


**STATE OF NEW HAMPSHIRE  
INTER-DEPARTMENT COMMUNICATION**

**FROM:**  Andrew O'Sullivan  
Wetlands Program Manager

**DATE:** July 29, 2020

**AT (OFFICE):** Department of  
Transportation

**SUBJECT** Dredge & Fill Application  
Stoddard, 42708

Bureau of  
Environment

**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 Highway Design for the subject major impact project. This project is classified as major per Env-Wt 904.03(g); rehabilitation of an existing legal Tier 3 structure. The project is located along NH Route 9 in the Town of Stoddard, NH. The proposed work consists of rehabilitation of existing twin 44" high x 72" wide x 92' long corrugated metal arch pipes with mitered ends. The proposed work includes slip lining the pipes with cured in place liners, shortening the pipes by removing the mitered ends and replacing the end sections with concrete headwalls.

This project was reviewed at the Natural Resource Agency Coordination Meeting on April 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>.

NHDOT anticipates that this project will be reviewed and permitted by the Army Corp of Engineers through the State Programmatic General Permit process. A copy of the application has been sent to the Army Corp of Engineers.

Mitigation was determined to not be triggered by the proposed impacts and therefore is not required.

The lead people to contact for this project are Kirk Mudgett, Bureau of Highway Design (271-2731 or [Kirk.Mudgett@dot.nh.gov](mailto:Kirk.Mudgett@dot.nh.gov)) or Sarah Large, Wetlands Program Analyst, Bureau of Environment (271-3226 or [Sarah.Large@dot.nh.gov](mailto:Sarah.Large@dot.nh.gov)).

A payment voucher has been processed for this application (Voucher # 616415) in the amount of \$1,361.20.

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:sel

cc:

BOE Original

Town of Stoddard (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 & Jeanie Brochi, US Environmental Protection Agency (via electronic notification)

Michael Hicks & Rick Kristoff, US Army Corp of Engineers (via electronic notification)

Kevin Nyhan, BOE (via electronic notification)

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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:** NH Dept. of Transportation

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

A person may request a waiver to requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interests of the public or the environment. A person may also request a waiver of standard for existing dwellings over water pursuant to RSA 482-A:26, III (b). For more information, please consult the [request form](#).

**SECTION 1 - CONCURRENT PROCESSING OF RELATED SHORELAND/WETLANDS PERMIT APPLICATIONS (Env-Wt 313.05)**  
If the applicant is not requesting concurrent processing, please proceed to Section 2.

Is the proposed project eligible for the optional concurrent processing of related shoreland/wetlands permit applications (Env-Wt 313.05(d))? If the project is not eligible, proceed to Section 2 (the files will not be processed concurrently).  Yes  No

By signing this form and initialing this section, the applicant is requesting concurrent processing of related shoreland/wetlands permit applications and understands that concurrently filing the applications with a request to process the applications together constitutes:

- A waiver by the applicant of the shorter time frame, if application processing timelines are different for each permit program under the 2 statutes and their implementing rules; and Initials:
- An agreement by the applicant that any request for additional information by the department under either or both statutes shall affect the review timeframe of both applications being processed together. Initials:

**SECTION 2 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05)**  
Please use the Wetland Permit Planning Tool (WPPT) or any other database or source to assist in identifying key features such as: priority resource areas (PRA), protected species or habitat, coastal area, or designated river, or designated prime wetlands.

**Step 1:** A certified wetland scientist must delineate and classify all wetlands and identify the predominant resource functions of each wetland, unless the exceptions listed in Env-Wt 306.05(a)(1) are met (Env-Wt 306.05(a)(1)).

**Step 2:** Determine whether the subject property is or contains a PRA by answering the following questions (Env-Wt 306.05(a)(2)):

- 1. Does the property contain any documented occurrences of protected species or habitat for such species? Please use the Natural Heritage Bureau (NHB) DataCheck Tool to make this determination.  Yes  No
- 2. Is the property a bog? Please use the WPPT "Peatland" layer (under the PRA module) for general location of bogs or any other database or source.  Yes  No
- 3. Is the property a floodplain wetland contiguous to a tier 3 or higher watercourse? Please use the WPPT "Floodplain Wetlands Adjacent to Tier 3 Streams" layer (under PRA module) or any other database or source.  Yes  No
- 4. Is the property a designated prime wetland or a duly-established 100-foot buffer? Please use the WPPT "Prime Wetlands" layers (under PRA module) or any other database or source.  Yes  No
- 5. Is the property a sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone? Please use the WPPT "Coastal" layers module and PRA module or any other database or source.  Yes  No

**Step 3:** For projects that are subject to Env-Wt 600, please attach the Coastal Functional Assessment (Env-Wt 603.04) and Vulnerability Assessment (Env-Wt 603.05) and conduct the data screening required by Env-Wt 603.03.

**Step 4:** Determine whether the following apply to the subject property (Env-Wt 306.05(a)(4); RSA 482-A:3, I(d)(2)):

- 1. Is the property within a Local River Management Advisory Committee (LAC) jurisdiction?
  - If yes, please provide the following information:
    - The project is within ¼ mile of:   Yes  No
    - A copy of the application was sent to the LAC on Month:  Day:  Year: .
      - N/A (Env-Wt 311.01(e))
- 2. Is the property within or contains any areas that are subject to time of year restrictions under Env-Wt 307?  Yes  No

**Step 5:** For stream crossing projects: what is the size of the watershed (Env-Wt 306.05(a)(5))? 721.4 acres  
 N/A

**Step 6:** For dredge projects: is the subject property contaminated (Env-Wt 306.05(a)(6))?  Yes  No  
 N/A

- Step 7:** Does the project have the potential to impact any of the following (Env-Wt 306.05(a)(7)):
- N/A
- 1. Impaired waters?  Yes  No
  - 2. Class A waters?  Yes  No
  - 3. Outstanding resource waters?  Yes  No

**SECTION 3 - 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" in the space provided below.

The project will rehabilitate twin 44" high x 72" wide x 92' long\* corrugated metal arch pipes, with mitered ends, carrying an un-named brook under NH Route 9. Total length of each pipe is about 102' including the mitered ends. The proposed rehabilitation is slip lining with cured in place liners. The existing mitered ends and portions of the existing pipes will be removed and replaced with concrete headwalls, shortening the total length of the crossing from 102' to 84'. A small amount of stone armor will be placed in front of each headwall to protect the foundations from scour; this area is currently where the pipe ends exist. The stone will be covered with excavated streambed material.  
 \*Existing Length Measurements: 92' long is the length of the full height pipes. 102' long is measured from the inverts at the end of the mitered sections.

**SECTION 4 - PROJECT LOCATION**

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

ADDRESS: NH Route 9, 1000' south of NH 123 TOWN/CITY: Stoddard, NH

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

UNITED STATES GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: un-named brook  
 N/A

LATITUDE (D.ddddd): 43.039128° North (Optional) LONGITUDE (D.ddddd): 72.074681° West (Optional)

**SECTION 5 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))**

If the applicant is a trust or a company, then the name of the trust or company should be written as the applicant's name.

NAME: NH Dept. of Transportation

MAILING ADDRESS: PO Box 483

TOWN/CITY: Concord STATE: NH ZIP CODE: 03302

EMAIL ADDRESS: Kirk.Mudgett@dot.nh.gov FAX: PHONE: 603-271-1598

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

**SECTION 6 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))**

N/A

LAST NAME, FIRST NAME, M.I.:

COMPANY 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 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))**

If the owner is a trust or a company, then the name of the trust or company should be written as the owner's name.

Same as applicant

NAME: [REDACTED]			
MAILING ADDRESS: [REDACTED]			
TOWN/CITY: [REDACTED]		STATE: [REDACTED]	ZIP CODE: [REDACTED]
EMAIL ADDRESS: Andrew.OSullivan@dot.nh.gov		FAX: [REDACTED]	PHONE: [REDACTED]
ELECTRONIC COMMUNICATION: By initialing here <u>AMO</u> , I hereby authorize NHDES to communicate all matters relative to this application electronically.			
<b>SECTION 8 - 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)).</b>			
Describe how the resource-specific criteria have been met (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters).			
<p>In accordance with Env-Wt 400 the jurisdictional areas within the project limits have been delineated by Sarah Large, NHDOT Bureau of Environment Wetlands Program Analyst. The jurisdictional areas are referenced on the attached included wetlands impact plans. The project has been designed in accordance with, Env-wt 514, Env-Wt 527, and Env-Wt 900 to the maximum extent practicable. An Alternative Design Request is included per Env-Wt 904.10. Unavoidable impacts to wetlands have been minimized to the maximum extent practicable. Project specific information is contained within this permit application.</p>			
<b>SECTION 9 - AVOIDANCE AND MINIMIZATION</b>			
Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)). If all impacts cannot be avoided, a functional assessment is required for minor and major projects (Env-Wt 311.03(b)(10)). Any project with unavoidable jurisdictional impacts must then be minimized as described in the <u>Wetlands Best Management Practice Techniques For Avoidance and Minimization</u> . Please refer to the application checklist to ensure that you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable).			
<b>SECTION 10 - MITIGATION REQUIREMENT (Env-Wt 311.02)</b>			
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.			

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

[www.des.nh.gov](http://www.des.nh.gov)

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

N/A - Mitigation is not required

**SECTION 11 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c).**

Have you submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent impacts that will remain after avoidance and minimization demonstration?

Yes  No

N/A - Mitigation is not required

**SECTION 12 - 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 required permitting).

For intermittent streams, the linear footage of impact is measured along the thread of the channel.

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 SF / LF		TEMPORARY SF / LF	
Forested Wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Scrub-shrub Wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Emergent Wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Wet Meadow		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Intermittent Stream	/	<input type="checkbox"/> ATF	41 / 13	<input type="checkbox"/> ATF
Perennial Stream or River	/	<input type="checkbox"/> ATF	855 / 30	<input type="checkbox"/> ATF
Lake / Pond	/	<input type="checkbox"/> ATF	1107 / 84	<input type="checkbox"/> ATF
Bank - Intermittent Stream	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Bank - Perennial Stream / River	99 / 33	<input type="checkbox"/> ATF	1301 / 156	<input type="checkbox"/> ATF
Bank/shoreline - Lake / Pond	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Tidal Waters	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Tidal Marsh		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Sand Dune		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Designated Prime Wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Duly-established 100-foot Prime Wetland Buffer		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Undeveloped Tidal Buffer Zone (TBZ)		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Previously-developed TBZ		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - Lake / Pond		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - River		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - Tidal Water		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Vernal Pool		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
<b>TOTAL</b>	<b>99 / 33</b>		<b>3304 / 283</b>	

**SECTION 13 - APPLICATION FEE (RSA 482-A:3, I)**

**MINIMUM IMPACT FEE:** Flat fee of \$400

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

[www.des.nh.gov](http://www.des.nh.gov)

<input type="checkbox"/> <b>NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION:</b> Flat fee of \$400 (refer to RSA 482-A:3, 1(c) for restrictions)			
<input checked="" type="checkbox"/> <b>MINOR OR MAJOR IMPACT FEE:</b> Calculate using the table below:			
Permanent and temporary (non-docking):	3403 SF	× \$0.40 =	\$ 1,361.20
Seasonal docking structure:	SF	× \$2.00 =	\$
Permanent docking structure:	SF	× \$4.00 =	\$
Projects proposing shoreline structures (including docks) add \$400 =			\$
Total =			\$ 1,361.20
<b>The application fee for minor or major impact is the above calculated total or \$400, whichever is greater = \$ 1,361.20</b>			

**SECTION 14 - PROJECT CLASSIFICATION (Env-Wt 306.05)**  
Indicate the project classification.

Minimum Impact Project     
  Minor Project     
  Major Project

**SECTION 15 - ALL APPLICABLE CONDITIONS IN Env-Wt 307 HAVE BEEN MET (Env-Wt 311.04(j); Env-Wt 313.01(a)(2)).**

Check all conditions applicable to your project below. Please ensure that your plan design and access, construction sequence, and timing appropriately meet applicable conditions below:

<input checked="" type="checkbox"/> Env-Wt 307.02	US Army Corps of Engineers (USACE) Conditions	<input checked="" type="checkbox"/> Env-Wt 307.11	Filling Activity Conditions
<input checked="" type="checkbox"/> Env-Wt 307.03	Protection of Water Quality Required	<input checked="" type="checkbox"/> Env-Wt 307.12	Restoring Temporary Impacts: Site Stabilization
<input type="checkbox"/> Env-Wt 307.04	Protection of Fisheries and Breeding Areas Required	<input type="checkbox"/> Env-Wt 307.13	Property Line Setbacks
<input checked="" type="checkbox"/> Env-Wt 307.05	Protection Against Invasive Species Required	<input type="checkbox"/> Env-Wt 307.14	Rock Removal
<input checked="" type="checkbox"/> Env-Wt 307.06	Protection of Rare, Threatened or Endangered Species and Critical Habitat	<input checked="" type="checkbox"/> Env-Wt 307.15	Use of Heavy Equipment in Wetlands
<input type="checkbox"/> Env-Wt 307.07	Consistency Required with Shoreland Water Quality Protection Act	<input checked="" type="checkbox"/> Env-Wt 307.16	Adherence to Approved Plans Required
<input type="checkbox"/> Env-Wt 307.08	Protection of Designated Prime Wetlands and Duly-Established 100-Foot Buffers	<input type="checkbox"/> Env-Wt 307.17	Unpermitted Activities
<input type="checkbox"/> Env-Wt 307.09	Shoreline Structures	<input checked="" type="checkbox"/> Env-Wt 307.18	Reports
<input checked="" type="checkbox"/> Env-Wt 307.10	Dredging Activity Conditions		

Provide an explanation as to methods, timing, and manner as to how your project will meet standard permit conditions required in Env-Wt 307 (Env-Wt 311.03(b)(7)):

The project will be constructed in accordance with the NHDOT Standard Specifications for Road and Bridge Construction, 2016 Edition, and project specific Plans, Prosecution of Work requirements, and Special Provisions.

Project construction is expected to occur in Summer of 2021, with a total project duration of about 2 months.

Means and methods of construction and schedule of work are proposed by the Contractor and are subject to approval by NHDOT. Temporary works such as cofferdams and water diversions are designed by the Contractor and submitted to NHDOT for documentation in accordance with Section 105.02 of the Standard Specifications.

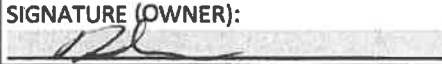
See the Construction Sequence included in the application.

**SECTION 16 - REQUIRED CERTIFICATIONS ( Env-Wt 311.11)**

Initial each box below to certify:

Initials: KOM	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials: KOM	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: KOM	<p>The signer understands that:</p> <ul style="list-style-type: none"> <li>The submission of false, incomplete, or misleading information constitutes grounds for NHDES to:                     <ol style="list-style-type: none"> <li>Deny the application.</li> <li>Revoke any approval that is granted based on the information. And</li> <li>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.</li> </ol> </li> <li>The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.</li> <li>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 trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.</li> </ul>
Initials: KOM	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 17 - REQUIRED SIGNATURE (Env-Wt 311.04(d); Env-Wt 311.11)**

SIGNATURE (OWNER): 	PRINT NAME LEGIBLY: KIRK MUDGETT	DATE: 7/15/20
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): _____	PRINT NAME LEGIBLY: _____	DATE: _____
SIGNATURE (AGENT, IF APPLICABLE): _____	PRINT NAME LEGIBLY: _____	DATE: _____





SECTION 18 - 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: _____	PRINT NAME LEGIBLY: _____
TOWN/CITY: _____	DATE: _____

**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. And
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

Please refer to Env-wt 311.05(a)(14) & RSA 482-A:3I(a)(1)  
 The four (4) town copies have been sent via certified mail and filed directly with the town in accordance with the above rule and regulation.

