STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

DATE: March 24, 2021

FROM: Andrew O'Sullivan
Wetlands Program Manager

AT (OFFICE): Department of Transportation
Bureau of Environment

SUBJECT Dredge & Fill Application
Allenstown-Pembroke, 40362

TO: Karl Benedict, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the application package prepared by NH DOT Bureau of Bridge Design for the subject Major impact project. This project is classified as Major per Env-Wt 903.01(g)(3)(b). The project is located on NH Route 28 in the Town of Allenstown and Pembroke, NH. The proposed work consists of rehabilitation through a deck and superstructure replacement, along with wing wall reconstruction, slope protection at the toe of the existing southern abutment, and pier collar installation.

The NHDES issued a Wetlands and Non-Site Specific Permit #2020-01405 for the project on August 7, 2020. However, the NHDOT Bureau of Construction had concerns with the temporary impacts as depicted on the approved project plans and requested that the temporary impact area adjacent to the bridge and around the piers be expanded to allow space to conduct the proposed rehabilitation work and allow for alternating one-way traffic on both sides of the bridge. Since the proposed changes increase the previously approved temporary dredge and fill impact area by greater than 20 percent, they are classified as a significant amendment in accordance with RSA 482-A:3, XIV(b)(4)(e) and require the submission of a new permit application. Other than the increased temporary workspace, no project elements have changed relative to the project permitted under the previous permit. Refer to the Wetland Impact Comparison Figure provided in *Appendix R*, that shows the previously approved impacts in black with the proposed bed and bank impact increases shown with red and blue polygons, respectively.

This project was reviewed at the Natural Resource Agency Coordination Meeting on 4/15/2020. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link: http://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/wetland-applications.htm

Mitigation is not required for this project.

The lead people to contact for this project are David Scott, Bureau of Bridge Design (271-2731 or david.scott@dot.nh.gov) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-3226 or andrew.o'sullivan@dot.nh.gov).

A payment voucher has been processed for this application (Voucher #640716) in the amount of $5,036.80.

If and when this application meets with the approval of the Bureau, please send the permit directly to Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment.

AMO:amo
Enclosures

cc:
BOE Original
Town of Allenstown (4 copies via certified mail)
Town of Pembroke (4 copies via certified mail)
David Trubey, NH Division of Historic Resources (Cultural Review Within)
Bureau of Construction
Carol Henderson, NH Fish & Game (via electronic notification)
Maria Tur, US Fish & Wildlife (via electronic notification)
Beth Alafat, US Environmental Protection Agency (via electronic notification)
Michael Hicks, US Army Corp of Engineers (via electronic notification)
Kevin Nyhan, BOE (via electronic notification)

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Allenstown-Pembroke 40362

Bridge No. 107/098

NH 28 over Suncook River

Allenstown and Pembroke, New Hampshire

PREPARED FOR

NH Department of Transportation
PO Box 483; 7 Hazen Drive
Concord, NH 03302-0483
603.271.3226

PREPARED BY

VHB
2 Bedford Farms Drive, Suite 200
Bedford, NH 03110
603.391.3900

March 2021

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STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

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

APPLICANT'S NAME: **New Hampshire Department of Transportation** **TOWN NAME:** Allenstown & Pembroke

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

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the Waiver Request Form.

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))

Please use the Wetland Permit Planning Tool (WPPT), the Natural Heritage Bureau (NHB) DataCheck Tool, the Aquatic Restoration Mapper, or other sources to assist in identifying key features such as: priority resource areas (PRAs), protected species or habitats, coastal areas, designated rivers, or designated prime wetlands.

Has the required planning been completed?	☒ Yes ☐ No
Does the property contain a PRA? If yes, provide the following information:	☐ Yes ☒ No
• Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04.	☐ Yes ☒ No
• Protected species or habitat? ○ If yes, species or habitat name(s): unidentifed record, no impacts expected. ○ NHB Project ID #: 19-1799	☐ Yes ☒ No
• Bog?	☐ Yes ☒ No
• Floodplain wetland contiguous to a tier 3 or higher watercourse?	☐ Yes ☒ No
• Designated prime wetland or duly-established 100-foot buffer?	☐ Yes ☒ No
• Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone?	☐ Yes ☒ No
Is the property within a Designated River corridor? If yes, provide the following information: • Name of Local River Management Advisory Committee (LAC): • A copy of the application was sent to the LAC on Month: Day: Year:	☐ Yes ☒ No

For dredging projects, is the subject property contaminated? • If yes, list contaminant:	☐ Yes ☒ No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	☐ Yes ☒ No
For stream crossing projects, provide watershed size (see WPPT or Stream Stats): 240 square miles	

SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))

Provide a **brief** description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.

The NH Department of Transportation (NHDOT) proposes to rehabilitate Bridge No. 107/098 which carries NH Route 28 over the Suncook River. The project proposes to permanently impact 818 SF (122 LF) within the bed of the Suncook River to install concrete pier collars to protect the bridge piers from further abrasion and to extend rip-rap along the southern abutment toe-of-slope. The project also proposes to permanently impact 162 SF (78 LF) within the bank of the Suncook River from the rip-rap extension along the southern abutment toe-of-slope and to reconstruct the southern wingwalls. The proposed temporary bed impacts are 9,490 SF (180 LF) resulting from the in-water erosion control measures around the bridge piers (i.e., sandbag cofferdam or turbidity curtain). Proposed temporary bank impacts are 2,122 SF (141 LF) resulting from construction access areas.

Bridge No. 107/098 has been on the State Red List since 2013 and is in poor condition. The bridge will be rehabilitated by replacing the existing superstructure, deck, and wingwalls while retaining the existing abutments and piers. In-stream work will be limited to the extension of an existing rip-rap slope at the southern abutment and installation of concrete reinforcement collars on the two piers. The northern bridge abutment will be accessed using an existing gravel access road that runs underneath the bridge, which will also serve as a construction laydown area for the project. Based on the current plans, there is no clearing of mature vegetation proposed. The project's temporary and permanent impacts within the bed and banks of the Suncook River have been minimized to the maximum extent practicable while still achieving the project goal of stabilizing the riverbank under the bridge and protecting the bridge piers from further abrasion. Furthermore, all impacts will be limited to the existing roadway right-of-way.

The NHDES issued a Wetlands and Non-Site Specific Permit #2020-01405 for the project on August 7, 2020. However, the NHDOT Bureau of Construction had concerns with the temporary impacts as depicted on the approved project plans and requested that the temporary impact area adjacent to the bridge and around the piers be expanded to allow space to conduct the proposed rehabilitation work. Since the proposed changes increase the previously approved temporary dredge and fill impact area by greater than 20 percent, they are classified as a significant amendment in accordance with RSA 482-A:3, XIV(b)(4)(e) and require the submission of a new permit application. Other than the increased temporary workspace, no project elements have changed relative to the project permitted under the previous permit. Refer to the **Wetland Impact Comparison Figure** provided in ***Appendix R***, that shows the previously approved impacts in black with the proposed bed and bank impact increases shown with red and blue polygons, respectively.

SECTION 3 - PROJECT LOCATION

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

ADDRESS: State of NH, Route 28 Right-of-Way

TOWN/CITY: Allenstown & Pembroke

TAX MAP/BLOCK/LOT/UNIT: N/A

US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: Suncook River
☐ N/A

(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places): 43.15976° North
-71.40594° West

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))

If the applicant is a trust or a company, then complete with the trust or company information.

NAME: NH Department of Transportation		
MAILING ADDRESS: 7 Hazen Drive		
TOWN/CITY: Concord	STATE: NH	ZIP CODE: 03301
EMAIL ADDRESS: David.Scott@dot.nh.gov		
FAX:	PHONE: (603) 271-2731	

ELECTRONIC COMMUNICATION: By initialing here: , I hereby authorize NHDES to communicate all matters relative to this application electronically.

SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))

☐ N/A

LAST NAME, FIRST NAME, M.I.: Walker, Peter J.		
COMPANY NAME: VHB, Inc.		
MAILING ADDRESS: 2 Bedford Farms Drive, Suite 200		
TOWN/CITY: Bedford	STATE: NH	ZIP CODE: 03110
EMAIL ADDRESS: pwalker@vhb.com		
FAX: (603) 518-7495	PHONE: (603) 391-3942	

ELECTRONIC COMMUNICATION: By initialing here *PJW*, I hereby authorize NHDES to communicate all matters relative to this application electronically.

SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))

If the owner is a trust or a company, then complete with the trust or company information.

☒ Same as applicant

NAME:		
MAILING ADDRESS:		
TOWN/CITY:	STATE:	ZIP CODE:
EMAIL ADDRESS:		
FAX:	PHONE:	

ELECTRONIC COMMUNICATION: By initialing here , I hereby authorize NHDES to communicate all matters relative to this application electronically.

SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):

All jurisdictional areas were delineated and classified in accordance with the requirements of Env-Wt 400. Wetlands and Suncook River top-of-bank and ordinary-high-water-mark were delineated on September 6, 2019 by Kristopher Wilkes (NH CWS #288). The project complies with the bank stabilization measures outlined in Env-Wt 514 (refer to the worksheet provided in ***Appendix I***) and public highway requirements outlined in Env-Wt 527 (refer to the supplemental narrative for details). Env Wt 600 and Env-Wt 700 are not applicable to the proposed project, as there are no coastal lands/tidal waters/tidal wetlands or prime wetlands within or near the project area.

Env-Wt 900 is applicable to the proposed project, as the bridge (or span structure) is a regulated stream crossing. This project is a major impact project involving the rehabilitation of a tier 3 stream crossing [Env-Wt 903.01(g)(3)(b)]. The corresponding permit application has been compiled in accordance with Env-Wt 903.04, aside from the omission of the stream geomorphic assessment. Email correspondence with Craig Rennie and Karl Benedict confirmed this since the project is a bridge rehabilitation with no substantial substructure changes. Refer to the Natural Resource Agency Meeting Minutes provided in ***Appendix A.*** The Env-Wt 904.01(a) design considerations and Env-Wt 904.09 criteria (rehabilitation of tier 3 existing legal crossings) were incorporated into the project design and development (refer to the supplemental narrative for details).

SECTION 8 - AVOIDANCE AND MINIMIZATION

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).* Any project with unavoidable jurisdictional impacts must then be minimized as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization and the Wetlands Permitting: Avoidance, Minimization and Mitigation Fact Sheet. For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the Avoidance and Minimization Checklist, the Avoidance and Minimization Narrative, or your own avoidance and minimization narrative.

**See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.*

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

If unavoidable jurisdictional impacts require mitigation, a mitigation pre-application meeting must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

Mitigation Pre-Application Meeting Date: Month: Day: Year:

(☒ N/A - Mitigation is not required)

SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable: ☐ I confirm submittal.

(☒ N/A – Compensatory mitigation is not required)

SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/rivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

Temporary impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland			☐			☐
	Scrub-shrub Wetland			☐			☐
	Emergent Wetland			☐			☐
	Wet Meadow			☐			☐
	Vernal Pool			☐			☐
	Designated Prime Wetland			☐			☐
	Duly-established 100-foot Prime Wetland Buffer			☐			☐
Surface Water	Intermittent / Ephemeral Stream			☐			☐
	Perennial Stream or River	818	122	☐	9,490	180	☐
	Lake / Pond			☐			☐
	Docking - Lake / Pond			☐			☐
	Docking - River			☐			☐
Banks	Bank - Intermittent Stream			☐			☐
	Bank - Perennial Stream / River	162	78	☐	2,122	141	☐
	Bank / Shoreline - Lake / Pond			☐			☐
Tidal	Tidal Waters			☐			☐
	Tidal Marsh			☐			☐
	Sand Dune			☐			☐
	Undeveloped Tidal Buffer Zone (TBZ)			☐			☐
	Previously-developed TBZ			☐			☐
	Docking - Tidal Water			☐			☐
TOTAL		980	200		11,612	321	

SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)

☐ **MINIMUM IMPACT FEE**: Flat fee of $400.

☐ **NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION:** Flat fee of $400 (refer to RSA 482-A:3, 1(c) for restrictions).

☒ **MINOR OR MAJOR IMPACT FEE:** Calculate using the table below:

Permanent and temporary (non-docking):	12,592 SF	× $0.40 =	$ 5,036.80
Seasonal docking structure:	0 SF	× $2.00 =	$ 0
Permanent docking structure:	0 SF	× $4.00 =	$ 0
Projects proposing shoreline structures (including docks) add $400 =			$ -
		Total =	$ 5,036.80

The application fee for minor or major impact is the above calculated total or $400, whichever is greater =	$ 5,036.80

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)

Indicate the project classification.

☐ Minimum Impact Project	☐ Minor Project	☒ Major Project

SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials: DLS	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials: DLS	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
Initials: DLS	The signer understands that: • The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: 1. Deny the application. 2. Revoke any approval that is granted based on the information. 3. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1. • The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. • The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.
Initials: DLS	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)

SIGNATURE (OWNER): David L Scott	PRINT NAME LEGIBLY: NHDOT/David Scott	DATE: 3/23/21
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER):	PRINT NAME LEGIBLY:	DATE:
SIGNATURE (AGENT, IF APPLICABLE): Peter J Walker	PRINT NAME LEGIBLY: Peter J. Walker	DATE: 3/22/21

SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))

As required by RSA 482-A:3, I(a)(1), 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: ***See exemption below.**	PRINT NAME LEGIBLY:

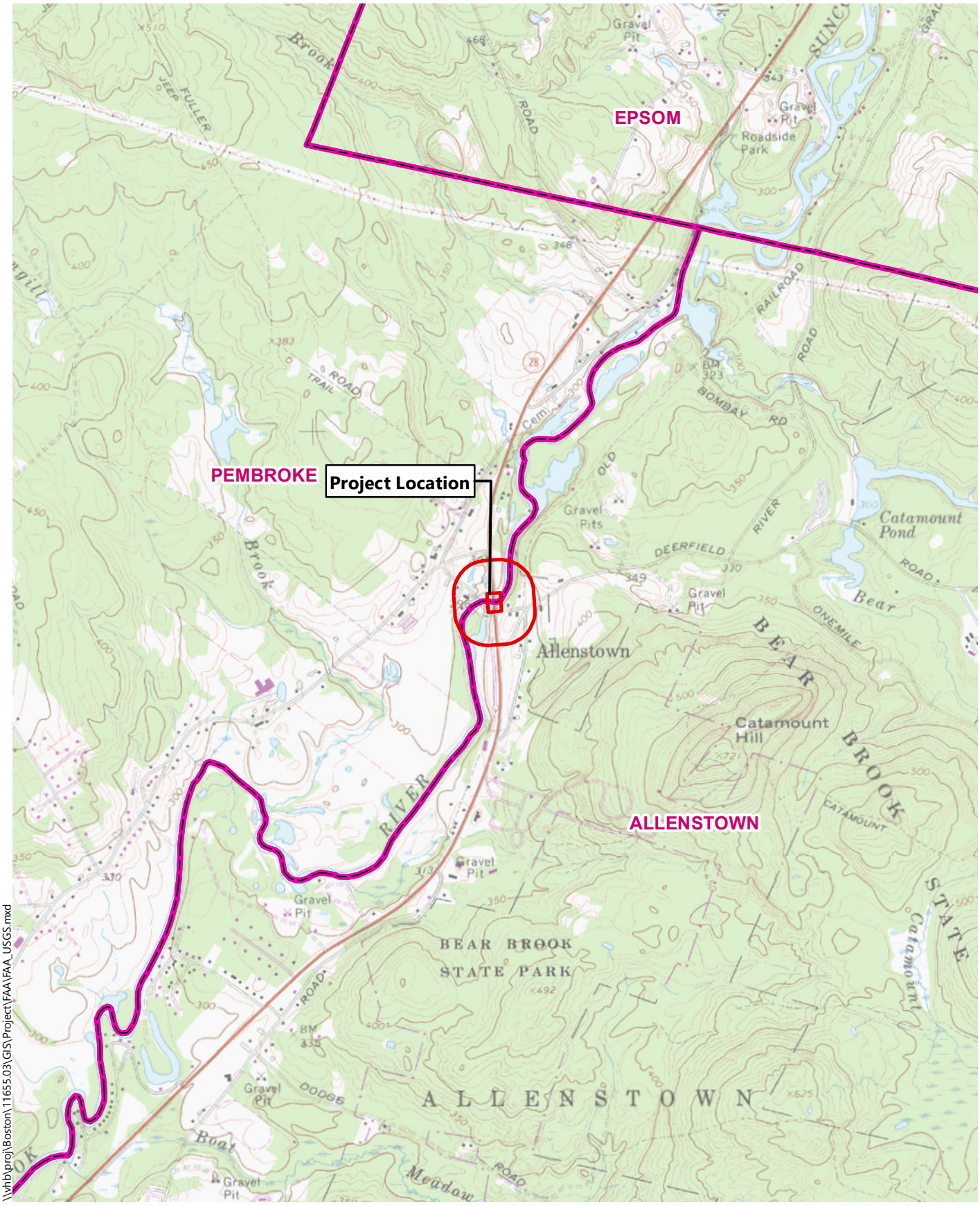
TOWN/CITY:	DATE:

***Per RSA 482-A:3, I(a)(1), applications and fees for projects by agencies of the state may be filed directly with the department, with 4 copies of the application, plan, and map filed at the same time with the town or city clerk.**

DIRECTIONS FOR TOWN/CITY CLERK:
Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. 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.
3. 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.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:
Submit the 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 at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".



\\vhb\proj\Boston\11655.03\GIS\Project\FAA\FAA_USGS.mxd

Scale: 1:24,000

0 1000 2000 4000 Feet

Legend

- Project Area
- Town Boundaries

Allenstown 40362 Bridge # 107/098 | Allenstown, New Hampshire

NH 28 Over Suncook River
USGS Locus Map

Source: USGS, VHB

STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION ATTACHMENT A: MINOR AND MAJOR PROJECTS

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/ Rule: RSA 482-A/ Env-Wt 311.10; Env-Wt 313.01(a)(1); Env-Wt 313.03

APPLICANT'S NAME: **NH Department of Transportation** **TOWN NAME:** Allenstown & Pembroke

Attachment A is required for *all minor and major projects*, and must be completed *in addition* to the Avoidance and Minimization Narrative or Checklist that is required by Env-Wt 307.11.

For projects involving construction or modification of non-tidal shoreline structures over areas of surface waters having an absence of wetland vegetation, only Sections I.X through I.XV are required to be completed.

PART I: AVOIDANCE AND MINIMIZATION

In accordance with Env-Wt 313.03(a), the Department shall not approve any alteration of any jurisdictional area unless the applicant demonstrates that the potential impacts to jurisdictional areas have been avoided to the maximum extent practicable and that any unavoidable impacts have been minimized, as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization.

SECTION I.I - ALTERNATIVES (Env-Wt 313.03(b)(1))

Describe how there is no practicable alternative that would have a less adverse impact on the area and environments under the Department's jurisdiction.

The purpose of this project is to rehabilitate a structurally deficient bridge (No. 107/098) to extend the structure's service life and protect public safety. Given the poor condition of this bridge, the no-action alternative is not feasible; the bridge would continue to deteriorate and eventually require closure. Similarly, constructing a new bridge in a different location is not reasonable, as this project is located on an existing highway alignment and proposes to reuse the existing substructure as a means to minimize impacts and project costs. A new bridge would likely increase overall impacts to the Suncook River. Permanent project impacts include 818 square feet (SF) to the bed and 162 SF to the bank (980 SF total permanent impacts). Temporary project impacts include 9,490 SF to the bed and 2,122 SF to the bank (11,612 SF total temporary impacts). Project impacts (especially permanent impacts) have been minimized to the maximum extent practicable, primarily by avoiding the need for a complete bridge replacement through the reuse of the existing substructure.

SECTION I.II - MARSHES (Env-Wt 313.03(b)(2))

Describe how the project avoids and minimizes impacts to tidal marshes and non-tidal marshes where documented to provide sources of nutrients for finfish, crustacean, shellfish, and wildlife of significant value.

This section is not applicable to the proposed project, as there are no tidal or non-tidal marshes within or near the project area.

SECTION I.III - HYDROLOGIC CONNECTION (Env-Wt 313.03(b)(3))

Describe how the project maintains hydrologic connections between adjacent wetland or stream systems.

This project will not negatively impact the hydrologic connections between adjacent wetland and/or stream systems and, therefore, will maintain the current hydrologic connections of the Suncook River. The superstructure replacement and streambank stabilization will have no impact on the hydrology of the watercourse or surrounding features. The concrete pier collars within the stream channel were calculated to result in a slight decrease in the hydraulic opening at ordinary high-water. To account for this, the gravel area under the north span and landward of the top of bank will be lowered to provide compensatory storage and maintain the existing hydraulic opening in reference to base flood elevation (BFE). Therefore, the project will not impact BFE, floodway elevation, or floodway width of the Suncook River. Refer to the **Floodway "No Rise" Certification** provided in ***Appendix D***.

SECTION I.IV - JURISDICTIONAL IMPACTS (Env-Wt 313.03(b)(4))

Describe how the project avoids and minimizes impacts to wetlands and other areas of jurisdiction under RSA 482-A, especially those in which there are exemplary natural communities, vernal pools, protected species and habitat, documented fisheries, and habitat and reproduction areas for species of concern, or any combination thereof.

As previously mentioned, the project was designed to minimize impacts to the surrounding areas of NHDES jurisdiction to the maximum extent practicable while still achieving the project objective of rehabilitating the structurally deficient Bridge No. 107/098 over Suncook River. The limits of disturbance were minimized by utilizing existing access roads, where possible, and ensuring that all work is contained within the previously disturbed NH 28 right-of-way (ROW) which is approximately 150 feet wide (centered on NH 28). Limited impacts to the banks and bed of the Suncook River are unavoidable but have been minimized. Rehabilitation of the bridge yields less negative environmental impacts than would otherwise result from a complete bridge replacement (which has been avoided at this time). The rehabilitation efforts involve a superstructure/ deck replacement, wingwall reconstruction, toe-of-slope rip-rap extension to stabilize the streambanks, and pier collar installation to protect them from further abrasion. The rip-rap will be installed six to eight inches below the surface and covered with the excavated natural stream bed material. This will ensure the benthic habitat over the disturbed area is restored. Based on the current plans, there is no clearing of mature vegetation proposed. Furthermore, there are no known jurisdictional areas within or near the project area that contain exemplary natural communities, vernal pools, protected species/habitat, documented fisheries, etc. The Natural Heritage Bureau (NHB21-0156) indicated the potential presence of the following four species within the vicinity of the project area: brook floater (*Alasmidonta varicosa*), northern black racer (*Coluber constrictor constrictor*), smooth green snake (*Opheodrys vernalis*), and swamp darter (*Etheostoma fusiforme*). NH Fish and Game recommended the use of wildlife friendly erosion controls and a mussel survey to address potential impact concerns. Refer to **Section 6.1** of the **Supplemental Narrative** for more information. The US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) Report identified the northern long-eared bat (NLEB) and small whorled pogonia (SWP). A 4(d) consistency letter was generated through IPaC and found that the project is consistent with activities analyzed by the Programmatic Biological Opinion. The proposed project may affect the NLEB, however, incidental take of the NLEB resulting from this project is not prohibited under the Endangered Species Act. USFWS consultation with Susi von Oettingen determined that suitable SWP habitat is likely absent from the project area.

SECTION I.V - PUBLIC COMMERCE, NAVIGATION, OR RECREATION (Env-Wt 313.03(b)(5))

Describe how the project avoids and minimizes impacts that eliminate, depreciate or obstruct public commerce, navigation, or recreation.

The intent of the project is to rehabilitate the structurally deficient bridge, which will yield long term benefits to public commerce, navigation, and recreation through improved structural integrity and durability of the bridge to safely accommodate traffic demands. The project has also been designed to reduce negative impacts to the public during construction through the maintenance of traffic along NH 28 using a single lane of alternating two-way traffic with temporary traffic signals. This method was preferable to the establishment of a detour, according to the Traffic Control Feasibility Evaluation, as the detour options would require more travel time than the single lane of alternating traffic. Therefore, this project is anticipated to have minor impacts to public transportation that are limited to the duration of construction. No long-term or permanent negative impacts to public commerce, navigation, or recreation will result from this proposed project.

SECTION I.VI - FLOODPLAIN WETLANDS (Env-Wt 313.03(b)(6))

Describe how the project avoids and minimizes impacts to floodplain wetlands that provide flood storage.

This section is not applicable to the proposed project. According to the NHDES Wetlands Permit Planning Tool (WPPT), there are no floodplain wetlands mapped within or near the project area. However, the project is located within a FEMA floodway (Zone AE) of Suncook River and its associated 100-year floodplain (Zone A). These areas may provide flood storage; however, the project does not propose floodplain fill beyond a negligible amount for the pier collars. Overall limits of disturbance associated with this project have been minimized to the maximum extent practicable in order to avoid any impacts to surrounding resources that are not absolutely necessary in order to accomplish the project purpose and need.

SECTION I.VII - RIVERINE FORESTED WETLAND SYSTEMS AND SCRUB-SHRUB – MARSH COMPLEXES (Env-Wt 313.03(b)(7))

Describe how the project avoids and minimizes impacts to natural riverine forested wetland systems and scrub-shrub – marsh complexes of high ecological integrity.

The limits of disturbance associated with the proposed project have been reduced to the minimum requirement while still ensuring that the project purpose and need of rehabilitating the structurally deficient bridge is adequately addressed. Aside from the limited impacts to the banks and bed of Suncook River, no additional wetland areas will be impacted by the proposed project activities. A wetland delineation was performed by Kristopher Wilkes (NH CWS #288) on September 6, 2019, where a wetland area landward of the delineated top of bank was identified along the northern bank of the river, located downstream and northwest of the project bridge. This wetland was classified as a Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded (PFO1C), with a small portion classified as Palustrine, Emergent, Persistent, Seasonally-Flooded (PEM1C). The project was designed to fully avoid impacts to this forested wetland complex. Furthermore, unavoidable impacts to Suncook River (Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded - R2UBH) have been minimized to the maximum extent practicable.

SECTION I.VIII - DRINKING WATER SUPPLY AND GROUNDWATER AQUIFER LEVELS (Env-Wt 313.03(b)(8))

Describe how the project avoids and minimizes impacts to wetlands that would be detrimental to adjacent drinking water supply and groundwater aquifer levels.

The proposed project activities will not impact drinking water supply or groundwater aquifer levels. The project does not propose an increase in impervious surface area, would not introduce a new source of potential groundwater contamination, and would not affect recharge or the hydraulic capacity of the Suncook River (R2UBH).

SECTION I.IX - STREAM CHANNELS (Env-Wt 313.03(b)(9))

Describe how the project avoids and minimizes adverse impacts to stream channels and the ability of such channels to handle runoff of waters.

The proposed bridge rehabilitation project design minimizes unavoidable stream channel impacts to the maximum extent practicable. The stream crossing is generally stable, however the proposed rip-rap extension along the southern abutment toe-of-slope is required to adequately stabilize the bridge and prevent erosion of the existing granite pavers. This requirement is the result of the removal of two downstream dams, known as the Buck Street Dam, in 2011/2012 that lowered the ordinary high water (OHW) level within the project area to be below the granite pavers. This threatens the stability of the structure and the proposed rip-rap extension will address this. The rip-rap will be placed six to eight inches below the surface and covered with the natural stream bed material to minimize impacts and allow the disturbed area to mimic existing conditions. The pier collar installation is required to protect these structures from abrasion and preserve their service life. Without the collars, more extensive substructure work would be required. Since the hydraulic capacity of the stream crossing will remain the same post-construction, the ability of the stream channel to handle runoff of waters will not be impacted by the proposed activities.

Furthermore, erosion control measures are proposed and will be implemented during construction to minimize temporary, indirect stream channel impacts of sedimentation. These measures include perimeter controls (i.e., silt fence, erosion control mix sox/berm, etc.) along the upland limits of disturbance and natural buffer/perimeter control (i.e., cofferdam, turbidity curtain, etc.) along the natural resource areas (i.e., Suncook River). These measures will help preserve water quality throughout construction

SECTION I.X - SHORELINE STRUCTURES - CONSTRUCTION SURFACE AREA (Env-Wt 313.03(c)(1))

Describe how the project has been designed to use the minimum construction surface area over surface waters necessary to meet the stated purpose of the structures.

The proposed bridge rehabilitation has been designed to use the minimum construction surface area over the Suncook River necessary to meet the project purpose and need through the utilization and preservation of the existing structure to the extent practicable. The project mainly involves a deck/superstructure replacement with limited substructure work to reduce impacts and prevent the need for a complete bridge replacement that would likely impact a larger area of the river. The temporary impacts associated with the proposed work are the minimum amount required to allow construction crews adequate space to conduct the proposed work efficiently.

SECTION I.XI - SHORELINE STRUCTURES - LEAST INTRUSIVE UPON PUBLIC TRUST (Env-Wt 313.03(c)(2))

Describe how the type of construction proposed is the least intrusive upon the public trust that will ensure safe docking on the frontage.

As described above, impact minimization was considered during the design of the proposed bridge rehabilitation, establishing the smallest work area to the maximum extent practicable while still providing the contractors with sufficient space to efficiently conduct the proposed work. With the project objective of rehabilitating the structurally deficient bridge to protect public safety, the no-action alternative is not an option. The proposed bridge rehabilitation is preferable and least intrusive upon the public trust when compared to the complete bridge replacement alternative, as it utilizes and preserves components of the existing bridge substructure to further minimize jurisdictional impacts.

SECTION I.XII - SHORELINE STRUCTURES – ABUTTING PROPERTIES (Env-Wt 313.03(c)(3))

Describe how the structures have been designed to avoid and minimize impacts on ability of abutting owners to use and enjoy their properties.

The proposed bridge rehabilitation work will not impact the abutting properties, as it will be fully contained with the existing NH 28 ROW. Furthermore, since the project proposes work on an existing substructure instead of constructing a new one, the rehabilitated bridge will closely match the existing one and not yield negative visual impacts to the abutters. No impacts to the ability of abutting owners to use and enjoy their properties will result from this project, aside from the temporary duration of construction activities.

SECTION I.XIII - SHORELINE STRUCTURES – COMMERCE AND RECREATION (Env-Wt 313.03(c)(4))

Describe how the structures have been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.

The rehabilitation of the structurally deficient bridge that conveys NH 28 over the Suncook River will improve public safety and support the continued use of this bridge for navigation and transportation. Since the proposed design of the rehabilitated bridge will closely match that of the existing structure, the existing suitability of the Suncook River within the project area for navigation, passage, commerce, and recreation will not be impacted post-construction.

SECTION I.XIV - SHORELINE STRUCTURES – WATER QUALITY, AQUATIC VEGETATION, WILDLIFE AND FINFISH HABITAT (Env-Wt 313.03(c)(5))

Describe how the structures have been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.

The project was designed to avoid potential impacts to water quality via temporary sedimentation during the short duration of construction activities through the use of erosion control measures, both in-water and on land. Silt fence or silt sock (at the discretion of the contractor) will be placed on land around the proposed limits of disturbance to prevent sediment-laden runoff from leaving the project area during construction. Upon completion of the proposed work, the land will be stabilized and re-vegetated with a native seed mix that complements the existing conditions of the site. Sandbag cofferdams or turbidity curtains (at the discretion of the contractor) will be utilized within the Suncook River to isolate the proposed work areas around the bridge piers during the installation of the concrete collars and toe-of-slope rip-rap. These erosion control measures will contain the potential turbid waters and preserve the water quality of the surrounding and downstream aquatic habitat areas. Additionally, a clean water bypass is proposed between the piers beneath the bridge to allow water flow and aquatic organism passage throughout construction. The proposed toe-of-slope rip-rap will be buried six to eight inches and covered with the natural streambed material to restore the benthic habitat over the rip-rap and facilitate continued/unimpeded wildlife passage. Lastly, a 400-foot downstream mixing zone has been requested to monitor and control construction-related stream turbidity. Refer to ***Appendix Q*** for more information.

