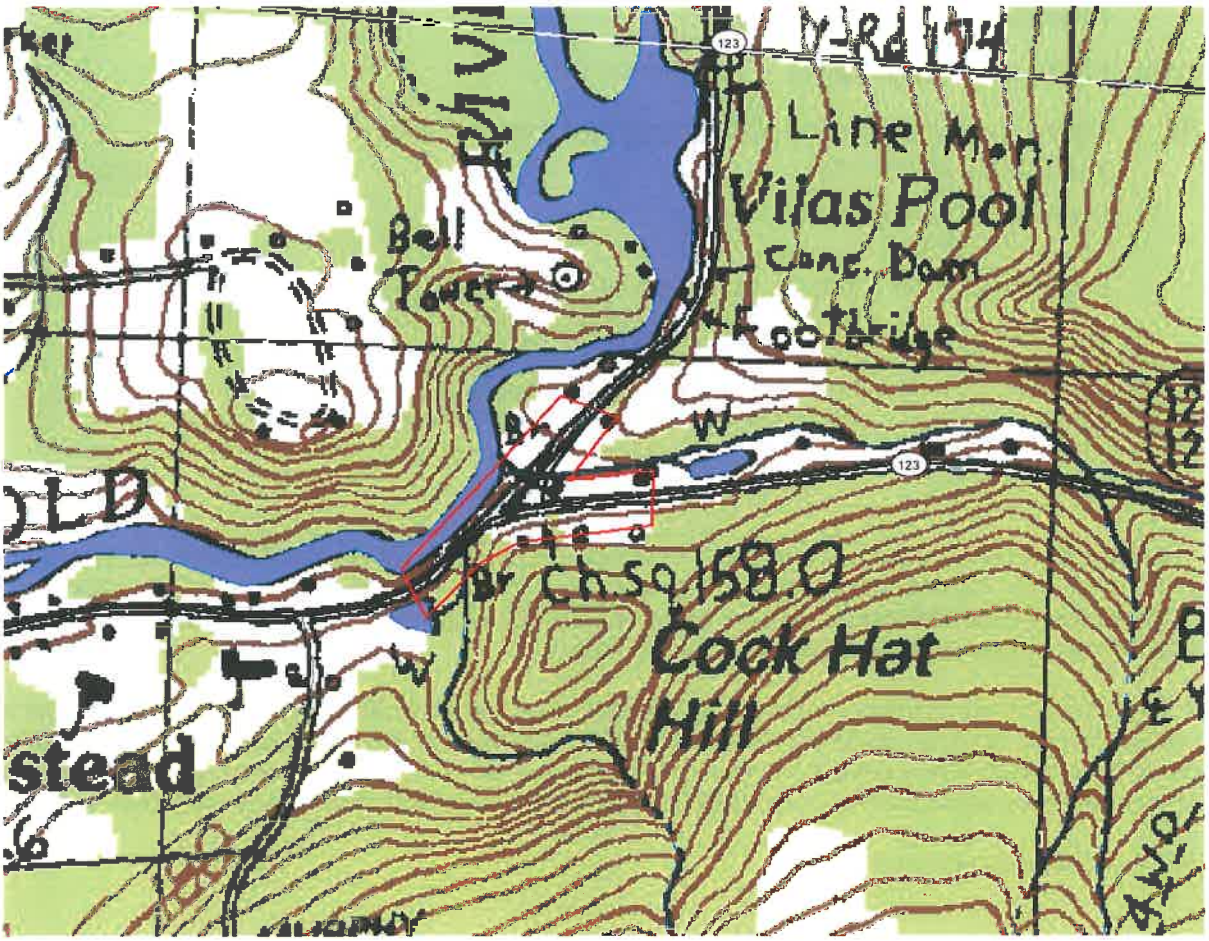
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

This report is valid through 8/13/2018.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Road
Concord NH 03301

MAP OF PROJECT BOUNDARIES FOR NHB FILE ID: NHB17-2517



Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Road
Concord NH 03301

Dube, Melilotus

From: Lamb, Amy
Sent: Monday, November 06, 2017 10:32 AM
To: Dube, Melilotus
Subject: RE: Official NHB Report for project NHB17-2517 (NHDOT Alstead 20817)

Hi Meli,

This email is to confirm that all known Northern Long-Eared Bat hibernacula are greater than 0.5 miles from the project area. Thank you for checking with us.

-Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323
amy.lamb@dncr.nh.gov

NH Natural Heritage Bureau
DNCR - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

Please note: DRED no longer exists; NHB is now part of the **Department of Natural and Cultural Resources (DNCR)**. Please update your address book with my new email address.

From: Dube, Melilotus
Sent: Monday, November 06, 2017 9:26 AM
To: Lamb, Amy
Subject: RE: Official NHB Report for project NHB17-2517 (NHDOT Alstead 20817)

Amy,
This project proposes to replace the bridge carrying NH Route 123A over Warren Brook in Alstead. This NHB report came back with no known records of any species in the project area. Our records show that Alstead is home to a known NLEB hibernaculum site. Can you confirm for me that the hibernaculum is more than 0.5 miles away from this project location?
Thank you!
Meli

From: Amy.Lamb@dred.nh.gov [mailto:Amy.Lamb@dred.nh.gov]
Sent: Monday, August 14, 2017 10:30 AM
To: Dube, Melilotus
Subject: Official NHB Report for project NHB17-2517
Importance: High

Dear Melilotus Dube:

Your official NHB Report has been generated for NHB DataCheck project #NHB17-2517, submitted on 8/14/2017.

Please see the attached document NHB17-2517.pdf.

The Report is valid through 8/13/2018.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

Amy Lamb
Environmental Information Specialist,
Division of Forest & Lands - Natural Heritage Bureau,
Department of Resources and Economic Development
172 Pembroke Road
Concord, NH 03301

603-271-2215
www.nhnaturalheritage.org

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2017-SLI-2440
Event Code: 05E1NE00-2018-E-02251
Project Name: Alstead 20817

February 15, 2018

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2017-SLI-2440

Event Code: 05E1NE00-2018-E-02251

Project Name: Alstead 20817

Project Type: TRANSPORTATION

Project Description: The proposed project will replace Bridge 073/163 carrying NH Route 123A over Warren Brook. The new alignment will widen NH Route 123A and shift the bridge to the east of the existing location in order to allow for a more adequate turning radius at the intersection of NH Route 123/12A just south of the bridge.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.151530256742575N72.34991316163621W

Counties: Cheshire, NH

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9045

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

March 5, 2018

Rebecca Martin
Bureau of Environment
NH Department of Transportation
7 Hazen Drive
P.O. Box 483
Concord, New Hampshire 03302-0483

Re: NH DOT Alstead 20817, NH Route 123A bridge over Warren Brook
TAILS: 05E1NE00-2017-F-2440

Dear Ms. Martin:

The U.S. Fish and Wildlife Service (Service) is responding to your request, dated February 16, 2018, to verify that the NH DOT Alstead 20815 project (Project), in Alstead, New Hampshire may rely on the December 15, 2016, Programmatic Biological Opinion (BO) for federally funded or approved transportation projects that may affect the federally threatened northern long-eared bat (*Myotis septentrionalis*) (NLEB). We received your request and the associated Likely to Adversely Affect (LAA) Consistency Letter on February 20, 2018.

This letter provides the Service's response as to whether the Federal Highway Administration may rely on the BO to comply with section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531, *et seq.*) for its effects to the NLEB.