**DIRECTIONS FOR APPLICANT:**

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



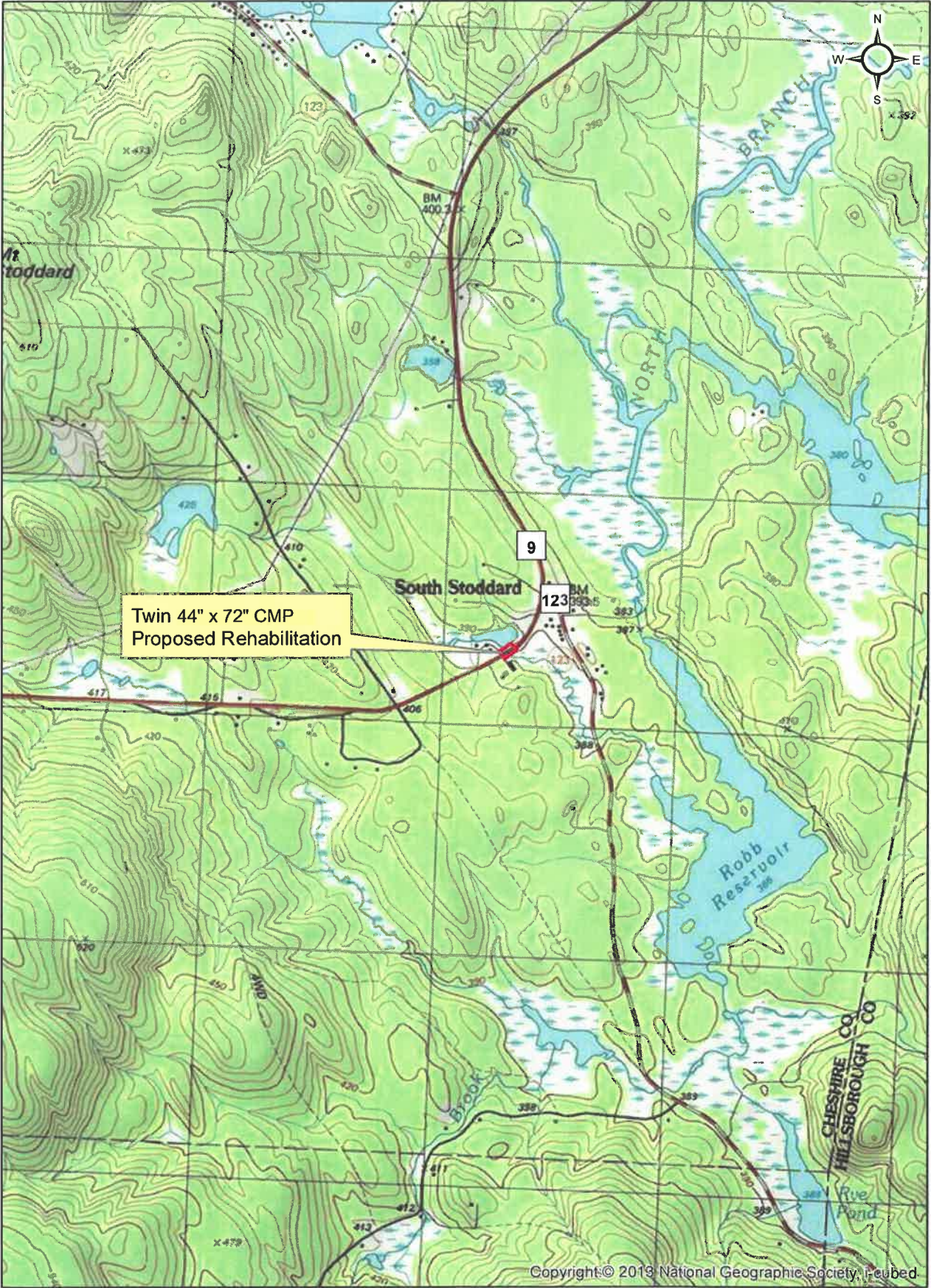
**APPLICATION CHECKLIST**

(Items identified with an asterisk (\*) are required only for Minor and Major Projects)

- The completed, dated, signed and certified application (Env-Wt 311.03(b)(1)).
- Correct fee as determined in RSA 482-A:3, I(b) or (c), subject to any cap established by RSA 482-A:3, X (Env-Wt 311.03(b)(2)).
- USACE "Appendix B, New Hampshire General Permits (GPs), Required Information and Corps Secondary Impacts Checklist" and its required attachments (Env-Wt 307.02).
- The results of actions required by Env-Wt 311.01 as part of an application preparation for a standard permit (Env-Wt 311.03(b)(3)).
- Project plans described in Env-Wt 311.05 (Env-Wt 311.03(b)(4)).
- Maps, or electronic shape files and meta data, and other attachments specified in Env-Wt 311.06 (Env-Wt 311.03(b)(5)).
- Explanation as to methods, timing, and manner as to how the project will meet standard permit conditions required in Env-Wt 307 (Env-Wt 311.03(b)(7)).
- If applicable, the information regarding proposed compensatory mitigation specified in Env-Wt 311.08 and Chapter Env-Wt 800 – Mitigation Worksheet, unless not required under Env-Wt 313.04 (Env-Wt 311.03(b)(8); Env-Wt 311.08; Env-Wt 313.04). – **N/A, no mitigation required**
- Any additional information specific to the type of resource as specified in Env-Wt 311.09 (Env-Wt 311.03(b)(9); Env-Wt 311.04(j)).
- Project specific information required by Env-Wt 500, Env-Wt 600, and Env-Wt 900 (Env-Wt 311.03(b)(11)).
- A list containing the name, mailing address and tax map/lot number of each abutter to the subject property (Env-Wt 311.03(b)(12)).
- Copies of certified postal receipts or other proof of receipt of the notices that are required by RSA 482-A:3, I(d) (Env-Wt 311.03(b)(13)).
- Project design considerations required by Env-Wt 313 (Env-Wt 311.04(j)).
- Town tax map showing the subject property, the location of the project on the property, and the location of properties of abutters with each lot labeled with the name and mailing address of the abutter (Env-Wt 311.06(a)).
- Dated and labeled color photographs that:
  - (1) Clearly depict:
    - a. All jurisdictional areas, including but not limited to portions of wetland, shoreline, or surface water where impacts have or are proposed to occur. And
    - b. All existing shoreline structures. And
  - (2) Are mounted or printed no more than 2 per sheet on 8.5 x 11 inch sheets (Env-Wt 311.06(b)).
- A copy of the appropriate USGS map or updated data based on LiDAR at a scale of one inch equals 24,000 feet showing the location of the subject property and proposed project (Env-Wt 311.06(c)).
- A narrative that describes the work sequence, including pre-construction through post-construction, and the relative timing and progression of all work (Env-Wt 311.06(d)). **See Construction Sequence document**
- For all coastal projects, include a copy of the recorded deed with book and page numbers for the property (Env-Wt 311.06(e)). **N/A**

- If the applicant is not the owner in fee of the subject property, documentation of the applicant's legal interest in the subject property, provided that for utility projects in a utility corridor, such documentation may comprise a list that: **N/A – All work within CAROW**
  - (1) Identifies the county registry of deeds and book and page numbers of all of the easements or other recorded instruments that provide the necessary legal interest. And
  - (2) Has been certified as complete and accurate by a knowledgeable representative of the applicant (Env-Wt 311.06(f)).
- The NHB memo containing the NHB identification number and results and recommendations from NHB as well as any written follow-up communications such as additional memos or email communications with either NHB or New Hampshire Fish and Game Department (NHF&G) (Env-Wt 311.06(g)).
- A statement of whether the applicant has received comments from the local conservation commission and, if so, how the applicant has addressed the comments (Env-Wt 311.06(h)).
- For projects in LAC jurisdiction, a statement of whether the applicant has received comments from the LAC and, if so, how the applicant has addressed the comments (Env-Wt 311.06(i)). **N/A**
- If the applicant is also seeking to be covered by the state general permits, a statement of whether comments have been received from any federal agency and, if so, how the applicant has addressed the comments (Env-Wt 311.06(j)).
- For after-the-fact applications: information required by Env-Wt 311.12 (Env-Wt 311.12). **N/A**
- Coastal Resource Worksheet for coastal projects as required under Env-Wt 600. **N/A**
- Prime Wetlands information required under Env-Wt 700. **N/A**
- Stream Crossing Worksheet required by Env-Wt 900.
- Avoidance and Minimization Written Narrative, Avoidance and Minimization Checklist, or your own avoidance and minimization narrative (Env-Wt 311.07).
- \* Attachment A: Minor and Major Projects (Env-Wt 311.10).
- \* Functional Assessment (Env-Wt 311.10).

# Stoddard 42708



Twin 44" x 72" CMP  
Proposed Rehabilitation

Copyright © 2013 National Geographic Society. Reused

0 0.25 0.5 1 Miles 1:24,000

Stoddard 42708





**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 LAST NAME, FIRST NAME, M.I.:** NH Dept. of Transportation

Attachment A can be used to satisfy some of the additional requirements for minor and major projects regarding avoidance and minimization, as well as functional assessment.

**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.

A FULLY COMPLIANT STREAM CROSSING DESIGN WOULD INVOLVE REPLACING THE TWIN ARCH CULVERTS WITH A 30’ SPAN BRIDGE. DUE TO THE DEPTH OF FILL AND SHARP CURVATURE OF THE ROADWAY, WETLAND IMPACTS WOULD BE SIGNIFICANTLY LARGER THAN FOR THE PROPOSED ALTERNATIVE. THE COMPLIANT STRUCTURE WOULD PASS HIGH FLOWS WITHOUT UTILIZING THE STORAGE IN THE UPSTREAM FLOODPLAIN TO ATTENUATE PEAK FLOWS. FOR Q100, THE INCOMING DESIGN FLOW IS 424 CFS AND ONLY ABOUT 311 CFS GOES THROUGH THE EXISTING TWIN CULVERTS. A COMPLIANT STRUCTURE WOULD ALLOW THE ENTIRE 424 CFS PEAK FLOW INTO THE DOWNSTREAM CHANNEL. THE ADDITIONAL FLOW WOULD INCREASE THE RISK OF FLOODING DOWNSTREAM.

A HYDRAULIC DESIGN WAS ALSO CONSIDERED, THAT WOULD PASS THE 50 YEAR STORM WITHOUT SUBMERGING THE INLET. THIS WOULD BE A 6’ HIGH X 8’ WIDE BOX CULVERT, EMBEDDED 24”. THE EXTENT OF WETLAND IMPACTS AND THE POTENTIAL FOR INCREASED DOWNSTREAM FLOODING ARE SIMILAR TO THE FULLY COMPLIANT OPTION.

THE POOR CONDITION OF THE EXISTING TWIN CULVERTS REQUIRES TIMELY ACTION TO PREVENT STRUCTURAL FAILURE AND ASSOCIATED DAMAGE TO ENVIRONMENTAL REOURCES AS WELL AS PUBLIC AND PRIVATE INFRASTRUCTURE.

SEVERAL REHABILITATION METHODS WERE CONSIDERED, INCLUDING CONCRETE INVERT REPAIR AND SLIPLINING WITH OTHER MATERIALS SUCH AS METAL LINERS, SPRAYED ON MORTAR LINING, AND VARIOUS PLASTIC LINERS. NONE OF THESE ALTERNATIVES MEETS THE PROJECT OBJECTIVE OF A TIMELY AND FULLY STRUCTURAL REHABILITATION THAT DOES NOT DECREASE THE CAPACITY OF THE CROSSING AND MINIMIZES CHANGES TO THE CULVERT OUTLET VELOCITY.

The crossing was identified by NHDOT’s Culvert Management Committee as being a statewide high priority to repair and rehabilitate as soon as possible due to the significant deterioration, size of crossing, and traffic volume.

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

[www.des.nh.gov](http://www.des.nh.gov)



**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, crustacea, shellfish and wildlife of significant value.

There are no palustrine marshes delineated within 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.

The existing twin culverts provide a hydrologic connection between the upstream and downstream channels. There is no perch at the inlet or outlet. The proposed cured in place liners will conform closely to the existing pipes, resulting in a change in invert elevation of less than 1 inch. The non-jurisdictional area beneath the existing culverts at the inlet and outlet will be day lighted / exposed associated with shortening the pipes and will be graded such that there is no perch. The proposed liner will maintain the existing hydrologic connection and match the existing flow conditions to the maximum extent practicable. Hydrologic and hydraulic analysis is included in the Supplemental Narrative included in this application. There will be no effect on wetlands adjacent to the upstream and downstream channels.

**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.

The proposed design is the minimum impact alternative that meets the project need. There will be minimal permanent impacts to resources at the culvert inlet and outlet. The stream and adjacent wetlands will continue to function as they do currently. The limited permanent impacts to the jurisdictional bank and temporary impacts to the pond, stream channel, and adjacent palustrine wetlands of the un-named stream are necessary to rehabilitate the culverts in order to prevent failure. The project only proposes permanent impacts to the banks and the extent of impacts to the banks are the minimum necessary to stabilize the areas in the immediately vicinity of the culvert inlet and outlet. The temporary impacts are for accessing the structure to complete the work and for placement of sediment and erosion control best management practices and water diversion to protect the site and resources during construction. No vernal pools, nor exemplary natural communities, protected species nor habitat, documented fisheries, or habitat and reproduction areas for species of concern have been identified within the project area. NH Fish & Game reviewed the project at the April 15, 2020 Natural Resource Agency meeting and supported the proposed rehabilitation. The NHB DataCheck webtool was used to determine that there are no known records of protected species in the project area and no further coordination was necessary. US Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPAC) webtool was reviewed and confirmed that the project area is located within the range of the federally threatened northern long-eared bat (NLEB). The USFWS concurred that the proposed actions are consistent with the FHWA, Federal Rail Administration and Federal Transit Administration Programmatic Biological Opinion for Transportation Projects within the Ranges of the Indiana Bat and the Northern Long-eared Bat (PBO) and that the work may affect, but would not be likely to adversely affect NLEB with the use of appropriate avoidance and minimization measures as detailed in the PBO.

**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 project will have no permanent effect on public commerce, navigation, and recreation.

The subject un-named brook is not considered navigable by the US Coast Guard. Areas immediately upstream and downstream of the twin culverts (within the State ROW) are not used for recreational purposes. Failure to repair the existing culverts could result in significant damage to public and private infrastructure upstream and downstream of the crossing and substantial traffic disruptions.

**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.

The floodplain wetlands that surround the brook upstream of the twin culverts provide flood flow attenuation. The proposed design will maintain the floodplain function, with water levels similar to existing conditions.

The proposed design matches existing flow condition to the maximum extent practicable. The existing twin culverts pond water in the upstream floodplain at high flows. The proposed design closely matches the existing ponding elevations for the range of expected flows. At low flows, the depth of surface water and groundwater in the upstream floodplain will not be significantly affected. Avoidance of all impacts is not practicable, due to the poor structural condition of the existing culverts. Work at the site is necessary to protect the crossing and road from failing to continue supporting a safe roadway for the traveling public.

Hydraulic analysis is contained in the Supplemental Narrative included in this application. The analysis summarizes the assessed water elevations anticipated at this crossing as well as details, profiles, and cross sections that reference the pond's normal high water elevation, existing Q100 elevation, and the proposed Q100 elevation as they relate to the structure's invert elevations.

**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.

Avoidance of all impacts is not practicable due to the poor structural condition of the existing culvert. The proposed design has the least impact to wetlands of any practicable alternative. The majority of impacts at the culvert inlet and outlet are temporary. Disturbed jurisdictional areas will be restored to existing conditions.

The scrub shrub and forested wetlands have functions and values associated with being immediately adjacent to roadway infrastructure as well as commercial and residential development such as: sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, sediment/shoreline stabilization, as well as flood flow alteration (storage). The delineated palustrine wetlands adjacent to NH Route 9 are highly influenced by the roadway and surrounding development and are of lower value than the more pristine wetlands upstream or downstream of the crossing that are farther away from human influence. The proposed impacts are minimized to the maximum extent practicable and are limited to the palustrine wetlands immediately adjacent to the roadway that have already been impacted by the road.

**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 project will have no effect on wetlands that would be detrimental to adjacent drinking water supply and groundwater aquifer levels.

**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 project will have only temporary impacts to the upstream and downstream channels. Disturbed areas will be restored to existing conditions, except for replacing the culverts' mitered ends with concrete headwalls. The cured in place liners will cause a slight increase in the culverts' outlet velocities at high flows. The predicted increase in velocities is not significant enough to cause instability in the downstream channel. There will be no permanent impact to the upstream channel, ponded area, or floodplains.

**PART II: FUNCTIONAL ASSESSMENT**

**REQUIREMENTS**

Ensure that project meets requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).

FUNCTIONAL ASSESSMENT METHOD USED:

US Army Corps of Engineers Highway Methodology

NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT:

ASSESMENT BY NHDOT SARAH LARGE, WETLAND PROGRAM ANALYST  
DELINEATION PER ENV-WT 406

DATE OF ASSESSMENT: 11-25-2019

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.

**CULVERT REHABILITATION PROJECT**  
**Un-Named Brook under NH Route 9**  
**STODDARD, NH**  
**NHDOT PROJECT NO. 42708**  
**SUPPLEMENTAL NARRATIVE**

**Project Description**

The project will rehabilitate twin 44" high x 72" wide x 92' long corrugated metal arch pipes, with mitered ends, carrying an un-named brook under NH Route 9. Total length of each pipe is about 102' including the mitered ends. The proposed rehabilitation is slip lining with cured in place liners. The existing mitered ends and portions of the existing pipes will be removed and replaced with concrete headwalls, shortening the total length of the crossing from 102' to 84'. A small amount of stone armor will be placed in the channel in front of each headwall where the old mitered pipe end sections were located to protect the foundations from scour. The stone armor will be intermixed with and covered by existing streambed material.

This project was initiated under NHDOT's Federal Culvert Replacement/Rehabilitation & Drainage Repair (CRDR) Program. The Program purpose is to address major culvert and drainage needs statewide that are not being addressed through current or future Capital Improvement or other programmatic projects. The Program receives \$2,000,000 in total funding annually, which includes construction, engineering, and ROW costs. Projects are selected and scheduled based primarily on the condition of the culvert (risk of failure), and Road Tier, traffic volume, depth of fill, and detour length (potential impact of failure). The Program funding is fully committed for at least the next three years. This culvert is one of the highest statewide priority locations out of nearly 50 known locations eligible for the Program. Failure to address the structural deficiency of this culvert risks deformation of the culvert which would make rehabilitation impossible and/or collapse of the culvert which could cause serious impacts to downstream wetlands, public/private infrastructure, and the travelling public.