SECTION I.XV - SHORELINE STRUCTURES – VEGETATION REMOVAL, ACCESS POINTS, AND SHORELINE STABILITY (Env-Wt 313.03(c)(6))

Describe how the structures have been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.

Based on the current plans, no clearing of mature vegetation is proposed. The area within the limits of disturbance will be stabilized and re-vegetated with a native seed mix post-construction, as previously mentioned. All project activities will be contained within the previously disturbed right-of-way (ROW). The proposed project has been designed to avoid and minimize the number of access points through jurisdictional areas by utilizing the existing roadway (NH 28) and the existing gravel access road that runs underneath the bridge to access the northern abutment. The purpose of the proposed toe-of-slope rip-rap and extension of the existing granite pavers is to stabilize the shoreline to prevent erosion and preserve the structural integrity of the rehabilitated bridge. The removal of the two upstream Buck Street Dams in 2011/2012 lowered the water level in the project area below the existing shoreline protection measures, requiring additional stabilization.

PART II: FUNCTIONAL ASSESSMENT
REQUIREMENTS Ensure that project meets the requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).
FUNCTIONAL ASSESSMENT METHOD USED: **USACE Highway Methodology Workbook, dated 1993, together with the USACE New England District Highway Method Workbook Supplement, dated 1999.**
NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT: **KRISTOPHER WILKES (NH CWS #288)**
DATE OF ASSESSMENT: **SEPTEMBER 6, 2019**
Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT: ☒
For minor or major projects requiring a standard permit without mitigation, the applicant shall submit a wetland evaluation report that includes completed checklists and information demonstrating the RELATIVE FUNCTIONS AND VALUES OF EACH WETLAND EVALUATED. Check this box to confirm that the application includes this information, if applicable: ☒ Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.

AVOIDANCE AND MINIMIZATION WRITTEN NARRATIVE

Water Division/Land Resources Management

Wetlands Bureau

Check the Status of your Application

RSA/ Rule: RSA 482-A/ Env-Wt 311.04(j); Env-Wt 311.07; Env-Wt 313.01(a)(1)b; Env-Wt 313.01(c)

APPLICANT'S NAME: **NH Department of Transportation** **TOWN NAME:** **Allenstown & Pembroke**

An applicant for a standard permit shall submit with the permit application a written narrative that explains how all impacts to functions and values of all jurisdictional areas have been avoided and minimized to the maximum extent practicable. This attachment can be used to guide the narrative (attach additional pages if needed). Alternatively, the applicant may attach a completed Avoidance and Minimization Checklist (NHDES-W-06-050) to the permit application.

SECTION 1 - WATER ACCESS STRUCTURES (Env-Wt 311.07(b)(1))

Is the primary purpose of the proposed project to construct a water access structure?

No, the purpose of the project is to rehabilitate the structurally deficient Bridge No. 107/098 over the Suncook River to extend the structure's service life and protect public safety.

SECTION 2 - BUILDABLE LOT (Env-Wt 311.07(b)(1))

Does the proposed project require access through wetlands to reach a buildable lot or portion thereof?

This project requires access through the Suncook River, waterward of the delineated top of bank line, to conduct the proposed bridge rehabilitation work (i.e., slope rip-rap, pier collars, etc.).

SECTION 3 - AVAILABLE PROPERTY (Env-Wt 311.07(b)(2))*

For any project that proposes permanent impacts of more than one acre, or that proposes permanent impacts to a PRA, or both, are any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, that could be used to achieve the project's purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs?

**Except as provided in any project-specific criteria and except for NH Department of Transportation projects that qualify for a categorical exclusion under the National Environmental Policy Act.*

Not applicable, as the permanent impacts associated with this project are less than one acre (980 square feet) and no impacts to a priority resource area are proposed.

SECTION 4 - ALTERNATIVES (Env-Wt 311.07(b)(3))

Could alternative designs or techniques, such as different layouts, different construction sequencing, or alternative technologies be used to avoid impacts to jurisdictional areas or their functions and values as described in the Wetlands Best Management Practice Techniques For Avoidance and Minimization?

Impacts to the Suncook River could not entirely be avoided while still accomplishing the project objective of rehabilitating the structurally deficient bridge. However, impacts were minimized to the maximum extent practicable while providing the contractor with sufficient space around the existing bridge piers to install the concrete collars and place the proposed toe-of-slope rip-rap. These activities will result in less jurisdictional impacts than the complete bridge replacement alternative.

SECTION 5 - CONFORMANCE WITH Env-Wt 311.10(c) (Env-Wt 311.07(b)(4))**

How does the project conform to Env-Wt 311.10(c)?

***Except for projects solely limited to construction or modification of non-tidal shoreline structures only need to complete relevant sections of Attachment A.*

The project conforms to Env-Wt 311.10(c), as follows:

(1) Use the results of the functional assessment to select the location of the proposed project having the least impact to wetland functions.
The functions and values of the Suncook River are uniform throughout the project area. Given the homogeneous functional assessment, limiting impacts to an area of lesser wetland functions was not an option. Furthermore, the project's goal of rehabilitating a specific structurally deficient bridge resulted in no flexibility to change the project location.

(2) Design the proposed project to have the least impact to wetlands functions.
The project location is set based on the historic ROW limits. Impacts to the bed and bank of the Suncook River were minimized to the maximum extent practicable while still achieving project objectives. For example, the toe-of-slope rip-rap will be buried six to eight inches and covered with natural streambed material to restore the benthic habitat and not impede wildlife passage.

(3) Where impact to wetland functions is unavoidable, limit the project impacts to the least valuable functions on the site while avoiding and minimizing impacts to the highest and most valuable functions.
As previously mentioned, the functions and values of the Suncook River are uniform throughout the project area. Given the homogeneous functional assessment, avoiding impacts to higher or more valuable function wetlands was not an option.

(4) Include on-site minimization measures and construction management practices to protect aquatic resource functions.
The overall limit of disturbance for the project was designed to be the minimum amount required while still achieving the project objectives of rehabilitating the structurally deficient bridge to protect public safety. The buried and backfilled rip-rap mentioned above is one way these impacts were minimized. Furthermore, erosion control best management practices (i.e., clean water bypass and turbidity curtains) will isolate the work area. This will prevent sedimentation of the surrounding area resulting from the construction activities and ensure aquatic organism passage and water flow are maintained to protect aquatic resource functions.

Supplemental Narrative

1. Introduction

On behalf of the New Hampshire Department of Transportation (NHDOT or "the Applicant"), this Wetlands Permit Application was prepared by VHB pursuant to the New Hampshire Revised Statutes Annotated (RSA) Chapter 482-A, Fill and Dredge in Wetlands, and Wetland Bureau Code of Administrative Rules, Chapters Env-Wt 100 through Env-Wt 900.

The NH Department of Environmental Services (NHDES) issued a Wetlands and Non-Site Specific Permit #2020-01405 for the project on August 7, 2020. However, the NHDOT Bureau of Construction had concerns with the temporary impacts as depicted on the approved project plans and requested that the temporary impact area adjacent to the bridge and around the piers be expanded to allow space to conduct the proposed rehabilitation work. Since the proposed changes increase the previously approved temporary dredge and fill impact area by greater than 20 percent, they are classified as a significant amendment in accordance with RSA 482-A:3, XIV(b)(4)(e) and require the submission of a new permit application. Other than the increased temporary workspace, no project elements have changed relative to the project permitted under the previous permit. Refer to the **Wetland Impact Comparison Figure** provided in ***Appendix R***, that shows the previously approved impacts in black with the proposed bed and bank impact increases shown with red and blue polygons, respectively.

2. Site Description and Existing Conditions

Bridge No. 107/098 is located on the town border of Allenstown and Pembroke and conveys NH Route 28 over Suncook River. The subject bridge carries 8,800 vehicles per day over the Suncook River and is a major north-south route in this part of NH. This bridge is approximately 3.2 miles north of the intersection of NH 28 with US 3 and one mile south of its intersection with North Pembroke Road. The bridge was built in 1958 and is a three span (65 feet, 80 feet, and 65 feet) steel beam superstructure with a non-composite concrete deck (5 inches thick) and asphalt wearing surface. The rail-to-rail width is 39.5 feet, with approach roadway width of 39.5 feet. The shoulders contain steel open-grate drainage structures along the full length of the bridge that were filled in during rehabilitation efforts in the 1990's. The bridge has been rehabilitated many times, including painting, new expansion joints, railing repairs, debris removal, and other similar work.

The bridge was added to the State Red List in 2013. The bridge has a sufficiency rating of 59% and was noted as "structurally deficient" per the latest NHDOT Inspection Report dated March 12, 2020. Although the superstructure and substructure of the bridge are indicated to be in fair and satisfactory condition, the poor condition of the deck (rated 4) resulted in its addition to the State Red List.

The project is located within a residential/rural area along the town border of Allenstown and Pembroke. The town border is the Suncook River, which is the dominant feature within this area. The Suncook River meanders around an upland island immediately southwest of Bridge No. 107/098. A discontinued roadway crosses the Suncook River in two locations using the northern portion of the upland island. Downstream of the former roadway is the site of former Buck Street Dam - two dam structures located on either side of the upland island were removed in 2011/2012. The removal of these dam structures lowered the water elevation of the Suncook River immediately upstream of the dams within the vicinity of Allenstown-Pembroke Bridge No. 107/098. **Photographs** are provided in ***Appendix M***.

3. Proposed Project Description

The project proposes to rehabilitate Bridge No. 107/098 through the replacement of the existing structurally deficient deck with a traditional deck with membrane and pavement riding surface (refer to the **Wetland Impact Plans** provided in ***Appendix R*** and the **Erosion Control Plan** provided in ***Appendix S***). The new superstructure will be designed to ensure full HL-93 load carrying capacity and limit live load deflection to L/1000. The project will also include the following work:

- Approach slab installation at both the north and south abutments;
- Removal, modification, and replacement of existing wingwalls;
- Reinforced elastomeric bearings with sliding surfaces at expansion locations;
- New weathering steel beams and diaphragms;
- New concrete deck with steel reinforcement;
- Pier collar installation around Pier No. 1 and 2;
- Lowering of the gravel area under the north span; and
- Riprap installation along southern abutment toe-of-slope.

The project will maintain the existing lane and shoulder widths and will match the existing alignment, with only a 1.5-inch profile raise. During construction, traffic will be maintained using one lane of alternating two-way traffic with temporary signals. The northern bridge abutment will be accessed using an existing gravel access road that runs underneath the bridge. This gravel access road will also be used as a construction laydown area for the project. The southern abutment will be accessed from the western side of the bridge. Based on the current plans, there is no clearing of mature vegetation proposed. All project activities will be contained with the previously disturbed right-of-way (ROW). The project is currently scheduled to be advertised for bids in May 2021. Refer to the **Construction Sequence Narrative** provided in ***Appendix N*** for additional project implementation details.

4. Wetland & Surface Water Resources

Jurisdictional wetlands and surface waters within and adjacent to Bridge No. 107/098 were delineated by VHB Senior Environmental Scientist, Kristopher Wilkes (NH CWS #288), on September 6, 2019. Wetland delineation was performed in accordance with the procedures and standards outlined in the *Corps of Engineers Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0* (January 2012). Wetland delineation also relied upon the *Field Indicators for Identifying Hydric Soils in the United States, Version 8.2*, published by the Natural Resource Conservation Service and the *Field Indicators for Identifying Hydric Soils in New England, Version 4.0*, published by the New England Interstate Water Pollution Control Commission. Dominant wetland vegetation was assessed using the *2018 National Wetland Plant List* published by the U.S. Army Corps of Engineers. Lastly, wetlands were classified using the USFWS methodology *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979, revised 1985). The top-of-bank and ordinary-high-water of the Suncook River were delineated in accordance with *Env-Wt 103.50 & RSA 483-B:4 (XI-e)* using alpha-numerically coded blue and

orange flagging tape, respectively. Refer to the **Photographs** and **Existing Conditions Figure** provided in ***Appendix M.***

4.1 Suncook River

The Suncook River is approximately 35.7 miles long originating at the outlet of Crystal Lake in Gilmanton, NH. It is a tributary to the Merrimack River and forms the town boundary between Pembroke and Allenstown before flowing into the Merrimack River near the village of Suncook. The river is not designated under the New Hampshire Rivers Management and Protection Act (RSA 483), however is protected under the NHDES Shoreland Water Quality Protection Act (RSA 483-B) and the NHDES Wetland Rules (RSA 482-A). The Suncook River flows northeast to southwest under the existing bridge. Based on site observations at the time of the delineation, the Suncook River is classified as Riverine, Lower Perennial, Unconsolidated Bottom, Sand (R2UB2). Refer to the P**hotographs** and **Existing Conditions Figure** provided in ***Appendix M***. Additionally, since the proposed project involves rehabilitation of the bridge, a formal geomorphic stream assessment is not required. Refer to the April 15, 2020 **Natural Resource Agency Coordination Meeting Minutes** provided in ***Appendix A*** for NHDES concurrence.

Southern Bank

The delineated southern bank of the Suncook River directly upstream of the subject crossing ranges in height from 8 to 15 feet. The bank is steep with some undercutting present. Well established vegetation is present along the bank including eastern hemlock (*Tsuga canadensis*), poison ivy (*Toxicodendron radicans),* red maple (*Acer rubrum*), red oak (*Quercus rubra*), striped maple (*Acer pensylvanicum*), white pine (*Pinus strobus*), and witch hazel (*Hamamelis virginiana*). There are several shelves of wetland vegetation along the water's edge downslope of the delineated top of bank. Vegetation present within these shelves include aster species (*Aster* spp.), beggar ticks (*Bidens frondosa*), goldenrod (*Solidago* spp.), jewelweed (*Impatiens capensis*), joe pye weed (*Eupatorium maculatum*), nettle (*Boehmeria* sp.), nodding smartweed (*Persicaria lapathifolia*), poison ivy, reed canary grass (*Phalaris arundinacea*), sedges (*Carex* spp.), soft rush (*Juncus effusus*), speckled alder (*Alnus incana*), white meadowsweet (*Spiraea alba*), woolgrass (*Scirpus cyperinus*), and the invasive purple loosestrife (*Lythrum salicaria*).

The delineated southern bank of the Suncook River directly downstream of the subject crossing ranges in height from 8 to 10 feet, increasing to approximately 20 feet at the bridge abutment. The bank is densely vegetated with minor undercutting observed. Similar to upstream, a wetland shelf is present between the delineated top-of-bank and the ordinary high-water lines. Bank vegetation includes American elm (*Ulmus americana*), poison ivy, red maple, speckled alder, sugar maple (*Acer saccharum*), and white pine. Wetland vegetation includes aster, boneset (*Eupatorium perfoliatum*), beggar ticks, deer tongue (*Dichanthelium clandestinum*), fringed sedge (*Carex crinita*), goldenrod, joe pye weed, narrow-leaved goldenrod (*Euthamia graminifolia*), reed canary grass, steeplebush (*Spiraea tomentosa*), white meadowsweet, and willow (*Salix* spp.), along with the invasive glossy buckthorn (*Frangula alnus*) and purple loosestrife.

Northern Bank

The delineated northern bank of the Suncook River directly upstream of the subject crossing ranges in height from 8 to 12 feet and is characterized by steep slopes which are nearly vertical in some areas. Some undercutting is present however, the bank is densely vegetated with no major erosion observed. Bank vegetation includes black cherry (*Prunus serotina*), eastern hemlock, high-bush blueberry (*Vaccinium*

corymbosum), poison ivy, red maple, red oak, staghorn sumac (*Rhus typhina*), white meadowsweet, and white pine. Wetland vegetation including arrowhead (*Sagittaria* spp.), beggar-ticks, bur-reed (*Sparganium eurycarpum*), cardinal flower (*Lobelia cardinalis*), dogwood (*Cornus* spp.), goldenrod, hop sedge (*Carex lipulina*), jewelweed, joe pye weed, meadowrue (*Thalictrum pubescens*), narrow-leaved goldenrod, nettle, pickerelweed (*Pontedaria cordata*), reed canary grass, sedges, sensitive fern, soft rush, soft stemmed bulrush (*Scirpus validus*), speckled alder, steeplebush, and the invasive purple loosestrife are present along the water's edge downslope of the delineated top-of-bank.

The delineated northern bank of the Suncook River directly downstream of the subject crossing is near vertical and was estimated at 6 feet in height. The bank is well vegetated with American elm, aster species, deer tongue, goldenrod species, poison ivy, and silver maple (*Acer saccharinum*). Some invasive species are also present, including glossy buckthorn and Japanese knotweed (*Polygonum cuspidatum*).

4.2 Suncook River Functions and Values

As a major Tier 3 surface water draining a watershed of approximately 153,644 acres (240 square miles), which includes 17 towns in New Hampshire, the Suncook River plays an important part in the water cycle and provides a multitude of functions and values often associated with large river systems. Functions and values were assessed based on guidance provided in the US Army Corps of Engineers (USACE) Highway Methodology Workbook, dated 1993, together with the USACE New England District Highway Method Workbook Supplement, dated 1999. Refer to the **Wetland Function-Value Evaluation Form** provided in ***Appendix C*** for additional information. Principle functions and values of the Suncook River include:

- Flood and Erosion Protection - The Suncook River provides a level of flood and erosion protection by receiving precipitation, surface water, groundwater, and other sources of runoff/ discharge associated with surrounding natural and urban areas. The river's storage ability plays an important role in reducing erosion and flood damage to communities along the river corridor and downstream.
- Groundwater Recharge/Drinking Water - The Suncook River provides opportunity for groundwater recharge and influences the drinking water supply in the region as water often penetrates groundwater through wetlands and the beds of rivers and streams. According to the US Geological Survey, approximately 27% of Allenstown is underlain by stratified drift aquifers with the highest yielding aquifer located near the convergence of Bear Brook and the Suncook River (Allenstown Master Plan, 2016). The Pembroke Water Works municipal well which supplies water to Allenstown and Pembroke residents currently draws from this aquifer. Additional other high yielding aquifers are located along the Suncook River.
- Sediment & Toxicant Retention/Nutrient Removal - The Suncook River functions like other surface waters in reducing pollution that flows downstream to the Merrimack River, New Hampshire ponds and lakes, and ultimately coastal waters. The river retains sediments, pollutants, and excess nutrients and also plays a role in reducing carbon to the atmosphere.
- Wildlife Habitat - The Suncook River provides habitat for a diverse assemblage of plant, fish, amphibian, bird, and mammal species. Rivers are often vital for spawning and nursery habitats, provide feeding opportunity and refuge, and act as travel corridors.
- Recreation – Like many other large rivers in New Hampshire, the Suncook River provides opportunity for recreation including fishing, hunting, and small boating (paddling).

The proposed project will not have an impact on the functions and values of the Suncook River as it involves the rehabilitation of infrastructure already present within the river corridor. Most of the proposed work will involve the existing bridge superstructure which is above and outside the jurisdictional limits of the river.

Additionally, impacts proposed along the streambanks as a result of the rip-rap extension will benefit the river by ensuring bank stability and reducing the potential for erosion and sedimentation at the bridge crossing. Standard best management practices (BMPs) will be implemented throughout construction to reduce the risk of erosion and sedimentation within the river, as discussed in **Section 7.2**, below.

Proposed bed impacts involve the installation of protective collars around the existing bridge piers but do not significantly expand the bridge footprint within the riverbed to the degree that could measurably impact flood storage. The proposed change will not result in water surface elevations changes and the hydraulic capacity of the existing bridge crossing will be maintained.

Lastly, project construction may have some impact to wildlife and river recreation due to enhanced noise and activity underneath and surrounding the bridge, however, these impacts are temporary in nature and will occur over a relatively short period of time. Also, the location of the proposed work, involving a frequently trafficked bridge, reduces the likelihood that the river provides essential wildlife and recreation opportunity at this location.

4.3 Wetlands

A forested wetland, identified in the field as KW-01, was delineated along the northern bank of the Suncook River downstream of the subject crossing. The wetland is located within a depression and appears to collect runoff from areas upslope, including NH 28 and an adjacent field. Drainage patterns observed in the field suggest that the wetland directly drains to the river. Wetland KW-01 is classified as Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded (PFO1C) with a smaller portion of the wetland extending into the field classified as Palustrine, Emergent, Persistent, Seasonally-Flooded (PEM1C). Wetland vegetation includes aster species, beggar ticks, deer tongue, jewelweed, joe pye weed, meadowrue, nettle species, poison ivy, red maple, sedges, sensitive fern, silky dogwood (*Cornus amomum*), silver maple, Virginia creeper (*Parthenocissus quinquefolia*), and the invasive glossy buckthorn. Wetland hydrology consists of soil saturation, sediment deposits, drainage patterns, and geomorphic position. Wetland soils were observed to meet Hydric Soil Indicators S5: Sandy Redox or F8: Redox Depressions.

As previously mentioned, this wetland is located outside of the limits of disturbance and will not be impacted by the proposed activities. Therefore, a functional assessment for the KW-01 was not performed.

5. Floodplains and Floodways

The project is located within the Special Flood Hazard Area Zone AE of the Suncook River, as shown on the effective Flood Insurance Rate Map, Map No. 33013C0566E and 33013C0567E, dated April 19, 2010; refer to the **Floodplain Map** provided in ***Appendix D***. Prior to removal of the dam structures located downstream of the bridge in 2011/2012, the water level of the Suncook River under the existing bridge structure was higher than the existing conditions. The current FEMA data is outdated and includes the downstream dam; therefore, flood elevations are likely mapped higher than the current conditions. Additionally, the Bridge No. 107/098 crossing over Suncook River has been extensively studied, indicating that the base flood elevation (BFE) at Q100 (100-year peak flow) has dropped approximately two feet and the ordinary high-water (OHW) elevation has dropped approximately five to six feet.

The proposed project will result in limited permanent impacts to the floodway and 100-year floodplain of Suncook River since ground disturbing work will occur in the bed and bank of the river to stabilize the southern

riverbank under the bridge and to reinforce the existing bridge piers. To account for the proposed pier collars, an adjacent gravel access area under the north span of the bridge will be lowered to provide compensatory storage and maintain the existing hydraulic opening in reference to BFE. Therefore, the project will not impact BFE, floodway elevation, and floodway width of the Suncook River. Refer to the **Floodway "No Rise" Certification** provided in ***Appendix D***.

6. Rare, Threatened, and Endangered Species

The following is a discussion of rare, threatened, and endangered species identified within the vicinity of the Allenstown-Pembroke Bridge by the NH Natural Heritage Bureau (NHB) DataCheck tool and US Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) system.

6.1 Natural Heritage Bureau

A search for the occurrence of rare plant, animal, or natural communities within the vicinity of the proposed project was completed using the NHB online DataCheck tool. A project report provided by NHB, dated January 29, 2021, indicated the potential presence of the following four species within the vicinity of the project area: brook floater (*Alasmidonta varicosa*), northern black racer (*Coluber constrictor constrictor*), smooth green snake (*Opheodrys vernalis*), and swamp darter (*Etheostoma fusiforme*). Refer to the **NHB DataCheck Report** provided in ***Appendix H***.

Based on coordination with Kim Tuttle from the NH Fish and Game Department (NHF&G), the project will use wildlife friendly erosion controls (such as woven organic material like coco or jute matting) and avoid the use of welded plastic or 'biodegradable plastic' netting or thread (e.g. polypropylene) to reduce the likelihood of wildlife entrapment. The NHF&G snake flyers will be distributed to the contractors to assist with identification (provided in ***Appendix H***). If snakes are spotted during construction, activities would cease, and the sighting would be reported to NHF&G if it is a species they are tracking. All observations of northern black racer snakes encountered from the end of September through the month of April will be immediately reported to the NHF&G (Melissa Doperalski 603-479-1129 or Brendan Clifford 603-944-0885) as this would indicate a potential hibernaculum in the area. Construction activities would resume upon receipt of NHF&G guidance for proper relocation of the animal(s). If the species is not one being tracked by NHF&G, the contractors will be directed to relocate the animal(s) with the guidance of the environmental monitor to a nearby suitable habitat outside of the work area.

In coordination with Melissa Doperalski from the NHF&G, a mussel survey is recommended to avoid impacts to the brook floater since there is a potential for this species to be present at the crossing and a time of year work restriction does not pertain to this species. To meet the project schedule of advertising in May 2021, protect public safety, and conduct project activities in the most economic and cost-efficient manner, the brook floater survey is proposed after the submission of this Standard Dredge and Fill Wetlands Permit Application but prior to the start of construction in 2022. Given the poor state of the existing bridge, a delay would cause potential public safety consequences. A delayed bid phase would result in the need to delay the construction start, allowing the potential for further deterioration of the bridge and delay its safe rehabilitation.

NHDOT proposes to conduct the mussel survey following the permit application, during the contractor bid period, but well in advance of the start of in-stream work. NHDOT intends to retain Mr. Ethan Nedeau (Biodrawversity) to conduct the concurrent pre-construction mussel survey and relocation. Mr. Nedeau is well

qualified to conduct these surveys, having completed numerous such studies in NH and throughout New England. Mr. Nedeau will work directly with NHF&G to obtain approval of a study plan as well as obtaining the required collection permits. The fieldwork will be conducted within two weeks prior to the start of construction, sometime between mid-May and late September 2021 when water levels, water temperature, and water clarity are conducive for finding mussels with visual searches. The mussel survey will be conducted in all areas where the substrate may be affected by project-related construction, including a 25-meter upstream buffer and a 50-meter downstream buffer. Biologists will search for freshwater mussels at the sediment surface (visually) by snorkeling or SCUBA diving, depending on water depth. If brook floater are found, biologists will collect and hold them in underwater enclosures until the entire area is fully searched. Biologists will record the shell length, shell condition, habitat (depth, substrate), and location (using GPS) of every individual brook floater that is encountered. If 10 or more brook floater are found, biologists will tag each with a unique numeric tag affixed with Super Glue (none will be tagged if fewer than 10 are found). Biologists will then seek a suitable relocation site at least 100 meters upstream or 200 meters downstream from the project area. The site will be selected based on environmental conditions (flow, depth, and substrate) and a brief survey will be conducted to confirm that brook floater already inhabit these areas. Mussels will be transported to the relocation site and carefully released. If 10 or more are found and tagged, NHF&G requires follow-up monitoring one month and one year after relocation. During the follow-up monitoring, biologists will attempt to find all the tagged mussels and record mortality, movement (i.e., distance from where they were placed), and shell length. Upon completion of the survey and relocation, a report will be submitted to NHF&G for review and input to obtain their final impact avoidance and minimization recommendations that will be followed during construction, along with a follow-up monitoring report, if applicable.

6.2 US Fish and Wildlife Service

The project area was reviewed for the presence of federally listed or proposed, threatened, or endangered species, designated critical habitat, or other natural resources concerning the USFWS IPaC System. Results dated January 19, 2021 indicated the potential presence of two species within the vicinity of the project corridor: northern long-eared bat (*Myotis septentrionalis*, "NLEB") and small whorled pogonia (*Isotria medeoloides*). Refer to the **USFWS IPaC Report** provided in ***Appendix I***. Agency consultation occurred during the preparation of the previous permit application for an IPaC Report that was generated on February 26, 2019. Since the updated report identifies the same species and the current proposed impacts resemble the previously proposed impacts, the consultation results below are still pertinent.

Northern Long-Eared Bat

The proposed project is located within the federally protected range of the NLEB, which is a federally threatened species. Tree clearing activities are one of the largest threats to the NLEB. Additionally, work on bridge structures may also impact NLEB habitat or roosting if bat species are found to be using the structure. Based on the current plans, there is no clearing of mature vegetation proposed. The proposed project is not within 150 feet of known occupied maternity roost trees, nor within a ¼ mile of known hibernaculum. The nearest known NLEB site is in Manchester, south of the proposed project area. A verification letter for the 40362 Allenstown-Pembroke Bridge No. 107/098, NH 28 Over Suncook River was generated in the IPaC system on February 28, 2020, and found that the proposed project is consistent with activities analyzed by the Programmatic Biological Opinion. The proposed project may affect the NLEB, however, incidental take of this species resulting from this project is not prohibited under the Endangered Species Act final Section 4(d) rule at 50 CFR §17.40(o). Refer to the **NLEB Consistency Letter** provided in ***Appendix I***.

Small Whorled Pogonia

The proposed project is not anticipated to negatively impact small whorled pogonia, which is a federally threatened species. Small whorled pogonia grows in birch/beech/maple/oak/hickory forest stands with an open understory, and prefers sloping habitat, particularly near small streams. This habitat type is absent from the area that would be impacted by the project. Rather, the project area has too much ground cover to support small whorled pogonia. Witch hazel, a common small whorled pogonia associate, was noted in the project area during the natural resource delineation. However, it was determined that the likelihood of small whorled pogonia occurring in the project area is low. The proposed project will occur entirely within the previously disturbed ROW of NH 28. Therefore, the habitat within the vicinity of the Allenstown-Pembroke Bridge is not likely to support small whorled pogonia, to which Susi von Oettingen (a USFWS Endangered Species Biologist) concurred on March 3, 2020. Refer to the **Small Whorled Pogonia Email Correspondence** provided in ***Appendix I***.

6.3 Wildlife

The NHF&G Wildlife Action Plan (WAP) identifies ranked habitat tiers that recognize the highest quality habitats in the state. Habitat tiers were created by the NHF&G Department using biological data, landscape data, and human influence information. Habitat tiers are separated into three rankings, which are 1) *Highest Ranked Habitat in the State*, 2) *Highest Ranked Habitat in Biological Region*, and 3) *Supporting Landscape*.

No ranked habitat exists within the project area (refer to the **Ranked Habitat** map provided in ***Appendix O***). The project is located adjacent to habitat ranked as Supporting Landscape. Additionally, there are areas of Highest Ranked Habitat in the State and Biological Region along the Suncook River corridor south/downstream of the project area, and within Bear Brook State Park located west of the project area. While there are highly ranked habitat areas near the proposed bridge work, the bridge work is limited to the roadway ROW and will not extend into these areas. Therefore, the project is not anticipated to impact areas of ranked wildlife habitat.

The proposed bridge replacement work is located within areas of open water habitat, and is adjacent to grassland, wet meadow/shrub wetland, floodplain forest, and hemlock-hardwood-pine habitat (refer to the **Habitat Type** map provided in ***Appendix O***). The project will have temporary and permanent impacts within the open water habitat of the Suncook River to stabilize the riverbank under the bridge and to protect the bridge piers from further abrasion. Therefore, while the project will cause limited permanent and temporary disturbance within the bed and bank of Suncook River, the project will have long-term beneficial impacts to open water habitat. This project is not anticipated to impact the adjacent habitat types around the bridge structure since project work is limited to the roadway ROW.

It should also be noted that Suncook River has been identified as an important wildlife corridor based on The Nature Conservancy (TNC)'s "Connect the Coast" project. In order to accommodate terrestrial wildlife, the rip-rap installation along the southern abutment toe-of-slope will be configured and smoothed out to avoid impacts to wildlife passage.

7. Impact Analysis and Best Management Practices

7.1 Proposed Impacts

Permanent Impacts

The project will have limited permanent impacts (818 SF / 122 LF) within the bed of the Suncook River to install concrete "pier collars" to protect the bridge piers from further abrasion and rip-rap extension along the southern abutment toe-of-slope in Allenstown. The project will also have limited permanent impacts (162 SF / 78 LF) within the bank of the Suncook River from the rip-rap extension along the southern abutment toe-of-slope and to reconstruct the existing southern wingwalls in Allenstown.

Pier Collars

The existing bridge piers require concrete collars to stabilize them and prevent additional abrasion from the flowing water. This impact to jurisdictional wetland areas is unavoidable. The alternative to these collars would be the installation of extensive rip-rap that would result in a larger footprint of permanent streambed disturbance. The intent is to protect and extend the service life of the existing pier infrastructure and avoid major substructure repairs, thus, limiting streambed impacts to the maximum extent practicable. The permanent streambed impact from these pier collars is 206 SF (90 LF).