The New Hampshire Department of Transportation (NHDOT), as the non-Federal agency representative for the Federal Highway Administration, has determined that the Project may affect, and is likely to adversely affect the NLEB. The Project proposes to replace and slightly realign the bridge carrying NH Route 123A over Warren Brook. The Project will require approximately 0.5 acre of tree clearing and bridge removal during the bat active season. The NHDOT also determined the Project may rely on the programmatic BO to comply with section 7(a)(2) of the ESA, because the Project meets the conditions outlined in the BO and all tree clearing related to the proposed work will occur farther than 0.25 mile from documented roosts and farther than 0.5 mile from any known hibernacula. The Service reviewed the LAA Consistency Letter and concurs with the NHDOT's determination. This concurrence concludes your ESA section 7 responsibilities relative to this species for this Project, subject to the Reinitiation Notice below.

Conclusion

The Service has reviewed the effects of the proposed Project, which include the NHDOT's commitment to implement the impact avoidance, minimization, and compensation measures as indicated on the LAA Consistency Letter. We confirm that the proposed Project's effects are consistent with those analyzed in the BO. The Service has determined that the Project is consistent with the BO's conservation measures, and the scope of the program analyzed in the BO is not likely to jeopardize the continued existence of the NLEB. In coordination with your agency, the Federal Highway Administration, and the other sponsoring Federal Transportation Agencies, the Service will reevaluate this conclusion annually in light of any new pertinent information under the adaptive management provisions of the BO.

Incidental Take of the Northern Long-eared Bat

The Service anticipates that tree removal associated with the proposed Project will cause incidental take of the NLEB. However, the Project is consistent with the BO, and such projects will not cause take of NLEBs that is prohibited under the final 4(d) rule for this species (50 CFR §17.40(o)). Therefore, this taking does not require exemption from the Service.

Reporting Dead or Injured Bats

The Federal Highway Administration, its State/local cooperators, and any contractors must take care when handling dead or injured NLEBs that are found at the project site, in order to preserve biological material in the best possible condition and to protect the handler from exposure to diseases, such as rabies. Project personnel are responsible for ensuring that any evidence about determining the cause of death or injury is not unnecessarily disturbed. Reporting the discovery of dead or injured listed species is required in all cases to enable the Service to determine whether the level of incidental take exempted by this BO is exceeded, and to ensure that the terms and conditions are appropriate and effective. Parties finding a dead, injured, or sick specimen of any endangered or threatened species must promptly notify the Service's New England Field Office.

Reinitiation Notice

This letter concludes consultation for the proposed Project, which qualifies for inclusion in the BO issued to the Federal Transportation Agencies. To maintain this inclusion, a reinitiation of this project-level consultation is required where the Federal Highway Administration's discretionary involvement or control over the Project has been retained (or is authorized by law) and if:

1. new information reveals that the Project may affect listed species or critical habitat in a manner or to an extent not considered in the BO;
2. the Project is subsequently modified in a manner that causes an effect to listed species or designated critical habitat not considered in the BO; or
3. a new species is listed or critical habitat designated that the Project may affect.

In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending reinitiation.

We appreciate your continued efforts to ensure that this Project is fully consistent with all applicable provisions of the BO. If you have any questions regarding our response, or if you need additional information, please contact Susi von Oettingen of this office at 603-227-6418.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

Date Reviewed:	12/13/2016		
Project Name:	Alstead		
State Number:	20817	**FHWA Number:**	X-A002(091)
Environmental Contact:	Meli Dube	**DOT**	
Email Address:	Melilotus.dube@dot.nh.gov	**Project Manager:**	David Scott
Project Description:	Replace the bridge that carries NH Route 123A over Warren Brook (073/163)		

Please select the applicable undertaking type(s):

☐	1. Modernization and general highway maintenance **that may require additional highway right-of-way or easement**, and which is **not within the boundaries of a historic property or district,** including:
	Choose an item. Choose an item.
☒	2. Non-historic bridge and culvert maintenance, renovation, or total replacement, **that may require minor additional right-of-way or easement**, and which is **not within the boundaries of a historic property or district**, including:
	b. replacement or maintenance of non-historic bridges Choose an item.
☐	3. Historic bridge maintenance activities within the limits of existing right-of-way, including:
	Choose an item. Choose an item.
☐	4. Stream stabilization and restoration activities (including removal of debris or sediment obstructing the natural waterway, or any non-invasive action to restore natural conditions).
☐	5. Construction of bicycle lanes and pedestrian walkways, sidewalks, shared-use paths and facilities, small passenger shelters, and alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons, **not within the boundaries of a historic property or district**.
☐	6. Installation of bicycle racks, **not within the boundaries of a historic property or district**.
☐	7. Recreational trail construction, **not within the boundaries of a historic property or district**.
☐	8. Recreational trail maintenance when done on existing alignment.
☐	9. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, **not within the boundaries of a historic property or district, and no historic railroad features are impacted,** including, but not limited to:
	Choose an item. Choose an item.
☐	10. Acquisition or renewal of scenic, conservation, habitat, or other land preservation easements
☐	11. Installation of Intelligent Transportation Systems.

Please describe how this project is applicable under Appendix B of the Programmatic Agreement.

An individual inventory form was completed on the bridge, and it was determined that the 1935 concrete tee-beam bridge was not individually eligible, nor was it located within or contributing to the adjacent Alstead Village Historic District. Current plans will replace the bridge on alignment with any additional impacts occurring east of crossing. There will be no impacts to the west, into the Alstead Village Historic District.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

NHDOT in-house projects: Please append photographs, USGS maps, design plans and as-built plans, if available, for review.
LPA projects: Please submit this Certification Form along with the Transportation RPR

Coordination Efforts:

Has an RPR been submitted to NHDOT for this project?	Yes	NHDHR R&C # assigned?	RPR 6310
Please identify public outreach effort contacts; method of outreach and date:	Letters were sent to town officials, including the Historic District Commission on 1/11/2016, no responses were received. A public information meeting was held on 12/13/2016, no concerns for natural or cultural resources were raised.		

Finding: (To be filled out by NHDOT Cultural Resources Staff)

☐	**No Potential to Cause Effects**	☒	**No Historic Properties Affected**
This finding serves as the Section 106 Memorandum for your environmental documents, no further coordination is necessary.			
☐	This project does *not* comply with Appendix B, and will continue under the Section 106 review process outlined in 36 CFR 800.3-800.7. Please contact NHDOT Cultural Resources Staff to determine next steps.		
NHDOT comments:			

Jill Edelblute — NHDOT Cultural Resources Staff

12/19/2016 — Date

Coordination of the Section 106 process should begin as early as possible in the planning phase of the project (undertaking) so as not to cause a delay.

Project sponsors should not predetermine a Section 106 finding under the assumption that an undertaking conforms to the types listed in Appendix B until this form is signed by the NHDOT Bureau of Environment Cultural Resources Program staff.

Every project shall be coordinated with, and reviewed by the NHDOT-BOE Cultural Resources Program in accordance with the Cultural Resources Programmatic Agreement among the Advisory Council on Historic Preservation, Federal Highway Administration, NH Department of Transportation, and the State Historic Preservation Office. In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

If any portion of the undertaking is not entirely limited to any one or a combination of the types specified in Appendix B (with, or without a portion that is included as a type listed in Appendix A), please continue discussions with NHDOT Cultural Resources staff.

This No Potential to Cause Effect or No Historic Properties Affected project determination is your Section 106 finding, as defined in the Programmatic Agreement.