Due to the above noted funding constraints, 100% State funding was proposed in order to accomplish the rehabilitation as soon as possible. Based on current State funding uncertainties, it has been determined that some federal funding will be required. The project intent is to address the structural deficiency as soon as practical.

The proposed advertising date is September 29, 2020, with construction anticipated to begin in summer of 2021. Project duration is expected to be 2 months.

**Existing Conditions**

The crossing carries an un-named perennial stream under NH Route 9 at approximately 1,000' southwest of NH123 South (or 1,750' northeast of Juniper Hill Rd). The un-named stream passes through several palustrine scrub-shrub and emergent marsh wetlands as well as forested wetlands upstream of the crossing. The stream then passes through a small pond immediately at the inlet of the crossing and enters into Robb Reservoir approximately 0.7 miles downstream of the crossing's outlet. The un-named stream passes under NH Route 123 prior to entering into the reservoir. The

scrub shrub, emergent, and forested wetlands have functions and values associated with being immediately adjacent to roadway infrastructure as well as commercial and residential development such as: sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, sediment/shoreline stabilization, as well as flood flow alteration (storage). The delineated palustrine wetlands adjacent to NH Route 9 are highly influenced by the roadway and surrounding development and are of lower value than the more pristine wetlands upstream or downstream of the crossing that are farther away from human influence.

The existing crossing consists of two 44" high x 72" wide x 92' long corrugated metal arch pipes, with mitered ends. Total length of each pipe is about 102' including the mitered ends. Original construction was in 1963, under Project P4792. Old plans indicated 1' of fall over the 92' pipe length (about 1% slope). NHDOT survey found the inlet inverts lower than old plans and outlet inverts higher, indicating a slightly negative slope. Field measurements indicate a positive slope of approximately 0.6%. Inverts were re-surveyed in May 2020, finding positive slopes of 0.94% for the north pipe and 0.7% for the south pipe. Shots were taken where the pipes were full height, not at the damaged/deteriorated mitered ends. Fill height at the inlet is about 10' and fill height at the outlet is about 13' (heights are from invert to edge of pavement),

The culverts are in poor condition, with severe corrosion and perforations along the lower sides. Backfill material is being lost through the perforations. The original arch shape of both culverts is still intact. The size, type, age, and condition of the twin culverts is very similar to a culvert under NH107 in Northwood that failed in August of 2019.

The Stoddard twin culvert crossing was Statewide Priority #2 (at the time the project was scheduled) based on fill height, traffic volume, and risk of failure. NH Route 9 is a Tier 2 roadway, one of the only high capacity routes connecting Concord to Keene and the southwest region of the State. 2018 traffic volume was 7,675 vehicles per day with a significant portion of trucks and regional commercial traffic.

In the event of a failure at the crossing, regional traffic could be detoured via US 202 south to NH 101 west, an increase of about 10.8 miles. Local traffic would be detoured via state routes (NH123 to NH 10), an increase of up to 30 miles depending on the destination in relation to the closure. There are very few suitable town roads in the vicinity.

NHDOT Maintenance District 4 reports this crossing has no history of flooding, but there has been beaver activity. A phone conversation with the adjacent owner (Hayes Auto) confirms no history of flooding of Route 9 no flooding on the developed portion of the owner's property, which is about 5' lower than the Route 9 pavement. There is no bypass mechanism other than overtopping of Route 9.

This crossing has been impacted by beaver activity in the past, resulting in installation of a beaver deterrent fence. Activity has subsided lately, so the project is not proposing to reinstall the beaver fence.

There is a large permanently ponded area immediately upstream of the crossing inlet, with a significant amount of storage. Farther upstream, the stream is a Type E, with a shallow meandering channel and wide connected floodplain, which also contributes to the available storage. Immediately downstream of the crossing, there is a short section of incised channel, about 16' wide x 75' long, but then returns to Type E morphology, a diffuse stream within a scrub shrub / emergent wetland. The culvert inlets and outlets are not perched.

Baseflow in the culverts has been observed at 8" to 12" deep on several occasions during periods of low rainfall. Due to the large upstream ponded area and floodplain storage, it is unlikely that the crossing is ever dry, except in cases of extreme drought.

The next downstream crossing is 10' span x 5' high bridge carrying the brook under NH 123 (Bridge #161/050). The NH Aquatic Restoration Mapper tool indicates this crossing is undersized and flooding occurs in the vicinity annually. The FEMA regulated floodplain begins just downstream of NH 123.

The crossing is Tier 3 based on its drainage area of 1.13 Sq mi. (721.4 acres from LIDAR vs 707 acres from Streamstats).

A HydroCADD model was used as a check for runoff predictions and to evaluate the effects of upstream storage. The SCS Method predicts Q100 = 424 cfs for 7.09" of rain in 24 hours (NOAA Rainfall Data, Atlas 14, 2019) vs the Streamstats Q100 of 296 cfs. The SCC Method runoff predictions were used for analysis and design. FHWA's HY-8 Culvert Analysis Program was used to evaluate culvert hydraulics. The HY-8 culvert stage-discharge results were input into Hydrocadd. Of the 424 cfs Q100 inflow, the culverts pass about 311 cfs at a headwater depth of about 6.2 feet (El 1278.98), which is very close to the approximate elevation of the perimeter of the developed portion of the Hayes Auto property, El 1278.5. As this elevation is significantly lower than the NH Route 9 pavement, the developed perimeter elevation was used as the design control for analysis of the 100 year storm. Approximately 21 acre-feet of water would be stored upstream of the culverts in the 100 year storm. This can also be seen visually on sheet 6 "Culvert Profile" of the wetland impact plans.

The above referenced developed perimeter was identified from LIDAR contours (El 1278.0 NAVD88 datum). In this area, the LIDAR datum is approximately 0.5' lower than the NHDOT survey datum (NGVD29). Where used, LIDAR elevations were adjusted to NHDOT survey datum (NGVD29) to be consistent with the surveyed culvert inverts. All elevation references in the Plans and Application are referenced to the NHDOT survey datum, unless otherwise noted.

A detailed stream assessment was not performed for this crossing due to the presence of a large ponded area at the inlet of the culvert, which was classified as a pond (PUB23) and eliminated the feasibility to collect upstream reference reach data. Regional curves predict a bankfull width of 13.1' for this crossing based on drainage area. Using the guidance of 2.2 x bankfull width for Type E streams, the calculated compliant structure span would be 28.8'.

## **Resources**

Threatened and Endangered Species [Env-Wt 307.06-Protection of Rare, Threatened or Endangered Species and Critical Habitat]: USFWS was consulted and confirmed that the project area is in the range of the northern long-eared bat (NLEB). The USFWS concurred that the project may affect, but is not likely to adversely affect NLEB in accordance with the FHWA, Federal Rail Administration and Federal Transit Administration Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and the Northern Long-eared Bat. The New Hampshire Natural Heritage Bureau also reviewed the project area and concluded that there are no known records of protected species or their habitats in the vicinity of the project area.



Invasive Species [Env-Wt 307.05- Protection Against Invasive Species]: An inventory of invasive plant species was completed during the Spring of 2020. No existing populations of invasive species were identified at the time. The Contractor will be required to perform all work activities in accordance with the Department publication “Best Management Practices for the Control of Invasive and Noxious Plant Species” in order to prevent the spread of invasive species to the site during construction.

Cultural Resources: The proposed work was reviewed by the Department’s Cultural Resources Program and was found to be consistent with the Section 106 Programmatic Agreement (Section 196 PA) among the FHWA, the New Hampshire State Historic Preservation Office, the Advisory Council on Historic Preservation and the Department. The existing twin culverts are included in the Program Comment for Post-1945 Bridges and Culverts and are therefore considered to be non-historic. As such, the proposed work has been determined to have no potential to effect historical resources under Appendix B of the Section 106 PA.

Water Quality: [Env-Wt 307.03 Protection of Water Quality] The project does not propose to increase the amount of impervious surface. It is anticipated that the project will not result in a negative impact on water quality in the project area and therefore, no permanent stormwater treatment is proposed. A NPDES Discharge General Permit may be required if dewatering within the stream is required. Best Management practices will be utilized to prevent and reduce the likelihood of erosion or sediment entering the wetlands system. See the include erosion control plans for more details regarding BMPs.

Prime Wetlands, Designated Rivers, and Shoreland Water Quality Protection Act [Env-Wt 307.07- Consistency Required with Shoreland Water Quality Protection Act, Env-Wt 307.08- Protection of Designated Prime Wetlands and Duly-Established 100-Foot Buffers]: There are no prime wetlands in the vicinity of the project area and the project is not located within the protected corridor of any designated rivers. The project is not located near any waterbodies protected by the NH Shoreland Water Quality Protection Act.

Env-Wt 307.02 Requirements for coverage under state general permits- Appendix B is attached to this permit application. NHDOT seeks to receive review and approval by the Army Corps of Engineers through their General Permit and via submittal of this State wetlands permit application to NHDES.

Env-Wt 307.04 Protection of Fisheries and Breeding Areas Required- N/A no fisheries or protected fisheries habitat were identified within the project area.

Env-Wt 307.11 Filling Activity Conditions- All fill material will conform to the requirements listed in 307.11

Env-Wt 307.15 Use of Heavy Equipment in Wetlands ) It is not anticipated that equipment will need to be in the stream. If access roads need to cross wetlands, stone over geotextile will be used to minimize disruption to native soils and vegetation.

Env-Wt 307.16 Adherence to Approved Plans Required- All work shall be in accordance with the plans prepared the NHDOT Highway Design (Chris Carucci, PE) and approved by NHDES.

*Env-Wt 311.06(h)*

Initial contact letters describing the project area and requesting feedback, as well as mitigation priorities for the Town, were sent to the Town Officials and the Stoddard Conservation Commission on March 31<sup>st</sup> 2020. No responses have been received to date.

**Alternatives**

A fully compliant design would be a 30' span bridge, cost estimated at **\$2,099,694**.

Funding and design time would require a delay in the start of construction of 3 – 5 years.

Construction could be expected to take at least 1 season, with significant temporary widening on both sides of NH Route 9 to accommodate 2 lanes of traffic and phased construction. The sharp curvature and steep cross slope of NH 9 in the culvert area increases the complexity and length of the traffic shifts that would be required for lane closures. Up to 1,200 LF of NH 9 pavement would be impacted by the traffic shifts for phased bridge construction. Not utilizing the upstream storage would cause a significant increase in downstream flows and 100 year flood elevations. The chronic flooding location downstream would be made worse by the increased flows.

**The cost estimate for the fully compliant option is as follows:**

Structure (including excavation, backfill, headwalls, wingwalls)	\$ 741,563
Based on 35' clear roadway width x 67.8' total length x \$312.50 / SF	
Structure Incidentals (water diversion, cofferdams, simulated streambed, etc.)	\$ 209,889
Temporary widening, both sides, including concrete barrier	\$ 205,905
NH Route 9 Roadway Reconstruction (900 LF x 32' wide)	\$ 115,168
Project wide Items (Fill, Access Roads, LRS, Invasives Humus/Seed/Mulch, Field Office, etc)	\$ 137,000
	<b>Sub-Total \$1,409,525</b>
Erosion Control (5% of Sub-Total)	\$ 70,476
Traffic Control (10% of Sub-Total)	\$ 140,952
Misc. Items and Contingency (10% of Sub-Total)	\$ 140,952
	<b>Contract Sub-Total \$1,761,905</b>
Mobilization (8% of Contract Sub-Total)	\$ 140,952
Fuel & Asphalt Adjustments (fixed amount based on Contract Sub-Total)	\$ 20,000
Construction Administration and Inspection (10% of Contract Sub-Total)	\$ 176,191
	<b>Construction Total \$2,099,048</b>

Note that Design Engineering, additional survey, geotechnical investigation, and ROW and/or Easement acquisition costs are not included in the above Construction Estimate. NHDOT Engineering and Contract preparation costs are typically 5% to 15% of the Construction Total, based on the size and complexity of the project. Projects designed by NHDOT Consultants are typically higher.

A hydraulic design was also considered, passing the 50 year storm without submerging the inlet. This would be a 6' high x 8' wide box culvert, embedded 24" below streambed. Cost for this option is estimated at **\$1,243,458**. Funding, delay, and impacts would be similar to, but slightly less, than for the bridge option.

Replacement in-kind was also considered, with an estimated cost of **\$1,006,948**. Delay and impacts would be similar as all of the replacement options involve similar funding and scheduling constraints, excavation depths, and maintenance of traffic issues.

The preferred method of addressing these culverts before they fail is rehabilitation. Rehabilitation with standard size plastic or metal pipe liners would decrease capacity due to a significant loss of cross sectional pipe area. Use of a smoother pipe material such as plastic could offset the decrease in area, but would cause a significant increase in velocity. Concrete invert repair would not be considered due to the extent of heavy rust (over half of the pipe height). Sprayed on mortar lining would not be considered due to the uncertainties in the structural analysis for the arch shaped pipes.

### **Proposed Design**

The proposed design is rehabilitation with cured in place liners. The liner thickness is estimated at 5/8" to 3/4" to provide a fully structural rehabilitation. The inlet ends of the culverts would be shortened by about 12', replacing the mitered ends with a more hydraulically efficient concrete headwall. The outlet ends would be shorted by 6', replacing the miters with a concrete headwall. The liners will conform to and maintain the existing corrugations, but will reduce the overall barrel roughness coefficient and improve capacity slightly. The combined increase in efficiency will prevent any significant increase in headwater elevation.

The proposed condition hydraulic modelling was based on the same methods and parameters as the existing condition, except culvert inverts were raised by 0.1', culvert roughness value was reduced from 0.024 to 0.016, length was shortened to 84' and inlet condition was changed to headwall.

Proposed condition model results are as follows:

Q100 headwater elevation decreased from 1278.98 to 1278.73 (about 4" lower).

Q100 flowrate through the culverts increased from 311 cfs to 328 cfs.

Storage at the Q100 headwater elevation is reduced from 21 ac-ft to 18 ac-ft.

For low flows, there was no significant change in culvert outlet velocities.

Q10 culvert outlet velocities increased from existing (average) of 4.75 ft/s to 4.8 ft/s.

Q50 culvert outlet velocities increased from existing (average) of 7.7 ft/s to 8 ft/s.

Based on the above analysis, no significant effect on upstream or downstream conditions is anticipated.

Access to the inlet will be directly from the maintained grass area along the edge of NH Route 9. A temporary access road will be required at the outlet along the grassed road embankment. No clearing of trees >3" diameter is proposed. Any vegetation that is cut will be allowed to re-establish naturally. [*Env-Wt 307.12 Restoring Temporary Impacts: Site Stabilization*]

A Water Diversion Item will be provided with the construction contract for passing stream flow through the work area. The water diversion will be designed by the Contractor to accommodate a 2 year storm, with the provision that excess flows be allowed through the existing culvert(s). The proposed slipling process can accommodate these requirements. A typical water diversion for this type of project would be a sandbag dam at the inlet and pump(s) to maintain the upstream water elevation at an acceptable level. The pump discharge hose would be routed through one of the existing culverts. In the event of storm predicted to exceed the pump capacity, workers and loose materials would be removed from the culverts and flow would be allowed through or over the dam

and into the existing culverts. [*Env-Wt 307.03 Protection of Water Quality and Env-527.06- Construction Requirements for Public Highway Projects*]

A Cofferdam Item will be provided for construction of the headwalls. This is a Contractor designed system to support the roadway embankment and isolate the headwall foundation area from surface water and groundwater. [*Env-Wt 307.03 Protection of Water Quality and Env-527.06- Construction Requirements for Public Highway Projects*]

All work will be within the existing ROW.

Duration of construction is estimated at 2 months, with no significant impact to traffic, utilities, or other resources.

**The preliminary estimate for the proposed option is as follows:**

Cured in place liners, including cleaning and preparation of the existing pipes, and grouting of voids around the pipes (if needed)	\$ 231,021
Inlet side concrete headwall, including stone and streambed material	\$ 21,420
Outlet side concrete headwall , including stone and streambed material	\$ 22,225
Water Diversion and Cofferdam Items	\$ 25,000
Project wide Items (Access Road, LRS, humus/seed/mulch , field office, etc	\$ 32,988
Erosion Control Items	\$ 16,100
Traffic Control Items	\$ 64,980
Misc. Items and Contingency (approx 5% of Item Total)	\$ 20,787
Fuel Adjustment (fixed amount based on Contract Total)	\$ 2,000
Mobilization (fixed amount, approx 10% of Contract Total)	\$ 50,000

**Contract Total \$ 486,521**

Construction Administration and Inspection (approx 8% of Contract Total) \$ 40,000

**Construction Total \$ 526,521**

The project was presented as a Repair, Rehabilitation, or Replacement of a Tier 3 Legal Crossing, under Env-Wt 904.09 at the project's Natural Resources Coordination Meeting. The proposed design meets all requirements for permitting under Env-Wt 904.09.

Comment from NHDES indicated that it should be permitted as an Alternative Design (904.10), so it is presented as such in this application.