Rip-Rap Installation

The ordinary high-water (OHW) level within the project area has been lowered by five to six feet resulting from the removal of two downstream dam structures (Buck Street Dams), necessitating the extension of the existing granite paver bank protection. The OHW is now below the granite pavers, making them susceptible to erosion and threatening the structural integrity of the bridge without additional hard-armoring support. Refer to the **Env-Wt 514 Bank/Shoreline Stabilization Project-Specific Worksheet** provided in ***Appendix F*** for more information regarding rip-rap details. In order to minimize the impacts of this rip-rap, it will be positioned six to eight inches below the ground surface and covered with the natural streambed material to restore the benthic habitat over this disturbed area. The permanent streambed impact of this rip-rap installation is 612 SF (62 LF). The rip-rap will also extend landward of the OHW line at the toe-of-slope and result in 128 SF (65 LF) of streambank impact.

Wingwall Reconstruction

The wingwalls at both bridge abutments will be reconstructed, but only the southern abutment wingwalls are located with the regulated bank of the Suncook River. The superstructure replacement consists of new bearings, beams, deck, and bridge rail. In addition, approach slabs will be installed using semi-integral detailing. The backwall will be removed to create this "semi-integral" system at the bridge ends, necessitating the reconstruction of the wingwalls, as they would be unstable during construction. It is impractical to employ additional support mechanisms to support the existing wingwalls during this process; reconstructing them is the least environmentally impacting alternative. Additionally, the "semi-integral" detailing places the bridge rail on the approach slabs, leaving no room for the existing wingwalls. Hence the proposed wingwall reconstruction is proposed beyond the existing fascia. The wingwall reconstruction will result in 34 SF (13 LF) of permanent streambank impact.

Temporary Impacts

The project will have limited temporary impacts (9,490 SF / 180 LF) within the bed of the Suncook River resulting from the in-water erosion control measures around the bridge piers in both towns. This will either be a sandbag cofferdam or a turbidity curtain at the discretion of the contractor. The project will also have limited temporary impacts (2,122 SF / 141 LF) within the bank of the Suncook River as this area will provide construction access to perform the proposed activities in both towns.

Sandbag Cofferdam/Turbidity Curtain

Temporary impacts resulting from the natural barrier/perimeter control measure is necessary to isolate the work area and prevent siltation of the surrounding habitat and downstream waters, making the 9,490 SF of temporary streambed impact unavoidable. A clean water bypass will be used to ensure adequate streamflow is maintained and aquatic fauna passage is not prohibited during construction. These erosion control measures will be removed upon completion of the proposed activities.

Access

The 2,122 SF of temporary streambank disturbance is also unavoidable because construction crews and equipment need access to the bridge abutments and piers to conduct the proposed rehabilitation. These access areas between the top of bank and ordinary high-water line will be restored to pre-construction condition following the completion of the proposed activities.

7.2 Mitigation and Best Management Practices

This project does not require mitigation pursuant to Env-Wt 313.04(a)(3)(a) and Env-Wt 904.05(f)(2). The superstructure replacement itself will not impact the bed or banks of Suncook River and, therefore, no mitigation is required for this project component. The rip-rap installation along the toe-of-slope of the southern abutment will impact jurisdictional bank and bed areas but is excluded from mitigation requirements as it is required to provide adequate bank stabilization for the existing granite paving and protect the rehabilitated bridge structure. NHDES concurred with this determination at the April 15, 2020 Natural Resource Agency Meeting (NRAM). Refer to the **Natural Resource Agency Coordination Meeting Minutes** provided in ***Appendix A.*** Furthermore, the adjacent gravel area under the north span will be lowered to provide compensatory storage and maintain the existing hydraulic opening in reference to base flood elevation. Refer to **Section 5** above for a more detailed discussion.

Standard BMPs will be applied throughout project construction in accordance with applicable NHDES and NHDOT BMP Manuals to reduce the risk of erosion and sediment-laden run-off from entering Suncook River and adjacent wetlands. Perimeter controls such as silt fence and/or silt sock will be installed upslope of project wetlands and streams to ensure that surface water run-off from un-stabilized areas does not carry silt, sediment, and other debris outside of the limits of work. Temporary diversion BMPs, such as sandbag cofferdams, turbidity curtains, flumes, and/or clean water bypass pumps will be implemented within Suncook River to isolate dry work areas and minimize the risk of sedimentation downstream. All installed temporary erosion control measures shall be inspected daily and repaired/replaced as necessary.

In accordance with the *New Hampshire Stormwater Manual, Volume 3, Erosion and Sediment Controls During Construction* dated December 2008, areas remaining un-stabilized for a period of more than 30 days shall be temporarily seeded and mulched. Erosion control blankets shall be installed on all slopes that are greater than 3 feet horizontal and 1 foot vertical (3:1). Upon the completion of the proposed work, all disturbed and graded areas located upslope of the erosion control measures will be seeded and mulched as needed. Disturbed areas

that have been seeded and mulched will be considered stable once 85-percent vegetative growth has been achieved. Refer to the **Erosion Control Plan** included as ***Appendix S*** for further details.

Soil disturbance is anticipated to occur as a result of the bridge rehabilitation and associated slope stabilization. Since invasive plants are known to occur within the project area, all work including daily removal of plant material from construction equipment, shall be constructed in accordance with NHDOT's *Best Management Practices for Roadside Invasive Plants Manual* (2008) and *Best Management Practices for the Control of Invasive and Noxious Plant Species* (2018). Only clean equipment that is free of plant material and debris shall be delivered to the project site and utilized during construction. All machinery entering and leaving any area containing invasive plants will be inspected for foreign plant matter (i.e., stems, flowers, and roots.) and soil embedded in the tracks or wheels. If foreign plant matter or soil is present, the operator shall remove the plant material and soil from the machine using hand tools.

7.3 Turbidity Mixing Zone, Sampling, and Control

NHDOT requests approval for a mixing zone pursuant to Clean Water Act Section 404(b)(1) Guidelines to ensure compliance with State Water Quality Standards as described in Env-Wq 1707. Details of the proposed turbidity best management plan includes a mixing zone, sampling, and control measures for in-water work provided in ***Appendix Q***.

8. Cultural Resources

A Request for Project Review (RPR) for the proposed project was submitted on August 21, 2019 to the NH Division of Historical Resources (NHDHR). The NHDHR responded requesting determination as to whether the bridge is contributing to the Cultural Landscape Historic District that overlaps with the project footprint. An Effect Evaluation completed for the proposed project determined that the Preferred Alternative will result in the rehabilitation of Allenstown-Pembroke Bridge No. 107/098, which is adjacent to but not contributing to the Buck Street-Bachelder Road Cultural Landscape (ZMT-BBCL), with a recommended finding of *No Historic Properties Affected*. Furthermore, NHDHR concurred with a no historic properties affected determination. Refer to the **NHDHR Section 106 Consultation** provided in ***Appendix J*** for more information.

9. US Army Corps of Engineers and US Coast Guard

United States Army Corps of Engineers

The proposed project would permanently impact 818 SF and temporarily impact 9,490 SF below the ordinary high-water line to install the proposed of toe-of-slope rip-rap extension and pier collars, and these work components would therefore fall under the US Army Corps of Engineers (USACE) Section 404 jurisdiction. As such, Appendix B – Corps Secondary Impacts Checklist has been completed. Refer to the **ACOE Appendix B** checklist provided in ***Appendix K***.

United States Coast Guard

Since the proposed project involves modifying an existing bridge, the US Coast Guard (USCG) was consulted to determine the navigable status of Suncook River and potential need for further USCG coordination or authorization. Based on email correspondence with Chris Bisignano, it was determined that Suncook River is

designated as non-navigable for USCG Bridge Program jurisdiction. Refer to the **USCG Correspondence** provided in ***Appendix P***.

10. Project-Specific Requirements (Env-Wt 500)

Since the project involves the rehabilitation of the bridge that conveys a public highway within jurisdictional areas, the standards outlined in New Hampshire Administrative Rule Env-Wt 527 must be addressed.

10.1 Env-Wt 527.02: Approval Criteria for Public Highways

In accordance with RSA 482-A:3, I-a, this NHDOT project is subject to the rebuttable presumption that for applications "proposed, sponsored, or administered by the department of transportation", NHDOT "has exercised appropriate engineering judgement in the project's design."

(a) The project meets the design criteria specified in Env-Wt 527.04;

See applicable discussion below in Section 10.3.

(b) The project is consistent with RSA 482-A:1, RSA 483, RSA 483-B, RSA 485-A, and RSA 212-A;

The proposed project is consistent with all above referenced statutes. In accordance with RSA 482-A:1 "Finding of Public Purpose," the interests of the general public regarding preservation of natural resources is in line with the proposed activities. No substantial adverse impacts to the functions and values of wetlands, stream channel hydraulic capacity, groundwater recharge, recreation, etc. will result from the proposed activities. In accordance with RSA 483 "NH Rivers Management and Protection Program," the characteristics and functions of Suncook River will be preserved. Furthermore, the project complies with RSA 483-B "Shoreland Water Quality Protection Act"; a Shoreland Permit by Notification (PBN) for this project was approved by NHDES on August 10, 2020. Finally, coordination with NHB and USFWS was conducted to ensure all appropriate conservation measures are followed to avoid adverse impacts to identified species, thereby, complying with RSA 212-A "Endangered Species Conservation Act."

(c) The purpose of the project is to improve or maintain public safety, consistent with federal and state safety standards;

The purpose of the project is to improve public safety through the rehabilitation of the structurally deficient bridge by stopping continued deck deterioration leading to the closure of the bridge.

d) The project will not cause displacement of flood storage wetlands or cause diversion of stream flow impacting abutting landowner property; and

The project will not cause displacement of flood storage wetlands or cause diversion of stream flows impacting abutting landowner property.

(e) For a project in the 100-year floodplain, the project will not increase flood stages off-site.

The project will not increase flood stages off-site. The post-construction hydraulic capacity of the stream crossing will match the existing conditions.

10.2 Env-Wt 527.03: Application Requirements for Public Highway Projects

(a) A description of the scope of the project, the size of the impacts to aquatic resources, and the purpose of the project;

Please refer to the preceding sections of this supplemental narrative.

(b) An accurate drawing with existing and proposed structure dimensions clearly annotated to:

(1) Document existing site conditions;

(2) Detail the precise location of the project and show the impact of the proposed activity on jurisdictional areas;

(3) Show existing and proposed contours at 2-foot intervals;

(4) Show existing and proposed structure invert elevations on the plans; and

(5) Use a scale based on standard measures of whole units, such as an engineering rule of one to 10, provided that if plans are not printed at full scale, a secondary scale shall be noted on the plans that identifies the half scale unit of measurement;

The project plans attached to this application meet these specifications.

(d) All easements and right-of-way acquisition area outlines in relation to the project;

The proposed work will occur within the limits of the existing NH 28 ROW, as depicted on the project plans.

(e) The name of the professional engineer who developed the plans, whether an employee of the applicant or at a consulting firm; and

Ms. Julie Whitmore, NH Professional Engineer #13861, developed the project plans.

(e) An erosion control plan that shows:

(1) Existing and proposed contours at 2-foot intervals, with existing contours shown with a lighter line weight and proposed contours shown with a heavier line weight such as a bold font; and

(2) The outermost limit of all work areas, including temporary phasing work, with perimeter controls.

An erosion control plan has been included in Appendix S.

10.3 Env-Wt 527.04: Design Requirements for Public Highway Projects

(a) Protect significant function wetlands, watercourses, and PRAs;

No significant function wetlands or PRAs are located in the vicinity of the proposed activities. The project has been designed to minimize impacts to the Suncook River.

(b) Minimize impacts to wetland and riparian function;

All project impacts have been minimized to the maximum extent practicable while still accomplishing project objectives (i.e., public safety). This is also in compliance with Env-Wt 311.07(a).

(c) Maintain wetland and stream hydrology and function to the remaining aquatic resources;

The overall hydrology and function of Suncook River to the remaining aquatic resources will not be adversely impacted. Post-construction conditions will closely match existing conditions.

(d) Use on-site measures to compensate for any loss of flood storage where the project proposes:

(1) Filling or placement of structures in a 100-year floodplain; or

(2) Greater than 0.5 acre-feet of fill volume or a road crossing that affects floodplain conveyance;

The placement of rip-rap along the southern abutment toe-of-slope to prevent erosion constitutes fill within the Suncook River. However, the rip-rap will be placed six to eight inches below the surface and covered with the natural streambed material. The final grade will match existing contours, such that no loss of flood storage would result from this activity.

(e) Use on-site minimization and water quality protection measures to prevent direct discharge to surface waters and wetlands, including retention of vegetated filter strips between the construction area and the aquatic resource areas to disperse runoff with no direct discharge to natural wetlands or surface waters; and

Temporary erosion controls (i.e., turbidity curtain and silt sock) will be implemented throughout construction to prevent silt-laden discharge from the construction site from entering the surrounding habitat areas.

(f) Where temporary impacts will occur, include re-establishment of a similar ecosystem using vegetative species and spacing that are as similar as practicable to what was removed unless the applicant shows that the proposed vegetative composition will provide higher functions and values.

Upon completion of the bridge rehabilitation work, all temporary erosion control measures will be removed, and the site will be reseeded and stabilized with a seed mix that compliments the site and will perform similar functions and values to the existing vegetation.

10.4 Env-Wt 527.05: Construction Requirements for Public Highway Projects

(a) The permit shall be contingent on review and approval by the department of final stream diversion and erosion control plans that detail the timing and method of stream flow diversion during construction and show temporary siltation, erosion, and turbidity control measures to be implemented; and

As previously mentioned, temporary erosion controls (i.e., turbidity curtain and silt sock) will be implemented throughout construction to protect the surrounding habitat areas. A clean water bypass will be implemented, as needed, to divert the flow around the turbidity curtain and permit continued passage of aquatic fauna during construction. Refer to the Erosion Control Plan provided in Appendix S.

(b) The contractor responsible for completion of the work shall use techniques described in Env-Wq 1504.06, Env-Wq 1504.16, Env-Wq 1505.02, Env-Wq 1506, and Env-Wq 1508.

The contractor responsible for the completion of the proposed work will comply with the techniques described in Env-Wq 1504.06 "Plan Information," Env-Wq 1504.16 "Erosion Control Notes," Env-Wq 1505.02 "Required Construction Practices," Env-Wq 1506 "Methods for Erosion and Sediment Control During Terrain Alteration Activities," and Env-Wq 1508 "Permanent Methods for Protecting Water Quality," as applicable.

11. Stream Crossings (Env-Wt 900)

Since the proposed bridge rehabilitation project is located on a watercourse where the contributing watershed exceeds 640 acres and the bridge is considered a tier 3 stream crossing, the stream crossing standards as outlined in New Hampshire Administrative Rule Env-Wt 900 must be addressed.

NOTE: It was determined that a stream geomorphic assessment is not required for this project, since the proposed project involves the rehabilitation of the bridge superstructure, with limited substructure work. In an email dated March 17, 2020, Craig Rennie and Karl Benedict from NHDES concurred with this assessment, as long as the project addresses 904.09(c).

11.1 Env-Wt 904.01: General Design Considerations

(a) All stream crossings, whether over tidal or non-tidal waters, shall be designed and constructed so as to:

(1) Not be a barrier to sediment transport;

No sediment deposition was observed during site visits; however, some scour was observed to be impacting the existing southern abutment of the bridge due to reduced water levels, along with abrasion to the bridge piers. The proposed bridge rehabilitation activities include the installation of rip-rap at the toe-of-slope of the southern abutment. This rip-rap will stabilize the streambank and prevent future erosion and associated downstream sediment transport. Additionally, the proposed activities will maintain the existing hydrology of the stream crossing, further ensuring that the project will not be a barrier to sediment transport.

(2) Not restrict high flows and maintain existing low flows;

The rehabilitated bridge will maintain the existing hydraulic capacity of the stream crossing. The superstructure replacement and streambank stabilization will have no impact on the hydrology of the watercourse or surrounding features. To account for the concrete pier collars within the stream channel, an adjacent gravel access area under the north span of the bridge will be lowered to maintain the existing hydraulic opening in reference to base flood elevation. Therefore, the project will not impact BFE, floodway elevation, and floodway width of the Suncook River. Refer to the Floodway "No Rise" Certification provided in Appendix D.

(3) Not obstruct or otherwise substantially disrupt the movement of aquatic organisms indigenous to the waterbody beyond the actual duration of construction;

Aside from temporary obstructions or disruptions resulting from the construction activities (i.e., in-stream erosion control measures), the rehabilitated bridge structure will maintain the existing movement of aquatic life. Most of the proposed work focuses on the deck/superstructure replacement which will have no impact to the aquatic habitat of Suncook River. The limited bed and bank impacts will not permanently impact aquatic organism passage, especially given the stream simulation incorporated into the design for the rip-rap tow extension.

(4) Not cause an increase in the frequency of flooding or overtopping of banks;

The proposed project will be located within the floodway and 100-year floodplain of Suncook River; however, the hydraulic capacity of the stream crossing will be maintained. As previously mentioned, the adjacent gravel area to be lowered will ensure the existing hydraulic opening of the bridge is maintained once the concrete pier collars are installed. Therefore, there will be no increase in the frequency of flooding or overtopping of banks as a result of this project.

(5) Maintain or enhance geomorphic compatibility by:

a. Minimizing the potential for inlet obstruction by sediment, wood, or debris; and

b. Preserving the natural alignment of the stream channel;

The current geomorphic compatibility of the bridge will be maintained. The potential for sediment, wood, or debris obstruction post-construction will not exceed that of the existing structure. Furthermore, the existing channel alignment of Suncook River will be preserved, as no realignment is included in the project design. The proposed work along the stream channel is limited to streambank stabilization toe-of-slope rip-rap, which is necessary due to lower water levels as a result of the downstream dam structures that were removed in 2011/2012. The proposed pier collar installation and superstructure replacement will have no measurable impact on geomorphic compatibility. Furthermore, no grading is proposed, and all temporarily disturbed areas will be restored to pre-construction condition following project completion.

(6) Preserve watercourse connectivity where it currently exists;

No significant disruptions in overall hydrological connectivity currently exists at this crossing. The rehabilitated bridge structure will have the same footprint as the existing structure, thus maintaining and preserving the existing watercourse connectivity.

(7) Restore watercourse connectivity where:

a. Connectivity previously was disrupted as a result of human activity(ies); and

b. Restoration of connectivity will benefit aquatic organisms upstream or downstream of the crossing, or both;

Watercourse connectivity of Suncook River was previously disrupted when the existing bridge was first constructed in 1958. Since the rehabilitated bridge footprint will match that of the existing structure, the existing watercourse connectivity will be preserved and maintained, but not restored. Aquatic organisms upstream and downstream of the crossing will not be negatively impacted by the proposed project (following construction activities), as the ability of these organisms to pass through the stream crossing will be maintained.

(8) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

The proposed rip-rap installation along the toe-of-slope of the southern abutment will prevent erosion, scour, downstream sediment transport, and aggradation by stabilizing the streambank against the erosive force of the moving waters where no streambank stabilization measures currently exist. The installation of rip-rap over the bare soil area of the southern streambank will help resist erosion and abutment scour.

(9) Not cause water quality degradation.

The rehabilitated bridge structure will not cause water quality degradation. In fact, the erosion and scour reduction anticipated to result from the streambank rip-rap installation may improve water quality through reduced sedimentation of the waterway.

(b) For stream crossings over tidal waters, the stream crossing shall be designed to:
(1) Match the velocity, depth, cross-sectional area, and substrate of the natural stream; and
(2) Be of sufficient size to not restrict bi-directional tidal flow over the natural tide range above, below, and through the crossing.

Not applicable, since Suncook River is not a tidal waterway.

11.2 Env-Wt 904.05: Tier 3 Stream Crossings

(a) Subject to (b), below, a tier 3 stream crossing shall be a crossing located:
(1) On a watercourse where the contributing watershed is 640 acres or greater;
(2) Within a designated river corridor, unless:
a. *The crossing would be a tier 1 stream based on the contributing watershed size; or*
b. *The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT;*
(3) Within a 100-year flood plain;
(4) In a jurisdictional area having any protected species or habitat; or
(5) In a prime wetlands or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706.

The watershed of Suncook River, which crosses under Bridge No. 107/098 located on the Allenstown-Pembroke town line, is approximately 153,664 acres in size (or 240 square miles). Refer to the Watershed Map provided in Appendix D. The stream crossing is also located within the 100-year floodplain of Suncook River. Therefore, this stream crossing is classified as a Tier 3 stream.

(b) The applicant for a project in which a stream crossing is categorized as tier 3 based solely on being in a 100-year floodplain may request that the crossing be categorized as a tier 1 or tier 2 stream crossing, as applicable based on watershed size, if the impacts to the floodplain are specifically mitigated in accordance with Env-Wt 800.

Not applicable. The stream crossing is also categorized as tier 3 based on the contributing watershed size, not solely on being in a 100-year floodplain.

(c) If an applicant for a project in which a stream crossing is categorized as tier 3 based solely in a jurisdictional area having any protected species or habitat may request that the crossing be categorized as tier 1 or tier 2 based on watershed size, provided:
(1) The applicant consults with NHB to determine whether any protected plant species or habitat would be impacted;
(2) The applicant consults with NHF&G to determine whether any protected species or habitat is impacted; and
(3) The NHB, NHF&G, or both, as applicable, recommend(s) such a downgrade to the department in writing.

Not applicable. The stream crossing is not located in a jurisdictional area having any protected species or habitat, according to the NHB DataCheck Report provided in Appendix H.

(d) A tier 3 stream crossing shall be a span structure or an open-bottomed culvert with stream simulation, not a closed-bottom culvert or pipe arch.

The rehabilitated bridge structure will be an open-bottomed span structure.

(e) The applicant shall use an alternative design by submitting a request as specified in Env-Wt 904.10.

Not applicable. No alternative design will be requested for this project.

(f) Compensatory mitigation shall not be required for:
- *(1) Any new tier 3 stream crossing that:*
  - *a. Meets the general design criteria in Env-Wt 904.01 and the tier-specific criteria of Env-Wt 904.07;*
  - *b. Is self-mitigating; and*
  - *c. Improves aquatic organism passage, connectivity, and hydraulics; or*
- *(2) Any replacement of a crossing that met all applicable requirements when originally installed but is in a location that results in the crossing being classified as tier 3 under these rules, provided the proposed stream crossing meets the requirements of Env-Wt 904.09.*

As mentioned above in Section 7.2, the project does not require mitigation in accordance with Env-Wt 313.04(a)(3)(d). Lori Sommer concurred with this assessment during the April 15, 2020 NHDOT Natural Resource Coordination Meeting (refer to Appendix A). These impacts include bank stabilization to protect existing infrastructure (i.e., rip-rap tow extension and pier collars design that minimizes what would otherwise require extensive rip-rap). The rip-rap installation along the toe-of-slope of the southern abutment will impact jurisdictional wetland areas but is required to provide adequate bank stabilization to protect the rehabilitated bridge structure. Furthermore, this tier 3 stream crossing is self-mitigating since the project essentially maintains the stream crossings hydraulic capacity and meets the requirements of Env-Wt 904.09, detailed below.

(g) Plans for a tier 3 stream crossing shall be dated and bear the signature of the professional engineer who prepared or had responsibility for and approved them, as required by RSA 310-A:18.

Refer to Appendix R for a copy of the Wetland Impact Plans and Appendix S for a copy of the Erosion Control Plan which have been dated and signed by a licensed NH professional engineer.

11.3 Env-Wt 904.09: Repair, Rehabilitation, or Replacement of Tier 3 and Tier 4 Existing Legal Crossings

(a) The repair, rehabilitation, or replacement of tier 3 stream crossings shall be limited to existing legal crossings where the tier classification is based only on the size of the contributing watershed.

The stream crossing is classified as tier 3 due to the size of the contributing watershed, but also because it is located within the 100-year floodplain of Suncook River.

(b) Rehabilitation of a culvert or other closed-bottom stream crossing structure pursuant to this section may be accomplished by concrete repair, slip lining, cured-in place lining, or concrete invert lining, or any combination thereof, except that slip lining shall not occur more than once.

Not applicable. The proposed project does not involve a culvert or closed-bottom stream crossing structure.

(c) A project shall qualify under this section only if a professional engineer certifies, and provides supporting analyses to show, that:

(1) The existing crossing does not have a history of causing or contributing to flooding that damages the crossing or other human infrastructure or protected species habitat; and

The existing crossing does not have a history of causing or contributing to damaging flooding events.

(2) The proposed stream crossing will:

a. Meet the general criteria specified in Env-Wt 904.01;

Refer to the previous description for additional information regarding the proposed project's compliance with the general criteria specified in Env-Wt 904.01.

b. Maintain or enhance the hydraulic capacity of the stream crossing;

The project will maintain the hydraulic capacity of the stream crossing. As previously discussed, the gravel area under the north span will be lowered to account for the slight hydraulic opening decrease from the pier collars to maintain the existing hydraulic opening post-construction.

c. Maintain or enhance the capacity of the crossing to accommodate aquatic organism passage;

The capacity of the stream crossing to accommodate aquatic organism passage will be maintained. The bridge opening will not be narrowed and will remain an open bottom structure.

d. Maintain or enhance the connectivity of the stream reaches upstream or downstream of the crossing; and

The connectivity of the stream reaches upstream and downstream of the crossing will be maintained. The limited scope of work proposed within jurisdictional areas (i.e., rip-rap and pier collars) will not negatively impact stream connectivity.

e. Not cause or contribute to the increase in the frequency of flooding or overtopping of the banks upstream or downstream of the crossing.

The proposed rehabilitation activities will not cause or contribute to the increase in the frequency of flooding or overtopping of the banks upstream or downstream of the crossing. The hydraulic capacity of the rehabilitated bridge will remain the same as the existing structure. Furthermore, the water levels at this bridge have been lowered due to the removal of downstream dam structure in 2011/2012. Consequently, the flooding frequency may have been reduced.

(d) Repair, rehabilitation, or replacement of a tier 4 stream crossing shall comply with Env-Wt 904.07(d).

Not applicable. The proposed work involves a tier 3 stream crossing.

Appendix A – Natural Resource Agency Coordination Meeting Minutes

BUREAU OF ENVIRONMENT
CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: April 15, 2020
LOCATION OF CONFERENCE: John O. Morton Building
ATTENDED BY:

NHDOT
Sarah Large
Ron Crickard
Andrew O'Sullivan
Meli Dube
Chris Carucci
Russ St. Pierre
Samantha Fifield
Anthony Weatherbee
Rebecca Martin
Jason Tremblay
David Scott
Marc Laurin
Phile Miles
Sandra Newman
Bill Saffian
Chelsey Noyes

ACOE
Rick Kristoff

EPA
Jeannie Brochi
Beth Alafat

Federal Highway Administration
Jaimie Sikora

NHDES
Lori Sommer
Karl Benedict

NH Fish & Game
Carol Henderson

Natural Heritage Bureau
Amy Lamb

The Nature Conservancy
Pete Steckler

Consultants/Public Participants
Peter Walker
Julie Whitmore
Kimberly Peace
Joanne Theriault
Sean James
Marge Badois

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.)

On the east side of Route 107, there will be 2,288 square feet of temporary and permanent impacts (PEM1E and PEM1E×ditch) in a strip between the road and a chain link fence along the fire pond. Total permanent impacts equal 1,991 square feet; total temporary impacts equal 812 square feet total combined impacts equal 2803 square feet.

Other issues: the US Fish & Wildlife Service IPaC tool identified northern long eared bats within the project area. This project does not include tree cutting and therefore is unlikely to impact bats. The NH Natural Heritage Bureau identified the smooth green snake, a State species of concern within the project area.

S.Large mentioned that the project impacts do not reach the mitigation threshold of 10,000 SF of permanent impacts to palustrine wetlands and therefore mitigation was not anticipated for this project. L. Sommer agreed that the threshold didn't appear to be met and therefore concurred no mitigation was required.

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

Allenstown-Pembroke, #40362

Julie introduced the project, which is the rehabilitation of Bridge #107/098 in Allenstown and Pembroke, NH. The bridge carries NH Route 28 over the Suncook River and was originally constructed in 1958. The bridge is a three-span structure, consisting of painted steel beams with a reinforced concrete deck. The bridge is immediately upstream of the Buck Street Dams, which were removed in 2011. The bridge was rehabilitated in the 1990's and included minor deck patch repairs, new bridge rail and curb, and new pavement and membrane.

The deck is in poor condition and the bridge is now on the State's Red List. To extend the life of the structure another 50 to 60 years, VHB completed an engineering analysis and determined a superstructure replacement while retaining the existing substructure as the most appropriate solution. Since the downstream dams were removed, water surface elevations dropped approximately 5 feet at the bridge, exposing deficiencies in the pier stem walls and the slope paving at the southern abutment.

Rehabilitation items include new beams, bearings, reinforced concrete deck, bridge curb and railing, expansion joints, approach slabs, pier collars, and riprap at the southern toe of abutment. Bridge width will match existing conditions, but a slight profile raise is anticipated due to slight variation in the cross-section geometry from the existing conditions.

Pete Walker discussed wetland impact plans, indicating significant features such as the Top of Bank (TOB) and Ordinary High Water (OHW). TOB was mapped within the project area and was determined to connect at the top of slope at abutments on both sides. Pete discussed proposed impacts, both temporary and permanent. Approximately 980 square feet of permanent impacts are anticipated, primarily associated with the extension of a rip-rap slope protecting the southern abutment. A small amount of permanent impacts would result from installation of pier collars to reinforce the existing piers. Temporary impacts are required to construct pier collars and install riprap. The temporary impacts at the southern abutment encompass a large area due to the proximity of the pier to the toe of slope. A water diversion structure, possibly sand bags, is anticipated at the southern abutment and pier 1. Construction access to the southern abutment is anticipated along the western side of the bridge. Temporary impacts to the northern pier are less than the

other pier since one side is within the ordinary high water and the other side is beyond. Access to the northern pier is anticipated along an existing access road within the Right-of-way (ROW).

No significant impacts are anticipated to resources, including Northern Long Eared Bat or Small Whorled Pogonia, and coordination with the USFWS has been completed. Section 106 consultation is nearing completion, with no archaeological concerns or affected historic properties. An effects memo is pending final submittal and acceptance.

VHB considers the riprap at the southern toe of slope to be self-mitigating to stabilize the existing granite slope paving and extend the life of the structure but is seeking concurrence. Additionally, due to the fact that the project is a rehabilitation, a geomorphic assessment has not been conducted and VHB is not planning to develop a formal stream crossing assessment, but would address Env-Wt 904.09(c). Pete Walker referred to email correspondence with Karl Benedict and Craig Rennie regarding the approach to the stream rules, but VHB would like concurrence on both the mitigation question, as well as the stream rules.

Sarah opened the forum up to questions and comments from participants, which was conducted in a roll call manner.

Rebecca Martin (NHDOT Bureau of Environment) had no further remarks, nor did Anthony Weatherbee, Jason Tremblay, or David Scott, representing the Bureau of Bridge Design.

Karl Benedict (NHDES) concurred with VHB's assumption that a geomorphic assessment is not required. He requested that VHB consider stream simulation at the extended riprap. Julie responded that the riprap would be placed to properly key in the stone. Pete Walker agreed that riprap must extend below OHW due to the reduced water levels, and that the rip-rap would not pose a barrier to aquatic organisms. However, VHB will consider embedding the rip-rap or adding some stream simulation material to the design. Karl asked if a Shoreland Permit is anticipated. Pete responded all work is within the ROW and therefore a Permit by Notification (PBN) is expected. Karl also asked for additional information regarding the water diversion, considering the location of the project. Julie explained that the river is relatively flat and shallow through this reach, with low velocities. In channel work is anticipated during low flows and appropriate diversion structures will be evaluated during final design and included in contract documents, as appropriate.