Should project plans change, please inform the NHDOT Cultural Resources staff in accordance with Stipulation VII of the Programmatic Agreement.

cc Jamie Sikora, FHWA
Laura Black, SHPO
Meli Dube, NHDOT

US Army Corps of Engineers
New England District

U.S. Army Corps of Engineers
New Hampshire Programmatic General Permit (PGP)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See PGP, GC 5 regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*		X
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, shellfish beds, special wetlands and vernal pools (see PGP, GC 26 and Appendix A)? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) website, www.nhnaturalheritage.org, specifically the book Natural Community Systems of New Hampshire.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	X	
2.5 The overall project site is more than 40 acres.		X
2.6 What is the size of the existing impervious surface area?	9,220 sf	
2.7 What is the size of the proposed impervious surface area?	10,320 sf	
2.8 What is the % of the impervious area (new and existing) to the overall project site?	41.5%	
3. Wildlife	Yes	No
3.1 Has the NHB determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require a NHB determination.)		X
3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html.		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the PGP, GC 21?	X	

4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?		X
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	n/a	
5. Historic/Archaeological Resources		
If a minor or major impact project, has a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) been sent to the NH Division of Historical Resources as required on Page 5 of the PGP?**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.
** If project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

February 15, 2018

NHDOT Alstead 20817
Wetland Impact Location Photographs

Figure 1. View of project area looking south towards NH Route 123/NH Route 12 from north of Bridge 073/163 on NH Route 123A. (Meli Dube, September 2017)

Figure 2. View of project area looking north towards NH Route 123A from south of Bridge 073/163 from the intersection of NH Route 123A and NH Route 123/NH Route 12. (Meli Dube, September 2017)

Figure 3. Impact Areas E and C: View of Warren Brook looking downstream (west) towards the confluence of the Cold River through the crossing, including the existing concrete pad, from upstream (east) of Bridge 073/163. Proposed channel impacts will be due to removal of the concrete pad and existing abutments, work access and installation of BMPs. (Meli Dube, September 2017)

Figure 4. Impact Areas C, E and H: View of Warren Brook looking upstream (east) through the crossing, including the existing granite slabs and perch at the outlet and the existing concrete pad, from downstream (west) of Bridge 073/163. Proposed channel impacts due to removal of granite slabs, concrete pad and abutments, work access and installation of BMPs. (Meli Dube, September 2017)

Figure 5. Impact Areas H, J and I: View of the upstream channel and bank in the southeastern quadrant of the crossing from the upstream bank in the northeastern quadrant. Proposed bank impacts due to removal of wingwall and grading to match upstream slope, channel impacts due to work access and installation of BMPs. (Meli Dube, September 2017)

Figure 6. Impact Areas I, J, H, G and F: View of the upstream channel and bank in the northeastern quadrant of the crossing from Bridge 073/163. Proposed bank impacts due to removal of wingwall and grading to match upstream slope, proposed channel impacts due to work access and installation of BMPs.

Figure 7. Impact Areas C, B and A: View of downstream channel and bank in the northwestern quadrant of the crossing from Bridge 073/163. Proposed bank impacts due to removal of wingwall and grading to match downstream slope, proposed channel impacts due to removal of granite slabs, work access and installation of BMPs. (Meli Dube, September 2017)

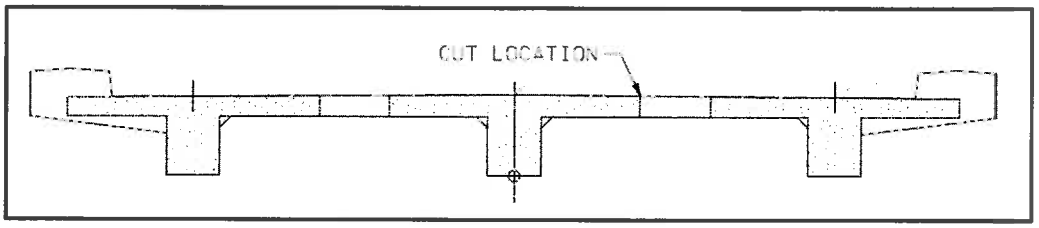
Figure 8. Impact Areas C and D: View of downstream channel and bank in the southwestern quardrant of the crossing from Bridge 073/163. Proposed bank impacts due to removal of wingwall and grading to match downstream slope, proposed channel impacts due to work access and installation of BMPs. (Meli Dube, September 2017)

Construction Sequence Discussion

The existing bridge consists of a 1935 concrete "T" beam (3 tees) superstructure on a mass concrete substructure. It's length is 23.6' perpendicular to the stream and 30' along the skew. The proposed bridge is 60' perpendicular to the stream and 70' on the skew, exceeding the stream crossing guidelines.

The town requested a phased construction sequence over accelerated bridge construction with a road closure, so both phased options were studied (shifted to the East & shifted to the West). East was chosen due fewer impacts.

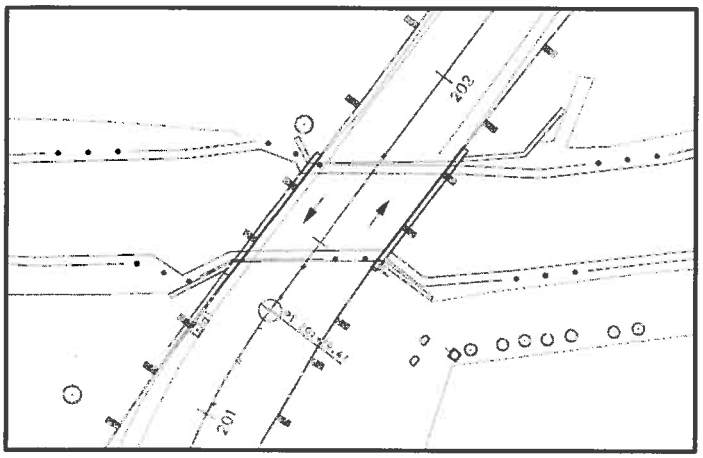
Because the existing bridge's superstructure is made up of 3 concrete "T" beams there is only one location it can be cut longitudinally and still remain a viable structure. The location of this cut line sets the location of the new bridge and the need to maintain one lane of traffic results in a slightly over widened bridge.



Due to the bridge's location (next to the intersection of route 123A to 123 & 12A) and the existing curved alignment, most of the over widening is used to accommodate truck turning radiuses and the transitions to the existing roadway width.

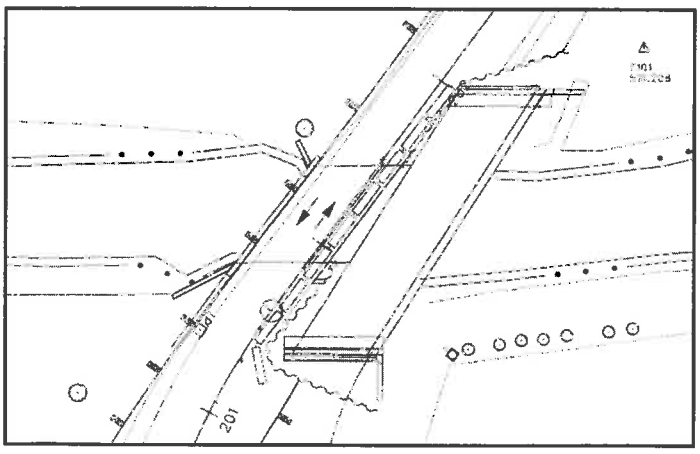
Proposed Construction Sequence (shown below)

Existing Bridge



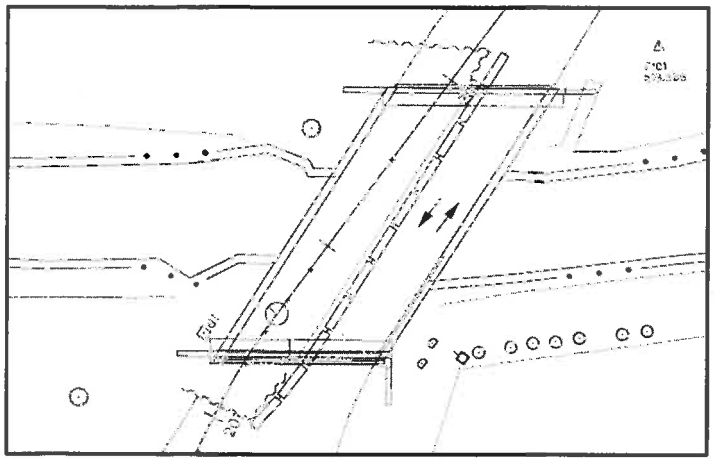
Pre-construction Activities

1) Install silt fence, cofferdams and other sedimentation control measures
2) Install water diversion
3) Stage equipment
4) Install traffic control
5) Shift traffic to west side of bridge and maintain alternating one lane two-way traffic