# Wetland Function-Value Evaluation Form

Wetland I.D. wetlands south of the road  
 Latitude \_\_\_\_\_ Longitude \_\_\_\_\_  
 Prepared by: S.large Date 11-25-2019  
 Wetland Impact: \_\_\_\_\_ Area see impact plans  
 Type <sup>temporary</sup> \_\_\_\_\_

Evaluation based on:  
 Office  Field   
 Corps manual wetland delineation completed? Y  N \_\_\_\_\_

Total area of wetland > 15 acres no Human made? no Is wetland part of a wildlife corridor? partially or a "habitat island"? no  
 Adjacent land use transportation, commercial, residential Distance to nearest roadway or other development adjacent  
 Dominant wetland systems present PSS1E and PSS/FO1E 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? headwaters/ upper portion  
 How many tributaries contribute to the wetland? two Wildlife & vegetation diversity/abundance (see attached list)

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge	Y	7, 12, 15,		
 Floodflow Alteration	Y	1, 2, 6, 7, 8*, 9*, 10*, 11, 13, 14*, 16, 17	P	4- its possible there is a high percentage of impervious surface within the watershed, haven't quantified. 18. mixed density of veg
 Fish and Shellfish Habitat	Y	4*, 5, 7, 8, 10, 14*, 15		no records for fish came back for this crossing from NFB or USFWS but it is likely the pond supports aquatic organisms. stream width is highly variable
 Sediment/Toxicant Retention	Y	1, 3, 4, 5, 7, 8, 9, 10, 11, 12*, 13, 14, 15*, 16		
 Nutrient Removal	Y	1, 2*, 3, 4, 5*, 7*, 9, 10, 11, 12		open water pond at inlet of crossing. intermixed vegetation density
 Production Export		1, 2, 4, 7, 8, 10, 11, 12,		
 Sediment/Shoreline Stabilization		4, 9, 12, 13, 15		
 Wildlife Habitat		8, 9, 11, 14, 15, 19, 20, 21,		wetland is degraded by human activity: road infrastructure, commercial and residential development and some of the upland is undeveloped
 Recreation		6, 7, 9		wetland is not used for any registered recreational use
 Educational/Scientific Value				
 Uniqueness/Heritage		7, 12, 13, 17, 18, 27,		
 Visual Quality/Aesthetics		1, 2, 3, 7,		
<b>ES</b> Endangered Species Habitat				<b>none were identified</b>
Other				

Notes: \_\_\_\_\_  
 \* Refer to backup list of numbered considerations.



# Wetland Function-Value Evaluation Form






Wetland I.D. Wetland North of Road  
 Latitude \_\_\_\_\_ Longitude \_\_\_\_\_  
 Prepared by: S.large Date 11-25-2019  
 Wetland Impact: \_\_\_\_\_ Area see impact plans  
 Type temporary

Evaluation based on:  
 Office  Field   
 Corps manual wetland delineation completed? Y  N \_\_\_\_\_

Total area of wetland 11 acres Human made? no Is wetland part of a wildlife corridor? partially or a "habitat island"? no  
 Adjacent land use transportation, commercial, residential Distance to nearest roadway or other development adjacent  
 Dominant wetland systems present PSS1E and PSS/FOIE 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? headwaters/ upper portion  
 How many tributaries contribute to the wetland? two Wildlife & vegetation diversity/abundance (see attached list) \_\_\_\_\_

Function/Value Suitability Y / N Rationality (Reference #)\* Principal Function(s)/Value(s) Comments

 Groundwater Recharge/Discharge		<b>7, 12, 15,</b>		
 Floodflow Alteration	<b>Y</b>	1, 2, 6, 7, 8*, 9*, 10*, 11, 13, 14*, 16, 17, 18	<b>P</b>	4- its possible there is a high percentage of impervious surface within the watershed, haven't quantified. 18. mixed density of veg
 Fish and Shellfish Habitat		<b>4*, 5, 7, 8, 10, 14*, 15</b>		no records for fish came back for this crossing from NHD or USFWS but it is likely the pond supports aquatic organisms. stream width is highly variable
 Sediment/Toxicant Retention	<b>Y</b>	1, 3, 4, 5, 7, 8, 9, 10, 11, 12*, 13, 14, 15*, 16		
 Nutrient Removal	<b>Y</b>	1, 2*, 3, 4, 5*, 7*, 9, 10, 11, 12		<b>open water pond at inlet of crossing. intermixed vegetation density</b>
Production Export		<b>1, 2, 4, 7, 8, 10, 11, 12,</b>		
Sediment/Shoreline Stabilization		<b>4, 9, 12, 13, 15</b>		
Wildlife Habitat		<b>8, 9, 11, 14, 15, 19, 20, 21,</b>		wetland is degraded by human activity: road infrastructure, commercial and residential development and some of the upland is undeveloped
Recreation		<b>6, 7, 9</b>		<b>wetland is not used for any registered recreational use</b>
Educational/Scientific Value				
Uniqueness/Heritage		<b>7, 12, 13, 17, 18, 27,</b>		
Visual Quality/Aesthetics		<b>1, 2, 3, 7,</b>		
<b>ES</b> Endangered Species Habitat				<b>none were identified</b>
Other				

Notes: \_\_\_\_\_  
 \* Refer to backup list of numbered considerations.







**PUBLIC HIGHWAYS**  
**PROJECT-SPECIFIC WORKSHEET**  
**FOR STANDARD APPLICATION**  
 Water Division/Land Resources Management  
 Wetlands Bureau  
Check the Status of your Application



**RSA/Rule:** RSA 482-A/ Env-Wt 522

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

This worksheet summarizes the criteria and requirements for a Standard Permit for “Public Highways”, one of the 18 specific project types in Chapter Env-Wt 500. In addition to the project-specific criteria and requirements on this worksheet, all Standard Dredge and Fill Applications must meet the criteria and requirements listed in the Standard Dredge and Fill Application form (NHDES-W-06-012).

**SECTION 1 - APPLICABILITY AND EXEMPTION (Env-Wt 527.01; Env-Wt 527.06(b))**

This worksheet is for construction and maintenance projects for public highways in jurisdictional areas, but not for:

- Activities relating to stream crossings (which must be undertaken in accordance with Env-Wt 900);
- Public highway projects that impact tidal resources (which must be undertaken in accordance with Env-Wt 600); or
- Bank stabilization projects (which must be undertaken in accordance with Env-Wt 514).

Replacement of dislodged rocks on an existing rip-rap portion of a legally existing permitted road embankment to stabilize the structure may be done without a permit.

**SECTION 2 - APPROVAL CRITERIA FOR PUBLIC HIGHWAY PROJECTS (Env-Wt 527.02)**

An application for public highway project must meet the following approval criteria, subject to the rebuttable presumption in RSA 482-A:3, I-a that for applications proposed, sponsored, or administered by the New Hampshire Department of Transportation (NHDOT), NHDOT has exercised appropriate engineering judgment in the project’s design:

- The project meets the design criteria specified in Env-Wt 527.04;
- The project is consistent with RSA 482-A:1, RSA 483, RSA 483-B, RSA 485-A, and RSA 212-A;
- The purpose of the project is to improve or maintain public safety, consistent with federal and state safety standards;
- The project will not cause displacement of flood storage wetlands or cause diversion of stream flow impacting abutting landowner property; and
- For a project in the 100-year floodplain, the project will not increase flood stages off-site.

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO BOX 95, Concord, NH 03302-0095

[www.des.nh.gov](http://www.des.nh.gov)

**SECTION 3 - APPLICATION REQUIREMENTS FOR PUBLIC HIGHWAY PROJECTS (Env-Wt 527.03)**

Please provide the following information:

- A description of the scope of the project, the size of the impacts to aquatic resources, and the purpose of the project;

The purpose of the project is to maintain and preserve the function of the existing twin culverts.

The project will rehabilitate the twin culverts by sliplining with cured in place liners. The existing mitered pipe ends will be removed and replaced with concrete headwalls.

Summary of Impacts:

Permanent wetland impacts - 0

Permanent Channel Impacts – 0

Permanent Bank Impacts - 99 SF (33 LF)

Temporary Wetland Impacts - 0

Temporary Pond Impacts - 1,107 SF (84 LF)

Temp Channel Impacts – 896 SF (43 LF)

Temp Bank Impacts – 1,301 SF (156 LF)

- An accurate drawing with existing and proposed structure dimensions clearly annotated to:

- Document existing site conditions;
- Detail the precise location of the project and show the impact of the proposed activity on jurisdictional areas;
- Show existing and proposed contours at 2-foot intervals;
- Show existing and proposed structure invert elevations on the plans; and
- 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;

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

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

- An erosion control plan that shows:

- 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
- The outermost limit of all work areas, including temporary phasing work, with perimeter controls.

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#### **SECTION 4 - DESIGN REQUIREMENTS FOR PUBLIC HIGHWAY PROJECTS (Env-Wt 527.04)**

In addition to meeting all applicable criteria established in Env-Wt 300, all projects must:

- Protect significant function wetlands, watercourses, and priority resource area(s);
- Minimize impacts to wetland and riparian function;
- Maintain wetland and stream hydrology and function to the remaining aquatic resources;
- Use on-site measures to compensate for any loss of flood storage where the project proposes:
  - Filling or placement of structures in a 100-year floodplain; or
  - Greater than 0.5 acre-feet of fill volume or a road crossing that affects floodplain conveyance;
- 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
- 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.

#### **SECTION 5 - CONSTRUCTION REQUIREMENTS FOR PUBLIC HIGHWAY PROJECTS (Env-Wt 527.05)**

In addition to complying with all applicable conditions in Env-Wt 307, the following construction requirements apply to public highway projects:

- The permit shall be contingent on review and approval by NHDES 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
- 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.

#### **SECTION 6 - PUBLIC HIGHWAY PROJECTS PROJECT CLASSIFICATION (Env-Wt 527.07)**

Public highway projects shall be classified based on the dimensions established in Env-Wt 407, subject to the adjustments and project exceptions established in Env-Wt 407.



# 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)*

Meeting Minutes.....	2
Stoddard, #42708.....	2
Pittsfield, #2019-M316-3 .....	5
Allentown-Pembroke, #40362 .....	6
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Salem-Manchester, #10418F (IM-0931(205)) .....	10
Statewide, #41915 (X-A004(799)).....	11

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

**NOTES ON CONFERENCE:****Meeting Minutes**

Finalized the February 19, 2020 meeting minutes.

**Stoddard, #42708**

Chris Carucci, NHDOT Bureau of Highway Design, provided a detailed explanation of the proposed project including purpose and need, environmental impacts and alternatives analysis. The existing crossing was originally constructed in 1963 and is comprised of twin 44" high by 72" wide by 92' long (102' long with mitered ends) arch shaped corrugated metal pipes carrying an unnamed stream under NH Route 9 approximately 1000' south of the intersection of NH Route 123 in the Town of Stoddard. The crossing is a Tier 3 stream crossing with a drainage area of 1.13 square miles. The Streamstats Q100 is 296 cubic feet per second (cfs). The pipes maintain a backwater condition and are not perched. The crossing is located on a sharp curve in the roadway, with a pavement cross slope of 8%. Fill height is 10' on the inlet side and 13' on the outlet side.

The purpose of this project is to address safety concerns at the crossing. The need for this is demonstrated by the poor condition of the pipes, which have severe corrosion and perforations along the lower sides. Though the original shape of both culverts is still intact, the backfill material of the roadway is visible and is falling through the perforations in the pipes into stream. The size, type, age, and condition of the pipes are very similar to another culvert under NH 107 in Northwood that failed in August of 2019, further demonstrating the risk associated with the poor condition of the pipes. NH Route 9 is a Tier 2 roadway and is one of the primary high capacity routes connecting Concord to Keene. The 2018 traffic volume was 7,675 vehicles per day with a significant portion being trucks and regional commercial traffic.

NHDOT Maintenance District 4 reports this crossing has no history of flooding, but there is beaver activity. A phone conversation with the adjacent owner (Hayes Auto) confirms no history of flooding of Route 9 or the owner's property, which is about 5' lower than the Route 9 pavement. There is no bypass mechanism other than overtopping of Route 9. There is a large permanently ponded area immediately upstream of the crossing inlet, with a significant amount of storage. Farther upstream, the stream is a Type E, with a shallow meandering channel and wide connected floodplain, which also contributes to the available storage. Downstream of the crossing, there is a short section of incised channel, about 16' wide x 75' long. The stream returns to Type E morphology downstream of the incised section. The next downstream crossing is 10' span x 5' high bridge carrying the brook under NH 123 (Bridge #161/050). The NH Aquatic Restoration Mapper tool indicates this crossing is undersized and flooding occurs in the vicinity annually. The FEMA regulated floodplain begins just downstream of NH 123 but there are no mapped floodplains or special flood hazard areas at the crossing.

A detailed stream assessment was not performed for this crossing due to the presence of a large ponded area at the inlet of the culvert, which could not be classified as a stream. Regional curves predict a bankfull width of 13.1' for this crossing based on drainage area of 1.13 square miles. Using the guidance of 2.2 x bankfull width for Type E streams, the NHDES Stream Crossing Rules compliant structure span would be 28.8'.

USFWS has been consulted and confirmed that the project area is in the range of the northern long-eared bat. Given that there is no clearing of suitable habitat proposed, it is assumed that this project will result in no effect to NLEB. The New Hampshire Natural Heritage Bureau (NHB19-3631) also reviewed the project area and concluded that there are no known records of protected species or their habitats in the vicinity of the project area.

An inventory of invasive plant species will occur during the Spring of 2020 and will be appropriately managed during construction according to the Department publication "Best Management Practices for the Control of Invasive and Noxious Plant Species."

The Department is in process of submitting the project to the Division of Historical Resources for review and will follow necessary steps to satisfy applicable requirements of Section 106 of the National Historic Preservation Act.

Assuming that no increase in impervious surface area will be proposed, the project is not anticipated to result in a negative impact on water quality in the project area and therefore no permanent stormwater treatment would be required. A NPDES Discharge General Permit may be required if dewatering within the stream is required.

There are no prime wetlands in the vicinity of the project area and the project is not located within the protected corridor of any designated rivers. The project is not located near any waterbodies protected by the NH Shoreland Water Quality Protection Act.

C. Carucci provided a summary of the alternatives analysis to address the needs at this culvert, which include replacement with a fully compliant span bridge, replacement with a hydraulically sufficient box culvert, replacement in-kind and rehabilitation of the existing pipes, which is the Department's preferred alternative.

A fully compliant design would be a 30' span bridge, cost estimated at \$2,099,694. Funding and design time would require a delay in the start of construction of 3 – 5 years. Construction could be expected to take at least 1 season, with significant temporary widening on both sides of NH Route 9 to accommodate 2 lanes of traffic and phased construction. Approximately 900 LF of NH 9 pavement would be impacted by the traffic shifts for phased construction. Removal of the upstream storage would cause a significant increase in downstream flows and 100-year flood elevations. The chronic flooding location downstream would be made worse by the increased flows.

A hydraulic design was also considered, passing the 50-year storm without submerging the inlet. This would be a 6' high x 8' wide box culvert, embedded 24" below streambed. Cost for this option is estimated at \$1,243,458. Flooding, delay, and construction/traffic impacts would be similar to, but slightly less, than for the bridge option discussed above.

Replacement in-kind was also considered, with an estimated cost of \$1,006,948. Delay and impacts would be similar to the replacement options and would involve similar funding and scheduling constraints, excavation depths, and maintenance of traffic issues.

The preferred method of addressing these culverts before they fail is rehabilitation. The proposed design is rehabilitation with cured in place liners. The liner thickness is estimated at 5/8" to 3/4". The inlet ends of the culverts would be shortened by about 12', replacing the mitered ends with a more hydraulically efficient concrete headwall. The outlet ends would be shorted by 6', replacing the miters with a concrete headwall.

The liners will conform to and maintain the existing corrugations, but will reduce the overall barrel roughness coefficient and improve capacity slightly. The combined increase in efficiency will prevent any significant increase in headwater elevation. No effect on FEMA maps or downstream conditions is anticipated. Due to the very flat (or negative) culvert slopes, outlet velocity increases will be less than 0.5 ft/s. Total crossing length will be shortened from about 102 LF to 84 LF. Cost for this option is estimated



at \$526,521. Duration of construction is estimated at 6 weeks, with no significant impact to traffic, utilities, or other resources.

Additional options for rehabilitation of the existing pipes using different materials were investigated but not selected as viable options. Access to the inlet will be directly from the edge of NH Route 9. A temporary access road will be required at the outlet. No clearing of trees >3" diameter is proposed. Any vegetation that is cut will be allowed to re-establish naturally. Water diversion will be through the one of the twin culverts while work is being performed on the other. All work will be within the existing ROW.

Anticipated total earth disturbance for the preferred rehabilitation alternative is 0.58 acres, including 11,300 square feet (SF) at the inlet and 13,750 SF at the outlet. Permanent wetland impacts associated with replacing the mitered ends of the pipes with headwalls would include 113 SF to the pond, 115 SF (34 LF) to the bank and 63 SF (13 LF) to the channel. Temporary wetland impacts associated with installation of BMPs, access and water diversion would include 1,020 SF to the pond, 1,680 SF to the bank and 1,753 SF to the channel.

C. Carucci concluded his presentation by requesting concurrence that the proposed work is consistent with Env-Wt 904.09(b) and 904.09(c) and that no mitigation be required due the fact that the square footage of impact to jurisdictional wetlands is under the 10,000 sf threshold and that the permanent impacts to stream channel and banks is associated with shortening both pipes from 102' to 84' and therefore restoring a total of 36' of stream channel.