Lori Sommer (NHDES) agreed with VHB's assumption that the riprap is self-mitigating.

Carol Henderson (NH F&G) requested flattening the riprap at the toe of slope to ensure wildlife passage. Amy Lamb (NHHHB) noted that the Natural Heritage Bureau has no concerns - the swamp darter is present in this reach of the river. Carol Henderson indicated that impacts are not anticipated.

Rick Kristoff (USACE) noted the project needs to provide for adequate fish passage. Rebecca Martin noted that the Suncook River is classified as Essential Fish Habitat (EFH) under the National Oceanic and Atmospheric Administration's (NOAA) guidance unless it can be demonstrated that a natural barrier (not a dam) exists downstream. The river is therefore subject to EFH regulations.

Beth Alafat (EPA) had no questions.

Jean Brochi (EPA) had no questions.

Pete Steckler (Nature Conservancy) indicated the Suncook River has been identified as an important wildlife corridor based on TNC's "Connect the Coast" project. Pete would like to ensure that the project accommodate terrestrial wildlife. He suggested smoother substrate to lock in at the southern abutment toe, concurring with Carol Henderson's request.

VHB will evaluate details to provide smoother riprap at the southern abutment toe of slope and evaluate water diversion structures in further detail.

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

Deerfield, #24477

Julie Whitmore introduced the project, which is the replacement of Bridge #137/116 in Deerfield, NH. The bridge carries NH Route 107 over Freeses Pond, essentially bisecting the pond. Freeses Pond is the impoundment of the Lamprey River that enters the pond to the north and exits via a dam to the south. The bridge is a 13-foot-wide by 8-foot-tall corrugated metal culvert with mortar rubble masonry wingwalls and headwalls that was originally constructed in 1973. The downstream dam impounds flow and as indicated in both the winter and summer photos; water levels do not vary much seasonally. Therefore, the culvert functions more like an equalizer to maintain constant water surface elevations through the pond.

The culvert is in poor condition and must be replaced. Water levels coincide with the seam in the culvert, leading to corrosion at the weakest point in the structure. The most practical replacement option for this location is a 14-foot-wide by 9-foot-tall precast concrete box culvert. The box culvert will be buried with 6 inches of simulated stream infill and provides additional hydraulic capacity above ordinary high water to improve conveyance for larger storm events. Approach work is limited to the extent practicable, with no change in pavement area and slight improvements to guardrail berms and grading. Riprap will be provided at the inlet and outlet.

Pete Walker discussed wetland impact plans, indicating features such as the Top of Bank (TOB) and Ordinary High Water (OHW). Based on the current design, VHB expects less than 3,000 square feet of permanent impact in the bed and banks of the pond. Approximately 540 square feet of temporary impacts would be required to install cofferdams and riprap. The permanent impacts at the southwest approach are due to improved slope stability with new guardrail berms and 2:1 slopes.

Coordination regarding potential effects on the northern long eared bat and small whorled pogonia is ongoing. However, Pete noted that pogonia habitat is lacking, and tree clearing would be very minimal so actual impact to NLEB are not expected. Blanding's Turtle has been recorded in the project vicinity and VHB will consult with NH Fish and Game to address any concerns. The Section 106 consultation is ongoing. NHDHR has no archaeological concerns, but an historic inventory may be required on an adjacent property (Parcel 208-58).

VHB considers the riprap proposed to stabilize the proposed structure at the inlet and outlet to be self-mitigating, but is seeking concurrence. Additionally, since the culvert is located within an impounded resource, a stream geomorphic assessment is not appropriate. Based on guidance from NHDOT, the crossing will be treated as a wetland crossing rather than a stream crossing.

Sarah Large opened the forum up to questions from participants, which was conducted in a roll call manner.

Appendix B – Mitigation Report / Coordination / ARM Calculators

This appendix is not applicable to this project, as no mitigation is required.

Appendix C – Wetlands Function-Value Evaluation Form

NOTE: The functions and values of the Suncook River are discussed within the narrative and do not constitute a separate attachment.

US Army Corps of Engineers
New England District

Wetland Function-Value Evaluation Form

Total area of wetland N/A Human made? N/A Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Roadway, Rural Residential, Agricultural Distance to nearest roadway or other development N/A - Roadway Bridge Crossing

Dominant wetland systems present R2UB2 (Suncook River) Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Project Site located in Lower Part

How many tributaries contribute to the wetland? Many Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Suncook River
Latitude 43.159837 Longitude -71.405941
Prepared by: KPW Date 03/27/2020
Wetland Impact:
Type Bed/Bank Area
Evaluation based on:
Office X Field X
Corps manual wetland delineation completed? Y N X

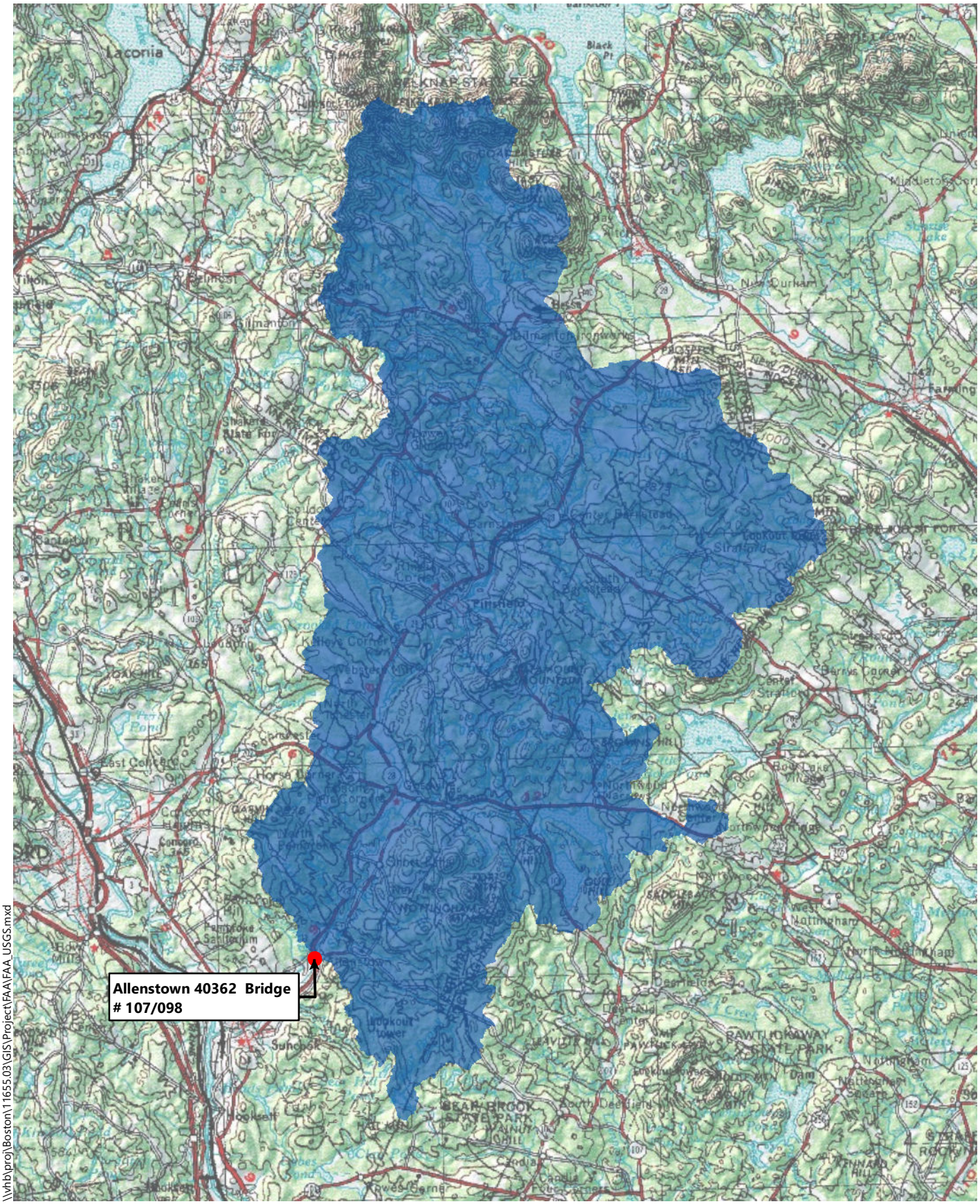
Function/Value	Suitability Y	Suitability N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	X		1, 3, 4, 7, 11, 15	X	Stratified drift aquifers present in Allenstown. High yielding aquifer present @ convergence of Bear Brook and Suncook River. Pembroke Water Works municipal well draws from this aquifer.
Floodflow Alteration	X		1, 5, 7, 9, 10, 11, 13	X	Receives precipitation, surface water, groundwater, and other sources of runoff/discharge from surrounding natural/urban areas. River plays an important role in reducing erosion and flood damage to communities located along the river corridor and downstream.
Fish and Shellfish Habitat	X		1, 4, 5, 6, 7, 8, 9, 10, 12, 14	X	Provides diverse assemblage of plant, fish, amphibian, birds and mammal species. Vital for spawning and nursery habitat, provides feeding opportunity and refuge, and acts a travel corridor.
Sediment/Toxicant Retention	X		1, 2, 3, 6, 10, 12	X	Reduces pollution that flows downstream to the Merrimack River, NH ponds and lakes, and ultimately coastal waters. The river retains sediments, pollutants, & excess nutrients & reduces carbon to the atmosphere.
Nutrient Removal	X		2, 3, 4, 6, 10	X	See comments above under Sediment/Toxicant Retention.
Production Export	X		1, 2, 6, 9, 10		Some suitability to provide food sources to fish, macroinvertebrates, etc.
Sediment/Shoreline Stabilization		X	N/A		Specific to wetlands located along the banks of waterbodies.
Wildlife Habitat	X		1,5,6,7,8,9,10,12,18,19,20	X	Provides habitat for a diverse assemblage of plant, fish, amphibian, bird, & mammal species. Vital for spawning/nursery habitat, provides feeding opportunity & refuge and acts as travel corridor.
Recreation	X		2, 5, 6, 8, 9		Provides opportunity for recreation including fishing, hunting and small boating.
Educational/Scientific Value		X			
Uniqueness/Heritage	X		7, 19, 21, 23		Some suitability due to presence of numerous dams along the river.
Visual Quality/Aesthetics		X	------		
ES Endangered Species Habitat		X	------		NH Natural Heritage Bureau Data Check revealed no concerns relative to endangered species.
Other					

Notes:

* Refer to backup list of numbered considerations.

Adapted from: U.S.Army Corps of Engineers - New England District. 1999. The Highway Methodology Workbook: Supplement: Wetland Functions and Values - A Descriptive Approach. NAEEP-360-1-30a.

Appendix D – Watershed Map, Floodplain Map, & Floodway “No Rise” Certification



\\vhb\proj\Boston\11655.03\GIS\Project\FAA\FAA_USGS.mxd

0 10000 20000 40000 Feet

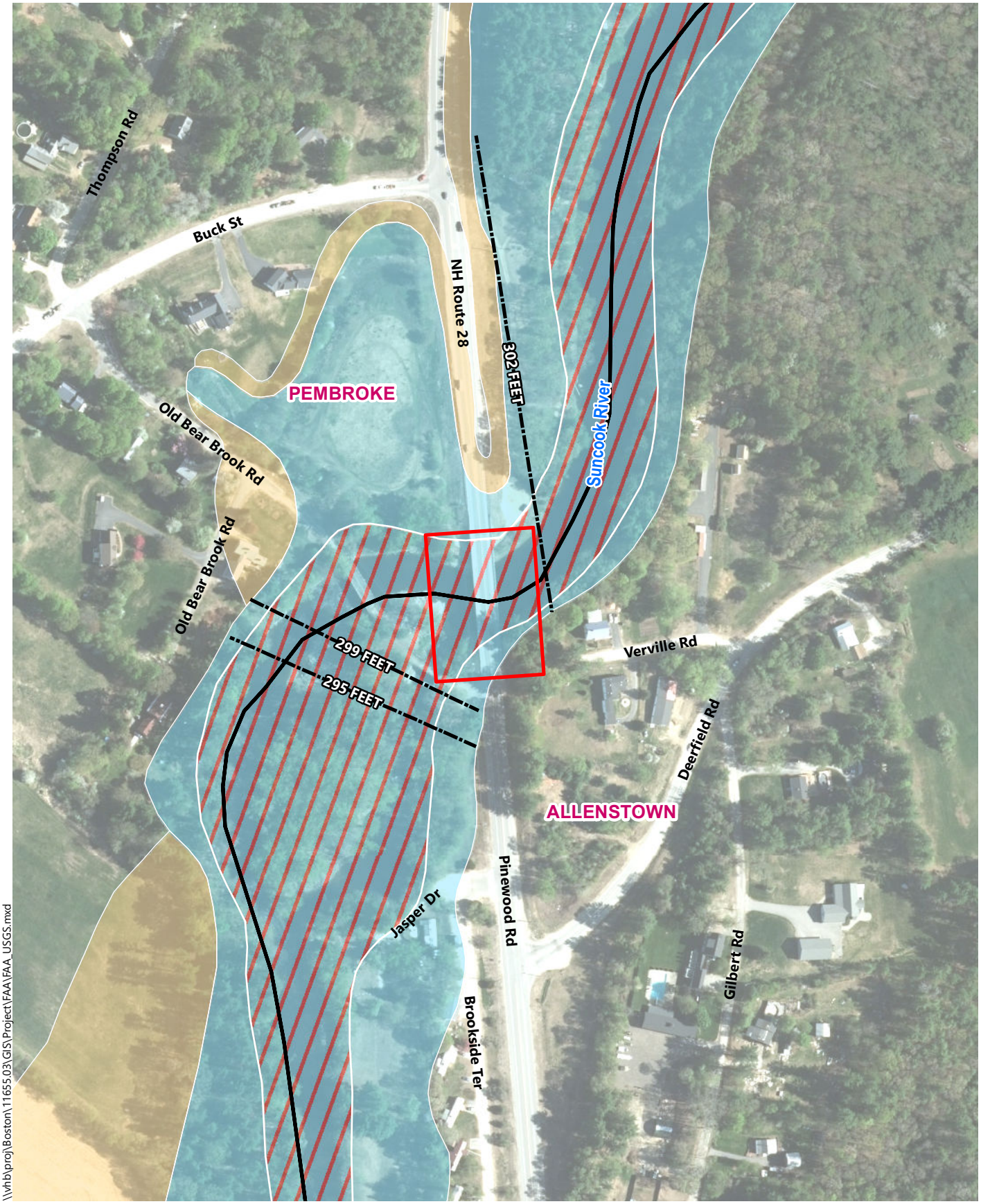
Project Limits

Watershed Boundary
Approx. 153,664 acres

Allenstown 40362 Bridge # 107/098 | Allenstown, New Hampshire

Watershed Map

Source: VHB, NHGRANIT



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0 125 250 500 Feet

Project Limits
Town Boundary
0.2% Annual Chance Flood Hazard
Floodzone Zone AE
Regulatory Floodway
Base Flood Elevation

Allenstown 40362 Bridge # 107/098 | Allenstown, New Hampshire

Floodplain Map

Source: VHB, NHGRANIT

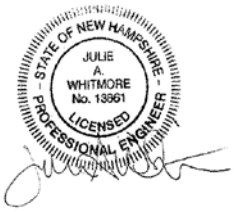
Memorandum

To: Rebecca Martin, NHDOT

Date: June 2, 2020
Project #: 52501.02

From: Julie Whitmore, PE

Re: Allenstown-Pembroke 40362
Floodway "No-Rise/No-Impact" Certification



This memo certifies that I am a qualified engineer licensed to practice in the State of New Hampshire and supports that the NHDOT Allenstown-Pembroke 40362 Project will not impact Base Flood Elevation, floodway elevation, and floodway width of the Suncook River.

The project replaces the existing superstructure with limited roadway approach work and substructure repairs of NH Bridge No. 107/098 carrying NH Route 28 over the Suncook River in Allenstown and Pembroke, NH. To address abrasion on the bridge piers and extend the service life of the bridge, concrete collars will be constructed as part of the NHDOT Allenstown-Pembroke 40362 Project. Concrete collars will be located within FEMA designated floodway; therefore, an adjacent gravel access area under the north span (Span 3) will be lowered to maintain the existing hydraulic opening in reference to the Base Flood Elevation. The project will not increase BFE due to this mitigation.

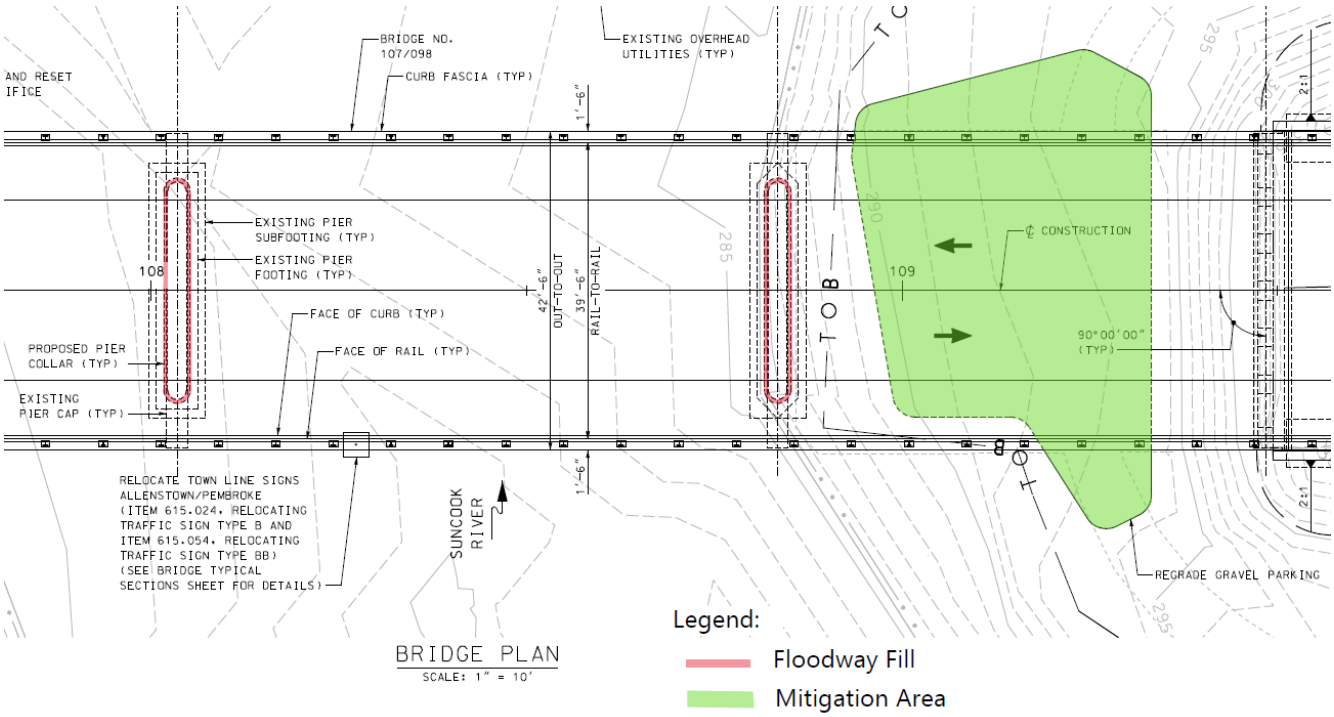


Figure 1: Plan View

\\vhb\gbl\proj\Bedford\52501.02 Allenstown 40362\docs\memos\FEMA No-Rise Cert\Allenstown-Pembroke 40362 No-Rise Cert.docx

2 Bedford Farms Drive
Suite 200
Bedford, NH 03110-6532
P 603.391.3900

Appendix E – Stream Crossing Forms

This appendix is not applicable to this project, since a stream geomorphic assessment is not required.

Appendix F – Env-Wt 514 Bank/Shoreline Stabilization Project-Specific Worksheet

This appendix includes the NHDES Project-Specific Worksheet, along with a written narrative that elaborates further on the project's compliance with Env-Wt 514.02.

BANK/SHORELINE STABILIZATION PROJECT-SPECIFIC WORKSHEET FOR STANDARD APPLICATION

Water Division/Land Resources Management
Wetlands Bureau

Check the Status of your Application

RSA/Rule: RSA 482/ Env-Wt 514

APPLICANT LAST NAME, FIRST NAME, M.I.: NH Department of Transportation

This worksheet summarizes the criteria and requirements for a Standard Permit for all types of "bank/shoreline stabilization" projects, as outlined in Chapter Env-Wt 500. In addition to the project-specific criteria and requirements on this worksheet, all Standard Applications must meet the criteria and requirements listed in the Standard Dredge and Fill Wetlands Permit Application form (NHDES-W-06-012).

Do **not** use this worksheet if the project is located in a coastal (tidal) area (Env-Wt 509.02(b)).

SECTION 1 - APPROVAL CRITERIA (Env-Wt 514.02)

An application for bank/shoreline stabilization must meet the following approval criteria:

☒ The project must meet the applicable conditions established in Env-Wt 300.

☒ For a hard-scape stabilization proposal, such as rip-rap or a retaining wall, the applicant must demonstrate that the bank or shoreline in that location cannot be stabilized by preserving natural vegetation, landscaping, or bioengineering.

☒ Bank/shoreline stabilization must be designed to be the least intrusive practicable method in accordance with Chapter 8 of the Wetlands Best Management Practice Techniques for Avoidance and Minimization (A/M BMPs).

☒ Bank/shoreline stabilization must conform to the natural alignment of the bank/shoreline.

☒ Bank/shoreline stabilization must not adversely affect the stream course such that water flow will be transported by the stream channel in a manner that the stream maintains it dimensions, general pattern, and slope with no unnatural raising or lowering of the channel bed elevation along the stream bed profile.

☒ Bank/shoreline stabilization must not adversely affect the physical stream forms or alter the local channel hydraulics, natural stream bank stability, or floodplain connectivity.

☒ Bank/shoreline stabilization must avoid and minimize impacts to shoreline resource functions as described in Env-Wt 514.01 and Chapter 8 of the A/M BMPs.

☐ If the project is a wall on a great pond or other surface water where the state holds fee simple ownership of the bed, bank/shoreline stabilization must locate the wall on the shoreward side of the normal high water line.

☐ If the project is to install rip-rap, bank/shoreline stabilization must locate the rip-rap shoreward of the normal high water line, where practicable, and extend it not more than two feet lakeward of that line at any point.

☒ The hierarchy of bank stabilization practices must be as follows:

(1) Soft vegetative bank stabilization, including regrading and replanting of slopes, in which all work occurs above ordinary high water or normal high water,

(2) Bioengineered bank stabilization or naturalized design techniques that uses a combination of live vegetation, woody material, or geotextile matting and may include regrading and replanting of slopes,

(3) Semi-natural form design shall be allowed only where the applicant demonstrates that anticipated turbulence, flows, restricted space, or similar factors, render vegetative or soft stabilization methods, bioengineering, and natural process design stabilization methods physically impractical,

(4) Hard-scape or rip-rap design shall be allowed only where anticipated turbulence, flows, restricted space, or similar factors render vegetative, bio-engineering, semi-natural form design and diversion methods physically impractical and where necessary to protect existing infrastructure, and

(5) Wall construction shall be allowed as the last available option, only where lack of space or other limitations of the site make alternative stabilization methods of bioengineering, seminatural, and rip-rap impractical. Wherever sufficient room exists, slopes shall be cut back to eliminate the requirement for a wall.

☒ Stream bank-stabilization project plans must be developed in accordance with the following techniques, as applicable:

- Naturalized and semi-natural design techniques where practicable in accordance with the Guidelines for Naturalized River Channel Design and Bank Stabilization dated February 2007; R. Schiff, J.G. MacBroom, and J. Armstrong Bonin.
- For bioengineering projects, National Engineering Handbook Part 654 (NEH 654), Technical Supplement 141, Streambank Soil Bioengineering, dated August 2007, USDA NRCS.
- For stream restoration projects, NEH 654, Stream Restoration Design, dated August 2007, USDA NRCS.

SECTION 2 - APPLICATION REQUIREMENTS FOR ALL BANK/SHORELINE STABILIZATION PROJECTS (Env-Wt 514.03)

An application for any bank/shoreline stabilization project must include:

☒ A narrative and photos that:

- Describe and illustrate existing conditions and locations where shoreline vegetation currently exists.

  The project is located within a residential/rural area along the town border of Allenstown and Pembroke. The town border is the Suncook River, which is the dominant feature within this area. The Suncook River meanders around an upland island immediately southwest of Bridge No. 107/098. A discontinued roadway crosses the Suncook River in two locations using the northern portion of the upland island. Existing shoreline vegetation directly adjacent to the bridge within the proposed limits of disturbance and existing roadway ROW includes various herbaceous species and some scattered shrubs. According to the current plans, no clearing of mature vegetation is proposed. Refer to the Supplemental Narrative for more information.

- Identify all known causes of erosion to the bank/shoreline in that location.

  Downstream from the project area is the site of former Buck Street Dam - two dam structures located on either side of the upland island were removed in 2011/2012. The removal of these dam structures lowered the ordinary high water elevation of the Suncook River immediately upstream of the dams within the vicinity of Allenstown-Pembroke Bridge No. 107/098 by approximately five to six feet. The current water levels are below the existing slope protection measures (i.e., granite pavers) and require additional stabilization to reduce erosion.

- Identify information and, for minor and major projects, engineering standards used to determine the appropriateness of the proposed bank stabilization treatment or practice.

  The riprap toe extension has been designed in accordance with applicable NHDOT design guidelines and specifications: Standard Specifications for Road and Bridge Construction (2016) and HEC-18 for evaluating bridge scour.

- Explain the design elements that have been incorporated to address erosion, by eliminating or minimizing the causes therefor.

  Due to the lowered water level in the project area as a result fo the removed downstream dams, the existing granite pavers are not sufficient to prevent bank erosion. Therefore, rip-rap is proposed along the southern abutment toe-of-slope to stabilize the slope, prevent further erosion, and provide adequate support for the rehabilitated bridge structure.

- For minor and major bank/shoreline stabilization projects or minimum impact bioengineering stream bank projects, identify the flood risk tolerance of the proposed treatment or practice using the appropriate technical guidance or national engineering handbook.

  The proposed project will not impact the Base Flood Elevation (BFE), floodway elevation, and floodway width of the Suncook River. The limited floodway fill via the proposed concrete pier collars will be offset with a compensatory flood storage area under the north span (Span 3) by lowering the adjacent gravel access area to maintain the existing hydraulic opening in reference to BFE. Refer to the Floodway "No Rise" Certification provided in Appendix B for more information.

A cross-section plan that shows:

☒ The difference in elevation between the lowest point of the bank/shoreline slope to be impacted by the construction and the highest point of the bank/shoreline slope to be impacted.

☒ The linear distance across the proposed project area as measured along a straight line between the highest and lowest point of the bank/shoreline slope to be impacted.

☒ The existing and proposed slope of the bank/shoreline.

☒ The normal high water line or ordinary high water mark, as applicable.

Hard-scape, rip-rap, or unnatural design plans that must include:

☒ Designation of minimum and maximum stone size.

☒ Gradation.

☒ Minimum rip-rap thickness.

☒ Type of bedding for stone.

☒ Cross-section and plan views of the proposed installation.

☒ A description of anticipated turbulence, flows, restricted space, or similar factors that would render vegetation and bioengineering stabilization methods physically impracticable.

☒ Engineering plans for rip-rap in excess of 100 linear feet along the bank or bed of a stream or river, including in-stream revetments, stamped by a professional engineer.

☒ If the project proposes rip-rap adjacent to great ponds or other surface waters where the state holds fee simple ownership to the bed, a stamped surveyed plan showing the location of the normal high water line and the footprint of the proposed project.

Design plans for a wall in non-tidal waters must include:

☐ Cross-section and plan views of the proposed installation and sufficient plans to clearly indicate the relationship of the project to fixed points of reference, abutting properties, and features of the natural shoreline.

☐ If the application is for a wall adjacent to a great pond or other surface water where the state holds fee simple ownership to the bed, a surveyed plan, stamped by a licensed land surveyor, showing the location of the normal high water line and the footprint of the proposed project.

SECTION 3 - DESIGN REQUIREMENTS FOR ALL BANK/SHORELINE STABILIZATION PROJECTS (Env-Wt 514.04)

In addition to meeting all applicable requirements in Env-Wt 300, bank/shoreline stabilization must be designed to:

☐ Incorporate stormwater diversion and retention to minimize erosion.

☒ Retain natural vegetation to the maximum extent possible.

☐ If space and soil conditions allow, cut back unstable banks to a flatter slope and then plant with native, non-invasive trees, shrubs, and groundcover.

☒ Avoid and minimize impacts to adjacent properties and infrastructure.

☒ Avoid and minimize impacts to water quality.

☒ Avoid and minimize impacts to priority resource areas, avian nesting areas, fish spawning locations, and other wildlife habitat to meet the requirements of Env-Wt 514.02.

☐ Incorporate naturalized and semi-natural design techniques where practicable in accordance with Guidelines for Naturalized River Channel Design and Bank Stabilization dated February 2007, R. Schiff, J.G. MacBroom, and J. Armstrong Bonin.

☐ For bioengineering projects, be in accordance with NEH 654, Technical Supplement 141, Streambank Soil Bioengineering, dated August 2007, USDA NRCS.

☐ For stream restoration projects, be in accordance with NEH 654, Stream Restoration Design, dated August, 2007, USDA NRCS.

SECTION 4 - CONSTRUCTION REQUIREMENTS FOR ALL BANK/SHORELINE STABILIZATION PROJECTS (Env-Wt 514.05)

In addition to all applicable construction standards specified in Env-Wt 300, the following apply to all bank/ shoreline stabilization projects:

☒ Materials used to emulate a natural channel bottom must:

- Be consistent with materials identified in the reference reach, and
- Not include any angular rip-rap or gravel unless specifically identified on the approved plan.

☐ Bank restoration must be constructed, landscaped, and monitored in a manner that will create a healthy riparian or lacustrine shoreline system.

☒ Bank/shoreline stabilization areas must:

(1) Have at least 75% successful establishment of vegetation after two growing seasons, or

(2) Be replanted and re-established until a functional lacustrine, wetland, or riparian system has been reestablished in accordance with the approved plans.

☒ Unless otherwise approved, construction must be performed during low flow or dry conditions.

☐ Where there is documented occurrence of a cold water fishery or protected species or habitat, unless a waiver of this condition is issued in writing by the department in consultation with the New Hampshire Fish and Game Department, work must occur:

- During low-flow or dry conditions during the growing season, and
- Prior to October 1.

☒ Work authorized must be carried out in accordance with Env-Wt 307 such that there are no discharges in or to spawning or nursery areas during spawning seasons.

☒ Work authorized must be carried out in accordance with Env-Wt 307 such that controls are in place to protect water quality and appropriate turbidity controls such that no turbidity escape the immediate dredge area and must remain until suspended particles have settled and water at the work site has returned to normal clarity.

☒ Within 60 days of completion of construction, the applicant must submit a post-construction report that:

- Has been prepared by a professional engineer, certified wetland scientist, or qualified professional, as applicable, and
- Contains a narrative, exhibits, and photographs, as necessary to report the status of the project area and restored jurisdictional area.

SECTION 5 - ON-GOING REQUIREMENTS FOR ALL BANK/SHORELINE STABILIZATION PROJECTS (Env-Wt 514.06)

The owner must monitor the project and take corrective measures if the area is inadequately stabilized or restored by:

(a) Replacing fallen or displaced materials without a permit, where no machinery in the channel is required,

(b) Identifying corrective actions and follow-up plans in accordance with Env-Wt 307, and

(c) Filing appropriate application and plans where work exceeds (a), above.