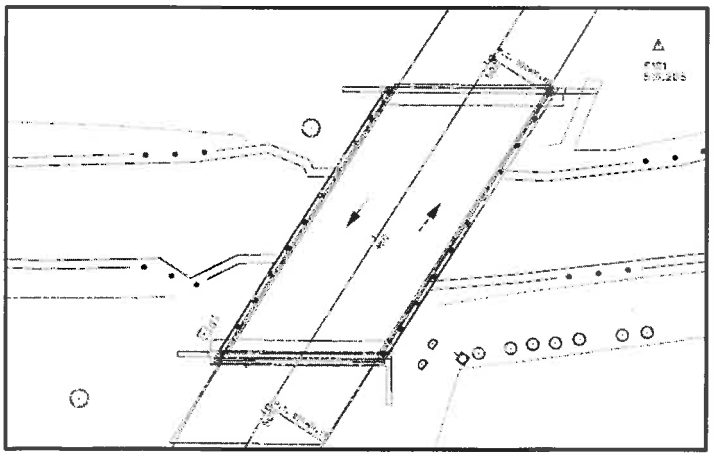
Phase 1 Construction

6) Remove east side of existing bridge
7) Leave existing abutment in place
8) Drive piles behind existing abutment
9) Construct stub abutment
10) Adjust water diversion
11) Remove SE section of abutment & river slab
12) Adjust water diversion
13) Remove NE section of abutment & river slab
14) Construct phase 1 superstructure



Phase 2 Construction

15) Move/add to existing silt fence pre phase 2 construction
16) Add to existing cofferdam & remove a portion of phase 1 cofferdam
17) Adjust water diversion
18) Adjust traffic control
19) Shift traffic to the newly constructed east side of the bridge and maintain alternating one lane two-way traffic
20) Remove west half of existing superstructure
21) Drive piles
22) Construct stub abutment
23) Adjust water diversion
24) Remove remaining existing SW abutment and streambed slab
25) Adjust water diversion
26) Remove remaining existing NW abutment & streambed slab
27) Construct phase 2 superstructure



Proposed Bridge

28) Adjust water diversion, sediment control & silt fences as needed for final grading
29) Proceed with final grading and site stabilization
30) Remove water diversion
31) Return traffic to 2 way (one lane in each direction)
32) Prepare for final inspection

This bridge project will rebuild the stream banks in the vicinity of the existing bridge to match upstream & downstream banks. Also the existing concrete stream bed slab will be removed to expose the original stream bed.

PART Env-Wt 404 CRITERIA FOR SHORELINE STABILIZATION

Env-Wt 404.01 Least Intrusive Method. Shoreline stabilization shall be by the least intrusive but practical method.

The NHDOT inspection report rates the deck as a "3" (serious) and since this superstructure is comprised of concrete "T" beams the deck is also an integral part of the longitudinal structural beams. "T" beams are practically problematic to repair and due to this feature we are and generally force to a complete superstructure replacement for all except the most minor deterioration cases.

The sub structure rates a "5" (fair) with some of its footing exposed on the downstream side.

A complete replacement seems the most prudent approach. This will allow removing the streambed slab, exposing the 1930's stream bottom, push the abutments back to meet the stream crossing rules and restore the pre 1930's stream banks.

To achieve these improvements, minor rip rap to protect the piles will be required.

Env-Wt 404.02 Diversion of Water. Diversion of stormwater run-off often provides effective and low maintenance erosion protection, and shall be used to the maximum extent practical.

The proposed bridge's substructure was pushed back from the streambank and the choice of stub abutment on piles was chosen in part to reduce construction impacts.

Removal of the existing substructure is intended to take place after construction of the proposed substructure to take advantage of the existing abutments water diversion characteristics.

Cofferdams, water diversions and other 645.XXX items will be included in the project to give construction the tools they need to handle storm water and water diversion.

Env-Wt 404.03 Vegetative Stabilization.

(a) Natural vegetation shall be left intact to the maximum extent possible. If space and soil conditions allow, unstable banks shall be cut back to a flatter slope, seeded, and replanted with native, non-invasive trees and shrubs.

The design limited impacts to only the sections of the steam banks that were needed return it to its pre 1930's state. All banks will be stabilized and all banks will be vegetated except for the rip-rap directly under the bridge and a small section in front of the wings.

Road shifts and drainage adjustments have been keep to only what is needed for construction. All areas will be seeded upon final grading

(b) If space relative to the highest observable tide line, water turbulence, and soil conditions allow, the project shall include vegetation of existing sand beach or dunes or construction of vegetated sand dunes.

Project is not located in a coastal zone.

Env-Wt 404.04 Rip-rap.

(a) Rip-rap applications shall be considered only where the applicant demonstrates that anticipated turbulence, flows, restricted space, or similar factors render vegetative and diversion methods physically impractical.

The existing 1935 bridge has a water way opening of 170 sf and a 23 ½' perpendicular stream crossing length. The 2005 flood washed out the road, NE wing and may have contributed to the scour on the SW corner, where the top of the footing are now exposed.

To reduce scour concerns the proposed bridge will have a 275 sf opening and a 57' perpendicular stream crossing as well as use a stub abutment piles. Rip rap will be used stabilize the bank under the bridge and to add protection to the piles. Rip-rap will also be used a short distance on either side of the bridge to blend the slopes to the natural stream bank.

(b) Applications for rip-rap shall include:

(1) Designation of a minimum and maximum stone size;
Class III rip-rap, nominal size: 12" maximum size :24"

(2) Gradation;
Per Table 583-1 of NHDOT Standard Specification

(3) Minimum rip-rap thickness;
2.5' thick

(4) Type of bedding for stone;
Geotextile Perm control CL.-1 non-woven

(5) Cross-section and plan views of the proposed installation;
Cross-section on Existing & Proposed Contours plan sheet 7

(6) Sufficient plans to clearly indicate the relationship of the project to fixed points of reference, abutting properties, and features of the natural shoreline; and
See Erosion & sediment Control Plan (sheet 6)

(7) A description of anticipated turbulence, flows, restricted space, or similar factors that would render vegetative and diversion methods physically impractical.
Rip-rap is needed in front of the abutment and wings to protect abutments, piles and wings from scour. Visual observation of the existing crossing indicates that velocities are accelerated through the constriction of the existing bridge affecting the natural streambed and banks.

(c) Applications to use rip-rap adjacent to great ponds or water bodies where the state holds fee simple ownership shall include a stamped surveyed plan showing the location of the normal high water shoreline and the footprint of the proposed project.

See Wetlands Impact plan

(d) Rip-rap shall be located shoreward of the normal high water shoreline, where practical, and shall not extend more than 2 feet lakeward of that line at any point.

n/a

(e) Stamped engineering plans shall be provided as part of any application for rip-rap in excess of 100 linear feet along the bank of a stream or river.

Stamped Wetlands Impact plan is provided

SECTION 583 -- RIPRAP

Description

1.1 This work shall consist of furnishing and placing riprap as shown on the plans or ordered. Riprap is typically required for erosion protection of bridge structures in waterways, for active waterway channel slopes and bottoms, and for intermittent waterway channels where the Engineer determines riprap protection is required to resist expected high water flow velocities.