Karl Benedict, NHDES Wetlands Bureau, stated that the Department's preferred alternative of rehabilitating the existing pipes with the cured-in-placed liner (slip-lining) is appropriate at this site. The work should be permitted as an Alternative Design according to the NHDES Stream Crossing Rules and a discussion of the potential for increased downstream flooding associated with the bridge and box culvert alternatives should be included in the Alternative Design Technical Report. He asked how much the elevation of the outlet will change by and if it would cause a perch. C. Carucci reiterated that the liner will raise the elevation of the outlet invert by approximately less than 1" and that this will not create a perch as the crossing is currently backwatered year round and will maintain this condition post construction. K. Benedict also inquired as to how the cofferdam for the clean water bypass system would be installed and whether the large temporary impact areas shown on the plans included area for this installation. C. Carucci confirmed that all BMPs and dewatering areas were included in the plans and impact area estimates. K. Benedict requested that the Alternative Design Technical Report include a detailed alternatives analysis and a discussion confirming that the outlet would remain in a backwatered state to ensure that there is no concern for aquatic organism passage.

Lori Sommer, NHDES Wetlands Bureau, requested clarification about the 0.58 acres of total disturbance and C. Carucci specified that this number reflects the entire project area earth disturbance for NPDES CGP calculations and that the actual areas of jurisdictional wetland impacts are much smaller, as detailed above, but that additional efforts will be made to reduce both wetland and overall impacts as the project is refined during the final design phase.

Sarah Large, NHDOT Bureau of Environment, asked if any riprap will be installed in the location that the pipes are being shortened. C. Carucci confirmed that some stone would be used for protection of the headwall foundations. Carol Henderson, NHFG, stated her support of the proposed alternative, especially given that there will be no perch at the outlet and that the cured-in-place liner will conform to the existing corrugations of the pipe. Amy Lamb, NH Natural Heritage Bureau, asked for clarification about how the capacity of the pipes will be increased despite the reduction in diameter. C. Carucci explained that for long culverts with low slopes, flow capacity is controlled by the roughness of the pipe instead of the inlet

opening area. Even though the liners will conform to the corrugations of the pipe, the material will still be smoother than the original metal and will therefore increase flow capacity.

Peter Steckler of The Nature Conservancy stated that the project area is not in a terrestrial crossing hotspot and therefore has no objections to the rehabilitation alternative. Representatives from the EPA the USACOE also confirmed that they had no additional concerns or objections to the project. L. Sommer stated that since the permanent impacts are associated with stream restoration due removing the mitered ends of the pipes that no mitigation would be necessary for the work as proposed.

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

### **Pittsfield, #2019-M316-3**

Russ presented a project to replace a failed culvert on NH Route 107 in Pittsfield and to raise a section of the road. The proposal would replace the existing 15-inch corrugated metal pipe with an 18-inch reinforced concrete pipe. To accommodate the larger pipe, approximately 300 feet of a section of the road containing the new culvert would be raised one foot and then taper back to the existing road profile.

Adjacent to the project area on the east side of the road is the BECP Solid Waste District Facility, a transfer station and recycling center for the Towns of Barnstead, Chichester, Epsom, & Pittsfield. The solid waste facility maintains a fire pond on its property. The failed culvert acts as an overflow structure for the fire pond, allowing excess water to flow under westward under Route 107 to a large wetland. Because of its failed condition, seasonally high water tables cause the fire pond to overflow into Route 107, resulting in standing water in the road, icing over in winter, and potholes. The topography of the project area also indicates water in the fire pond can flow easterly through a different culvert on the BCEP property and drain in a northeasterly direction.

Russ also noted that the Wetlands Permit Planning Tool (WPPT) identified a Priority Resource Area (PRA) labeled "peatlands" in the large wetland on the west side of Route 107. He expressed concern regarding this designation because peatlands is not a type of jurisdictional area included in the definition of a PRA. According to Natural Community Systems of NH, 2ed, peatlands is a general term pertaining to 11 different natural communities comprised of bogs, fens, and peat swamp systems. Bogs are listed in the NHDES wetland rules as a type of PRA, but fens and peat swamp systems are not. Russ also noted that when Bureau of Environment personnel delineated the wetlands within the project area, they did not observe any bogs, and their soil testing did not identify any peat. It was agreed there will need to be follow-up discussions on this issue.

Anticipated wetland impacts were described as follows:

On the west side of Route 107, there will be 23 square feet of temporary and permanent impacts (PSS/EM1E) in a narrow band south of the culvert location, 254 square feet of temporary impacts (PSS/EM1E) at the culvert replacement site, and 238 square feet of temporary and permanent impacts (PSS/EM1E) in a narrow band north of the culvert location.

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 (NH H&B) 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.

Karl Benedict (NHDES) concurs with VHB's assumption that a geomorphic assessment is not required. Karl requested more information to understand Impact Area A. VHB clarified the plans were developed using the standard legend and Impact Area A is a permanent impact due to berm and slope improvements for the guardrail adjacent to the structure. VHB will provide a legend on subsequent presentations for clarity.

Due to technical difficulties, Lori Sommer (NHDES) was unable to offer comments. Pete suggested that VHB would coordinate with Lori following the NRAM. (*April 20<sup>th</sup> coordination with Lori summarized below*).

Carol Henderson (NH F&G) had no questions.

Amy Lamb (NHHHB) had no questions.

Rick Kristoff (USACE) had no questions. He indicated that EFH is not required for this project. (Note: Following the NRAM, Marc Laurin and Rebecca Martin confirmed that the Lamprey River is considered EFH and requested that VHB complete an EFH worksheet.)

Beth Alafat (EPA) had no questions.

Jean Brochi (EPA) had no questions.

Jamie Sikora (FHWA) had no questions.

Pete Steckler (Nature Conservancy) indicated this location has been identified as an important wildlife corridor by the TNC's Connect the Coast project. Pete asked about the proposed water diversion method, and suggested that if a water diversion pipe is needed, that it might be left in place to serve as a wildlife tunnel. Julie indicated the project will require cofferdams to remove the existing culvert and install the proposed culvert and that a pump around diversion via temporary pipe is anticipated. However, this diversion system will likely be installed above the roadway level and not buried, so it was not anticipated to serve as a permanent structure. Additionally, there is minimal headroom to install an adjacent permanent structure within the project limits. Pete S. suggested installing a tunnel south of the crossing based on the aerial. As Julie navigated to this approximate location, Pete W. recognized this location is outside the project limits and may not be practical to install.

Jason Tremblay and David Scott represented the Bureau of Bridge Design and had no questions.

VHB will evaluate wildlife access details and discuss with Bridge Design to determine if a structure can be included. VHB will also follow up with Lori Sommer regarding any additional NHDES concerns.

*April 20, 2020 Telephone Conference with Lori Sommer, Pete Walker, and Julie Whitmore*

Pete, Julie, and Lori teleconferenced Monday, April 20<sup>th</sup> to discuss mitigation. Pete indicated VHB's assumption is that the riprap aprons are self-mitigating to stabilize and protect the proposed culvert. Lori expressed concern over fill in the pond and requested additional information to clarify. Julie described the project intention – replace the existing structure with a buried invert precast box culvert that matches existing inverts. Riprap was sized according to standard practice based on hydraulic analysis. Additional impacts to Area A are due to slope improvements to stabilize the guardrail berm and embankment. Lori asked if the dam owner is known and if coordination is anticipated. Lori also asked whether a Grant of Right might be needed due to the placement of fill in the pond. Pete and Julie noted the dam is owned by

the Town of Deerfield and that although coordination is anticipated to conduct work, water surface elevations are not anticipated to be dropped for construction. While Right-of-Way impacts are anticipated, the project does not propose fill for the purpose of making land. Rather, the placement of fill is intended to restore an eroded slope, and would not affect property boundaries. Therefore, a grant of right is not anticipated. Temporary steel sheet piling is assumed to be installed for construction and temporary impacts H and G indicate the anticipated locations upstream and downstream. After discussion, Lori agreed with VHB in the assumption the riprap is self-mitigating and expressed no other concerns.

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

### **Salem-Manchester, #10418F (IM-0931(205))**

Marc Laurin went through a PowerPoint presentation on the status of the South Road Mitigation Site #15 in Londonderry. This 24.4 acre property was developed as a mitigation creation/preservation area as part of a mitigation compensation package for the I-93 widening wetland impacts. The required monitoring of the mitigation area has been completed and the site has been determined to have achieved success with its intended design and the functions it sought to create. The Town of Londonderry Conservation Commission has requested transfer of the property from DOT to the Town for conservation purposes. The Department is processing this as a Surplus Land request.

Phil Miles summarized the steps that the Department would undergo to dispose of the site as a surplus property. The site would be appraised and the Town of Londonderry would purchase it at its fair market value. Marge Badois stated that the Londonderry Conservation Commission was not under that impression and had assumed that this would be handled as a transfer from DOT to the Town. Phil Miles explained that in order to just transfer the property, rather than a fair market value purchase, the Conservation Commission would need to send another letter to the Bureau of ROW administrator Steve LaBonte, with their reasons asking specifically for this consideration. Jamie Sikora stated that FHWA would need to approve this request in order to protect the public interest regarding the use of public funds.

A general discussion on the current deed restrictions and who would/could hold a conservation easement ensued. Marc stated that DOT has placed a Deed Restriction on the site. As requested, subsequent to the meeting Marc provided a copy to Marge and Susan Malouin of the Conservation Commission. He also provided a copy to Carol Henderson, as well as the mitigation site's final mitigation monitoring report. The Conservation Commission also mentioned extending a trail to the property from Kendall Pond and through their other conservation land on South Street.

Lori Sommer stated that she would want to be involved in determining the most appropriate method of placing easements on the property. A stewardship management plan would need to be developed by the Town, including how the trail would be used. Lori expressed concerns that the site is designated as mitigation and appropriate buffers to the wetland resources would need to be retained. Carol also expressed concerns with maintaining the turtle habitat/protection measures of the site. Rich Kristoff will also want to check the Corps' permit language to assure that their appropriate guidelines are being followed. Pete Steckler mentioned that DNCR (formerly DRED) is a steward on Londonderry's Kendall Pond conservation land, so they may be a potential resource to get involved in the management or stewardship of the site.

DOT's Bureau of Right-of-Way and Marc will continue to coordinate on the details of the property transfer. DOT will discuss with Lori and the Conservation Commission further details of the transfer process and easement requirements.

*This project in this context of mitigation land transfer has not been previously discussed at the Monthly Natural Resource Agency Coordination Meeting.*

**Statewide, #41915 (X-A004(799))**

The NH Department of Transportation (NHDOT) Statewide #41915 Project involves stabilization efforts at seven locations in Grafton County to address scour issues and prevent additional scouring or undermining of the existing crossings, and, where feasible, increase aquatic organism passage and stabilize bank and streambed areas through the crossing. The seven locations include: NH Route 118 over Bucks Brook in Dorchester; River Road over the South Branch Baker River in Dorchester; Millbrook Road over Mill Brook located in Landaff; NH Route 10 over Grant Brook located in Lyme; NH Route 25 over Halls Brook in Rumney; NH Route 175 over Mill Brook in Thornton; and Interstate 93 over Eastman Brook in Woodstock. Kimberly Peace, Sean James, and Joanne Theriault from Hoyle Tanner presented.

J. Theriault gave an overview of the project goals and then reviewed each bridge individually. In each location, scour stabilization measures will be installed to protect the existing infrastructure. Work will not be conducted on the bridge, wingwalls or abutments. Plans provided show approximate impact areas and locations of construction access routes. Survey/topo shown on plans has been created using LIDAR along with limited ground survey in some locations. In all locations, unless stated otherwise, the intent is to excavate the streambed to the required depth, install riprap to match existing elevations and key into the upstream and downstream profiles. Impacts to Northern long-eared bat summer habitat will need to be addressed at all locations, and Essential Fish Habitat (EFH) analysis for Atlantic salmon will need to be addressed at all but one location (Lyme 075/106). A Categorical Exclusion for the project is being developed that will address these issues, along with some potential Section 6(f) concerns in Dorchester and Section 106 and 4(f) concerns in Lyme. Each location will undergo state environmental permitting separately, and all locations are Tier 3 stream crossings with watersheds greater than or equal to 640 acres per Env-Wt 904.05.

NH Route 118 over Bucks Brook in Dorchester

Proposed installation of Class V stone on outlet side only for approximately 1,300 sq ft of streambed and bank impact. S. James noted that the streambed will be excavated approximately 3' deep so that the stone will be installed at existing grade, over a geotextile layer, with no change in streambed profile.

L. Sommer: Is the culvert perched? S. James: No.

R. Crickard: The plans for the next meeting should indicate more precise locations of riprap installation. Hoyle, Tanner agreed.

L. Sommer: The linear feet of channel impact would be used to calculate mitigation, and are you proposing to cover the bank areas with native or original streambed material?

K. Benedict: DES requests covering riprap to fill the voids, using existing stone where possible, and presenting a good alternatives analysis. The result should be a stream simulation that matches upstream and downstream conditions where possible, but if the hydrology of the stream would result in loose materials washing downstream, maybe just fill the voids. The end result should be a stabilized base to sit below the streambed simulation materials.

S. James: In this location, there is high enough velocity that the native material would wash downstream. Hoyle, Tanner agrees to look into filling the riprap voids.



K. Benedict: Look at the wetlands rules Env-Wt 514 to address the requirements for bank stabilization, specifically how high up the banks the riprap should be. Can some portion of the bank be left vegetated? How will impacts be minimized? The permit application will need to include analysis of stream velocities and flood elevations.

C. Henderson: What about the NHNHB Datacheck results?

J. Theriault: There are no species identified in this location, and per prior discussion with K. Benedict, plans with impacts identified will be sent to NHF&G for their review prior to permit submittal.

#### River Road over the South Branch Baker River in Dorchester

Proposed installation of Class IX stone on outlet and inlet sides for approximately 6,550 sq ft of streambed and bank impact. S. James noted that the streambed will be excavated approximately 6' deep so that the stone will be installed at existing grade, over a geotextile layer, with no change in streambed profile. The northwest bank will contain some armoring to provide stability where it currently erodes.

K Benedict: Similar concerns as prior crossing. Additionally, has there been thought of deflecting the energy using design instead of bank armoring?

S. James: Those options can be examined.

K. Benedict: Will the stream be crossed with equipment to work on the opposite bank, or will there be a second access on the west side?

S. James: The site has limited access options, so work will occur on the opposite (west) side from the access road while the stream is diverted on that side. The diversion and stream flow will then reverse, and work will occur on the east side closer to the access road.

#### Millbrook Road over Mill Brook located in Landaff

Proposed installation of Class VII stone on outlet side only for approximately 1,250 sq ft of streambed and bank impact along with repairs to the stone masonry wall on the northeast side. S. James noted that the streambed will be excavated approximately 4' deep so that the stone will be installed at existing grade, over a geotextile layer, with no change in streambed profile.

K. Benedict: Same concerns as prior crossings.

#### NH Route 10 over Grant Brook located in Lyme

Proposed installation of Class V stone on the outlet and inlet sides for approximately 3,500 sq ft of streambed and bank impact. S. James noted that the streambed will be excavated approximately 3' deep so that the stone will be installed at existing grade, over a geotextile layer, with no change in streambed profile. The stream has aggraded in the southeast side through the crossing.

A. O'Sullivan: Will the aggraded material be removed?

S. James: It isn't planned to be removed since the stream through the crossing is in a steady-state, the aggradation has been stabilized, and the focus is on protection of the infrastructure.

K. Benedict: Current and energy deflection could also be examined in this location to direct energy back to the center of the channel.

C. Henderson: NHF&G would like to examine this more closely as it relates to fish passage.

#### NH Route 25 over Halls Brook in Rumney

Proposed installation of stone on the outlet for approximately 4,500 sq ft of streambed and bank impact along with grout filled nylon bags at the wingwalls where they have been undermined. S. James noted that the depth and type of stone is still being investigated and will be based on final survey data to address the scour hole and perched outlet.

C. Henderson: How will the perched outlet be addressed?

S. James: Stone will be added to fill the scour hole and regrade the streambed so that it will key into the downstream elevation. In this location the streambed will not be excavated unless it is determined during final survey.

K. Benedict: Consider using a grade control structure.

S. James: The issue with grade control is that we encounter resistance during permitting due to reduction in aquatic organism passage. If DES could provide suggestions that could satisfy NHF&G we would review them for potential use in this location.

K. Benedict agreed and said the new crossing should be an improvement for fish passage.

J. Theriault: This location has wood turtle habitat nearby but just outside of the proposed work areas. Once impacts have been determined, coordination with NHF&G will occur to determine avoidance and minimization measures.

#### NH Route 175 over Mill Brook in Thornton

Proposed installation of Class VII stone on the outlet and inlet sides for approximately 5,650 sq ft of streambed and bank impact. This location will have two access routes. S. James noted that the streambed will be excavated approximately 4' deep so that the stone will be installed at existing grade, over a geotextile layer, with no change in streambed profile.

P. Steckler: What is the pond upstream and north of the site? Is it connected to the stream crossing?

S. James: We are aware of this water feature but are not sure whether it is natural or manmade. The water feature / pond is outside of the proposed work areas, but Hoyle, Tanner will review the mapping of the area to determine any potential connection between the pond and the river.