SECTION 6 - BANK STABILIZATION CONSTRUCTION PROJECT CLASSIFICATION (Env-Wt 514.07)

Refer to Env-Wt 514.07 for project classification.

Env-Wt 514.02 Approval Criteria for All Bank/Shoreline Stabilization Projects

(a) In addition to meeting the applicable conditions established in Env-Wt 300, the department shall not approve a hard-scape stabilization proposal such as rip-rap or a retaining wall unless the applicant demonstrates that the bank or shoreline in that location cannot be stabilized by preserving natural vegetation, landscaping, or bioengineering.

The toe-of-slope rip-rap streambank stabilization proposed at the southern abutment of the bridge is required to prevent erosion and scour and preserve the integrity of the bridge structure itself. Due to the removal of two downstream dam structures in 2011/2012, the ordinary high-water within the project area was reduced by five to six feet. As such, the water level is below the existing granite rip-rap, rendering it ineffective. Therefore, a hard-scape stabilization measure is needed to extend from the existing abutment protection below the existing ordinary high-water level. This area beneath the bridge does not receive adequate sunlight to support natural vegetation. Similarly, landscaping or bioengineering would also not be as effective in this location, nor have the required durability to protect the bridge abutment. To minimize the impacts of the proposed toe-of-slope rip-rap extension, the rip-rap will be placed six to eight inches below grade with stream simulation. The final grade will match the existing to ensure no adverse impacts result to hydraulics, wildlife passage, and benthic habitat.

(b) Bank/shoreline stabilization shall:

(1) Be designed to be the least intrusive practicable method in accordance with Chapter 8 of the A/M BMPs, available as noted in Appendix B;

The project will comply with the Structural (Hard-Armor) Bank Stabilization section of Chapter 8 of the A/M BMPs, as other more environmentally preferable options are infeasible. The buried rip-rap with stream simulation is the least intrusive practicable method to provide adequate structural support for the rehabilitated structure.

(2) Conform to the natural alignment of the bank/shoreline;

The project does not propose a change to the natural alignment of the streambank. The post-construction stream conditions will match the existing stream conditions with stream simulation over the buried rip-rap extension area.

(3) Not adversely affect the stream course such that water flow will be transported by the stream channel in a manner that the stream maintains it dimensions, general pattern, and slope with no unnatural raising or lowering of the channel bed elevation along the stream bed profile;

The project will not adversely affect the stream course. The stream dimensions, general pattern, slope, and streambed profile post-construction will match the existing conditions.

(4) Not adversely affect the physical stream forms or alter the local channel hydraulics, natural stream bank stability, or floodplain connectivity;

The proposed rip-rap extension will not adversely affect the physical stream forms or alter the local channel hydraulics, natural streambank stability, or floodplain connectivity. Rather, the natural streambank stability will be improved along the southern bridge abutment toe-of-slope.

Furthermore, the natural connection between Suncook River and its associated floodplain will be maintained since the final grade over the rip-rap will match the existing grade.

(5) Avoid and minimize impacts to shoreline resource functions as described in Env-Wt 514.01 and Chapter 8 of the A/M BMPs, available as noted in Appendix B;

Impacts to shoreline resource functions will be avoided and minimized to the maximum extent practicable through the installation of the rip-rap below grade with stream simulation to match existing streambed conditions. The existing soil stability and ecological communities that inhabit and utilize the streambanks will be maintained. No major impacts to the streambanks of Suncook River are proposed. Rip-rap is proposed along a bare soil area waterward of the existing granite rip-rap. The runoff filtering/sediment-trapping and flood abatement functions of these areas will be maintained, as all temporarily disturbed areas will be restored to pre-construction conditions.

(6) If the project is a wall on a great pond or other surface water where the state holds fee simple ownership of the bed, locate the wall on the shoreward side of the normal high water line; and

Not applicable.

(7) If the project is to install rip-rap, locate the rip-rap shoreward of the normal high water line, where practicable, and extend it not more than 2 feet lakeward of that line at any point.

The project proposes to install rip-rap waterward of the existing granite rip-rap by approximately 15 feet. This is needed to protect the southern bridge abutment and prevent scour. This is the minimum amount of rip-rap required to provide the necessary structural integrity.

(c) The hierarchy of bank stabilization practices shall be as follows:

(1) Soft vegetative bank stabilization, including regrading and replanting of slopes, in which all work occurs above ordinary high water or normal high water;

(2) Bioengineered bank stabilization or naturalized design techniques that uses a combination of live vegetation, woody material, or geotextile matting and may include regrading and replanting of slopes;

(3) Semi-natural form design shall be allowed only where the applicant demonstrates that anticipated turbulence, flows, restricted space, or similar factors, render vegetative or soft stabilization methods, bioengineering, and natural process design stabilization methods are physically impractical;

(4) Hard-scape or rip-rap design shall be allowed only where anticipated turbulence, flows, restricted space, or similar factors render vegetative, bio-engineering, semi-natural form design and diversion methods physically impractical and where necessary to protect existing infrastructure; and

(5) Wall construction shall be allowed as the last available option, only where lack of space or other limitations of the site make alternative stabilization methods of bioengineering, semi-natural, and rip-rap impractical. Wherever sufficient room exists, slopes shall be cut back to eliminate the requirement for a wall.

Number 4 above is the least intrusive method that will still accomplish the project goals. Given the constraints of the area below the bridge (i.e., lack of adequate sunlight, frequent inundation, turbulent/scour-prone stream flows, and restrictive space), rip-rap is the only practical method and is necessary to protect the structural integrity of the bridge. Providing vegetative or bio-

engineering would not mature quickly enough and could potential undermine the existing granite rip-rap. Vegetative methods may not contribute to stability in this case.

(d) Stream bank-stabilization project plans shall be developed in accordance with the following techniques, as applicable:

(1) Naturalized and semi-natural design techniques where practicable in accordance with "Guidelines for Naturalized River Channel Design and Bank Stabilization" dated February 2007, R. Schiff, J.G. MacBroom, and J. Armstrong Bonin, available as noted in Appendix B and at https://www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/r-wd-06-37.pdf

(2) For bioengineering projects, National Engineering Handbook Part 654 (NEH 654), Technical Supplement 141, Streambank Soil Bioengineering, dated August 2007, NRCS, available as noted in Appendix B and at https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17818.wba; and

(3) For stream restoration projects, NEH 654, Stream Restoration Design, dated August 2007, NRCS, available as noted in Appendix B and at https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/manage/restoration/?cid=stelprdb1044707.

Streambank stabilization is achieved by installing a six to eight-inch-thick layer of excavated native material on top of proposed rip-rap at the toe of slope at the southern abutment. Rip-rap is required to stabilize the existing granite rip-rap and ensure the integrity of the existing substructure. The rip-rap toe extension has been designed in accordance with applicable NHDOT design guidelines and specifications: Standard Specifications for Road and Bridge Construction (2016) and HEC-18 for evaluating bridge scour.

Appendix G – Restoration/Enhancement Activities Project-Specific Worksheet

This appendix is not applicable to this project, as no restoration or enhancement activities are proposed.

Appendix H – NHB DataCheck Report & Correspondence

This appendix includes the following:

- NHB DataCheck Report
- Email Coordination with NHF&G
- Two NHF&G Snake Flyers

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo

NH Natural Heritage Bureau
NHB Datacheck Results Letter

To: Nicole Martin, VHB, Inc.
2 Bedford Farms Drive
Suite 200
Bedford, NH 03110

From: Amy Lamb, NH Natural Heritage Bureau
Date: 1/29/2021 (valid until 01/29/2022)
Re: Review by NH Natural Heritage Bureau
Permits: NHDES - Wetland Standard Dredge & Fill - Major

NHB ID: NHB21-0156 Town: Allenstown Location: NH State Route 28 Right-of-Way
Description: The project proposes to rehabilitate Bridge No. 107/098 over the Suncook River through the replacement of the existing structurally deficient deck with a traditional deck, installation of concrete pier collars, toe-of-slope rip-rap, wingwall replacement, etc. All work will be contained within the previously disturbed existing NH Route 28 ROW. The work will occur during low flow conditions outside of the winter season.

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments NHB: No Comments At This Time
F&G: Contact NHFG. This area is within a NHFG Zone of Concern.
This site is within an area flagged for possible impacts on the state-listed *Alasmidonta varicosa* (brook floater) in the Suncook River

Invertebrate Species	**State[1]**	**Federal**	**Notes**
Brook Floater (*Alasmidonta varicosa*)	E	--	Contact the NH Fish & Game Dept (see below).

Vertebrate species	**State[1]**	**Federal**	**Notes**
Northern Black Racer (*Coluber constrictor constrictor*)	T	--	Contact the NH Fish & Game Dept (see below).
Smooth Green Snake (*Opheodrys vernalis*)	SC	--	Contact the NH Fish & Game Dept (see below).
Swamp Darter (*Etheostoma fusiforme*)	SC	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

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

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo

NH Natural Heritage Bureau
NHB Datacheck Results Letter

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

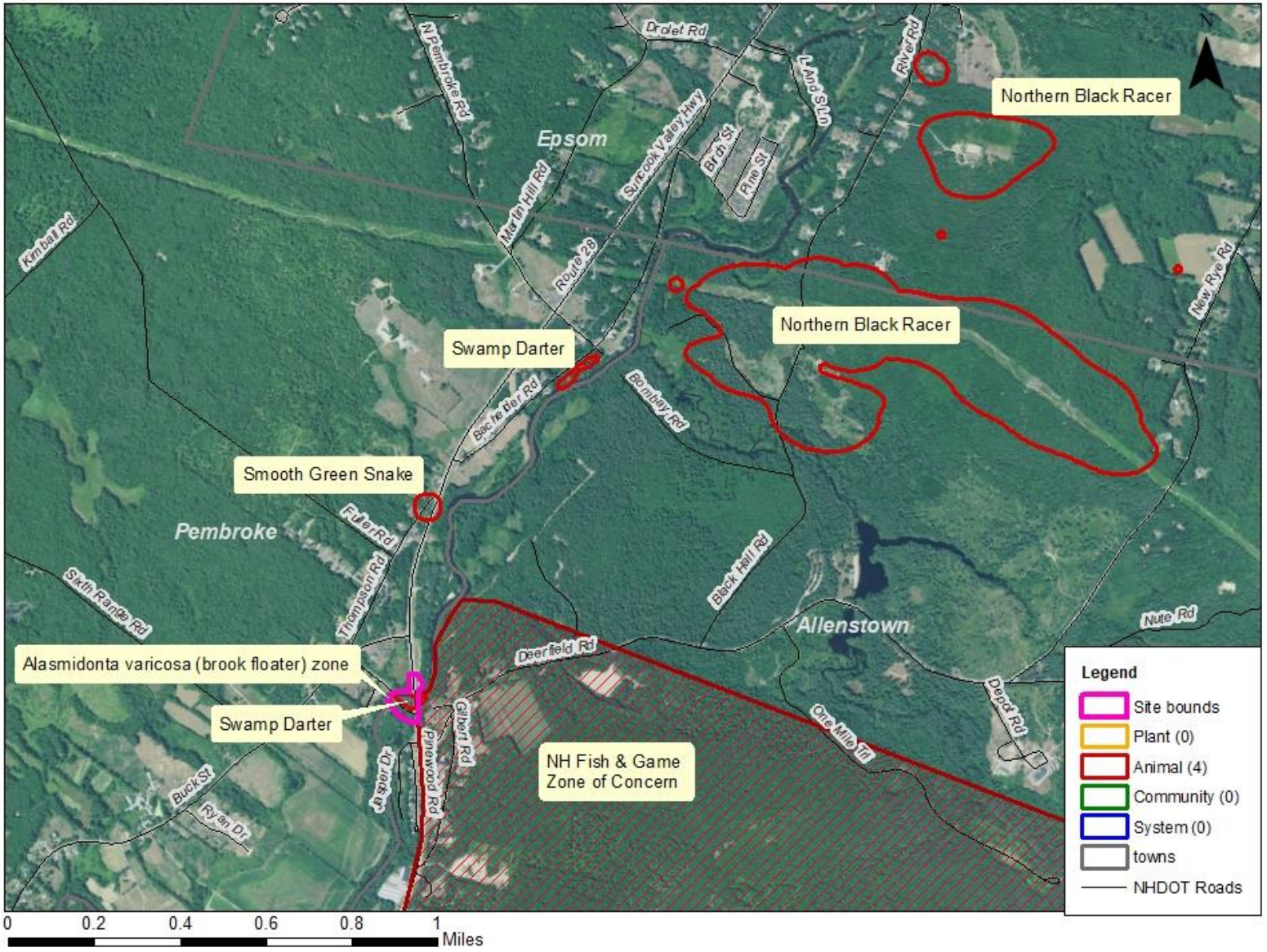
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed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

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

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

CONFIDENTIAL – NH Dept. of Environmental Services review

NHB21-0156



Martin, Nicole

From: Doperalski, Melissa <Melissa.J.Doperalski@wildlife.nh.gov>
Sent: Tuesday, February 16, 2021 3:12 PM
To: Martin, Rebecca
Cc: Tuttle, Kim
Subject: RE: Mussel Survey RE: Allenstown-Pembroke 40362 NHB21-0156

Hi Rebecca,
Winter surveys are not conducted due to water conditions. Typically surveys for mussels are conducted between the months of May (if sampling conditions are favorable) and September.

If the survey does not indicate the presence of brook floaters in this segment of the river, we would honor those results for the 2-year project window. If mussels are found and relocated, we would have to consider the relocation placement in the methods developed with the consultant to minimize the chance that they may move back into the project area during the term of the project.

-Melissa

From: Martin, Rebecca
Sent: Friday, February 12, 2021 7:01 PM
To: Doperalski, Melissa
Cc: Tuttle, Kim
Subject: RE: Mussel Survey RE: Allenstown-Pembroke 40362 NHB21-0156

Hello Melissa,

I spoke with the project team today and we have two different ideas for how to get the mussel survey contracted for the Allenstown Pembroke 40362 project. During that meeting there was discussion about whether it might be possible to complete the mussel survey ASAP to avoid needing to go through the rules waiver request. I have never seen a project with a mussel survey in the winter. I assume it is usually not done for diver safety concerns, but I figured I would ask about your experience- do the surveyors wait until spring (ice out) to complete mussel surveys?

Also, this project is expected to be a 2 year project- I assume 1 negative survey would be good for the entire project, but I want to confirm that? Also, if mussels are found and relocated, would that be sufficient for the entire project?

Thanks very much for your assistance,
Rebecca

From: Doperalski, Melissa <Melissa.J.Doperalski@wildlife.nh.gov>
Sent: Thursday, February 11, 2021 1:58 PM
To: Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Cc: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Subject: RE: Mussel Survey RE: Allenstown-Pembroke 40362 NHB21-0156

Methods for survey are usually provided by the consultant after they review the project details and then approved by NHFG. If you have a consultant that you typically work with that you have already reached out to, please feel free to have them contact me. A Scientific License would be required to be acquired by the consultant. For this project, I would likely include a provision that if any were encountered they could be relocated nearby in suitable habitat.

From: Martin, Rebecca
Sent: Thursday, February 11, 2021 1:41 PM
To: Doperalski, Melissa
Cc: Tuttle, Kim
Subject: Mussel Survey RE: Allenstown-Pembroke 40362 NHB21-0156

Hello Melissa,

As you suggested, I reached out to NHDES and it seems that they can no longer condition a permit on a mussel survey under the new rules, but we can submit a waiver request. That is what we are planning to move forward with at this time.

In your previous email you had indicated that a TOY restriction would not benefit brook floaters, are there any other avoidance recommendations you have (in addition to the survey)? Are there any special considerations for the mussel survey that you would recommend? I assume we will include relocation in the survey scope (if any brook floaters are found).

Excerpt of the email from Karl Benedict at NHDES
'The application and waiver request should provide Conditional language indicating schedule for mussel surveys, relocation requirements, project timing, and avoidance recommendations for both permanent and temporary impact areas per documentation provided by NHFG to be performed prior to start of work. Please be sure to summarize NHFG recommendations for all species identified on the datacheck.'

Thank you,
Rebecca

From: Martin, Rebecca
Sent: Monday, February 8, 2021 1:00 PM
To: Doperalski, Melissa <Melissa.J.Doperalski@wildlife.nh.gov>
Cc: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Subject: RE: Allenstown-Pembroke 40362 NHB21-0156

Hi Melissa,

Thank you for explaining. The project was discussed at the April 15, 2020 Natural Resource Agency Meeting https://www.nh.gov/dot/org/projectdevelopment/environment/units/project-management/documents/April152020minutes_FINAL.pdf , which was before the 2021 NHB report was requested. At that time, the dragon fly was the only other species that was mentioned (though it didn't show up on the NHB report either). This leads me to believe the records for the snakes and brook floater might be new.
'Carol Henderson (NH F&G) requested flattening the riprap at the toe of slope to ensure wildlife passage. Amy Lamb (NHHHB) noted that the Natural Heritage Bureau has no concerns - the swamp darter is present in this reach of the river. Carol Henderson indicated that impacts are not anticipated'
I will ask DES if the survey could be completed after the wetland permit application is completed. As was discussed during the Natural Resource meeting, this River is Essential fish habitat, so the work is being completed under low flow conditions. Also, this stretch of the Suncook was impounded until 2011/2012 when the Buck Street dams were removed. If you think of any conservation measures that might apply, which could eliminate the need for a survey, please let me know.

Best,
Rebecca

From: Doperalski, Melissa
Sent: Monday, February 8, 2021 10:26 AM
To: Martin, Rebecca
Cc: Tuttle, Kim
Subject: RE: Allenstown-Pembroke 40362 NHB21-0156

Morning,
When was the NR Agency meeting? If it was more recent I cannot speak as to why Carol didn't mention it or contact Nongame about the records. The NHB datacheck is constantly being updated which is why we have expirations on the letters and encourage proposers to keep it up to date for this reason. In addition, we sometimes screen species during our initial NHB datacheck reviews and may "remove" species from the letters if the proposed project as described is not likely to impact a particular species. As this project initially was not going to originally to impact the river and habitat, as I understand it, it may not have triggered a concern during the NHB review or during the meeting (can't speak to either specifically, but these are also likely reasons). But since the project is now proposing impacts to the river (or we now are learning of it), the current records of this species in the area as well as potential habitat in this stretch of river, there is a concern for impacts. I am not sure if it is feasible to have a survey/check for mussels at the time the cofferdams are placed? A time of year restriction unfortunately doesn't really pertain to this species.

Melissa

From: Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Sent: Monday, February 8, 2021 10:07 AM
To: Doperalski, Melissa <Melissa.J.Doperalski@wildlife.nh.gov>
Cc: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Subject: RE: Allenstown-Pembroke 40362 NHB21-0156

Hi Melissa,

Thank you for taking a look at the project details. Given that we are late in the project development process (wetland permit application was due to be submitted this week or next and advertising in May), I am writing in hopes that we might find a way to avoid harm to the species without a survey. The last NHB report did not indicate either the mussel or the snake species. When the project was discussed in the Natural Resource Agency Coordination meeting, only the dragonfly was mentioned as being present in the project area. The snakes and the mussel have taken us by surprise. Are there any other conservation measures that we could use to avoid harm to the brook floater, a certain time of year to complete the work or install the cofferdams that might be less impactful?

Thank you,
Rebecca

Rebecca Martin
Senior Environmental Manager
NH DOT Bureau of Environment
7 Hazen Drive
Concord, NH 03302
(603)271-6781
Rebecca.A.Martin@dot.nh.gov

From: Doperalski, Melissa <Melissa.J.Doperalski@wildlife.nh.gov>
Sent: Monday, February 8, 2021 9:23 AM
To: Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>; Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Subject: RE: Allenstown-Pembroke 40362 NHB21-0156

Morning,
I do think there is a potential for brook floaters at that crossing. Given the temporary and permanent areas of impact, a survey should be completed to be sure that impacts to this species are avoided.

-Melissa

From: Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Sent: Friday, February 5, 2021 7:35 PM
To: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>; Doperalski, Melissa <Melissa.J.Doperalski@wildlife.nh.gov>
Subject: RE: Allenstown-Pembroke 40362 NHB21-0156

Thank you Kim, I will add in the snake commitments and wildlife friendly erosion control. If you or Melissa find you have any additional questions, please let me know.

Hi Melissa, I had mentioned to Kim that this project was due to send in a wetland permit application (thus the NHB update) any day now to make a May advertising date. Understandably, schedules are very busy these days, so could you please let me know when you anticipate reviewing this project? I know the Project Manager is going to be concerned about the project schedule and I want to be able to provide the best information possible.

Have a nice weekend,

Rebecca

Rebecca Martin
Senior Environmental Manager
NH DOT Bureau of Environment
7 Hazen Drive
Concord, NH 03302
(603)271-6781
Rebecca.A.Martin@dot.nh.gov

From: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Sent: Thursday, February 4, 2021 11:28 AM
To: Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Cc: Doperalski, Melissa <Melissa.J.Doperalski@wildlife.nh.gov>
Subject: FW: Allenstown-Pembroke 40362 NHB21-0156

Rebecca,

I just have to check in with Melissa Doperalski about brook floaters. If it is an impounded section, it is unlikely they are there and will need a survey. Standard snake commitments about wildlife friendly erosion control will protect black racers and other wildlife including waterfowl.

Thanks,

Kim Tuttle
Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Carpenter, Matthew <mathew.a.carpenter@wildlife.nh.gov>
Sent: Wednesday, February 3, 2021 11:41 AM
To: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Subject: RE: Allenstown-Pembroke 40362 NHB21-0156

Hi Kim,
No concerns here.
Matt

From: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Sent: Wednesday, February 3, 2021 10:56 AM
To: Carpenter, Matthew <mathew.a.carpenter@wildlife.nh.gov>
Subject: FW: Allenstown-Pembroke 40362 NHB21-0156

Hi Matt,

Do you have any concerns with anadromous or eels?

From: Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Sent: Tuesday, February 2, 2021 2:39 PM
To: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Subject: Allenstown-Pembroke 40362 NHB Report

Hello Kim,

I hope that this message finds you well. I am writing about a bridge rehabilitation project on Bridge No. 107/098 over the Suncook River, which crosses between Allenstown and Pembroke. The project proposes to replace the existing structurally deficient bridge deck with a traditional deck, to install concrete pier collars and toe-of-slope rip-rap, and wingwall replacement. The project had previously been assessed as No Impacts Anticipated. A new NHB request was submitted because we are about to submit the wetland permit application and finalize the environmental document, and this year the Brook Floater and the Northern Black Racer were both included in the list. Two Special Concern species were also included (Smooth Green Snake and the Swamp Darter).

The NH Department of Environmental Services (NHDES) issued a Wetlands and Non-Site Specific Permit #2020-01405 for the project on August 7, 2020. However, the NHDOT Bureau of Construction had concerns with the temporary impacts as depicted on the approved project plans and requested that the temporary impact area adjacent to the bridge and around the piers be expanded to allow adequate space to conduct the proposed rehabilitation work. Since the proposed changes increase the previously approved temporary dredge and fill impact area by greater than 20 percent, it requires the submission of a new permit application. A Wetland Impact Comparison Figure (Appendix R) that shows the previously approved impacts in black with the proposed bed and bank impact increases shown with red and blue polygons is attached. The project will have limited permanent impacts (818 SF / 122 LF) within the bed of the Suncook

River to install concrete “pier collars” to protect the bridge piers from further abrasion and rip-rap extension along the southern abutment toe-of-slope in Allenstown. The project will also have limited permanent impacts (162 SF / 78 LF) within the bank of the Suncook River from the rip-rap extension along the southern abutment toe-of-slope and to reconstruct the existing southern wingwalls in Allenstown.

The Suncook River meanders around an upland island immediately southwest of Bridge No. 107/098. A discontinued roadway crosses the Suncook River in two locations using the northern portion of the upland island. Downstream of the former roadway is the site of former Buck Street Dam - two dam structures located on either side of the upland island were removed in 2011/2012. The removal of these dam structures lowered the water elevation of the Suncook River immediately upstream of the dams within the vicinity of Allenstown-Pembroke Bridge No. 107/098. The project will have temporary and permanent impacts within the open water habitat of the Suncook River to stabilize the riverbank under the bridge and to protect the bridge piers from further abrasion. Therefore, while the project will cause limited permanent and temporary disturbance within the bed and bank of Suncook River, the project will have long-term beneficial impacts to open water habitat. This project is not anticipated to impact the adjacent habitat types around the bridge structure since project work is limited to the roadway ROW.

The Suncook River has been identified as an important wildlife corridor based on The Nature Conservancy (TNC)’s “Connect the Coast” project. In order to accommodate terrestrial wildlife, the rip-rap installation along the southern abutment toe-of-slope will be configured and smoothed out to avoid impacts to wildlife passage.
The project was discussed at the April 15, 2020 Natural Resource Agency Meeting
https://www.nh.gov/dot/org/projectdevelopment/environment/units/project-management/documents/April152020minutes_FINAL.pdf
‘Carol Henderson (NH F&G) requested flattening the riprap at the toe of slope to ensure wildlife passage. Amy Lamb (NHHHB) noted that the Natural Heritage Bureau has no concerns - the swamp darter is present in this reach of the river. Carol Henderson indicated that impacts are not anticipated’

I do not think that incorporating the standard snake commitments would cause any issues for the project. However, I was concerned to see the brook floater included on the list. We are hoping to submit the new wetland permit application within the next 2 weeks to meet a May 2021 advertising date. Could you please let me know if you recommend any additional conservation measures or if you would like to discuss the project?

Thank you,

Rebecca Martin
Senior Environmental Manager
NH DOT Bureau of Environment
7 Hazen Drive
Concord, NH 03302
(603)271-6781
Rebecca.A.Martin@dot.nh.gov

SEEKING REPORTS OF RARE SNAKES

The NH Fish & Game Department is collecting observations of two species:

NONGAME & Endangered Wildlife PROGRAM
New Hampshire Fish and Game Department

BLACK RACER *(state threatened)*

- Solid black with a white throat and chin
- Slender with glossy scales, 3-6 ft. long
- Hatchlings are very small and patterned

EASTERN HOGNOSE SNAKE *(state endangered)*

- Black, gray or patterned appearance
- Upturned snout, 2-3 ft. long
- May spread neck out or hiss

Both Species Are Harmless!

Report sightings to RAARP@wildlife.nh.gov or 603-271-2461

Please report promptly, noting specific location and date
Photographs strongly encouraged

For more information on New Hampshire's 11 native snakes, see http://www.wildlife.state.nh.us/Wildlife/Nongame/snakes.htm

SMOOTH GREEN SNAKE *(special concern)*

Characteristics:

- Bright green on the top with white to pale yellow bellies.
- Smooth scales, approximately 12 – 26 inches long.
- Hatchlings are approximately 3 – 6.5 inches long and less brightly colored than the adults (olive-green or bluish-gray).

This species is harmless!

Report sightings to:
Kris Wilkes (VHB Environmental) at (201) 360-1517 or
Kellie Doherty (National Grid Environmental) at (781) 703-1085.

Northern Black Racer

(New Hampshire state threatened species)

- Solid black with a white throat and chin
- Slender with glossy scales, 3-6 ft. long
- Hatchlings are very small and patterned

Immediately report sightings to NH Fish and Game
Melissa Doperalski (603-419-1129) or
Brendan Clifford (603-944-0885)

Please report promptly, noting specific location and date
Photographs strongly encouraged

Appendix I – USFWS IPaC Report & Correspondence

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: January 19, 2021
Consultation Code: 05E1NE00-2021-SLI-1039
Event Code: 05E1NE00-2021-E-03278
Project Name: Allenstown Pembroke 40362

Subject: List of threatened and endangered species that may occur in your proposed project location 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:

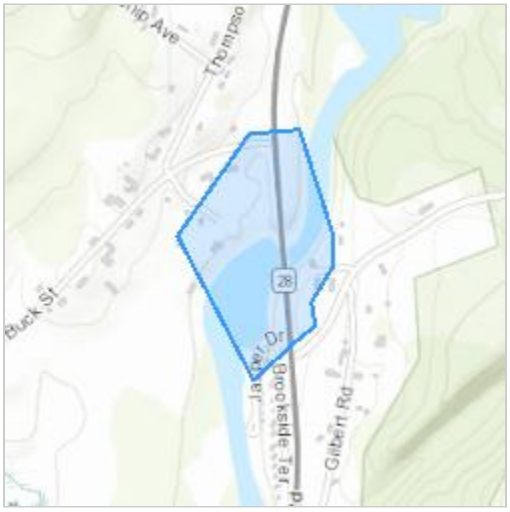
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2021-SLI-1039
Event Code: 05E1NE00-2021-E-03278
Project Name: Allenstown Pembroke 40362
Project Type: TRANSPORTATION
Project Description: The project involves the rehabilitation of Bridge 107/098 which carries NH Route 28 over the Suncook River.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@43.159793199999996,-71.40652141873508,14z



Counties: Merrimack County, New Hampshire

Endangered Species Act Species

There is a total of 2 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.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

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 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: February 28, 2020
Consultation Code: 05E1NE00-2019-TA-0997
Event Code: 05E1NE00-2020-E-04562
Project Name: 40362 Allenstown-Pembroke Bridge #107/098, NH 28 Over Suncook River

Subject: Verification letter for the '40362 Allenstown-Pembroke Bridge #107/098, NH 28 Over Suncook River' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Rebecca Martin:

The U.S. Fish and Wildlife Service (Service) received on February 28, 2020 your effects determination for the '40362 Allenstown-Pembroke Bridge #107/098, NH 28 Over Suncook River' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Small Whorled Pogonia, *Isotria medeoloides* (Threatened)

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

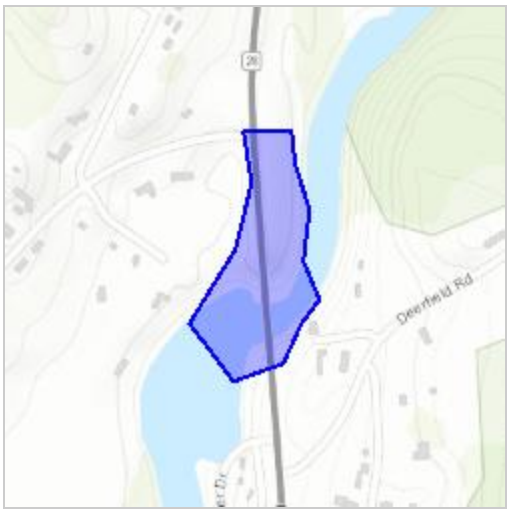
40362 Allenstown-Pembroke Bridge #107/098, NH 28 Over Suncook River

2. Description

The following description was provided for the project '40362 Allenstown-Pembroke Bridge #107/098, NH 28 Over Suncook River':

> The project involves the rehabilitation of Bridge #107/098, which would include either replacing the deck of the bridge and steel structural painting, or superstructure replacement. Minimal roadway work would be completed in conjunction with bridge rehabilitation including guardrail replacement. The project would maintain the existing lane and shoulder widths, and would match the existing alignment and the profile of the roadway.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.160470204315715N71.40593674249058W



Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

7. Will the action involve Tree Removal?

   Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

   No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

    No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

0.1

2. If known, estimated acres of forest conversion from April 1 to October 31

0.05

3. If known, estimated acres of forest conversion from June 1 to July 31

0.05

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?
0

From: vonOettingen, Susi <susi_vonoettingen@fws.gov>
Sent: Tuesday, March 3, 2020 4:45 PM
To: Martin, Rebecca <Rebecca.Martin@dot.nh.gov>
Subject: Re: Allenstown-Pembroke 40362 Small whorled pogonia

Hi Rebecca,

I would agree with Amy, it is highly unlikely that SWP would be in the work zone. The forest is fragmented and appears to have a floodplain component. That's not SWP habitat. I have a feeling it is periodically inundated as well, also not good for SWP.