Materials

2.1 Riprap shall be quarry stone of approved quality, hard, durable, sub-angular to angular in shape, resistant to weathering and free from structural defects such as weak seams and cracks.

2.1.1 The suitable shape of the individual stones shall be angular, meeting the gradation in 2.1.1.2 to create interlocking riprap to provide stability of the slope or channel. Round, thin and platy, elongated or needle-like shapes shall not be used.

2.1.1.1 The suitable riprap stone shape is determined by the Length to Thickness ratio, where Length is the longest dimension and Thickness is the shortest dimension, measured in perpendicular axes to each other. The suitable riprap stone shape shall have a length to thickness ratio of no greater than 3.

2.1.1.2 The gradation requirements of the riprap classes in Table 583-1 are based on the stone size Width, the largest dimension perpendicular to the Length and Thickness, and the distribution of stone sizes by volume. The volume distribution requires that 15 percent of the stone in the mass shall be no larger than the volume shown in the table (< 15% column), and 15 percent of the stone in the mass shall be no smaller than the volume shown in the table (> 85% column). The remaining 70 percent of the stone in the mass shall have a volume between these requirements, averaging to the volume shown in the table (15% - 85% column). None of the stones in the mass shall exceed the maximum volume shown in the table (Maximum column).

Table 583-1

Riprap Classes and Sizes			Percentage Distribution of Particle Sizes by Volume (cubic feet)			
Class	Nominal Size (in)	Maximum Size (in)	< 15%	15% – 85%	> 85%	Maximum
I	6	12	0.05	0.14	0.31	1.0
III	12	24	0.4	1.0	2.5	6.5
V	18	36	1.3	3.5	8.5	22
VII	24	48	3	8	19	53
IX	36	72	10	27	65	179

Note: Nominal Size and Maximum Size are based on the Width dimension of the stone. The riprap classes conform to the standard classes described in the FHWA HEC-23 publication.

2.1.2 The sources from which the stone is obtained shall be selected well in advance of the time when the material will be required in the field. The acceptability of the riprap stone shape and grading will be determined by the Engineer.

2.1.3 Control of the gradation will be completed by visual inspection approval by the Engineer of a stockpile at the quarry or other agreed site. Mechanical equipment as needed to assist in checking the stockpile gradation shall be provided by the Contractor. Stockpile replenishment will require re-approval.

2.2 Gravel blanket material shall conform to 209.2.1.2.

2.3 Geotextile shall conform to 593.2.

Construction Requirements

3.1 Preparation of slopes. Slopes that will be covered by riprap shall be free of brush, trees, stumps, and other organic material and shall be graded to a smooth surface. All soft material shall be removed to the depth shown on the plans or as directed and replaced with approved material per 203.3.6. It is the Contractor's responsibility to protect embankments and excavated slopes from erosion during construction of the riprap covered slope.

3.2 Gravel blanket construction. When called for on the plans, the gravel blanket shall be placed on the prepared area to the specified thickness in one operation, using methods which will not cause segregation of particle sizes within the layer. The surface of the finished layer shall be even and free from mounds or windrows.

3.3 Geotextile placement. Geotextile shall be placed in accordance with 593.3.

3.4 Riprap placement. Riprap shall be constructed to the dimensions shown on the plans or as directed by the Engineer.

3.4.1 Placement of riprap shall be conducted as soon as possible after gravel blanket or geotextile placement.

3.4.2 Placement of the riprap shall be started at the toe (key trench) and progress up the slope. The key trench at the bottom of the riprap shall be constructed as shown on the plans. If bedrock is encountered at the key trench it shall be brought to the attention of the Engineer to determine if modification to the riprap installation is needed.

3.4.3 Riprap shall be placed over geotextile by methods that do no stretch, tear, puncture or reposition the fabric. Riprap smaller than 1.5 cu. ft. in volume shall be placed with drop heights of less than 3 ft. to the placement surface. Riprap greater than 1.5 cu. ft. in volume shall be placed with no free fall height.

3.4.4 Equipment such as a clamshell, orange-peel bucket, skip or hydraulic excavator shall be used to place the riprap so it is well distributed and there is no large accumulations of either the larger or smaller sizes of stone. Dump trucks or front-end loaders tracked or wheeled vehicles shall not be used since they can destroy the interlocking integrity of the stone when driven over previously placed riprap. Placing the riprap by end dumping on the slopes will cause segregation and will not be permitted.

3.4.5 The riprap shall be placed in a manner which produces a well-graded mass. The larger stones shall be well distributed and the entire mass of riprap shall conform approximately to the gradation specified. Hand placing or rearranging of individual stones by mechanical equipment may be required to the extent necessary to secure the uniformity of gradation and surface specified. Fill voids between larger stones with small stones to ensure interlocking between the riprap.

3.4.6 After the riprap is in place, it shall be compacted by impacting (ramming) the exposed surface to produce a tight, locked surface, not varying more than 6" from the elevations shown on the plans.

3.4.7 Riprap placed in water requires close observation and increased quality control to ensure the required thickness, gradation and coverage is achieved.

Method of Measurement

4.1 Riprap will be measured by the cubic yard.

4.1.1 If the Engineer determines that in-place measurement is impracticable, the quantity for payment will be determined by loose measure in the hauling vehicle on the basis that 1 cubic yard vehicle measure is equivalent to 0.7 cubic yard in place.

Basis of Payment

5.1 The accepted quantity of riprap will be paid for at the Contract unit price per cubic yard (cubic meter) complete in place.

5.1.1 Only when the stone is examined in accordance with 2.1 and examination proves the gradation to be acceptable will payment be made as provided in 109.04.

5.1.2 Gravel blanket material specified or ordered will be paid for under Section 209.

5.1.3 Geotextile specified or ordered will be paid for under Section 593.

5.1.4 The accepted quantity of excavation required for placing riprap and for placing any underlying gravel blanket will be paid for under the item of excavation being performed. Excavation above refers only to excavation of original ground or to material ordered removed not shown on the plans.

5.1.5 Free borrow will not be required to replace the accepted quantity of stone obtained from the excavation. However, when the plans do not call for borrow but the quantity of material removed from excavation for use under this item requires the Contractor to furnish borrow to complete the work, such borrow will be subsidiary.

5.1.6 Replacement slope material resulting from the requirements of 3.1 will be paid in accordance with 203.5.1.9.

Pay item and unit:

583.1	Riprap, Class I	Cubic Yard
583.3	Riprap, Class III	Cubic Yard
583.5	Riprap, Class V	Cubic Yard
583.7	Riprap, Class VII	Cubic Yard
583.9	Riprap, Class IX	Cubic Yard