#### NH Route 175 over the Pemigewasset River in Woodstock

Proposed installation of A Jacks or an armor matrix on the outlet side within the streambed and Class IX stone to be placed on the banks for approximately 7,100 sq ft of streambed and bank impact. There is steel sheeting in the river on the downstream side that will be removed in order to install the armor matrix.

K. Benedict: DES will want to review the specs of the armor matrix.

S. Large: DOT has proposed and permitted this product and understands DES will require cross-section profiles as part of the permit for review. The impacts will be shown as permanent for the wetland permits. Adding native material or infill may not be feasible due to the high water velocity here. Hydraulic analysis will be provided with the application.

A. Lamb: Due to the way this project was drawn on the DataCheck tool, it just missed a "hit" for Northern Long-Eared Bat Hibernaculum. This record is just over 0.6 mile from impact areas.

Project Summary Discussion

S. Large: Crossing designs will need to be reviewed for consistency with the wetland rules regarding bank stabilization.

K. Benedict: In general, each permit application will need to address avoidance and minimization, alternative designs, stream simulations and materials, and plans will need to show cross-sections, erosion controls and water diversion. It would be helpful for the next meeting to have the limits of existing riprap shown. For the crossings that are perched, presentation should include longitudinal profiles. Consider adding a low flow channel through the center of the stream simulation to allow for continual hydraulic connectivity.

P. Steckler agreed with the need to design low flow channels into these projects.

K. Benedict: Information should also be provided to quantify linear feet of impacts between stream bed and banks, and DOT should consider and plan for timing of work to minimize impacts to fish populations.

S. Large: A meeting should be held between K. Benedict and DOT before the next NR Meeting.

S. James: Requested clarification on the amount of detail for water diversion, since contractor means and methods allow the to modify what we propose. K. Benedict stated that DES can condition the permit for the contractor to provide a final dewatering plan with DES given 2 weeks to review it before start of construction, and that his review is to ensure the impacts from dewatering are contained in the permit and that the dewatering plan is feasible.

There were no other concerns stated by the meeting attendees.

It was decided that a second NR Meeting should be held before submitting permit applications.

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



Streamstats  
Boundary  
707 AC

LIDAR  
Boundary  
721.4 AC

Twin Culvert  
Location

42708 Stoddard  
EXHIBIT 1  
Watershed Boundary  
Scale 1" = 1200 FT





# AVOIDANCE AND MINIMIZATION CHECKLIST

## Water Division/Land Resources Management Wetlands Bureau



Check the Status of your Application

**RSA/Rule:** RSA 482-A/ Env-Wt 311.07(d)

This checklist can be used in lieu of the written narrative required by Env-Wt 311.07(a) to demonstrate compliance with requirements for Avoidance and Minimization, pursuant to RSA 482-A:1 and Env-Wt 311.07(d).

A/M BMPs stands for *Wetlands Best Management Practice Techniques for Avoidance and Minimization* dated 2019, published by the New England Interstate Water Pollution Control Commission (Env-Wt 102.18).

Practicable means “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes” (Env-Wt 103.62).

SECTION 1 – CONTACT/LOCATION INFORMATION		
APPLICANT LAST NAME, FIRST NAME, M.I.: NH Dept. of Transportation		
PROJECT STREET ADDRESS: NH Route 9, 1000' south of NH123	PROJECT TOWN: Stoddard, NH	
TAX MAP/LOT NUMBER: N/A NHDOT ROW		
SECTION 2 - PRIMARY PURPOSE OF THE PROJECT		
Env-Wt 311.07(b)(1)	Indicate whether the primary purpose of the project is to construct a water-access structure or requires access through wetlands to reach a buildable lot or the buildable portion thereof.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If you answered “no” to this question, describe the purpose of the “non-access” project type you have proposed. The purpose of this project is to rehabilitate aging twin corrugated metal arch culverts and valuable state asset in order to support long term and safe use of the State's public transportation network.		

Avoidance and minimization requirements have not been met if you answer “No” to any technique/ construction timing in Sections 3 to 8, without providing justification that the requirements were not practicable and the proposed project incorporates the results of the functional assessment included as part of the functional assessment report or checklist.

SECTION 3 - AVOIDANCE PROJECT DESIGN TECHNIQUES		
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 Priority Resource Area (PRA), or both, whether any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, 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.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Env-Wt 311.07(b)(3)	Alternative design techniques could not be used to avoid impacts to jurisdictional areas or their functions and values on the subject property or on another property reasonably available to the applicant.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(1)	The results of the functional assessment required by Env-Wt 311.03(b)(10) were used to select the location of the proposed project having the least impact to wetland functions.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(2)	The proposed project has been designed to have the least impact to wetland functions.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(3)	Where impact to wetland functions is unavoidable, the proposed impacts are limited to the wetlands with the least valuable functions on the site while avoiding and minimizing impacts to the wetlands with the highest and most valuable functions.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 313.01(c) Env-Wt 313.03(b)(1)	No practicable alternative would reduce adverse impact on the area and environments and the project will not cause random or unnecessary destruction of wetlands.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 313.01(c)(3)	The project would not cause or contribute to the significant degradation of waters of the state or the loss of any PRAs.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 313.03(b)(2)	The project avoids impacts to marshes that are documented to provide sources of nutrients for finfish, crustacea, shellfish, and wildlife of significant value.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(b)(3) Env-Wt 904.07(c)(8)	The project maintains hydrologic connectivity between adjacent wetlands or stream systems.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 311.01(b) Env-Wt 313.03(b)(4)	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.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 313.03(b)(5)	The project avoids and minimizes impacts that eliminate, depreciate, or obstruct public commerce, navigation, or recreation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	Buildings and/or access are positioned away from high function wetlands or surface waters to avoid impact.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	The project clusters structures to avoid wetland impacts.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	The placement of roads and utility corridors avoids wetlands and their associated streams.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

[www.des.nh.gov](http://www.des.nh.gov)

A/M BMPs	Proposed utilities are suspended from bridges to avoid trenching through wetlands.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
A/M BMPs	The width of access roads or driveways is reduced to avoid and minimize impacts. Pullouts are incorporated in the design as needed.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
A/M BMPs	Retaining walls are proposed to avoid placing fill in wetlands. The retaining walls would not block hydrology or wildlife corridors.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
A/M BMPs	The project proposes bridges or spans instead of roads/driveways/trails with culverts.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
A/M BMPs	Natural topography is incorporated in the design to avoid grading.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

This checklist is not complete without a description of the specific avoidance project design techniques employed for this project:

The proposed rehabilitation design is the alternative with the least impact to wetland functions. The Supplemental Narrative provides detailed information on the options considered. Replacement of the twin culverts with a bridge or span structure was found to be not practicable due to site and funding constraints. The subject twin culverts are an existing legal crossing and the impacts proposed are at the existing inlet and outlet locations which are fixed, requiring impacts at the locations proposed.

Functions and values of existing wetlands, PRA's, and other resources were considered in selecting the location and extent of access roads that are proposed. Access road location, width, and associated tree clearing are the minimum necessary to accomplish the work in a safe and productive manner. The impact of temporary access roads will be further minimized by avoiding disturbance of wetland plant root systems through the use of temporary mats or stone over geotextile where equipment must cross wetlands.

The proposed rehabilitation will maintain hydrologic connectivity by ensuring there is no perch at the culvert inlet or outlet, using a liner that will conform to the existing corrugations to minimize culvert velocity, and shortening the culverts and constructing headwalls to avoid permanent fill in wetlands.

**SECTION 4 - MINIMIZATION DESIGN TECHNIQUES**

Env-Wt 311.10	The project was designed to minimize impacts to higher-quality wetlands.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Env-Wt 311.01(b) Env-Wt 313.03(b)	The project was designed to minimize impacts to habitat, reproduction areas, fishery, vernal pools, or protected species or habitat.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
A/M BMPs	The project was designed to minimize the number of crossings and their size.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
A/M BMPs	Wetlands and streams are proposed to be crossed at their narrowest point.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A



Env-Wt 500 Env-Wt 600 Env-Wt 900	Wetland and stream crossings include features that accommodate aquatic organism passage and wildlife passage.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Env-Wt 313.01(c)(1) Env-Wt 313.03(b)(6)	The project was designed to avoid and minimize impacts to floodplain wetlands that provide flood storage.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Env-Wt 313.01(c)(1) Env-Wt 313.03(b)(7)	Impacts to natural riverine forested wetlands systems and scrub-shrub marsh complexes of high ecologic integrity are avoided and minimized.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Env-Wt 313.01(c)(1) Env-Wt 313.03(b)(8)	Impacts to wetlands that would be detrimental to drinking water supply and groundwater aquifer levels are avoided and minimized.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 313.01(c)(1) Env-Wt 313.03(b)(9)	Adverse impacts to stream channels and their ability to handle stormwater runoff are avoided and minimized.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 900	Stream crossings are sized to address hydraulic capacity and geomorphic compatibility.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
A/M BMPs	Disturbed areas are used for crossings wherever practicable, including existing roadways, paths, or trails upgraded with new culverts or bridges.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
RSA 482-A:11, II	Project is designed to minimize impacts to abutting properties.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.13	Setbacks from property lines required by Env-Wt 307.13 are maintained.	<input type="checkbox"/> Yes <input type="checkbox"/> No

This checklist is not complete without a description of the specific minimization design techniques employed for this project:

The proposed rehabilitation design is the alternative with the least impact to wetland functions. The subject twin culverts are an existing legal crossing and inlet and outlet locations are fixed, requiring impacts at the locations where they are proposed. Impacts to abutters are minimized by keeping all work will be within the existing State ROW. The majority of impacts will be temporary. The proposed rehabilitation avoids impacts to floodplains, flood storage areas, and downstream structures.

Functions and values of existing wetlands, PRA's, and other resources were considered in selecting the location and extent of access roads that are proposed. Access road location, width, and associated tree clearing are the minimum necessary to accomplish the work in a safe and productive manner. The impact of temporary access roads will be further minimized by avoiding disturbance of wetland plant root systems through the use of temporary mats or stone over geotextile where equipment must cross wetlands.

The proposed rehabilitation will maintain hydrologic connectivity by ensuring there is no perch at the culvert inlet or outlet, using a liner with a corrugated interior to minimize culvert velocity, and shortening the culvert and constructing a headwall to avoid permanent fill in wetlands.

**SECTION 5 - RESOURCE-SPECIFIC DESIGN TECHNIQUES**

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

[www.des.nh.gov](http://www.des.nh.gov)

Env-Wt 500	The project is designed to address resource-specific avoidance and minimization criteria for non-tidal jurisdictional areas.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Env-Wt 600	The project is designed to address resource-specific avoidance and minimization criteria for coastal lands and tidal waters/wetlands.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Env-Wt 307.08 Env-Wt 700	The project is designed to address resource-specific avoidance and minimization criteria for designated prime wetlands.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

This checklist is not complete without a description of the resource-specific design techniques employed for this project:

The project is designed to avoid or minimize impacts to:

The 100 year floodplain downstream of the crossing and abutting public and private property upstream of the crossing, by selecting a rehabilitation treatment that closely matches existing flood storage and hydraulic capacity.

Aquatic organisms, by selecting a rehabilitation treatment that closely matches the existing (passable) condition, and by matching the existing streambed to new culvert inverts with simulated streambed material such that there is no perch at the inlet or outlet.

The Northern Long Eared Bat by minimizing clearing of trees

**SECTION 6 - PROJECT-SPECIFIC DESIGN TECHNIQUES**

Env-Wt 500	The project is designed to use techniques outlined in Env-Wt 500 for projects in non-tidal jurisdictional areas.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Env-Wt 600	The project is designed to use techniques outlined in Env-Wt 600 for projects in coastal lands and tidal waters/wetlands.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Env-Wt 900	The project is designed to use stream crossing techniques outlined in Env-Wt 900 for stream crossing projects.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

This checklist is not complete without a description of the project-specific design techniques employed for this project:  
The project was designed in accordance with Env-Wt 527- and Env-Wt 514. The project design includes stream crossing techniques outlined in Env-Wt 900 to the maximum extent practicable, such as covering new stone armor at the culvert inlet and outlet with excavated streambed material, requiring grading at the culvert inlet and outlet to ensure there is no perch, and using liners that closely conform to the existing corrugated texture to minimize culvert velocities.

SECTION 7 - CONSTRUCTION TECHNIQUES		
Env-Wt 311.05	Limits of jurisdictional areas, construction activities and proposed water quality protection measures are clearly marked on plans.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.03(b)	Best management practices (BMPs) for erosion control and construction stormwater management will be used and maintained during construction.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.03(c)	Techniques to protect water quality will be used.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.03(g)	Techniques to avoid fuel, oil, and hydraulic fluid spills in and around wetlands jurisdiction will be used.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.05(e)	The Best Management Practices For the Control of Invasive and Noxious Plant Species” (dated 2018, published by NHDOT) will be followed to avoid introducing nuisance or invasive species to the work site from soil or seed stock.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.03(b) Env-Wt 307.10 Env-Wt 307.15	Construction staging and stockpiling of materials will be kept out of wetlands with adequate containment measures.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.04	Techniques will be used to protect fisheries, bird migratory areas, fish, amphibian, and shellfish spawning or nursery areas, breeding areas, and high quality waters.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.05	Equipment brought from other sites will be cleaned away from wetlands so that invasive plants and exotic aquatic species of wildlife are not introduced into the work site.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.06	Techniques will be used to protect rare, threatened, and endangered species and habitat.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.07	The project will be conducted in compliance with the Shoreland Water Quality Protection Act.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Env-Wt 307.08	Water quality and environmental minimization measures will be in place to protect designated prime wetlands.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Env-Wt 307.10	Techniques will be used to meet standard dredge conditions outlined in Env-Wt 307.10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.11	Techniques will be used to meet standard fill conditions outlined in Env-Wt 307.11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.12	Work site will be restored in accordance with Env-Wt 307.12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Env-Wt 307.15	Impacts from use of heavy machinery will be minimized.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

This checklist is not complete without a description of the specific construction techniques employed for this project:  
 The project will be constructed in accordance with the NHDOT Standard specifications for Road and Bridge Construction, 2016 Edition, and amendments in effect at the time of Advertising. The project specifications incorporate the following by reference:

The Project Wetland Plans, Erosion Control Plan, and Erosion Control Strategies sheet

The approved Project Stormwater Pollution Prevention Plan

The NHDES wetland permit for the Project, including all general and project specific conditions

NHDOT manual Best Management Practices for Roadside Invasive Plants

NHDES Alteration of Terrain Env-Wq 1500 requirements applicable to construction practices

New Hampshire Stormwater Manual Vol. 3 – Erosion Control and Sediment Controls During Construction (December 2008).

**SECTION 8 - CONSTRUCTION TIMING**

Env-Wt 307.04	The project will be conducted outside spawning or breeding season to reduce impacts to aquatic resources.	<input type="checkbox"/> Yes <input type="checkbox"/> No N/A
Env-Wt 307.10	Timing restrictions described in Env-Wt 307.10 will be adhered to.	<input type="checkbox"/> Yes <input type="checkbox"/> No N/A

These criteria do not relieve the applicant from the obligation to obtain other local, state or federal permits, and/or consult with other agencies as may be required (including US Environmental Protection Agency, US Army Corps of Engineers, NH Department of Transportation, NH Division of Historical Resources, NHDES Alteration of Terrain Bureau, etc.)

This checklist is not complete without a description of the specific construction timing employed for this project:  
 There are no spawning or breeding time of year restrictions applicable to the project.  
 The project is scheduled for the typical summer low flow period.

**NH Department of Transportation  
Bureau of Highway Design  
Project, #42708 Stoddard  
Env-Wt 904.10 Alternative Design  
TECHNICAL REPORT  
Prepared by: C. Carucci, PE**

**Env-Wt 904.10(a) - If the applicant can demonstrate that installing the structure specified in the applicable rule is not practicable, as that term is defined in Env-Wt 103, the applicant may propose an alternative design in accordance with this section.**

Please explain why the structure specified in the applicable rule (*a compliant structure*) is not practicable. (Env-Wt 103.62) defines practicable as *available and capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes.*)

This project was initiated and is funded under NHDOT's Federal Culvert Replacement/Rehabilitation & Drainage Repair (CRDR) Program. The Program purpose is to address major culvert and drainage needs statewide that are not being addressed through current or future Capital Improvement or other programmatic projects. The Program receives \$2,000,000 in total funding annually, which includes construction, engineering, and ROW costs. Projects are selected and scheduled based primarily on the condition of the culvert (risk of failure), and Road Tier, traffic volume, depth of fill, and detour length (potential impact of failure). The Program funding is fully committed for at least the next three years. This culvert is one of the highest statewide priority locations out of nearly 50 known locations eligible for the Program. Failure to address the structural deficiency of this culvert risks deformation of the culvert which would make rehabilitation impossible and/or collapse of the culvert which could cause serious impacts to public/private infrastructure and the travelling public. Alternatives that significantly exceed the Program budget are not practicable since allocating multiple years of Program funding to a single culvert would put the State at risk for failures elsewhere.