I would agree with a no effect/ no species present for SWP.

Thanks for checking.

Susi

****

Susi von Oettingen
Endangered Species Biologist
New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301
(603) 227-6418 (direct line)

From: Martin, Rebecca <Rebecca.Martin@dot.nh.gov>
Sent: Tuesday, March 3, 2020 1:36 PM
To: vonOettingen, Susi <susi_vonoettingen@fws.gov>
Subject: [EXTERNAL] Allenstown-Pembroke 40362 Small whorled pogonia

Hi Susi,

I am writing to ask for your advice regarding the potential of small whorled pogonia to be in the area where NHDOT is planning a bridge project. The IPaC Consultation Code is 05E1NE00-2019-TA-0997. I checked in with Amy Lamb from NHNHB (the pogonia came up in IPaC, but not on the NHB report). Neither Amy or I have visited the site. The project involves the rehabilitation of Bridge #107/098, which would include either replacing the deck of the bridge and steel structural painting, or superstructure replacement. Minimal roadway work would be completed in conjunction with bridge rehabilitation including guardrail replacement. The project would maintain the existing lane and shoulder widths, and would match the existing alignment and the profile of the roadway. Some work is anticipated to address scour (repair bank armoring) and a small amount of additional bank armoring beyond the existing footprint is anticipated. Very little tree clearing (estimated at 0.1 acres) would be needed for the work.

https://goo.gl/maps/zoaNtNz3HkPRVGFm6

Amy shared that the closest extant record (from 2004) for small whorled pogonia is 4.25 miles away. Looking at the pictures included in the wetland report, for the most part there appears to be too much ground cover in the project area for the small whorled pogonia (except for potentially the southern upstream quadrant). Witch hazel, which Amy shared is a common small whorled pogonia associate, was noted in the wetland report. Amy reviewed the project area in google maps and noted that the 'likelihood of SWP occurring here seems fairly low.' There are pictures in the attached email. If you agree that it seems unlikely to occur in the project area, a no effect determination seems appropriate. However, if it is not a clear cut case for you, I could include a commitment in the environmental document to do a review of the project area for small whorled pogonia sometime between mid-May and mid-June. If we found any, we would consult with you. Please let me know if additional information would be helpful.

Thank you!

Rebecca Martin

Senior Environmental Manager
NH DOT Bureau of Environment
7 Hazen Drive
Concord, NH 03302
(603)271-6781
Rebecca.Martin@dot.nh.gov

Appendix J – NHDHR Section 106 Consultation

Please mail 2 copies of the completed form and required material to:

Cultural Resources Staff
Bureau of Environment
NH Department of Transportation
7 Hazen Drive
Concord, NH 03302

RECEIVED
SEP 10 2019

DHR Use Only	
R&C #	11094
Log In Date	9/10/19
Response Date	___/___/___
Sent Date	___/___/___

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

RECEIVED
OCT 10 2019
VHB

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

GENERAL PROJECT INFORMATION

DOT Project Name & Number **Allenstown 40362** Pembroke

Brief Descriptive Project Title **Bridge #107/098, NH 28 Over Suncook River**

Project Location **NH 28 crossing over the Suncook River**

City/Town **Allenstown**

Lead Federal Agency and Contact *(if applicable (Agency providing funds, licenses, or permits)* **US Army Corps of Engineers** X-A004(369)

Permit Type and Permit or Job Reference # **Wetland Permit (not yet submitted)**

DOT Environmental Manager *(if applicable)* **Rebecca Martin**

PROJECT SPONSOR INFORMATION

Project Sponsor Name **Rebecca Martin, NH Department of Transportation**

Mailing Address **PO Box 483** Phone Number **(603) 271-6781**

City **Concord** State **NH** Zip **03302-0483** Email **rebecca.martin@dot.nh.gov**

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company **Julie Whitmore, VHB**

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

City **Bedford** State **NH** Zip **03110-6532** Email **jwhitmore@vhb.com**

This form is updated periodically. Please download the current form at http://www.nh.gov/nhdhr/review. *Please refer to the Request for Project Review for Transportation Projects Instructions for direction on completing this form.* Submit 2 copies of this project review form for each project for which review is requested. Include 1 self-addressed stamped envelope to expedite review response. Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DOT and the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: http://www.nh.gov/nhdhr/review or contact the R&C Specialist at Marika.Labash@dncr.nh.gov or 603.271.3558.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION 11094

Project Boundaries and Description

☒ Attach the Project Mapping ***indicating the proposed area of potential effects (APE).*** *(See RPR for Transportation Projects Instructions and R&C FAQs for guidance. Note that the APE is subject to approval by lead federal agency and SHPO.)*

☒ Attach a detailed narrative description of the proposed project.

☒ Attach current engineering plans with tax parcel, landscape, and building references, and areas of proposed excavation, if available.

☒ Attach photos of the project area/APE with mapped photo key (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) *(Blank photo logs are available on the DHR website. Informative photo captions can be used in place of a photo log.)*

☒ A DHR records search must be conducted to identify properties within or adjacent to the APE. Provide records search results via EMMIT or in **Table 1**. *(Blank table forms are available on the DHR website.)* EMMIT or in-house records search conducted on **06/11/2019**.*

**The DHR recommends that all survey/National Register nomination forms and their Determination of Eligibility (green) sheets are downloaded or copied for your use in project development.*

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the APE? ☒ Yes ☐ No

If no, skip to Archaeology section. If yes, submit all of the following information:

☒ Attach completed **Table 2**.

☒ Photographs of ***each*** resource or streetscape located within the APE. Add to the mapped photo key and photo log noted above. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)

☒ Copies of National Register boundary (listed *or* eligible) mapping, and add National Register boundaries for listed and eligible properties to project mapping/engineering plans *(if applicable).*

Archaeology

Does the proposed undertaking involve ground-disturbing activity? ☒ Yes ☐ No

If yes, submit all of the following information:

☒ Description of current and previous land use and disturbances.

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

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

AGENCY COMMENT *This Space for DOT and Division of Historical Resources Use Only*

Sent to DHR; Authorized DOT Signature: Jill Edelmann Date: 9/6/2019

☐ Insufficient information to initiate review.

☐ Additional information is needed in order to complete review.

Comments: This bridge is located within or partially within the NR eligible Buck St - Bachelder Rd Cultural Landscape Historic District. The bridge's Contributing Status will need to be determined to clarify with effects evaluation and project design etc. Individual inventory of the bridge or the properties around the bridge does not appear necessary at this time. BASED ON ADDITIONAL INFORMATION PROVIDED BY THB, NO ARCHAEOLOGICAL CONCERNS.

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

Authorized DHR Signature: David Hanley Date: 10.8.19

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

Victoria F. Sheehan
Commissioner

William Cass, P.E.
Assistant Commissioner

ALLENSTOWN-PEMBROKE
40362
RPR 11094

Draft, 6/5/20

No Historic Properties Affected Memo

For the purpose of compliance with regulations of the National Historic Preservation Act, the Advisory Council on Historic Preservation's Procedures for the Protection of Historic Properties (36 CFR 800), and the US Army Corps of Engineers' Appendix C; the US Army Corps of Engineers' and the NH Division of Historical Resources have coordinated the identification and evaluation of cultural resources with plans to rehabilitate Bridge No. 107/098 that carries NH 28 over the Suncook River in Allenstown, NH, which involves the replacement of the bridge superstructure. The proposed project limits and APE are defined as 500 feet from the center of the project roadway to the east and west. This APE encompasses both physical and visual impacts to surrounding areas and resources.

The project would use an existing gravel access road within the northeast portion of the project area for construction laydown areas and bridge access. The rehabilitation work would be conducted via phased construction with temporary traffic signals to maintain one lane of alternating two-way traffic during construction.

Project Description:

Proposed work to Bridge No. 107/098 is required to remove the bridge from the State Red list, which is proposed to be accomplished with a superstructure replacement. The proposed roadway alignment will match the existing conditions to minimize impacts to the corridor, however profile adjustments are required to accommodate superstructure modifications and maintain the same vertical curvature.

The Proposed Action also include the following work along the bridge superstructure:

- New weathering steel girders and channel diaphragms to more closely match the existing superstructure deadload.
- Use of composite continuous girders with the deck and positioned in the same locations as the existing girders to limit existing seat modifications; their depth will be set such that profile raise is minimized.
- The installation of approach slabs, which the existing structure does not currently have.
- The existing wingwalls are proposed to be removed, modified, and replaced.
- Reinforced elastomeric bearings with sliding surfaces are proposed at the expansion locations to reduce the longitudinal loading induced on the substructure.
- Pier collars will be installed to the bridge piers to protect against further deterioration of the pier stems.
- Riprap will be installed from the water line to the channel bed to stabilize the recently exposed toe of slope at the southern abutment.

Identification:

Above-Ground Resources

In September 2019, a Request for Project Review (RPR) was submitted to NHDHR for the Allenstown-Pembroke Bridge Project (Allenstown 40362). It was determined prior to the submittal that Bridge No. 107/098 meets the criteria of the Advisory Council on Historic Preservation's (ACHP) Program Comment regarding common post-1945 concrete and steel bridges and culverts. However, NHDHR reviewed the RPR on October 10, 2019 and requested additional information regarding the contributing status of the bridge to the National Register-eligible Buck Street-Bachelder Road Cultural Landscape. In response, a memorandum was developed to determine if the bridge contributed to the Landscape, of which it was recommended as non-contributing the Landscape. NHDHR concurred with this recommendation of not contributing. An Effect Table was submitted for the Buck Street-Bachelder Road Cultural Landscape to NHDHR with a recommendation of "no historic properties affected" NHDHR concurred with the assessment of "no historic properties affected" from the Proposed Action on February 12, 2020.

Archaeological Resources

The project is located within areas of previous ground disturbance due to past roadway and bridge construction work. While the project area is rich in archaeological resources due to the presence of dam structures, mill buildings, and other resources that are no longer extant, the project will only involve ground disturbance within areas of previous disturbance from construction of NH 28 and the existing Bridge No. 107/098. The following is a summary of the approximate depth of disturbance for each ground disturbing activity:

- Approach slab installation: 3 feet (including excavation)
- Wingwall construction: 12 feet (including excavation)
- Riprap installation: 4 feet
- Pier collar installation: 4 feet

Therefore, the ground disturbance proposed within the project area from the culvert replacement is not anticipated to extend further or deeper than past disturbance. A site file review was conducted by NHDHR and with the additional information provided, determined that no further archaeological study was needed.

Public Consultation:

The presentation of the Allenstown Bridge rehabilitation project was included in a regularly scheduled Allenstown Select Board Meeting on August 26, 2019 to introduce the community to the project and discuss local concerns at the preliminary design stage. The presentation was also given during the regularly scheduled Pembroke Select Board Meeting. At both meetings, questions and opinions were asked of the communities regarding the project and if there were any significant recreational or cultural resources associated with the bridge, of which there were not. In addition, several questions and observations were posed by the members of the audiences. No additional consulting parties were identified.

Determination of Effect:

Although the Bridge No. 107/098 falls partially within the boundaries of the Buck Street-Bachelder Road Cultural Landscape, it was determined that the bridge does not contribute the Landscape. Areas and resources associated only with the suburbanization of the area, like Bridge No. 107/098, are specifically excluded from the boundary and appear to be associated with the expansion of the village rather than the historically agricultural land use. Applying the criteria of effect at 36 CFR 800.5, we have determined that the Proposed Action would have no effect to the Buck Street-Bachelder Road Cultural Landscape, which is significant for its associations with agricultural land use and early mill industries. There will be no physical impact to the Landscape from the Proposed Action. Bridge No. 107/098 is being replaced with a similar design and scale to the existing and therefore the existing visual characteristics of the Landscape will not be altered. In addition, it is not anticipated that the construction of the new bridge will be directly related to any significant increase in automobile traffic and as a result there is no increase in noise anticipated. Therefore, there will be no historic properties affected by the proposed action.

Archaeological Resources
Based on archaeological assessment completed to date, there would be no archaeological resources affected.

The result of identification and evaluation for the rehabilitation of the Allenstown Bridge No. 107/098 is a finding of *No Historic Properties Affected*.

Mitigation Measures
Due to the finding of *No Historic Properties Affected*, mitigation is not required.

In accordance with the Advisory Council's regulations, consultation will continue, as appropriate, as this project proceeds.

Jill Edelmann — 4/15/2020

Jill Edelmann
Cultural Resources Manager
Date

Concurred with by the NH State Historic Preservation Officer:

Nadine Miller
Deputy State Historic Preservation Officer
NH Division of Historical Resources
Date

cc: Rebecca Martin, NHDOT
Anthony Weatherbee, NHDOT
Julie Whittmore, VHB
Marika Labash, NHDHR

ASSESSMENT OF EFFECT TABLES

The New Hampshire Division of Historical Resources has developed this tool to assist in the assessment of effect under Section 106 of the National Historic Preservation Act. If a project has the potential to alter characteristics that make a property historically significant, that project is considered to have an "adverse effect." Adverse effects can be direct or indirect, and include all immediate and reasonably foreseeable effects to the property (http://www.achp.gov/usersguide.html).

The project proponent must gather, use and attach the following supporting materials to each resource's assessment of effect. Complete the appropriate table(s) to summarize each assessment.

NARRATIVE; Keep each section brief, yet informative:

1) Description of the Property

2) Significance Statement (including National Register Criteria)

3) National Register Boundary description

4) Relationship of the Project to the Property

5) Effect Evaluation Justification
(If finding is Historic Properties Affected complete section 6 below)

6) Adverse Effect Evaluation Justification

GRAPHIC MATERIALS; In addition to the above narrative, the following must be attached:

1) Maps showing the resource and the relationship to the project. Maps must include photo locations and the National Register Boundary.

2) Photographs. Photographs can be imbedded in the document but must be clear and in focus. Photographs are to be supportive of the Recommended Finding showing how the property relates to the project and vice versa (not simply just a head on photograph of the resource). Photographs are meant to provide justification of the recommended finding. Images should demonstrate both presence and absence of effect, as appropriate.

3) Photo-simulations, as necessary. Photo-simulations can be very helpful in understanding the relationship of the project to the historic resource. Photo-simulations are not required for every evaluation, but may be used when they clearly support the recommended finding.

TABLES: Complete the "Results of Effect Evaluation" Table 1 by providing a brief evaluation of the undertaking in the "Evaluation" box. Based upon this evaluation, provide a recommended finding of No Historic Properties Affected or Historic Properties Affected. If the recommended finding is Historic Properties Affected, complete "Results of Adverse Effect" Table 2 by briefly addressing each section (i-viii) in the corresponding "Evaluation" box. Provide a recommended finding of No Adverse Effect or Adverse Effect based upon the highest level of effect evidenced in sections i-viii.

ALLENSTOWN-PEMBROKE 40362 RESULTS OF EFFECT EVALUATION FOR Buck Street-Bachelder Road Cultural Landscape (ZMT-BBCL)	
DEFINITION OF EFFECT	**EVALUATION**
An effect may occur when there is alteration to the characteristics of a historic property qualifying it for inclusion in or eligible for the National Register as defined in 36 CFR Section 800.16(1).	The Preferred Alternative will result in the replacement of the superstructure of Bridge No. 107/098, which is adjacent, but not contributing to, the Buck Street-Bachelder Road Cultural Landscape (ZMT-BBCL).
RECOMMENDED FINDING (No Historic Properties Affected or Historic Properties Affected – Complete Table 2 if Historic Properties Affected)	No Historic Properties Affected

ALLENSTOWN-PEMBROKE 40362

RESULTS OF EFFECT EVALUATION FOR
Buck Street-Bachelder Road Cultural Landscape (ZMT-BBCL)

CRITERIA OF ADVERSE EFFECT

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association.

Example of Adverse Effects, pursuant to 36 CFR Section 800.5(a)(2)	Evaluation
(i) Physical destruction of or damage to all or part of the property;	N/A
(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties and applicable guidelines;	N/A
(iii) Removal of the property from its historic location;	N/A
(iv) change of the character of the property's use or of physical features within the property's setting that contribute to its historic features;	N/A
(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;	N/A
(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property or religious and cultural significance to an Indian tribe or Native Hawaiian organization; and	N/A
(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.	N/A
(viii) Other:	N/A
RECOMMENDED FINDING (No Adverse Effect or Adverse Effect)	No Adverse Effect

*Please limit table to one page

NARRATIVE; Keep each section brief, yet informative:

1) Description of the Property:

The resources that contribute to the district include farmsteads comprising residences, outbuildings, agricultural fields, and farm roads, non-agrarian rural residences, small-scale commercial buildings, road systems established in the eighteenth and nineteenth century, sites such as cemeteries and ruins and archaeological sites, and small-scale objects placed on the landscape. Aside from the directly agrarian-related resources, there are also those that are related to the milling and manufacturing history that was so interconnected with the farming activities, including the bridges and dam remains at Buck Street Island. Eighteenth and nineteenth century farming families were reliant on sawmills and gristmills in their domestic economy.

In addition to the tangible features of the district, there is also an importance placed on the significance of the visual character and intangible qualities that reflect the district's agrarian past and as a multi-generational farming community. The report states that "the combination of dispersed farmsteads and fields, wooded floodplain, boundary vegetation, village residences, and cemeteries within the Buck Street-Bachelder Road Landscape evokes Pembroke's agrarian past."

2) Significance Statement (including National Register Criteria)

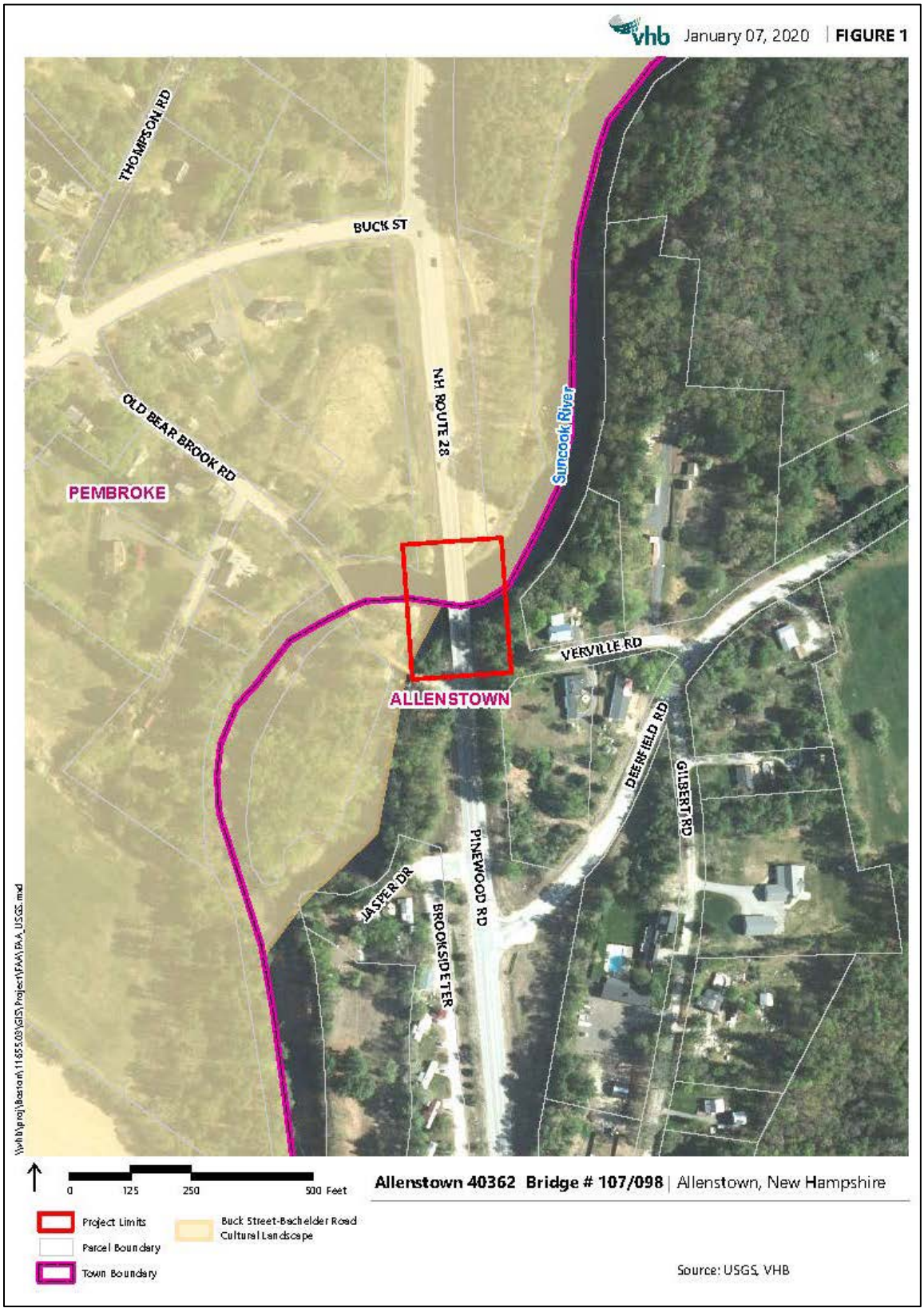
The Buck Street-Bachelder Road Cultural Landscape was determined eligible by NHDHR for listing in the National Register (10/25/2017). The Landscape possesses significance as a rural historic district at the local level under Criteria A, C, and D. Under Criterion A, the Landscape is significant as one of the earliest areas of settlement in Pembroke and one of the most important agricultural and manufacturing districts. Under Criterion C, the landscape is an exemplary and locally unique collection of resources associated with the town's eighteenth- and nineteenth-century settlement patterns, building types, and vernacular styles, including residential, commercial, industrial, and institutional buildings, structures, and landscapes and natural features. Under Criterion D, the Landscape is significant for its potential ability to provide information about the industrial history of the lower Suncook River valley. The Landscape also has the potential to contain archaeological sites and ruins of the former eighteenth- and nineteenth-century farm complex, historical circulation networks, residences, small mills, and dams.

The Landscape consists of resources and landscapes that are associated with the agricultural land use and early mill industries in the settlement, like those at Buck Island, within its boundaries. The period of significance extends into the latter half of the twentieth century to primarily capture the many late twentieth-century agricultural buildings constructed to support agricultural activities. Although Bridge No. 107/098, constructed in 1958, falls within the period of significance for the Landscape (ca. 1770-1967), the bridge does not meet the contextual criteria for inclusion. It appears the construction of Bridge No. 107/098 in 1958 actually marked the beginning of suburbanization in Pembroke. Areas and resources associated only with the suburbanization of the area, like Bridge No. 107/098, are specifically excluded from the

boundary and appear to be associated with the expansion of the village rather than the historically agricultural land use.

3) National Register Boundary description

The physical boundary of the Buck Street-Bachelder Road Cultural Landscape includes property on the northwest and southeast sides of Buck Street and Bachelder Road and to the Suncook River to the southeast (see Figure 1). This landscape stretches along the west side of the Suncook River, following an historical linear transportation corridor along Buck Street, Thompson Road, and Bachelder Road. The area represents the floodplain on the west side of the Suncook River that was well-suited to agricultural activities. The east side of the Suncook River in Allenstown has a smaller plain that was generally unsuitable for agriculture and is excluded from the district. In addition, lands north, south, and west of the district are also excluded because of modern infill development and a change of character from rural to suburban.


vhb January 07, 2020 | FIGURE 1
THOMPSON RD
BUCK ST
OLD BEAR BROOK RD
PEMBROKE
NH ROUTE 28
Suncook River
VERVILLE RD
ALLENSTOWN
DEERFIELD RD
GILBERT RD
PINEWOOD RD
JASPER DR
BROOKSIDE TER
\\vhb\proj\Boston\11655.03\GIS\Project\FAA\FAA_USGS.mxd
0 125 250 500 Feet
Allenstown 40362 Bridge # 107/098 | Allenstown, New Hampshire
Project Limits
Parcel Boundary
Town Boundary
Buck Street-Bachelder Road Cultural Landscape
Source: USGS, VHB

4) Relationship of the Project to the Property

Only half of Bridge No. 107/098, the northwest portion situated in Allenstown, overlaps that cultural landscape boundary; however, the bridge has been determined to not contribute to the cultural landscape. Although there is a physical proximity, the proposed bridge will so closely resemble the existing in size and scale, the visual character of the existing landscape will not change.

5) Effect Evaluation Justification

The Preferred Alternative will not affect the Buck Street-Bachelder Road Cultural Landscape.

Photographs

Photo 1. View northeast of Bridge No. 107/098 from Buck Street Island.

Photo 2. View north from at Bridge No. 107/098 at south boundary of the Buck Street-Bachelder Road Cultural Landscape.

Appendix K – ACOE Appendix B

US Army Corps of Engineers ®
New England District

New Hampshire General Permits (GPs)
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 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, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/. The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X[1]	
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 area of the previously filled wetlands?	N/A	
2.7 What is the area of the proposed fill in wetlands?	980 SF	
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?	N/A	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS 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 an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index	X[2]	

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: https://wildlife.state.nh.us/wildlife/wap-high-rank.html. • 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 GC 21?	X [3]	
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]	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	X [4]	
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X [5]	

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

Supporting Notes:

1. The opening of the rehabilitated bridge structure will match that of the existing bridge. The slight decrease that will result from the pier collar installation will be accounted for through the lowering of the adjacent gravel area under the north span to provide compensatory storage and maintain the existing hydraulic opening in reference to base flood elevation (BFE). Therefore, the hydrology, sediment transport, and wildlife passage capacity of the existing bridge structure will be maintained following the rehabilitation activities. Furthermore, the rip-rap extension will be placed six to eight inches below grade and covered with natural streambed material to simulate existing conditions.

2. The project was reviewed for the presence of rare plant, animal, or natural communities within the vicinity of the proposed project using the Natural Heritage Bureau (NHB) online DataCheck tool. The report provided by NHB dated January 29, 2021 identified the potential presence of the following four species within the vicinity of the project area: brook floater (*Alasmidonta varicosa*), northern black racer (*Coluber constrictor constrictor*), smooth green snake (*Opheodrys vernalis*), and swamp darter (*Etheostoma fusiforme*). Upon coordination with NH Fish and Game (NHF&G), wildlife friendly erosion controls will be used, NHF&G snake identification flyers will be distributed to contractors, and no concerns were raised for the swamp darter based on the proposed activities. However, a mussel survey for the brook floater was recommended. Refer to Section 6.1 of the Supplemental Narrative for more information. The project was also reviewed for the presence of federally listed or proposed threatened, or endangered species, designated critical habitat, or other natural communities using the US Fish and Wildlife Services' (USFWS) Information for Planning and Consultation (IPaC) project planning tool. Results dated January 19, 2021 indicated the potential presence of the northern long-eared bat (NLEB, *Myotis septentronalis)* and small whorled pogonia (*Isotria medeoloides*) within the vicinity of the project area. A verification letter regarding the NLEB was generated in IPaC for the Allenstown-Pembroke Bridge, which found that the proposed project is consistent with activities analyzed by the Programmatic Biological Opinion and that the incidental take for this species resulting from this project is not prohibited under the final 4(d) rule. Additionally, based on coordination with the NHB and USFWS, the habitat within the vicinity of the bridge structure is unlikely to support small whorled pogonia, and, therefore, the project is not anticipated to negatively affect this species.

3. In accordance with General Condition 21 "Bank Stabilization", the bank stabilization project component (toe-of-slope rip-rap) was designed to minimize environmental impacts while providing adequate bank stabilization and scour prevention to the maximum extent practicable. In accordance with General Condition 22 "Waterway/Wetland Work and Crossings", the rehabilitated bridge will not interfere with the natural stream processes and will maintain existing hydraulic characteristics. Furthermore, the rehabilitated bridge will remain aligned with the natural stream channel and continue to have an open bottom, so as not to impact the movement of aquatic life beyond the duration of construction.

4. The Allenstown-Pembroke Bridge No. 107/098 is located within the Special Flood Hazard Area Zone AE (regulatory floodway and 100-year floodplain) of Suncook River. The proposed activities will maintain the hydraulic capacity of the stream. As described in #1 above, the minor loss of flood storage capacity due to the pier collars will be mitigated through the lowering of the adjacent gravel area.

5. A Request for Project Review (RPR) for the proposed project was submitted on September 10, 2019, to the NH Division of Historical Resources (NHDHR) by VHB on behalf of the New Hampshire Department of Transportation (NHDOT). Upon review of the RPR, NHDHR found no archaeological concerns related to the bridge rehabilitation. Furthermore, NHDHR concurred with a no historic properties affected determination through an effects memorandum.

Appendix L – ACOE Wetland Determination Field Data Sheets

This appendix is not applicable to this project, as no palustrine wetlands are proposed to be impacted.

Appendix M – Photographs and Existing Conditions Figure

Representative Natural Resource Photographs
Bridge #107/098, NH Route 28 – Allenstown, NH

Photo 1: View of southern bank of Suncook River upstream of existing bridge crossing. 9/6/2019.

Photo 2: View of southern bank of Suncook River downstream of existing bridge crossing. 9/6/2019.

Representative Natural Resource Photographs
Bridge #107/098, NH Route 28 – Allenstown, NH

Photo 3: View of northern bank of Suncook River upstream of existing bridge crossing. 9/6/2019.

Photo 4: View of northern bank of Suncook River downstream of existing bridge crossing. 9/6/2019.

Representative Natural Resource Photographs
Bridge #107/098, NH Route 28 – Allenstown, NH

Photo 5: View of Suncook River upstream of bridge crossing. 9/6/2019.

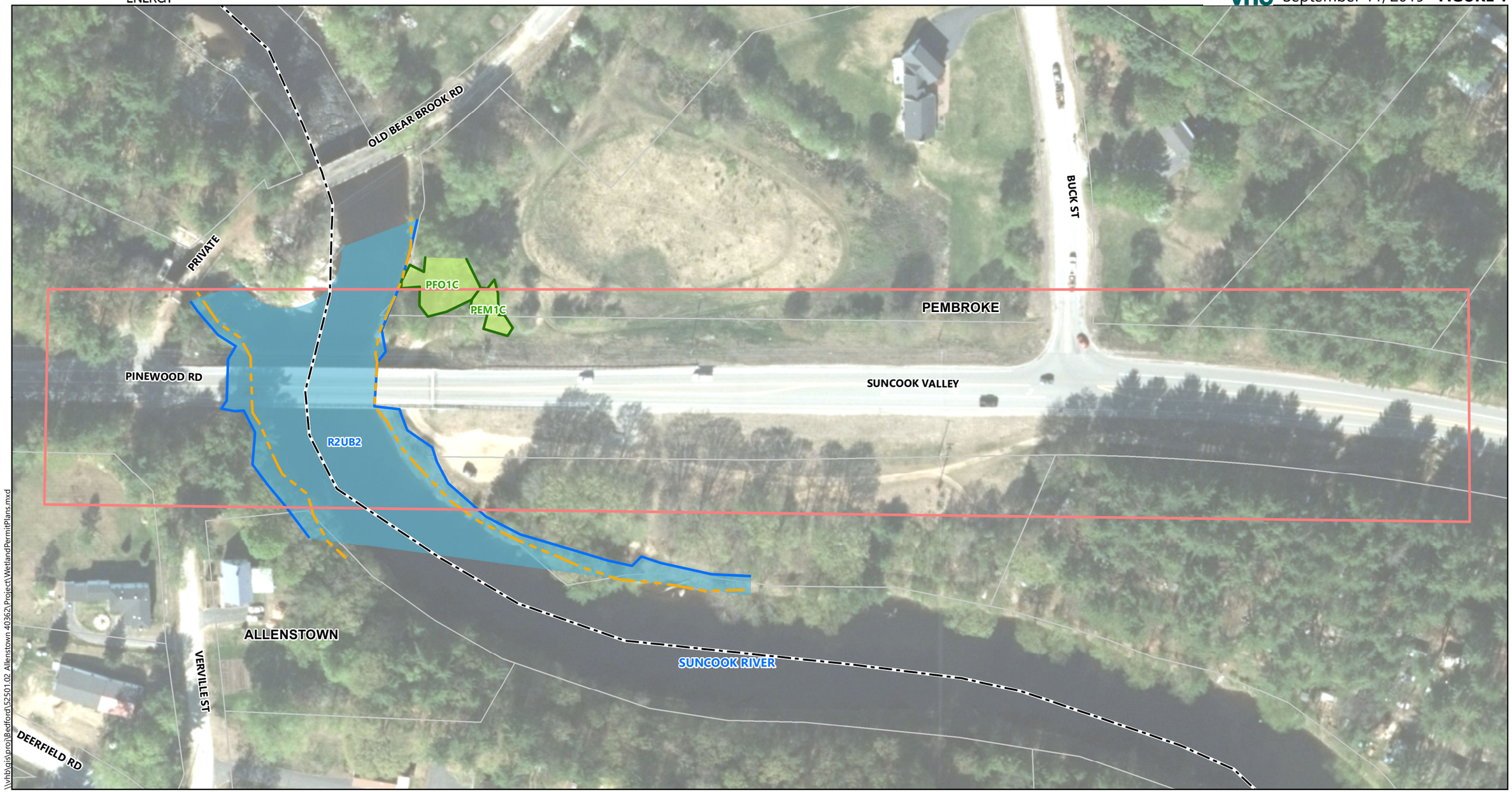
Photo 6: View of Suncook River downstream of bridge crossing. 9/6/2019.