THESE PLANS MEET THE REQUIREMENTS OF ENV-WT 404.
CRITERIA FOR SHORELINE STABILIZATION

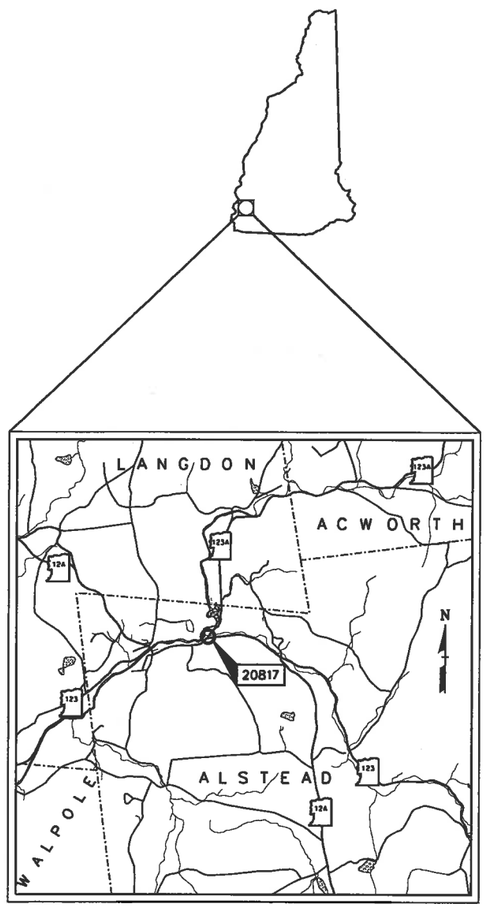
4/6/2018

BY: _____ DATE: _____

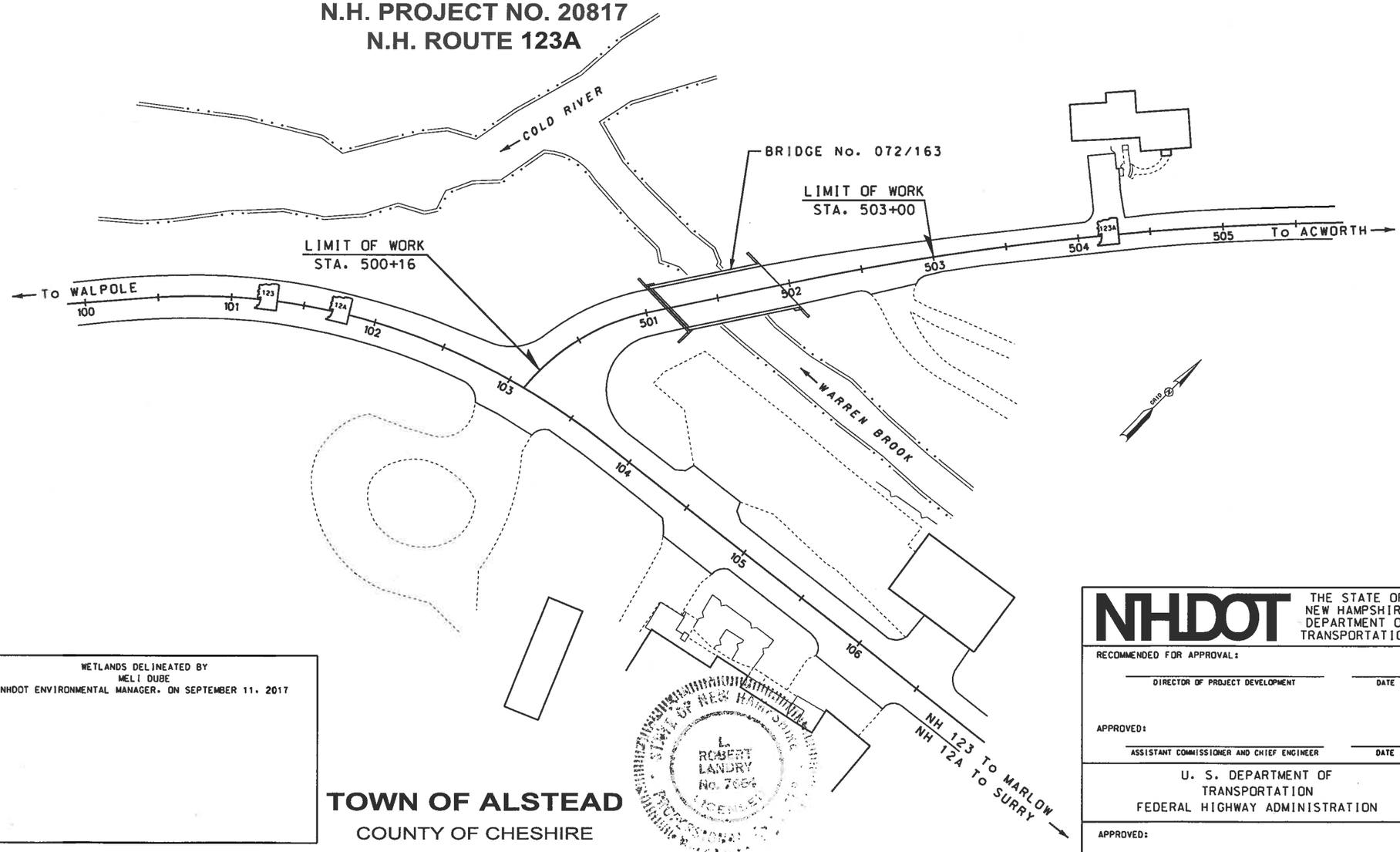
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

WETLANDS PLANS
FEDERAL AID PROJECT

X-A002(091)
N.H. PROJECT NO. 20817
N.H. ROUTE 123A



LOCATION MAP



INDEX OF SHEETS

WETLANDS DELINEATED BY
MELI DUBE
NHDOT ENVIRONMENTAL MANAGER. ON SEPTEMBER 11. 2017

TOWN OF ALSTEAD

COUNTY OF CHESHIRE

SCALE: 1" = 40'

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE CONSTRUCTION PLANS

NHDOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT — DATE

APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER — DATE

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR — DATE

DRAWN BY	PJP	DATE	2/2018		
CHECKED BY	JAS	DATE	2/2018		

SUBDIRECTORY	.DGN LOCATOR	FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Prj/Frontsheets	20817_FSW	X-A002(091)	20817	1	7

GENERAL

EDGE OF PAVEMENT
TRAVELED WAY
PROPOSED ROADWAY
existing roadway
(pavement removed outside slope lines)

DRIVEWAYS
(label surface type)

BUILDINGS
(building to be removed)
(label house or type of building)

FOUNDATION
(label type)

LEACH FIELD
leach field

BRIDGE CROSSINGS
STREAM
OVERPASS

STEPS AND WALK
(label type)

INTERMITTENT WATER COURSE

SHORE LINE
river/stream
pond
(label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS)
(deciduous) (coniferous) (stump)
(show station, circumference in feet & type)

TREE OR STUMP (CROSS-SECTIONS)

HEDGE
(label type)

MONITORING WELL
mon W

WELL
W

FLAG POLE
fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type)
existing
PROPOSED
bgr
cgr

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE)
(points toward retained ground)

FENCE (LABEL TYPE)

SIGNS
(single post)
(double post)

GAS PUMP
gp

FUEL TANK (ABOVE GROUND)
ft (label size & type)

STORAGE TANK FILLER CAP
fc

SEPTIC TANK
S

GRAVE
gr

MAILBOX
mb

VENT PIPE
vp

SATELLITE DISH ANTENNA
da

PHONE
ph

GROUND LIGHT/LAMP POST
gl lp

BORING LOCATION
B

TEST PIT
TP

INTERSTATE NUMBERED HIGHWAY
293

UNITED STATES NUMBERED HIGHWAY
3

STATE NUMBERED HIGHWAY
102

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE
2
PUB2E

DELINEATED WETLAND — DW
ORDINARY HIGH WATER — OHW
TOP OF BANK — TOB
TOP OF BANK & ORDINARY HIGH WATER — TOBOHW
NORMAL HIGH WATER — NHW
WIDTH AT BANK FULL — WBF
PRIME WETLAND — PWET
PRIME WETLAND 100' BUFFER — PWET100
NON-JURISDICTIONAL DRAINAGE AREA — NJDA
COWARDIN DISTINCTION LINE — CDL
TIDAL BUFFER ZONE — TBZ
DEVELOPED TIDAL BUFFER ZONE — DTBZ
HIGHEST OBSERVABLE TIDE LINE — HOTL
MEAN HIGH WATER — MHW
MEAN LOW WATER — MLW
VERNAL POOL — VP
SPECIAL AQUATIC SITE — SAS
REFERENCE LINE — REF
WATER FRONT BUFFER — WB50
NATURAL WOODLAND BUFFER — NWB150
PROTECTED SHORELAND — PS250
INVASIVE SPECIES LABEL
I.S. I I.S. II
INVASIVE SPECIES — INV