In addition to the cost and scheduling concerns, the larger alternative structures would not utilize the upstream storage which would cause a significant increase in downstream flows and increase the risk of flooding and damage to the next downstream crossing. The larger alternatives would also have significantly larger temporary impacts due to extensive temporary widening necessary to maintain two way traffic on NH Route 9.

**Env-Wt 904.10(c)(1) Explain how the proposed alternative meets the criteria for approval specified as applicable:**

- a. Detailed financial comparison of the costs of a structure that complies with all applicable design requirements, the proposed structure, and a structure that requires fewer waivers than the proposed structure, with a range of costs estimated for each;

Based on the calculated 28.8' bankfull width, a fully compliant design would be a 30' span bridge. The estimated construction cost for this option is \$2,099,048.

A hydraulic design was also considered, which would pass the 50 year storm without submerging the inlet. This would be a 6' high x 8' wide box culvert, embedded 24" below streambed. The estimated construction cost for this option is \$1,243,458.

The estimated construction cost for the proposed rehabilitation is \$526,521.

See the Supplemental Narrative for detailed cost information. The typical range of costs for the preliminary alternative estimates presented are from 10% under to 30% over the amount cited. The typical range of costs for the preferred alternative is 5% under to 20% over the amount cited.

- b. A detailed description of the physical limitations of the site; and  
The physical limitations for this site include the depth of fill over the culvert, critical roadway infrastructure over the culvert, traffic volumes, the large ponded wetland upstream, and adjacent private development.

See the Supplemental Narrative for detailed information about the site and associated resources and constraints.

- c. A hydraulic analysis to show the proposed stream crossing can accommodate the applicable design storm that the crossing, together with the associated roadway and roadway embankment, can safely accommodate overtopping flows;  
For this project, the design flow is 424 cfs, based on the SCS Method for a 100 year 24 hour storm. The existing culvert accommodates the design flow with approximately 6.2' of headwater depth (EL 1278.98), which is approximately 3.5' below the lowest edge of NH Route 9 (EL 1282.5). There is no bypass mechanism other than overtopping of NH Route 9. NHDOT Highway Maintenance District 4 has indicated that floodwater has never overtopped NH Route 9 and there are no reports of flooding associated with this culvert. The property owner adjacent to the inlet (Hayes Auto Repair) indicated that his property has not experienced any flooding or damage associated with the twin culverts. The approximate elevation of the developed portion of the Hayes Auto property is 1278.5. The proposed design will accommodate the design flow with approximately the same headwater depth and flowrate as currently exists.

See the Supplemental Narrative for detailed information about hydraulic modelling and associated model results.

**Env-Wt 904.10(c)(2)a – The proposed alternative design must meet the general design criteria established in Env-Wt 904.01:**

See the Supplemental Narrative for additional information related to the responses below.

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;  
The proposed design has no features that would be a barrier to sediment transport. The existing culvert has been in service for about 57 years, with no evidence of obstructing sediment transport. Flows will continue to be about the same from existing to proposed.
  - 2) Not restrict high flows and maintain existing low flows;  
The proposed liners will maintain existing high flow and low flow hydraulic capacities and flow depths.

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

The proposed liner will not obstruct the movement of aquatic life indigenous to the waterbody. The area immediately adjacent to the twin culverts inlet and outlet will be graded to match the liner invert such that there is no perch. The proposed cured in place liners will closely conform to the existing corrugated metal pipes, maintaining a corrugated texture. Velocities within the culvert will increase slightly as a result of the smoother liner, but not enough to inhibit aquatic organism passage. Potential for passage of aquatic life will remain the same post construction. The design has taken into consideration ways to not make aquatic organism passage substantially worse by not creating a perch at the inlet or outlet and by selecting a liner with a corrugated texture rather than a smooth liner.

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

The existing twin culverts can accommodate the 100 year flow of 424 cfs. The rehabilitated culverts will accommodate the same flow with no significant change to the 100 year flood elevations upstream or downstream. The upstream ponded area and adjacent floodplain also has approximately 21 acre-feet of storage capacity at the design 100 year flood elevation.

- 5) Maintain or enhance geomorphic compatibility by:

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

The existing mitered inlet ends will be replaced with a concrete headwall which is more hydraulically efficient and easier for sediment, wood, and debris to pass as well as making maintenance easier.

- b. Preserving the natural alignment of the stream channel;

The proposed design will not alter the existing culvert alignment. The existing culvert is aligned well with the upstream floodplain. The culvert is well aligned with the outlet channel within the project limits. Prior to any development in this area the stream was a sinuous meandering stream through a broad floodplain. However due to development the stream was previously impacted and redirected through the present day culvert. Due to the site and funding constraints, rehabilitating the existing structure is the proposed scope of work and restoring the stream back to its sinuous state is not feasible with this project. This project is not making the alignment worse.

- 6) Preserve watercourse connectivity where it currently exists;

The proposed design will not alter connectivity. The cured in place liners will closely conform to the existing culvert resulting in a change in invert elevations of less than one inch. The areas immediately adjacent to the inlet and outlet will be graded such that there is no perch.

- 7) Restore watercourse connectivity where:

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

Connectivity of stream flows and the hydrologic connection is maintained by the existing twin culverts and will be maintained by the proposed rehabilitation. It is not practicable to restore vegetated banks, buffers, or floodplain inside of the existing culverts.



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

The proposed rehabilitation will not alter existing connectivity.

- 8) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and  
The proposed rehabilitation will have no effect on upstream hydraulics or sediment transport through the culvert. Outlet velocities will increase slightly as a result of the smoother liner, but not enough to cause instability in the downstream channel. No changes to the downstream channel are proposed.

- 9) Not cause water quality degradation.

The project will have no effect on water quality. No new pavement or changes to drainage patterns is being proposed.

- (b) For stream crossing 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

N/A – This is not a tidal crossing

- 2) Be of sufficient size to not restrict bi-directional tidal flow over the natural tide range above, below, and through the crossing.

N/A – This is not a tidal crossing

**Env-Wt 904.10(c)(2)b - The proposed alternative design meets the applicable design criteria established in Env-Wt 904.07 for Tier 2, Tier 3, and Tier 4 stream crossings to the *maximum extent practicable*, as specified below.**

**Env-Wt 904.07 Design Criteria for Tier 2, Tier 3, and Tier 4 Stream Crossings**

- (a) Unless otherwise specified, all design criteria in this section shall apply to new and replacement Tier 2 crossings, new and replacement Tier 3 crossings, as well as new and replacement Tier 4 tidal crossings that do not meet the requirements of Env-Wt 904.07.

The proposed rehabilitation (by sliplining) meets all of the requirements for permitting under 904.09, but the project was discussed as an Alternative Design at the project's Natural Resource Meeting and is therefore presented as such in this application.

- (b) Tier 2 and tier 3 stream crossings shall be designed in accordance with the NH Stream Crossing Guidelines.

As this is not a new or replacement crossing, there is little to no opportunity to modify the crossing to better match the NH Stream Crossing Guidelines.

- (c) Tier 2, tier 3, and tier 4 stream crossings shall be designed:

- 1) To meet the general design considerations specific in En-Wt 904.01;

The proposed design meets the requirements of 904.01.

- 2) Of sufficient size to accommodate the greater of:
  - a. The 100-year 24-hour design storm;
  - b. Flows sufficient to:
    1. Prevent an increase in flooding on upstream and downstream properties; and
    2. Not affect flows and sediment transport characteristics in a way that would adversely affect channel stability; or
  - c. Applicable federal, state, or local requirements;

The project was designed to accommodate the 100 year 24 hour design storm, using the SCS Method (Hydrocadd). The predicted incoming 100 year flow is 424 cfs vs Streamstats Q100 prediction of 296 cfs, The design flow is greater than the NHDOT requirement of a 50 year storm design (322 cfs) for this type of crossing. The proposed design will accommodate the same flow without increasing 100 year flood elevations upstream or downstream. The existing culvert has performed well for about 57 years, with no evidence of obstructing sediment transport or causing channel instability. The proposed design will not significantly alter sediment transport capacity or flow conditions.

- 3) With bed forms and streambed characteristics necessary to cause water depths and velocities within the crossing structure at a variety of flows to be comparable to those found in the natural channel upstream and downstream of the stream crossing.

It is not practicable to cause water depths and velocities within the crossing structure at a variety of flows to be comparable to those found in the natural channel upstream and downstream of the stream crossing since the crossing is a closed bottom structure and will remain closed bottom as well as the site and funding constraints that prevent replacement and support rehabilitation. The selection of the liner material provides the best available balance between capacity and velocity.

- 4) To provide a vegetated bank on both sides of the watercourse or to provide a wildlife shelf of suitable substrate and access to allow for wildlife passage.

It is not practicable to provide a vegetated bank on both sides of the watercourse or to provide a wildlife shelf inside the existing culverts due to site and funding constraints.

- 5) To preserve the natural alignment and gradient of the stream channel, so as to accommodate natural flow regimes and the functioning of the natural floodplain.

It is not practicable to alter the alignment or gradient of the existing culvert to restore the natural alignment of the stream that it once was prior to the original culvert installation. The proposed rehabilitation maintains the existing alignment and gradient of the crossing.

- 6) To simulate a natural stream channel.

It is not practicable to simulate a natural stream channel inside the existing culverts. The existing twin arch pipes are closed bottom corrugated metal pipes. The addition of natural bed material inside the culverts would reduce capacity and increase the risk of flooding the adjacent upstream abutting property.

7) So as not to alter sediment transport competence.

The proposed design will not have a significant effect on sediment transport competence. Existing culvert velocities are sufficient to prevent aggregation of sediment inside the culverts. Proposed liner velocities will be slightly higher than the existing velocities.

8) To avoid and minimize impacts to the stream in accordance with Env-Wt 313.03

The project was designed to avoid and minimize wetland impacts to the maximum extent practicable. Additional details are provided in the Avoidance and Minimization checklist included elsewhere in the application.

(d) In addition to meeting the criteria specified in (c), above, new, repaired, rehabilitated, or replaced tier 4 stream crossing shall be designed:

N/A – Crossing is not a Tier 4

- 1) Based on a hydraulic analysis that accounts for daily fluctuating tides, bidirectional flows, tidal inundation, and coastal storm surge;
- 2) To prevent creating a restriction on tidal flows; and
- 3) To account for tidal channel morphology and potential impacts due to sea level rise.



## New Hampshire Natural Heritage Bureau

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**To:** Melilotus Dube  
7 Hazen Drive  
Concord, NH 03301

**Date:** 11/8/2019

**From:** NH Natural Heritage Bureau

**Re:** Review by NH Natural Heritage Bureau of request dated 11/8/2019

NHB File ID: NHB19-3631

Applicant: Melilotus Dube

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

**Project Description:** NHDOT Stoddard 42708. The proposed project involves rehabilitation of twin 46"x72" CMP culverts carrying an unnamed stream under NH Route 9. The work may include installing a cured in place liner in the existing pipes and installing an additional pipe to accommodate high flow events and provide wildlife transport under NH Route 9.

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

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

This report is valid through 11/7/2020.





MAP OF PROJECT BOUNDARIES FOR NHB FILE ID: NHB19-3631







## 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:

May 15, 2020

Consultation Code: 05E1NE00-2020-SLI-0424

Event Code: 05E1NE00-2020-E-07834

Project Name: Stoddard 42708

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

To Whom It May Concern:

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

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

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



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

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

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

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](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

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## Project Summary

Consultation Code: 05E1NE00-2020-SLI-0424

Event Code: 05E1NE00-2020-E-07834

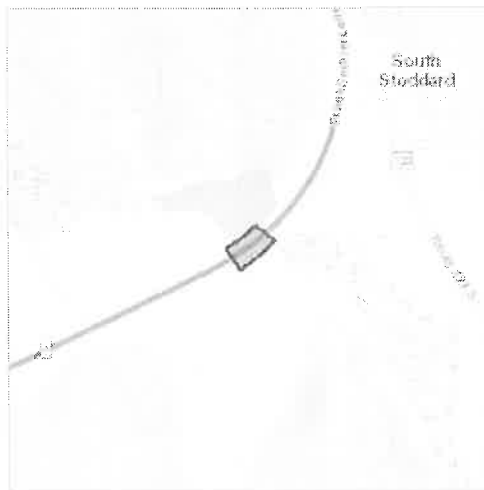
Project Name: Stoddard 42708

Project Type: TRANSPORTATION

Project Description: The proposed project would involve the rehabilitation of twin 46"x72" corrugated metal pipe culverts carrying an unnamed Tier 3 stream under NH Route 9 approximately 1000' south of the intersection of NH Route 123S in the Town of Stoddard. The work may include installing a cured in place liner in the existing culverts and installing a third culvert to accommodate high flow events and provide wildlife passage under NH Route 9. The work area would extend approximately 20' upstream, 50' downstream and 100' along NH Route 9 both north and south of the crossing.

### Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/43.03913126373783N72.07489063584177W>



Counties: Cheshire, NH

## Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, 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.

- 
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 <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

## Critical habitats

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

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## 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  
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In Reply Refer To:  
Consultation Code: 05E1NE00-2020-I-0424  
Event Code: 05E1NE00-2020-E-07908  
Project Name: Stoddard 42708

May 19, 2020

Subject: Concurrence verification letter for the 'Stoddard 42708' project under the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request to verify that the **Stoddard 42708** (Proposed Action) may rely on the concurrence provided in the February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action is within the scope and adheres to the criteria of the PBO, including the adoption of applicable avoidance and minimization measures, and may affect, but is not likely to adversely affect (NLAA) the endangered Indiana bat (*Myotis sodalis*) and/or the threatened Northern long-eared bat (*Myotis septentrionalis*).

The Service has 14 calendar days to notify the lead Federal action agency or designated non-federal representative if we determine that the Proposed Action does not meet the criteria for a NLAA determination under the PBO. If we do not notify the lead Federal action agency or designated non-federal representative within that timeframe, you may proceed with the Proposed Action under the terms of the NLAA concurrence provided in the PBO. This verification period allows Service Field Offices to apply local knowledge to implementation of the PBO, as we may identify a small subset of actions having impacts that were unanticipated. In such instances, Service Field Offices may request additional information that is necessary to verify inclusion of the proposed action under the PBO.

**For Proposed Actions that include bridge/structure removal, replacement, and/or maintenance activities:** If your initial bridge/structure assessments failed to detect Indiana bats, but you later detect bats during construction, please submit the Post Assessment Discovery of Bats at Bridge/Structure Form (User Guide Appendix E) to this Service Office. In these instances, potential incidental take of Indiana bats may be exempted provided that the take is reported to the Service.

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or Northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required. If the Proposed Action may affect any other federally-listed or proposed species, and/or any designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please contact this Service Office.

## Project Description

The following project name and description was collected in IPaC as part of the endangered species review process.

### Name

Stoddard 42708

### Description

The proposed project would involve the rehabilitation of twin 46"x72" corrugated metal pipe culverts carrying an unnamed Tier 3 stream under NH Route 9 approximately 1000' south of the intersection of NH Route 123S in the Town of Stoddard. The work may include installing a cured in place liner in the existing culverts and installing a third culvert to accommodate high flow events and provide wildlife passage under NH Route 9. The work area would extend approximately 20' upstream, 50' downstream and 100' along NH Route 9 both north and south of the crossing.



## Determination Key Result

Based on your answers provided, this project(s) may affect, but is not likely to adversely affect the endangered Indiana bat and/or the threatened Northern long-eared bat, therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the concurrence provided in the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

## Qualification Interview

1. Is the project within the range of the Indiana bat<sup>[1]</sup>?

[1] See [Indiana bat species profile](#)

**Automatically answered**

No

2. Is the project within the range of the Northern long-eared bat<sup>[1]</sup>?

[1] See [Northern long-eared bat species profile](#)

**Automatically answered**

Yes

3. Which Federal Agency is the lead for the action?

A) *Federal Highway Administration (FHWA)*

4. Are *all* project activities limited to non-construction<sup>[1]</sup> activities only? (examples of non-construction activities include: bridge/abandoned structure assessments, surveys, planning and technical studies, property inspections, and property sales)

[1] Construction refers to activities involving ground disturbance, percussive noise, and/or lighting.

No

5. Does the project include *any* activities that are **greater than** 300 feet from existing road/rail surfaces<sup>[1]</sup>?

[1] Road surface is defined as the actively used [e.g. motorized vehicles] driving surface and shoulders [may be pavement, gravel, etc.] and rail surface is defined as the edge of the actively used rail ballast.

No

6. Does the project include *any* activities **within** 0.5 miles of a known Indiana bat and/or NLEB hibernaculum<sup>[1]</sup>?

[1] For the purpose of this consultation, a hibernaculum is a site, most often a cave or mine, where bats hibernate during the winter (see suitable habitat), but could also include bridges and structures if bats are found to be hibernating there during the winter.

*No*

7. Is the project located **within** a karst area?

*No*

8. Is there *any* suitable<sup>[1]</sup> summer habitat for Indiana Bat or NLEB **within** the project action area<sup>[2]</sup>? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

[2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the [national consultation FAQs](#).

*Yes*

9. Will the project remove *any* suitable summer habitat<sup>[1]</sup> and/or remove/trim any existing trees **within** suitable summer habitat?

[1] See the Service's [summer survey guidance](#) for our current definitions of suitable habitat.