Photo 7: View at PFO1C portion of Wetland KW-01. 9/6/2019.

Photo 8: View at PEM1C portion of Wetland KW-01. 9/6/2019.

EVERSOURCE ENERGY

vhb September 11, 2019 | **FIGURE 1**



\\vhb\gis\proj\Bedford\52501.02 Allenstown 40362\Project\WetlandPermitPlans.mxd

0 50 100 200 Feet

- Project Limits
- Parcel Boundary
- Town Boundary
- Delineated Wetland Edge
- Delineated Top of Bank
- Delineated Ordinary High Water
- Wetland Resource
- Area Open Water

Allenstown 40362 Bridge # 107/098 | Allenstown, New Hampshire

Existing Conditions

Source: GRANIT, VHB

1. Allenstown Bridge No. 107/098 over the Suncook River, northeast railing, facing south. 08/15/2019.

2. Allenstown Bridge No. 107/098 profile, facing southwest. 08/15/2019.

3. Allenstown Bridge No. 107/098, south railing along roadway, facing north. 08/15/2019.

4. Current snowmobile trail bridge over Suncook River, immediately south of the Allenstown Bridge No. 107/098, facing southwest. 09/06/2019.

5. View of Allenstown Bridge No. 107/098 profile from the snowmobile bridge, facing northeast. 08/15/2019.

6. View of the former dam penstock controls located south of the current snowmobile trail bridge, facing west. 08/15/2019.

7. View of the former dam penstock controls from the snowmobile trail bridge, facing southeast. 08/15/2019.

8. View of the second snowmobile trail bridge over the Suncook River from Buck Street Island, facing northwest. 08/15/2019.

9. View west along the Suncook River, looking toward Allenstown Bridge No. 107/098. 09/06/2019.

10. View east along the Suncook River, looking from Allenstown Bridge No. 107/098 . 09/06/2019.

11. View of the southern bridge abutment. 09/06/2019.

12. View north along the western side of Allenstown Bridge No. 107/098. 09/06/2019.

13. View south along the eastern side of Allenstown Bridge No. 107/098. 09/06/2019.

Appendix N – Construction Sequence Narrative

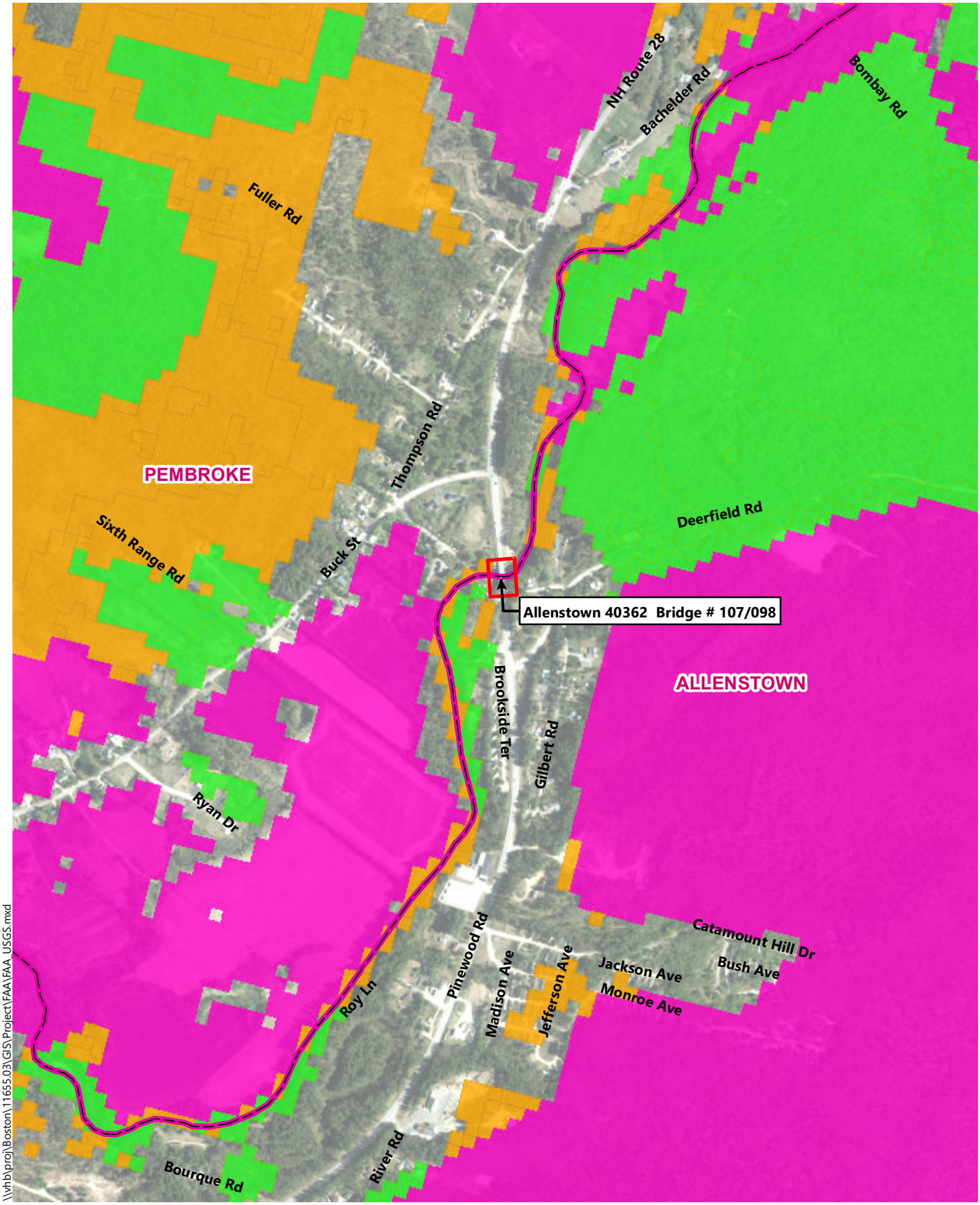
Construction Sequence

1. The proposed rip-rap extension, pier collar installation, wingwall reconstruction, and superstructure replacement work shall be located within the NH Route 28 right-of-way (ROW).
2. The Contractor shall install necessary temporary sediment and erosion control measures prior to construction to ensure there are no impacts to surrounding surface waters.
3. Construction will be phased beginning with construction of the northbound lane.
4. Traffic will be maintained via temporary traffic signals using one lane of alternating traffic over the existing southbound lane.
5. The existing bridge rail, concrete deck, painted steel beams, and bearings will be removed.
6. Steel sheeting will be installed on the approaches to support excavation required for removal of abutment backwalls and construction of proposed deck ends and approach slabs.
7. Water diversion structures will be installed under low flow conditions to construct pier collars and install riprap at the toe of slope at the southern abutment and removed once in-stream work is completed.
8. Concrete repairs, including crack repairs and concrete patching will be completed at the abutments.
9. New bearings and steel beams will be installed along the northbound lane.
10. The concrete deck will be poured, and approach slabs installed. Bridge rail and expansion joints will be installed.
11. Traffic will shift from the southbound lane to the northbound lane once the first phase of construction is complete.
12. Construction will begin on the southbound lane, following the same procedure as the east except for substructure work. It should be noted that either side could be constructed first as long as one lane is maintained during construction.
13. The gravel access area below the span 3, between the northern pier and northern abutment, will be regraded.
14. Materials excavated from within the operational ROW shall be addressed in accordance with applicable NHDES rules, waivers, and/or Soils Management Plans.
15. Traffic control measures will be removed after completion and acceptance of the work.
16. Since invasive plants are known to occur within the project area, all work, including daily removal of plant material from construction equipment, shall be constructed in accordance with the NHDOT publication *Best Management Practices for Roadside Invasive Plants* (2008) and *Best Management Practices for the Control of Invasive and Noxious Plant Species* (2018).

Appendix O – Wildlife Maps

This appendix includes the following NHF&G Wildlife Action Plan Maps:

- Ranked Habitat
- Habitat Type



0 500 1000 2000 Feet

Project Limits

Town Boundary

Wildlife Action Plan Tiers

1 Highest Ranked Habitat in New Hampshire

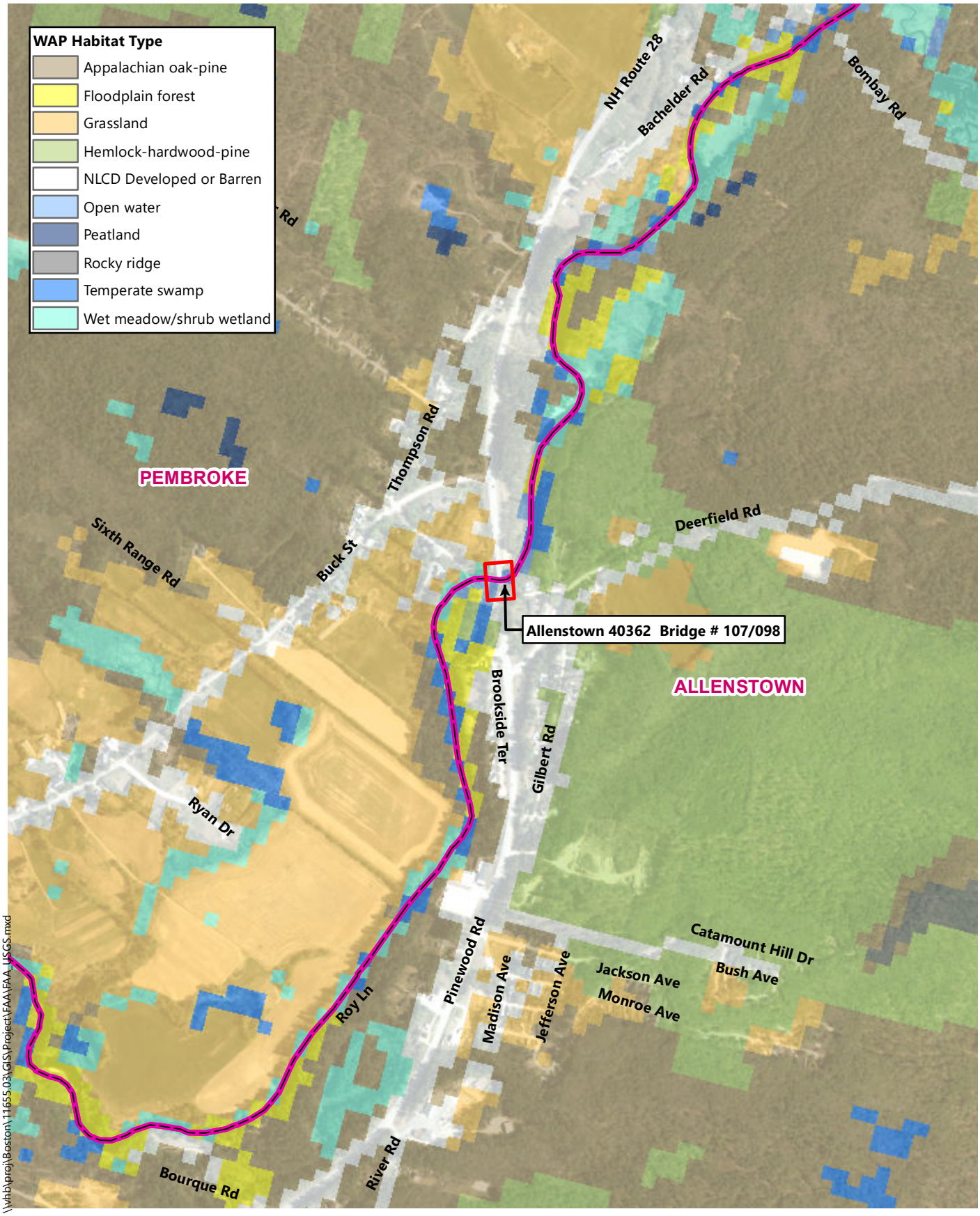
2 Highest Ranked Habitat in Biological Region

3 Supporting Landscapes

Allenstown 40362 Bridge # 107/098 | Allenstown, New Hampshire

NHF&G Wildlife Action Plan Ranked Habitat

Source: VHB, NHGRANIT



0 500 1000 2000 Feet

Project Limits

Town Boundary

Allenstown 40362 Bridge # 107/098 | Allenstown, New Hampshire

NHF&G Wildlife Action Plan Habitat Type

Source: VHB, NHGRANIT

Appendix P – USCG Correspondence

From: Large, Sarah <Sarah.Large@dot.nh.gov>
Sent: Monday, March 16, 2020 12:49 PM
To: Walker, Peter <PWalker@VHB.com>; Martin, Rebecca <Rebecca.Martin@dot.nh.gov>
Subject: [External] FW: March 2020 NHDOT Natural Resource Agency Coordination Meeting **AGENDA**

Good afternoon Pete and Rebecca,

The US Coast Guard has review the projects listed for this month's natural resource agency meeting and have provided the determination below for Allenstown 40362.

Best wishes,

Sarah Large

From: Bisignano, Christopher J CIV <Christopher.J.Bisignano@uscg.mil>
Sent: Monday, March 16, 2020 12:30 PM
To: Large, Sarah <Sarah.Large@dot.nh.gov>
Cc: Rousseau, James L CIV <James.L.Rousseau2@uscg.mil>; Lewis, Dale K CIV <Dale.K.Lewis2@uscg.mil>
Subject: FW: March 2020 NHDOT Natural Resource Agency Coordination Meeting **AGENDA**

Sarah,

Good afternoon.

The following waterway is designated non-navigable for USCG Bridge Program jurisdiction:

Suncook River

Regards,
Chris

Appendix Q – Turbidity Sampling and Control Plan for In-Water Work

Turbidity in the river during all in-water work shall be monitored and controlled as follows:

1. **General Condition:**
    a. All proposed monitoring for turbidity in the river during all in-water work shall be completed by a qualified Contractor approved by NHDOT and shall be conducted in accordance with the specifications below.
    b. All turbidity monitoring measurements at shall be conducted as described in sections below. In addition, visual monitoring (with photo documentation) for visible turbidity shall be conducted as described in sections below. Visible turbidity is assumed to be approximately 30 NTUs or greater.
    c. With NHDOT approval, turbidity measurements using turbidity meters or probes do not need to be made if the Contractor believes that it would be unsafe for personnel to collect in stream measurements due to conditions such as high water velocity and/or ice conditions.

2. **Monitoring Stations and Monitoring Frequency:** Markers (buoys or similar devices) shall be set up in the river at the location of four monitoring stations as described below:
    a. **Upstream - Background (UP-1):** A marker designating the background station will be located in the river just upstream from the bridge in an area not disturbed by the construction activity. The purpose of this station is to provide baseline turbidity information. During construction activities that could potentially result in increased in-stream turbidity (i.e., construction activities):
        i. Prior to the commitment of in-water work
        ii. Midday while in-water is being performed, and at the
        iii. Conclusion of in-water work
        iv. If there is visible turbidity within the mixing zone, visual monitoring and turbidity measurements shall be taken hourly.
    b. **Downstream 1 (DS-1):** A marker shall be placed 100 feet downstream from the bridge in each channel. Aquatic organism passage within the mixing zone will be assess at these locations. During construction activities that could potentially result in increased in-stream turbidity, monitoring for turbidity shall be conducted as follows:
        i. Visual Monitoring shall be take place every hour
        ii. Measurements shall be taken hourly if there is visible turbidity.
    c. **Downstream 2 (DS-2):** A marker shall be placed 200 feet downstream from the bridge in each channel. It is assumed that 50% of the turbidity would have dissipated or measure no more than 30 NTUs above background across the entire channel at these locations. During construction activities that could potentially result in increased in-stream turbidity, monitoring for turbidity shall be conducted as follows:
        i. Visual Monitoring shall be take place every hour
        ii. Measurements shall be taken hourly if there is visible turbidity.
    d. **Downstream 3 (DS-3):** four markers shall be placed 400 feet downstream from the bridge; 20 feet from each shore and the middle of the northern channel, and one in the middle of the southern channel. The purpose of this station is to

determine compliance with turbidity-related surface water quality standards and to identify the end of the mixing zone which is based on 100 times the river depth. There shall be no visible turbidity or turbidity measurements shall not be more than 10 NTUs above background across the entire channel at this location. During construction activities that could potentially result in increased in-stream turbidity, monitoring for turbidity shall be conducted as follows:

i. Visual Monitoring shall be take place every hour
ii. Measurements shall be taken hourly if there is visible turbidity

3. **Required Actions to Control Turbidity**:
   a. **DS-1:** If turbidity is visible in more than 1/4 of the channel at this station, work shall immediately stop and shall not resume until there is no visible turbidity in more than 1/4 of the channel. It is assumed that if turbidity is visible in more than 1/4 of the channel, the turbid discharge is impacting aquatic organism passage.
   b. **DS-2:** If turbidity is visible in any part of the channel at this station a sample will be taken and if turbidity is greater than 30 NTUs, work shall immediately stop until visible turbidity measures no more than 30 NTUs across any part of the channel. It is assumed that if there is visible turbidity at this station, there is a high potential that turbidity at the end of the mixing zone will be greater than 10 NTUs above background.
   c. **DS-3:** If visible turbidity measures more than 10 NTUs above background at the end of the mixing zone, work shall immediately stop and shall not resume until turbidity drops below 10 NTUs above background at the end of the mixing zone.

4. **Meter Monitoring Protocols:** Field measurements of turbidity using turbidity meters shall comply with the following:
   a. Monitoring frequency at each location shall comply with item 2 above.
   b. Results for in stream measurements, calibration and QA/QC shall be recorded on field data sheets, as well as the date, time, location and the names of those conducting the monitoring.
   c. Sampling Procedures for Hand-held Meters
      1) Rinse the sampling container three times with water from the waterbody.
      2) Submerge the sampling container a minimum of an arm's length upstream and allow the container to fill. Collect samples approximately one foot below the surface or at mid-depth (whichever is less) by placing a finger or thumb over the container opening, submersing the container to the appropriate depth, and then removing your finger or thumb from the container opening and allowing the container to fill.
      3) Do not collect any water immediately adjacent to legs or boots.
      4) Ensure that any introduced air bubbles are removed prior to analysis.
      5) Immediately cap the sample container, measure in the field using a turbidity meter and record results on the field data sheet.
   d. Sampling Procedures Using Dataloggers (Optional):

i. Dataloggers can be used instead of hand-held meters to automatically collect the majority of near-continuous (i.e., every 15 minutes) turbidity measurements.
ii. Dataloggers shall be calibrated according to manufacturer's instructions, with results recorded on the field data sheet.
iii. On the same day that dataloggers are deployed as well as prior to and on the same day that dataloggers are retrieved, hand-held turbidity measurements shall be made instream next to the datalogger for comparison to datalogger results.
iv. Dataloggers shall be retrieved, data downloaded, recalibrated and redeployed at least once every 2 weeks.
v. If dataloggers are used, hand-held turbidity meter measurements shall also be taken at least twice per day as a back-up in case the datalogger malfunctions and/or the data (which is downloaded at least once every 2 weeks) is later found to be invalid.

e. Quality Control and Quality Assurance
1) Turbidity meters shall have an accuracy of + 2% for readings below 100 NTUs and + 3% for readings above 100 NTUs, and a resolution of $\pm$ 0.1 NTU. Prior to monitoring, meter specifications shall be provided to NHDOT for approval.
2) Hand-held Meters shall be recalibrated daily with results recorded on the field data sheet.
3) Duplicate samples shall be taken for every 10th sample with results and identification of the duplicate sample clearly identified and recorded on the field data sheet. If the relative difference[1] between the duplicate measurement and the original measurement exceeds 10%, recalibrate the turbidity meter and re-measure turbidity.
4) Blank samples shall be taken every 10^{th} sample and recorded on the field data sheet. Blank samples shall be taken by filling a sample container with deionized water and measuring the turbidity immediately following measurement of the 10^{th} sample.

5. **Visual Monitoring with Photo Documentation Protocols:** Visual Monitoring for turbidity and photo documentation shall comply with the following:
a. Visual Monitoring results shall be recorded on field data sheets. Field Data sheets for Visual Monitoring shall include the names of those conducting the

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[1] $$RPD = \frac{|x_1 - x_2|}{\frac{x_1 + x_2}{2}} \times 100\%$$

The relative percent difference (RPD) is equal to the following:

where x_1 is the original sample concentration and
x_2 is the replicate sample concentration

observations, the date, time, location and result (i.e., visual turbidity or no visual turbidity) of each observation, and the date/time when work was ordered to be stopped and the date/time when work was allowed to resume.

b. Photos of each station shall be taken during each observation in which there is visible turbidity. Each photo shall include the date, time and location.
c. Photos must be taken from a location and angle that will clearly show visible turbidity should it occur. Use of drones for this purpose is recommended. Prior to construction, the Contractor shall provide photos of each monitoring location to NHDOT for approval proving that the proposed method to photograph conditions in-stream will clearly show visible turbidity should it occur.

6. Documentation, Notification and Reporting:

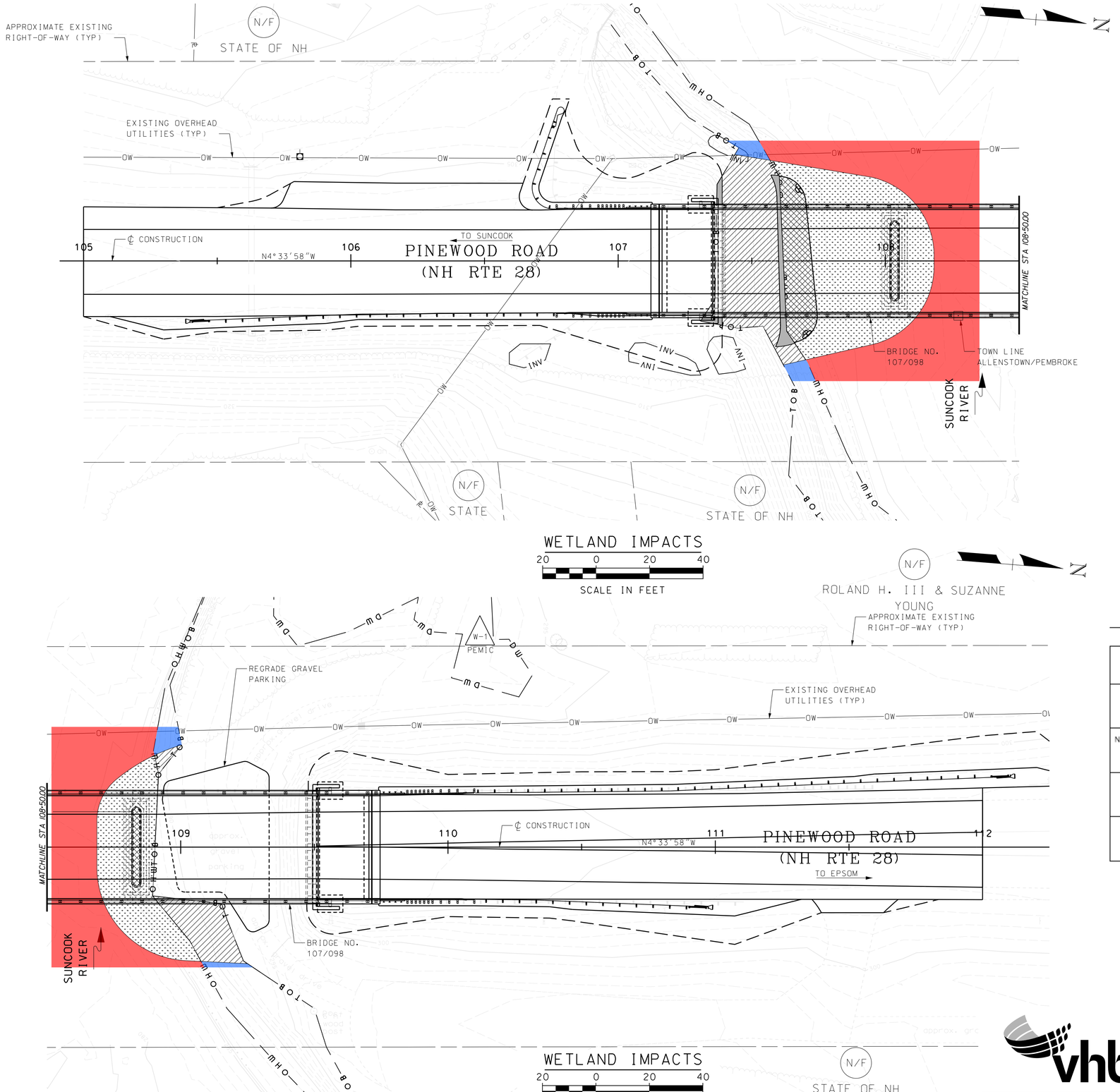
a. The Contractor shall maintain electronic copies of all field data sheets, datalogger data in MS Excel format (if dataloggers are used) and photos (with date, time and location) and submit them to NHDOT and/or NHDES within 48 hours of receiving a request.
b. Reports that include the results from the previous week, and shall be transmitted to NHDOT by Tuesday of the following week. The weekly reports shall include the following:
    i. If turbidity data was not collected, an explanation as to why and when it wasn't collected with supporting information (i.e., gage information showing high flows, photos showing ice build-up, etc.)
    ii. A summary of any data that was collected that did not meet the QA/QC requirements.
    iii. Turbidity meter results including the date, time and location.
    iv. The dates, times, locations and associated photos
    v. The dates and times when work was stopped due to exceedances of any of the criteria above.
    vi. The dates, times, associated photos at each location and turbidity meter results, when work was allowed to resume.
    vii. If dataloggers are used and retrieved the previous week, an MS Excel plot showing all datalogger results with NTUs on the y-axis and time/date on the x-axis.

7. **Notification:** NHDOT shall be notified immediately when turbidity results indicate that an exceedances have occurred and NHDES shall be notified **within 24 hours** when turbidity results indicate that exceedances outside the mixing zone have occurred.

Appendix R – Wetland Impacts

This appendix includes the following:

- Wetland Impact Comparison Figure
- Wetland Impact Plans



LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
TEMPORARY IMPACTS (NON-WETLAND)	
TEMPORARY IMPACTS (WETLAND)	

(#) WETLAND DESIGNATION NUMBER

(#) WETLAND IMPACT LOCATION

Proposed Temporary Bed Impact Increase

Proposed Temporary Bank Impact Increase

vhb

PLOT DATE	DRAWING NAME	SHEET SCALE
1/13/2021	$FILESS	AS NOTED

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

TOWN ALLENSTOWN-PEMBROKE	BRIDGE NO. 107/098	STATE PROJECT 40362
LOCATION NH ROUTE 28 OVER SUNCOOK RIVER		

WETLAND IMPACT COMPARISON FIGURE

\\vhb\gbl\proj\Bedford\52501.02 Allenstown 40362\cad\st\planset\40362wetplan_compare.dgn

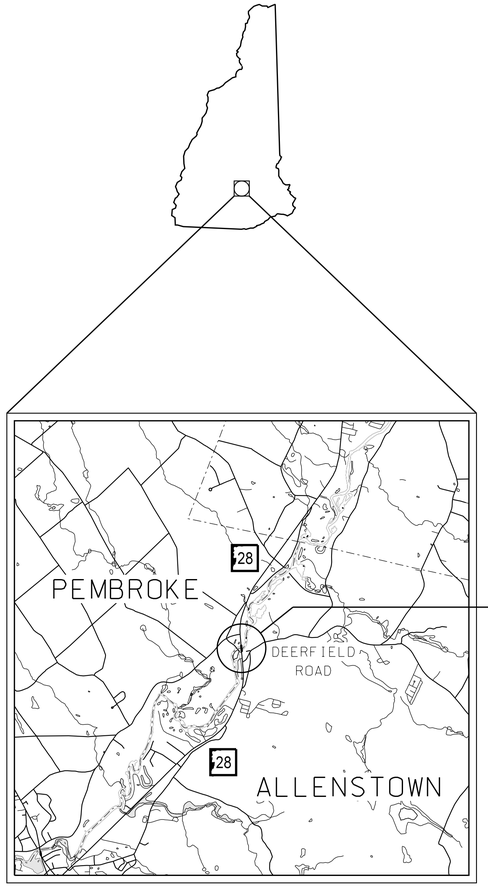
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

WETLAND IMPACT PLANS
FEDERAL AID PROJECT

X-A004(369)
N.H. PROJECT NO. 40362
NH ROUTE 28

DESIGN DATA	
AVERAGE DAILY TRAFFIC 20 19	8800
AVERAGE DAILY TRAFFIC 20 —	–
PERCENT OF TRUCKS	9
DESIGN SPEED	50 MPH
LENGTH OF PROJECT	600 FT

INDEX OF SHEETS

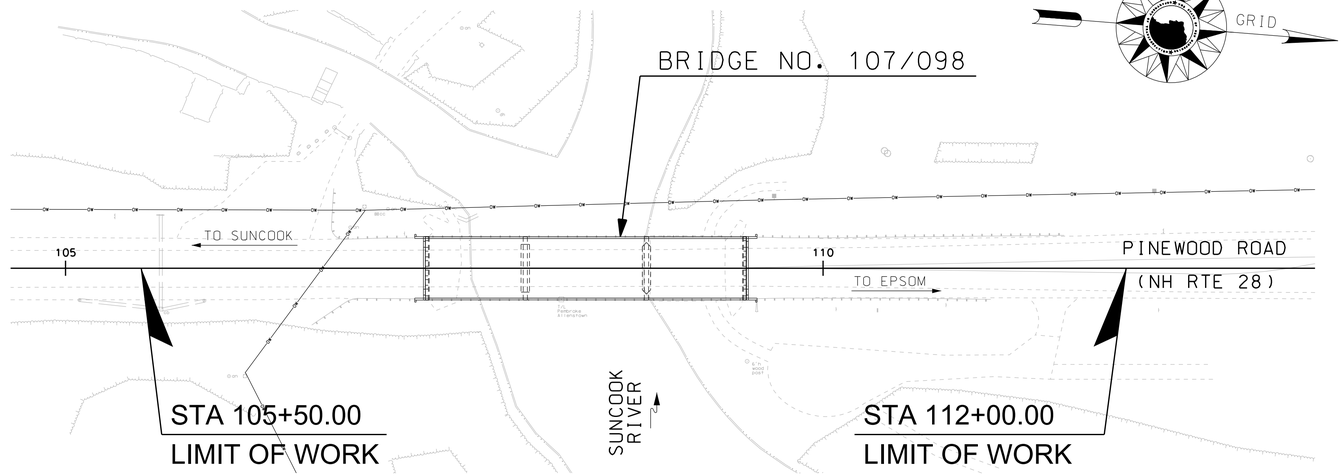


STATE PROJECT 40362

LOCATION MAP

1 1/2 0 1 2 mi.