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY — FP500
100 YEAR FLOODPLAIN BOUNDARY — FP100
FLOODWAY — FW

ENGINEERING

CONSTRUCTION BASELINE
30 31 32
PC. PT. POT (ON CONST BASELINE)
PI (IN CONSTRUCTION BASELINES)
INTERSECTION OR EQUATION OF TWO LINES
ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)
PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)
SLOPE LINE
CLEARING LINE
SLOPE LINE
SLOPE LINE (FILL)
SLOPE LINE (CUT)
PROFILES AND CROSS SECTIONS:
ORIGINAL GROUND ELEVATION (LEFT) 72.5
FINISHED GRADE ELEVATION (RIGHT) 79.14

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

SUBDIRECTORY	REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Cadd/Env	11-21-2014	20817_WSYMBLS1	20817	2	7

DRAINAGE

MANHOLE
CATCH BASIN — cb
DROP INLET — di
(existing) (PROPOSED)

DRAINAGE PIPE (existing) (label size & type)
DRAINAGE PIPE (PROPOSED)
UNDERDRAIN (existing) W/ FLUSHING BASIN — fb (label size & type)
UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN
show direction of flow
HEADER (existing & PROPOSED) (with stone outlet protection)
END SECTION (existing & PROPOSED) METAL or PLASTIC / RCP
OPEN DITCH (PROPOSED)
EROSION CONTROL/ STONE SLOPE PROTECTION

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE (label type)
RR RIGHT-OF-WAY LINE
PROPERTY LINE — P
PROPERTY LINE (COMMON OWNER) — Z
TOWN LINE — BOW / CONCORD
COUNTY LINE — COOS / GRAFTON
STATE LINE — MAINE / NEW HAMPSHIRE
NATIONAL FOREST
CONSERVATION LAND — LC
BENCH MARK / SURVEY DISK
BOUND — bnd (PROPOSED)
STATE LINE/ TOWN LINE MONUMENT — S/L T/L
NHDOT PROJECT MARKER
IRON PIPE OR PIN — ip
DRILL HOLE IN ROCK — dh
TAX MAP AND LOT NUMBER — 156 / 14 — 1642/341 — 6.80 Ac.±
PROPERTY PARCEL NUMBER — 12
HISTORIC PROPERTY — H

UTILITIES

	existing	PROPOSED
TELEPHONE POLE	(plot point at face not center of symbol)	
POWER POLE		
JOINT OCCUPANCY		
MISCELLANEOUS/UNKNOWN POLE		
GUY POLE OR PUSH BRACE		
LIGHT POLE		
LIGHT ON POWER POLE		
LIGHT ON JOINT POLE		
POLE STATUS: REMOVE, LEAVE, PROPOSED, OR TEMPORARY AS APPLICABLE e.g.:	R L	P+04 25.0' T+04 25.0'
RAILROAD	(label ownership)	
RAILROAD SIGN		
RAILROAD SIGNAL		
UTILITY JUNCTION BOX	jb	JB
OVERHEAD WIRE	OW (label type)	OW
UNDERGROUND UTILITIES		
WATER (on existing lines label size, type and note if abandoned)	W	PW
SEWER	S	PS
TELEPHONE	T	PT
ELECTRIC	E	PE
GAS	G	PG
LIGHTING	L	PL
INTELLIGENT TRANSPORTATION SYSTEM	ITS	PITS
FIBER OPTIC	FO	PFO
WATER SHUT OFF	WSO	
GAS SHUT OFF	GSO	
HYDRANT		
MANHOLES		
SEWER	S	MHS
TELEPHONE	T	MHT
ELECTRICAL	E	MHE
GAS	G	MHG
UNKNOWN	U	

TRAFFIC SIGNALS / ITS

	existing	PROPOSED
MAST ARM (existing)		30' MA (NOTE ANGLE FROM 8)
OPTICOM RECEIVER		
OPTICOM STROBE		
TRAFFIC SIGNAL		
PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT		
SIGNAL CONDUIT	C	PC
CONTROLLER CABINET	cc	CC
METER PEDESTAL	mp	MP
PULL BOX	pb	PB
LOOP DETECTOR (QUADRUPOLE)		(label size)
LOOP DETECTOR (RECTANGULAR)		(label size)
CAMERA POLE (CCTV)		
FIBER OPTIC DELINEATOR	fod	FOD
FIBER OPTIC SPLICE VAULT		SVF
ITS EQUIPMENT CABINET	its	ITS
VARIABLE SPEED LIMIT SIGN		
DYNAMIC MESSAGE SIGN		
ROAD AND WEATHER INFO SYSTEM		

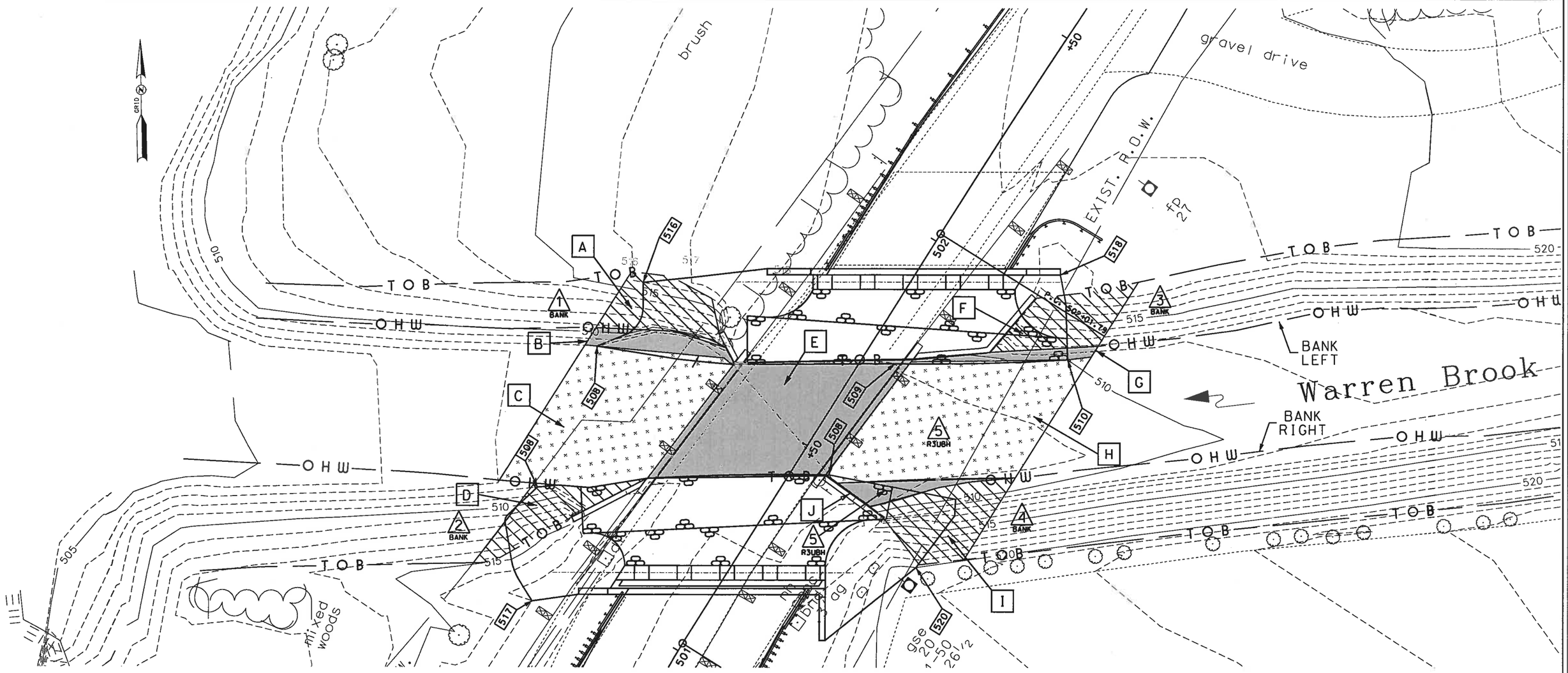
CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS	B-1
CURB MARK NUMBER - GRANITE	G-1
CLEARING AND GRUBBING AREA	A
DRAINAGE NOTE	1
EROSION CONTROL NOTE	A
FENCING NOTE	A
GUARDRAIL NOTE	1
ITS NOTE	1
LIGHTING NOTE	A
TRAFFIC SIGNAL NOTE	1

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

SUBDIRECTORY	REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Cadd/Env	9-1-2016	20817_WSYMBLS2	20817	3	7



WETLAND IMPACT SUMMARY

WETLAND DESIGNATION	USFWS WETLAND CLASSIFICATION	LOCATION	AREA			LINEAR STREAM IMPACTS		
			PERMANENT IMPACTS		TEMPORARY IMPACTS		PERMANENT	
			N.H.W.B. (NON-WETLAND)	N.H.W.B. & A.C.O.E. (WETLAND)		BANK LEFT	BANK RIGHT	CHANNEL
			SF	SF	SF	LF	LF	LF
1	BANK	A	235			21		
5	R3UBH	B		111		30		
5	R3UBH	C			863			
2	BANK	D	193				23	
5	R3UBH	E		* 874				* 36
3	BANK	F	242			22		
5	R3UBH	G		66		37		
5	R3UBH	H			942			
4	BANK	I	298				26	
5	R3UBH	J		81			36	
		TOTAL	968	1,132	1,805	110	85	36

(* CONCRETE RIVER SLAB REMOVAL)

PERMANENT	IMPACTS:	2,100 SF
TEMPORARY	IMPACTS:	1,805 SF
TOTAL	IMPACTS:	3,905 SF

LEGEND

TYPE OF WETLAND IMPACT	IMPACT
N.H.W.B. (NON-WETLAND)	
N.H.W.B. & A.C.O.E. (WETLAND)	
TEMPORARY IMPACTS	

N.H.W.B. - NEW HAMPSHIRE WETLANDS BUREAU
A.C.O.E. - ARMY CORP. OF ENGINEERS

- # — WETLAND DESIGNATION NUMBER
- # — WETLAND IMPACT LOCATION
- # — WETLAND MITIGATION AREA
- I.S. # — INVASIVE SPECIES
- TOB — TOP OF BANK
- OHW — ORDINARY HIGH WATER
- TOB OHW — TOP OF BANK & ORDINARY HIGH WATER
- DW — DELINEATED WETLAND

WETLAND CLASSIFICATION CODES	
R3UBH	RIVERINE, UPPER PERENIAL, UNCONSOLIDATED BOTTOM, PERMANTLY FLOODED
BANK	RIVERINE BANK

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF BRIDGE DESIGN

WETLAND IMPACT SUMMARY

SHEET SCALE	SUBDIRECTORY	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
1" = 10'	Cadd/Env	20817_WETLANDS 4-5-18	20817	4	7

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
   - 1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
   - 1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
   - 1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
   - 1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
   - 1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL, PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WQ 1500 REQUIREMENTS (HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM)
   - 1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.

2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
   - 2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
   - 2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
   - 2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
   - 2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
     - (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
     - (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
     - (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
     - (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
   - 2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
   - 2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
   - 2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
   - 2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30" AND MAY 1" OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
     - (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
     - (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
     - (C) AFTER NOVEMBER 30" INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
     - (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER CONSTRUCTION PLAN HAS BEEN APPROVED BY NHDOT THAT MEETS THE REQUIREMENTS OF ENV-WQ 1505.02 AND ENV-WQ 1505.05.
     - (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WQ 1505.05) AND INCLUDING THE REQUIREMENTS OF NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30".

GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS

3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
   - 3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
   - 3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
   - 3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
   - 3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
   - 3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.

4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
   - 4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
   - 4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
   - 4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1" THROUGH NOVEMBER 30". OR EXCEED ONE ACRE DURING WINTER MONTHS. UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.

5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
   - 5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
   - 5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
   - 5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
   - 5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
   - 5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.

6. PROTECT SLOPES:
   - 6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
   - 6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
   - 6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
   - 6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE. DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.

7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
   - 7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
   - 7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.

8. PROTECT STORM DRAIN INLETS:
   - 8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
   - 8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
   - 8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
   - 8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.

9. SOIL STABILIZATION:
   - 9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
   - 9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
   - 9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR. IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
   - 9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.

10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
    - 10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WQ 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER. TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
    - 10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
    - 10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
    - 11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
    - 11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
    - 11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
    - 11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
    - 11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
    - 11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
    - 11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
    - 11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION. TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
    - 11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
    - 12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500: ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
    - 12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
    - 12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
    - 12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
    - 12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%. THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
    - 12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
    - 12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.

13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
    - 13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
    - 13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
    - 13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
    - 13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.

14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
    - 14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
    - 14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1. IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
    - 14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WQ 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES[2]				ROLLED EROSION CONTROL BLANKETS[3]			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES[1]												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES*	YES*	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCB	2 NET COCONUT BLANKET

NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

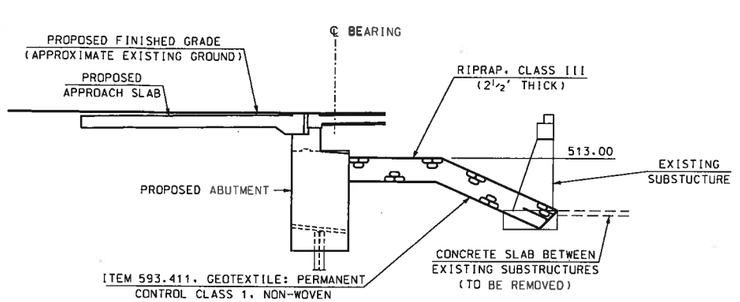
EROSION & SEDIMENT CONTROL

SUBDIRECTORY	REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
Cadd/Env	12-21-2015	20817_STRATEGY	20817	5	7

EROSION CONTROL PLAN LEGEND

- PC — PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
  - COFFER DAM
- NB/PC — NATURAL BUFFER/PERIMETER CONTROL
  - SILT FENCE
  - EROSION CONTROL MIX BERM
  - EROSION CONTROL MIX SOX
  - TURBIDITY CURTAIN
  - SHEET PILE
  - COFFER DAM
- CP — CHANNEL PROTECTION
  - STONE CHECK DAMS
  - STRAW WATTLES
  - CHANNEL MATTING
  - CLASS D EROSION STONE
  - CLASS C STONE
- CWB — CLEAN WATER BYPASS
  - PUMP THROUGH PIPE
  - DRAIN THROUGH PIPE OR CHANNEL

STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF BRIDGE DESIGN			
EROSION & SEDIMENT CONTROL PLAN			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
20817_ERO CNTRL	20817	6	7
SHEET SCALE	SUBDIRECTORY		
1" = 10'	Cadd/Env		



TYPICAL SECTION

NOT TO SCALE

GRID N

EXIST. R.O.W.

T O B

O H W

WARREN BROOK

P.C. 502+01.79

P.T. 501+01.79

EXIST. R.O.W.

EXIST. R.O.W.

CB

cb

nf conc bnd flush

asph apr

STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF BRIDGE DESIGN				
CONSTRUCTION SITE EXISTING & PROPOSED CONTOURS				
SHEET SCALE	SUBDIRECTORY	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
1" = 10'	Cadd/Env	20817_CNST SITE	20817	7	7