GRAPHIC SCALE



ALLENSTOWN-PEMBROKE

COUNTY OF MERRIMACK

SCALE: 1" = 50'

DRAWN BY DATE

CHECKED BY DATE

NHDOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT — DATE

MUNICIPAL HIGHWAYS ENGINEER
BUREAU OF PLANNING AND COMMUNITY ASSISTANCE — DATE

APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER — DATE

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
X-A004(369)	40362	1	7

GENERAL

EDGE OF PAVEMENT — PROPOSED ROADWAY
TRAVELED WAY — 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)

TREE OR STUMP (CROSS-SECTIONS) — (show station, circumference in feet & type)

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)

CLEARING LINE — SLOPE 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
ALLENSTOWN
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	wetsym1	40362	2	7

DRAINAGE

MANHOLE

CATCH BASIN

DROP INLET

(existing) (PROPOSED)

DRAINAGE PIPE (existing) (label size & type)

DRAINAGE PIPE (PROPOSED)

UNDERDRAIN (existing) W/ FLUSHING BASIN

UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN

show direction of flow (label size & type)

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

PROPERTY LINE (COMMON OWNER)

TOWN LINE BOW / CONCORD

COUNTY LINE COOS / GRAFTON

STATE LINE MAINE / NEW HAMPSHIRE

NATIONAL FOREST

CONSERVATION LAND

BENCH MARK / SURVEY DISK

BOUND (PROPOSED)

STATE LINE/ TOWN LINE MONUMENT S/L T/L

NHDOT PROJECT MARKER

IRON PIPE OR PIN

DRILL HOLE IN ROCK

TAX MAP AND LOT NUMBER 156 / 14, 1642/341, 6.80 Ac.±

PROPERTY PARCEL NUMBER 12

HISTORIC PROPERTY

UTILITIES

existing PROPOSED

TELEPHONE POLE

POWER POLE

JOINT OCCUPANCY

MISCELLANEOUS/UNKNOWN POLE

GUY POLE OR PUSH BRACE

(plot point at face not center of symbol)

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 W PW PW

SEWER S S PS PS

TELEPHONE T T PT PT

ELECTRIC E E PE PE

GAS G G PG PG

LIGHTING L L PL PL

INTELLIGENT TRANSPORTATION SYSTEM ITS ITS

FIBER OPTIC FO FO PFO PFO

WATER SHUT OFF

GAS SHUT OFF

HYDRANT

MANHOLES

SEWER MHS

TELEPHONE MHT

ELECTRICAL MHE

GAS MHG

UNKNOWN

TRAFFIC SIGNALS / ITS

existing PROPOSED

MAST ARM (existing) 30' MA (NOTE ANGLE FROM ℄)

OPTICOM RECEIVER

OPTICOM STROBE

TRAFFIC SIGNAL

PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT

SIGNAL CONDUIT C C C PC PC 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

SHEET 2 OF 2

STATE OF NEW HAMPSHIRE
ALLENSTOWN
DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	wetsym2	40362	3	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

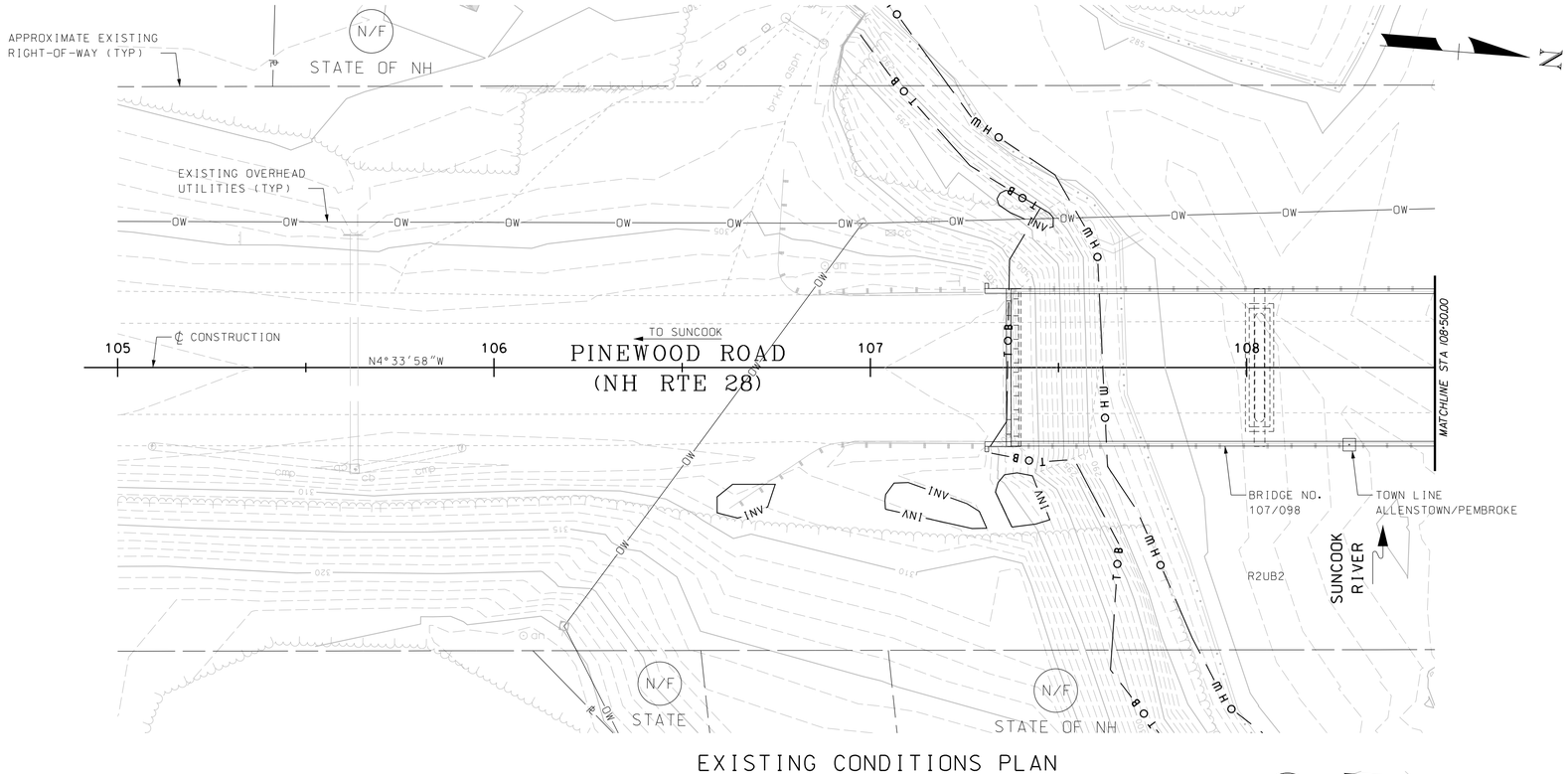
ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT 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
ALLENSTOWN
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

EROSION CONTROL LEGEND AND STRATEGY

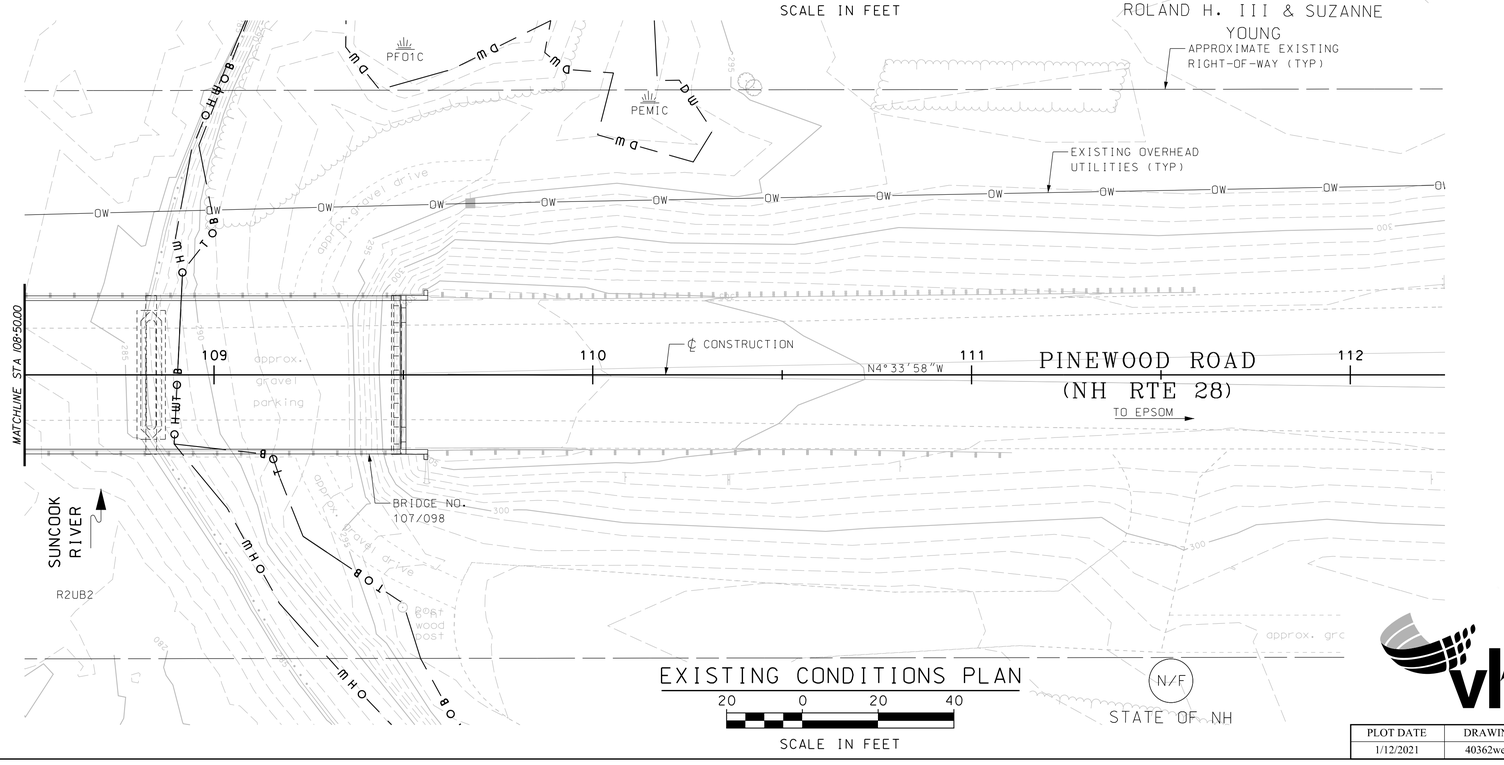
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
12-21-2015	weterosstrat	40362	4	7



EXISTING CONDITIONS PLAN

20 0 20 40

SCALE IN FEET



EXISTING CONDITIONS PLAN

20 0 20 40

SCALE IN FEET

WETLAND CLASSIFICATION CODES

PFO1C – PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY-FLOODED

PEM1C – PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY-FLOODED

R2UB2 – RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, SAND

NOTES

1. VHB SENIOR ENVIRONMENTAL SCIENTIST, KRISTOPHER WILKES (NH CWS #288), DELINEATED JURISDICTIONAL WETLANDS AND SURFACE WATERS ADJACENT TO THE EXISTING BRIDGE CROSSING ON SEPTEMBER 6, 2019.
2. WETLAND DELINEATION WAS PERFORMED IN ACCORDANCE WITH THE PROCEDURES AND STANDARDS OUTLINED IN THE REGIONAL SUPPLEMENT TO THE U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0 (JANUARY 2012).
3. WETLAND DELINEATION ALSO RELIED UPON THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2, PUBLISHED BY THE NATURAL RESOURCE CONSERVATION SERVICE AND THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4.0, PUBLISHED BY THE NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION.
4. DOMINANT WETLAND VEGETATION WAS ASSESSED USING THE NORTHCENTRAL AND NORTHEAST REGIONAL WETLAND PLANT LIST PUBLISHED BY THE U.S. ARMY CORPS OF ENGINEERS.
5. WETLANDS AND SURFACE WATERS WERE CLASSIFIED USING THE USFWS METHODOLOGY CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES (COWARDIN ET AL. 1979, REVISED 1985).
6. STREAM TOP-OF-BANK AND ORDINARY HIGH WATER DELINEATION WAS PERFORMED IN ACCORDANCE WITH ENV-WT 101.07 & RSA 483-B:4 (XI-E)."

STATE OF NEW HAMPSHIRE
KRISTOPHER P. WILKES
No. 288
CERTIFIED WETLAND SCIENTIST

vhb

PLOT DATE	DRAWING NAME	SHEET SCALE
1/12/2021	40362wetexcp.dgn	AS NOTED

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

TOWN ALLENSTOWN-PEMBROKE BRIDGE NO. 107/098 STATE PROJECT 40362

LOCATION NH ROUTE 28 OVER SUNCOOK RIVER

EXISTING CONDITIONS PLAN

BRIDGE SHEET 5 OF 7

PS&E PLANS
1/12/2021

	BY	DATE		BY	DATE
DESIGNED	TSP	1/21	CHECKED	JAW	1/21
DRAWN	KDW	1/21	CHECKED	JAW	1/21
QUANTITIES			CHECKED		

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE				7

FILE NUMBER

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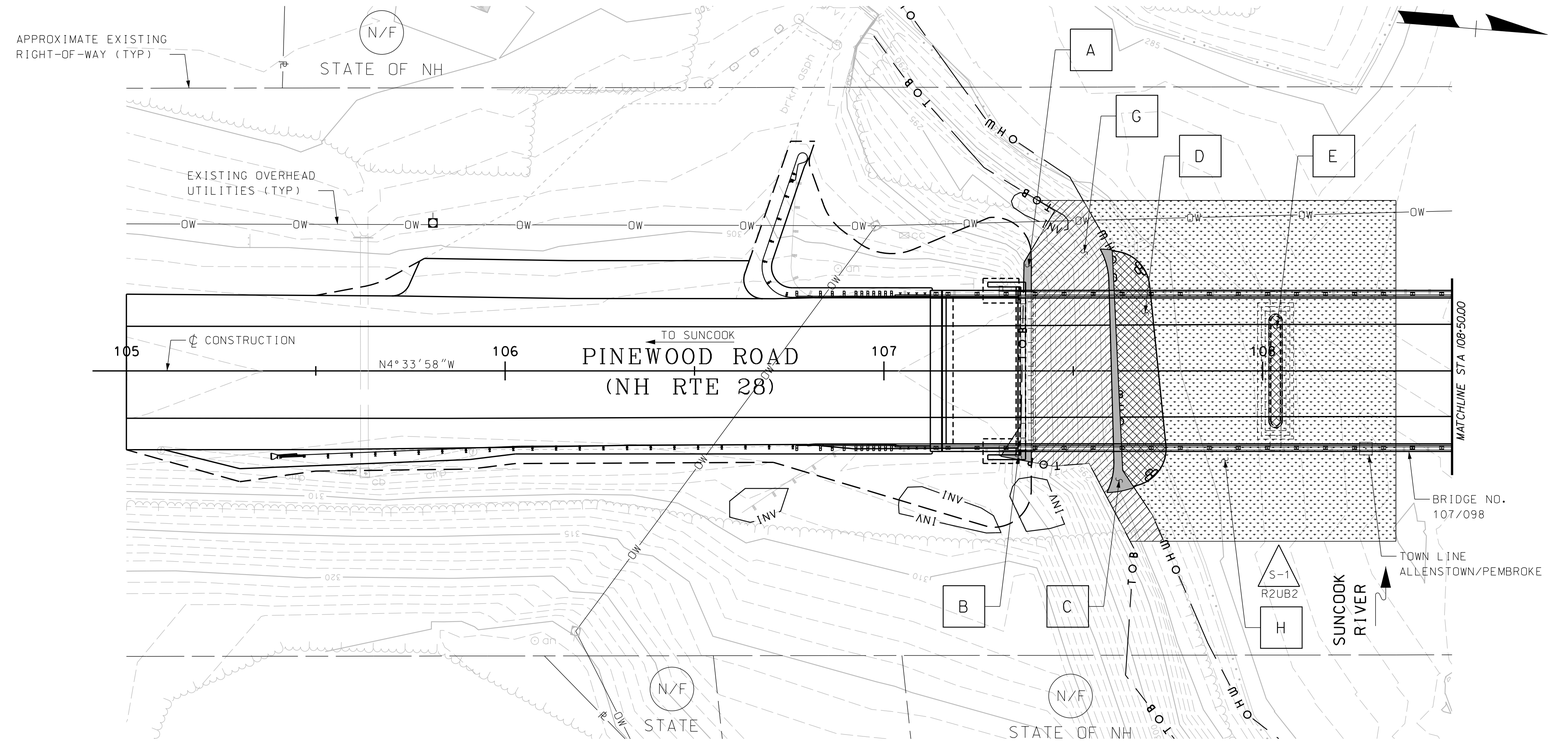

WETLAND IMPACTS

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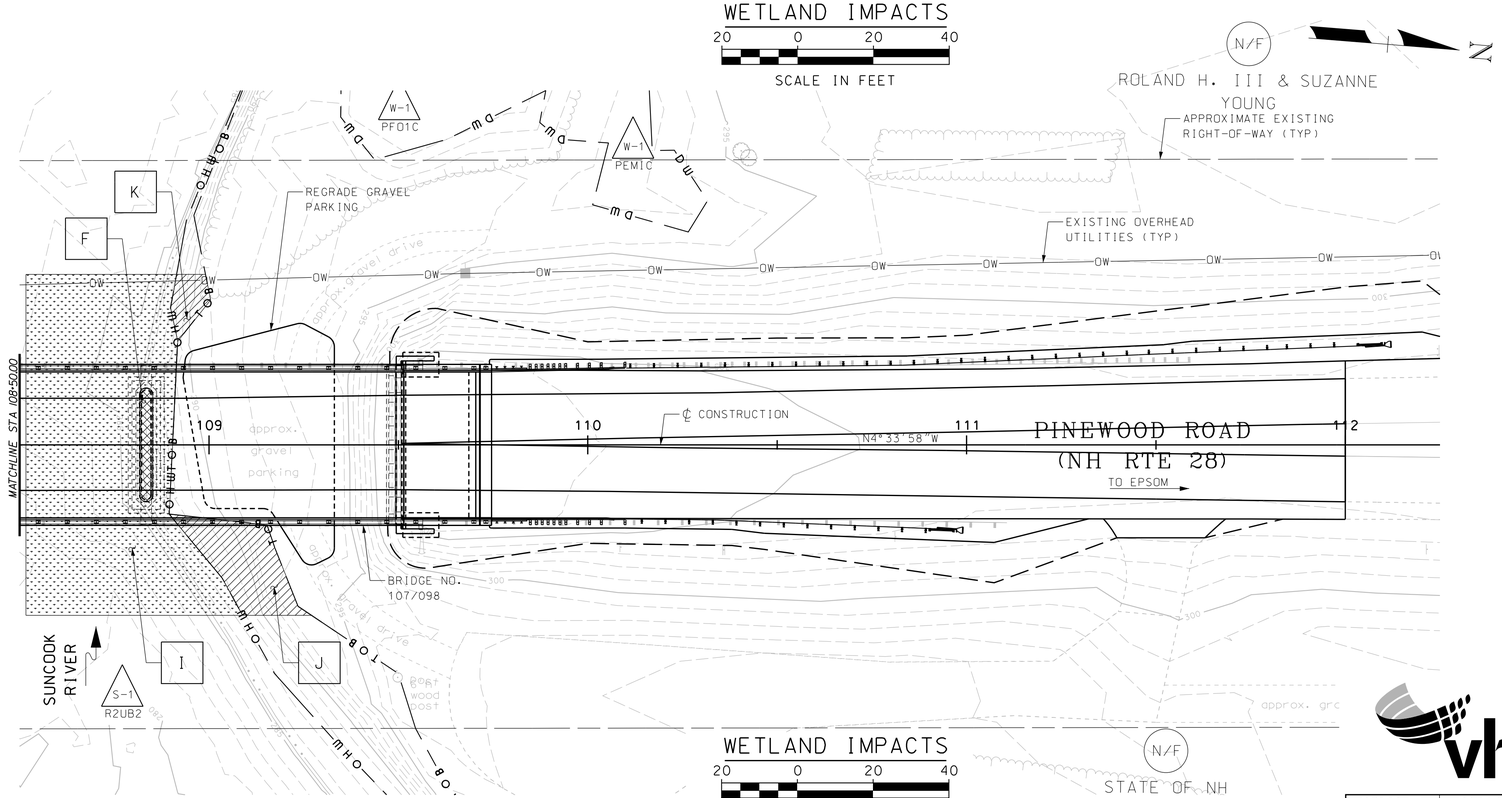
SCALE IN FEET



WETLAND IMPACTS

20 0 20 40

SCALE IN FEET

WETLAND IMPACT SUMMARY										
WETLAND IDENT-IFICATION	WETLAND CLASS-IFICATION	WETLAND DESIGNA-TION	AREA IMPACTS							
			PERMANENT				TEMPORARY			
			N.H.W.B. (NON-WETLAND) BANK		N.H.W.B. & A.C.O.E. (WETLAND) BED		(NON-WETLAND)		(WETLAND)	
			SF	LF	SF	LF	SF	LF	SF	LF
A	R2UB2 (BANK)	S-1	18	10						
B	R2UB2 (BANK)	S-1	16	3						
C	R2UB2 (BANK)	S-1	128	65						
D	R2UB2 (BED)	S-1			612	62				
E	R2UB2 (BED)	S-1			103	30				
F	R2UB2 (BED)	S-1			103	30				
G	R2UB2 (BANK)	S-1					1523	90		
H	R2UB2 (BED)	S-1							5833	90
I	R2UB2 (BED)	S-1							3657	90
J	R2UB2 (BANK)	S-1					480	33		
K	R2UB2 (BANK)	S-1					119	18		
TOTAL			162	78	818	122	2122	141	9490	180

PERMANENT IMPACTS: 980 SF
TEMPORARY IMPACTS: 11612 SF

TOTAL IMPACTS: 12592 SF

LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
TEMPORARY IMPACTS (NON-WETLAND)	
TEMPORARY IMPACTS (WETLAND)	

△ # WETLAND DESIGNATION NUMBER

WETLAND IMPACT LOCATION

WETLAND CLASSIFICATION CODES	
R2UB2	RIVERINE, LOWER PERENNIAL UNCONSOLIDATED BOTTOM, SAND
PFO1C	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED
PEM1C	PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED

PLOT DATE	DRAWING NAME	SHEET SCALE
1/12/2021	40362wetplan.dgn	AS NOTED

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

TOWN ALLENSTOWN-PEMBROKE BRIDGE NO. 107/098 STATE PROJECT 40362

LOCATION NH ROUTE 28 OVER SUNCOOK RIVER

WETLAND IMPACT PLAN

BRIDGE SHEET 6 OF 7

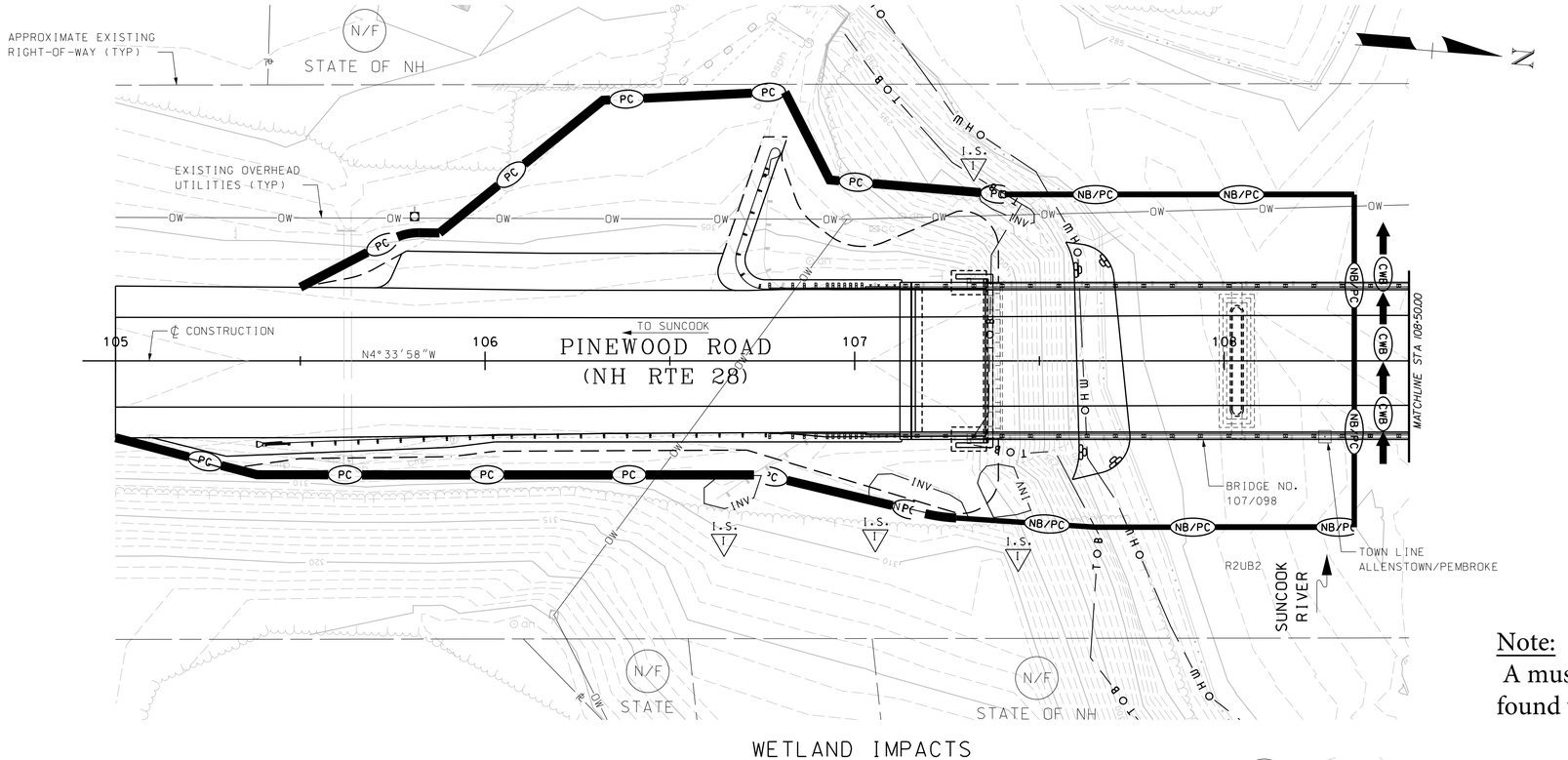
FILE NUMBER

PS&E PLANS
1/12/2021

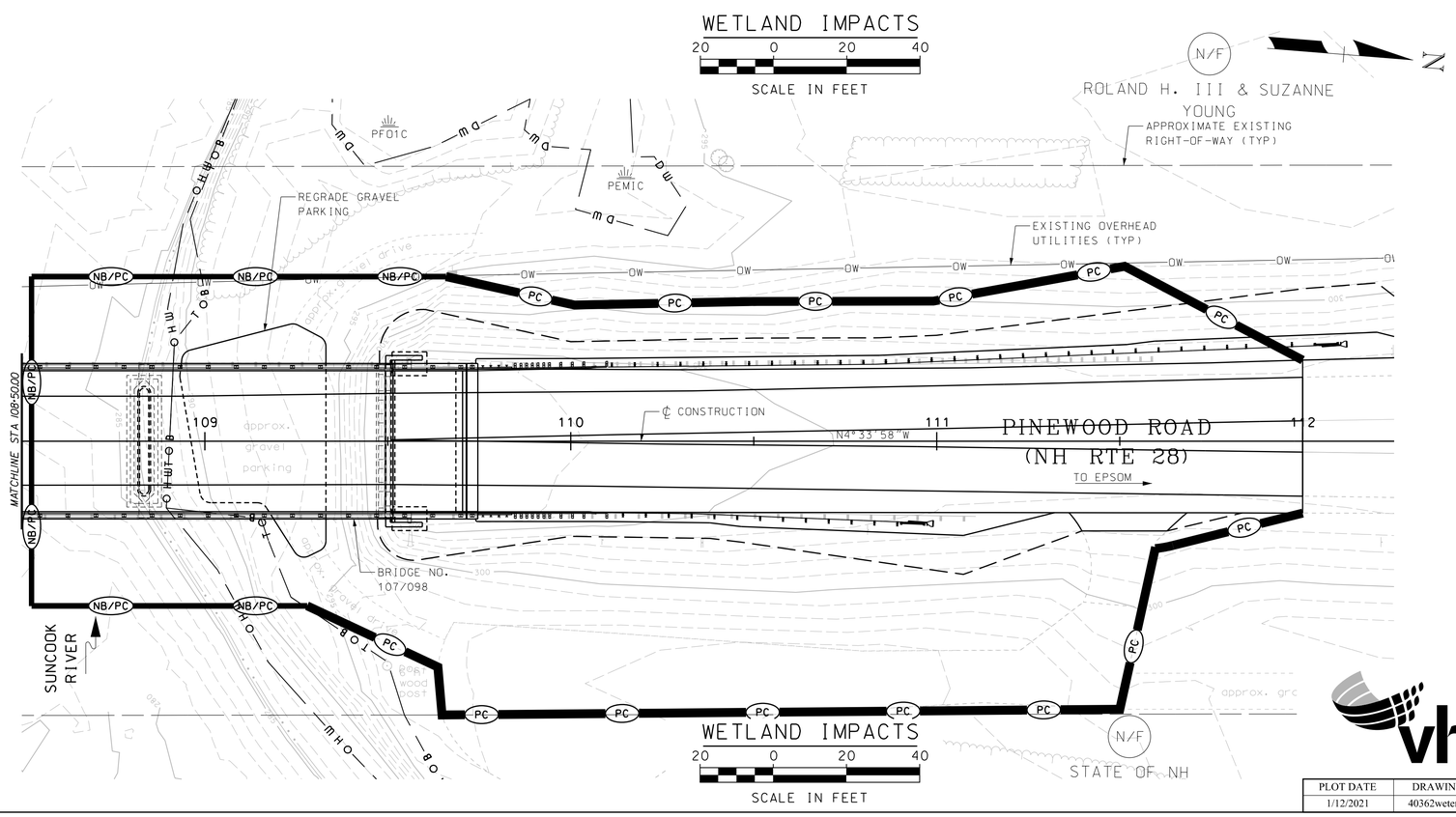
	BY	DATE		BY	DATE
DESIGNED	TSP	1/21	CHECKED	JAW	1/21
DRAWN	KDW	1/21	CHECKED	JAW	1/21
QUANTITIES			CHECKED		

ISSUE DATE		FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE				7

Appendix S – Erosion Control Plan



Note:
A mussel survey will be completed before construction and that any mussels found would be relocated.



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

LEGEND

I.S. = INVASIVE SPECIES TYPE 1

vhb

PLOT DATE	DRAWING NAME	SHEET SCALE
1/12/2021	40362wetercplan.dgn	AS NOTED

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

TOWN ALLENSTOWN-PEMBROKE BRIDGE NO. 107/098 STATE PROJECT 40362

LOCATION NH ROUTE 28 OVER SUNCOOK RIVER

EROSION CONTROL PLAN

BRIDGE SHEET 7 OF 7

FILE NUMBER

PS&E PLANS
1/12/2021

	BY	DATE		BY	DATE
DESIGNED	TSP	1/21	CHECKED	JAW	1/21
DRAWN	KDW	1/21	CHECKED	JAW	1/21
QUANTITIES			CHECKED		

ISSUE DATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
REV. DATE			7

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