*No*

10. Does the project include activities **within documented NLEB habitat**<sup>[1][2]</sup>?

[1] Documented roosting or foraging habitat – for the purposes of this consultation, we are considering documented habitat as that where Indiana bats and/or NLEB have actually been captured and tracked using (1) radio telemetry to roosts; (2) radio telemetry biangulation/triangulation to estimate foraging areas; or (3) foraging areas with repeated use documented using acoustics. Documented roosting habitat is also considered as suitable summer habitat within 0.25 miles of documented roosts.)

[2] For the purposes of this key, we are considering documented corridors as that where Indiana bats and/or NLEB have actually been captured and tracked to using (1) radio telemetry; or (2) treed corridors located directly between documented roosting and foraging habitat.

*No*

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11. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?  
*No*
12. Does the project include slash pile burning?  
*No*
13. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?  
*No*
14. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)  
*No*
15. Will the project involve the use of **temporary** lighting *during* the active season?  
*No*
16. Will the project install new or replace existing **permanent** lighting?  
*No*
17. Does the project include percussives or other activities (**not including tree removal/trimming or bridge/structure work**) that will increase noise levels above existing traffic/background levels?  
*Yes*
18. Will the activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the active season<sup>[1]</sup>?  
  
[1] Coordinate with the local Service Field Office for appropriate dates.  
*Yes*
19. Will *any* activities that use percussives (**not including tree removal/trimming or bridge/structure work**) and/or increase noise levels above existing traffic/background levels be conducted *during* the inactive season<sup>[1]</sup>?  
  
[1] Coordinate with the local Service Field Office for appropriate dates.  
*No*

20. Are *all* project activities that are **not associated with** habitat removal, tree removal/trimming, bridge and/or structure activities, temporary or permanent lighting, or use of percussives, limited to actions that DO NOT cause any additional stressors to the bat species?

Examples: lining roadways, unlighted signage , rail road crossing signals, signal lighting, and minor road repair such as asphalt fill of potholes, etc.

Yes

21. Will the project raise the road profile **above the tree canopy**?

No

22. Are the project activities that use percussives (not including tree removal/trimming or bridge/structure work) consistent with a Not Likely to Adversely Affect determination in this key?

**Automatically answered**

*Yes, because the activities are within 300 feet of the existing road/rail surface, greater than 0.5 miles from a hibernacula, and conducted during the active season within undocumented habitat.*

23. Are the project activities that are not associated with habitat removal, tree removal/trimming, bridge and/or structure activities, temporary or permanent lighting, or use of percussives consistent with a No Effect determination in this key?

**Automatically answered**

*Yes, other project activities are limited to actions that DO NOT cause any additional stressors to the bat species as described in the BA/BO*

24. **General AMM 1**

Will the project ensure *all* operators, employees, and contractors working in areas of known or presumed bat habitat are aware of *all* FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable Avoidance and Minimization Measures?

Yes

## Project Questionnaire

1. Have you made a No Effect determination for *all* other species indicated on the FWS IPaC generated species list?

N/A

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2. Have you made a May Affect determination for *any* other species on the FWS IPaC generated species list?

N/A

## **Avoidance And Minimization Measures (AMMs)**

This determination key result includes the commitment to implement the following Avoidance and Minimization Measures (AMMs):

### **GENERAL AMM 1**

Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs.

## **Determination Key Description: FHWA, FRA, FTA Programmatic Consultation For Transportation Projects Affecting NLEB Or Indiana Bat**

This key was last updated in IPaC on December 02, 2019. Keys are subject to periodic revision.

This decision key is intended for projects/activities funded or authorized by the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and/or Federal Transit Administration (FTA), which may require consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act (ESA) for the endangered **Indiana bat** (*Myotis sodalis*) and the threatened **Northern long-eared bat** (NLEB) (*Myotis septentrionalis*).

This decision key should only be used to verify project applicability with the Service's February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects. The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.



**Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding**

**Appendix B Certification – Activities with Minimal Potential to Cause Effects**

**Date Reviewed:** 5/5/2020  
(Desktop or Field Review Date)

**Project Name:** Stoddard

**State Number:** 42708

**FHWA Number:** Not Yet Available

**Environmental Contact:** Meli Dube  
**Email Address:** Melilotus.Dube@dot.nh.gov

**DOT Project Manager:** Kirk Mudgett

**Project Description:** The proposed project will address safety concerns associated with structural deficiencies of twin 46"x72" elliptical corrugated metal pipes carrying an unnamed stream under NH Route 9 at MM30.25 in the Town of Stoddard. The existing pipes, which were installed in 1963, are approximately 98' long including mitered ends and connect a large impounded area from the northern side of NH Route 9 to an unnamed stream to the south of NH Route 9. Both pipes have retained their original shape but have significant corrosion on the sides and bottom which has destabilized the structural integrity of the crossing and is considered a safety risk to the traveling public due to anticipated imminent failure of the culverts. The purpose of the project is to rehabilitate or replace the crossing such that the culverts are structurally sound and do not pose a safety risk.

Please select the applicable activity/activities:

<b>Highway and Roadway Improvements</b>	
<input type="checkbox"/>	1. Modernization and general highway maintenance <b><u>that may require additional highway right-of-way or easement</u></b> , including: Choose an item. Choose an item.
<input type="checkbox"/>	2. Installation of rumble strips or rumble stripes
<input type="checkbox"/>	3. Installation or replacement of pole-mounted signs
<input type="checkbox"/>	4. Guardrail replacement, provided any extension does not connect to a bridge older than 50 years old (unless it does already), and there is no change in access associated with the extension
<b>Bridge and Culvert Improvements</b>	
<input type="checkbox"/>	5. Culvert replacement (excluding stone box culverts), when the culvert is less than 60" in diameter and excavation for replacement is limited to previously disturbed areas
<input type="checkbox"/>	6. Bridge deck preservation and replacement, as long as no character defining features are impacted
<input checked="" type="checkbox"/>	7. Non-historic bridge and culvert maintenance, renovation, or total replacement, <b><u>that may require minor additional right-of-way or easement</u></b> , including: a. replacement or maintenance of non-historic bridges Choose an item.
<input type="checkbox"/>	8. Historic bridge maintenance activities within the limits of existing right-of-way, including: Choose an item. Choose an item.
<input type="checkbox"/>	9. Stream and/or slope stabilization and restoration activities (including removal of debris or sediment obstructing the natural waterway, or any non-invasive action to restore natural conditions)
<b>Bicycle and Pedestrian Improvements</b>	
<input type="checkbox"/>	10. Construction of pedestrian walkways, sidewalks, sidewalk tip-downs, small passenger shelters, and alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons
<input type="checkbox"/>	11. Installation of bicycle racks
<input type="checkbox"/>	12. Recreational trail construction



**Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding**

**Appendix B Certification – Activities with Minimal Potential to Cause Effects**

<input type="checkbox"/>	13. Recreational trail maintenance when done on existing alignment
<input type="checkbox"/>	14. Construction of bicycle lanes and shared use paths and facilities within the existing right-of-way
<b>Railroad Improvements</b>	
<input type="checkbox"/>	15. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, <b>provided no historic railroad features are impacted</b> , including, but not limited to: Choose an item. Choose an item.
<input type="checkbox"/>	16. In-kind replacement of modern railroad features (i.e. those features that are less than 50 years old)
<input type="checkbox"/>	17. Modernization/modification of railroad/roadway crossings provided that all work is undertaken within the limits of the roadway structure (edge of roadway fill to edge of roadway fill) and no associated character defining features are impacted
<b>Other Improvements</b>	
<input type="checkbox"/>	18. Installation of Intelligent Transportation Systems
<input type="checkbox"/>	19. Acquisition or renewal of scenic, conservation, habitat, or other land preservation easements where no construction will occur
<input type="checkbox"/>	20. Rehabilitation or replacement of existing storm drains.
<input type="checkbox"/>	21. Maintenance of stormwater treatment features and related infrastructure

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


<p><u>The project is applicable under Appendix B of the Programmatic Agreement due to the inclusion of the existing crossing in the Program Comment for Post 1945 Bridges and Culverts, which dictates that the culverts are considered non-historic. In-house review of archaeology determined no sensitivity in the area.</u></p>
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*Please submit this Certification Form along with the Transportation RPR, including photographs, USGS maps, design plans and as-built plans, if available, for review. Note: The RPR can be waived for in-house projects, please consult Cultural Resources Program Staff.*

Coordination Efforts:

Has an RPR been submitted to NHDOT for this project?	Choose an item.	NHDHR R&C # assigned?	Click here to enter text.
Please identify public outreach effort contacts; method of outreach and date:	<u>Town Officials in the Town of Stoddard, including the Historical Society, were contacted on March 31<sup>st</sup>, 2020 via letter notifying them of the project and requesting any information that they may have relevant to the proposed work. No response has been received to date.</u>		

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

<input checked="" type="checkbox"/>	<b>No Potential to Cause Effects</b>	<input type="checkbox"/>	<b>No Historic Properties Affected</b>
This finding serves as the Section 106 Memorandum of Effect. No further coordination is necessary.			
<input type="checkbox"/>	This project does <i>not</i> comply with Appendix B. Review will continue under Stipulation VII of the Programmatic Agreement. Please contact NHDOT Cultural Resources Staff to determine next steps.		
NHDOT comments:			
 _____ NHDOT Cultural Resources Staff		5/6/2020 _____ Date	

## Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

### Appendix B Certification – Activities with Minimal Potential to Cause Effects

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

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

Every project shall be coordinated with, and reviewed by the NHDOT-BOE Cultural Resources Program in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the New Hampshire State Historic Preservation Office, the Army Corps of Engineers, New England District, the Advisory Council on Historic Preservation, and the New Hampshire Department of Transportation Regarding the Federal Aid Highway Program in New Hampshire*. In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

If any portion of the project is not entirely limited to any one or a combination of the activities specified in Appendix B (with, or without the inclusion of any activities listed in Appendix A), please continue discussions with NHDOT Cultural Resources staff.

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

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

# New Hampshire Recordation of Bridges that Apply to the Program Comment for Common Post-1945 Concrete & Steel Bridges

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**Project Name:** Stoddard

**State Number:** 42708      **FHWA Number:** Not yet available

**Form Completed by:** Jill Edelmann      **Date:** 5/1/2020  
Email if not NHDOT staff: Jillian.edelmann@dot.nh.gov



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<b>Town</b>	Stoddard	<b>NHDOT Bridge No.</b>	Culvert
<b>Year Built (rebuilt)</b>	1963	<b>Owner</b>	NHDOT
<b>Road carrying</b>	NH Route 9	<b>Over feature</b>	Unnamed stream
<b>Bridge/culvert Type</b>	Twin elliptical corrugated metal pipes	<b>Number of Spans</b>	1
<b>Length</b>	98'	<b>Width</b>	Elliptical pipes 46" high by 72" wide
<b>Abutment style</b>	Vegetated embankment	<b>Pier style</b>	n/a
<b>Rail Type</b>	w-beam	<b>Rail installation date:</b>	unknown
<b>Designer/Engineer (if known)</b>		<b>Bridge Plaques or Engravings?</b>	none
<b>Reviewed by:</b>		<b>Date Reviewed:</b>	5/4/2020
	NHDOT Cultural Resources Staff		

**Approved**       **Not Approved**

RPR Number: \_\_\_\_\_      Reviewed under PA: \_\_\_\_\_

**Justification:**

Please refer to the *NHDOT Guidance on Using the Program Comment for Common Post-1945 Concrete and Steel Bridges*, located on the NHDOT Bureau of Environment Website, for information on using this form:

<http://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/cultural.htm>

Information on specific bridges can be found on the NHDOT Bureau of Bridge Design **Bridge Summary** Spreadsheet:

<http://www.nh.gov/dot/org/projectdevelopment/bridgedesign/documents.htm>.

(Additional photographs may be attached here if needed).



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## Appendix B

### Regional General Permits (GPs) Required Information and Corps Secondary Impacts Checklist

In order for the Corps of Engineers to properly evaluate your application, applicants must submit the following information along with the New Hampshire DES Wetlands Bureau application or permit notification forms. Some projects may require more information. For a more comprehensive checklist, go to [www.nae.usace.army.mil/regulatory](http://www.nae.usace.army.mil/regulatory), “Forms/Publications” and then “Application and Plan Guideline Checklist.” Check with the Corps at (978) 318-8832 for project-specific requirements. For your convenience, this Appendix B is also attached to the State of New Hampshire DES Wetlands Bureau application and Permit by Notification forms.

#### All Projects:

- Corps application form (ENG Form 4345) as appropriate.
- Photographs of wetland/waterway to be impacted.
- Purpose of the project.
- Legible, reproducible black and white (no color) plans no larger than 11”x17” with bar scale. Provide locus map and plan views of the entire property.
- Typical cross-section views of all wetland and waterway fill areas and wetland replication areas.
- In navigable waters, show mean low water (MLW) and mean high water (MHW) elevations. Show the high tide line (HTL) elevations when fill is involved. In other waters, show ordinary high water (OHW) elevation.
- On each plan, show the following for the project:
  - Vertical datum and the NAVD 1988 equivalent with the vertical units as U.S. feet. Don’t use local datum. In coastal waters this may be mean higher high water (MHHW), mean high water (MHW), mean low water (MLW), mean lower low water (MLLW) or other tidal datum with the vertical units as U.S. feet. MLLW and MHHW are preferred. Provide the correction factor detailing how the vertical datum (e.g., MLLW) was derived using the latest National Tidal Datum Epoch for that area, typically 1983-2001.
  - Horizontal state plane coordinates in U.S. survey feet based on the Traverse Mercator Grid system for the State of New Hampshire (Zone 2800) NAD 83.
  - Show project limits with existing and proposed conditions.
  - Limits of any Federal Navigation Project in the vicinity of the project area and horizontal State Plane Coordinates in U.S. survey feet for the limits of the proposed work closest to the Federal Navigation Project;
  - Volume, type, and source of fill material to be discharged into waters and wetlands, including the area(s) (in square feet or acres) of fill in wetlands, below the ordinary high water in inland waters and below the high tide line in coastal waters.
- Delineation of all waterways and wetlands on the project site,;
- Use Federal delineation methods and include Corps wetland delineation data sheets. See GC 2 and [www.nero.noaa.gov/hcd](http://www.nero.noaa.gov/hcd) for eelgrass survey guidance.
- GP 3, Moorings, contains eelgrass survey requirements for the placement of moorings.
- For activities involving discharges of dredged or fill material into waters of the U.S., include a statement describing how impacts to waters of the U.S. are to be avoided and minimized, and either a statement describing how impacts to waters of the U.S. are to be compensated for (or a conceptual or detailed mitigation plan) or a statement explaining why compensatory mitigation should not be required for the proposed impacts. Please contact the Corps for guidance.



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**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.

<b>1. Impaired Waters</b>	<b>Yes</b>	<b>No</b>
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See <a href="http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm">http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm</a> to determine if there is an impaired water in the vicinity of your work area.*		X
<b>2. Wetlands</b>	<b>Yes</b>	<b>No</b>
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 <a href="https://www2.des.state.nh.us/nhb_datacheck/">https://www2.des.state.nh.us/nhb_datacheck/</a> . The book <u>Natural Community Systems of New Hampshire</u> 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?     Rehabilitating an existing structure	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	1.6 Acres	
2.7 What is the area of the proposed fill in wetlands?	None	
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?	55%	
<b>3. Wildlife</b>	<b>Yes</b>	<b>No</b>
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: <a href="https://www2.des.state.nh.us/nhb_datacheck/">https://www2.des.state.nh.us/nhb_datacheck/</a> USFWS IPAC website: <a href="https://ecos.fws.gov/ipac/location/index">https://ecos.fws.gov/ipac/location/index</a> Possible presence of NLEB	X	

3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”) Map information can be found at: <ul style="list-style-type: none"> <li>• PDF: <a href="http://www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm">www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm</a>.</li> <li>• Data Mapper: <a href="http://www.granit.unh.edu">www.granit.unh.edu</a>.</li> <li>• GIS: <a href="http://www.granit.unh.edu/data/downloadfreedata/category/databycategory.html">www.granit.unh.edu/data/downloadfreedata/category/databycategory.html</a>.</li> </ul>		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	
<b>4. Flooding/Floodplain Values</b>	<b>Yes</b>	<b>No</b>
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?		X
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage? N/A: No loss of flood storage anticipated		
<b>5. Historic/Archaeological Resources</b>		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form ( <a href="http://www.nh.gov/nhdhr/review">www.nh.gov/nhdhr/review</a> ) 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	

\*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.

Supplemental information:

2.4 - No clearing of trees > 3" dbh is proposed. Smaller trees and brush may be cut to allow temporary access to the culvert inlet and outlet. Any vegetation that is cut will be allowed to re-establish naturally.

2.5 - The area of previously filled wetlands is unknown. The estimate provided represents the area of the base of roadway embankments within the project site area and potential wetland areas.

2.8 - The area of the "project site" is estimated at 2.9 acres, based on the area within the existing right of way and easements and within the project limits.







Photo from Google Street View 11/2019  
Site, looking north. Flow from left to right. Hayes Auto on left.



Photo from Google Street View 11/2019  
Site, looking south. Flow from right to left. Pond and Hayes Auto on right.



By NHDOT Bureau of Environment 4/29/2020

Culvert inlet side, looking upstream  
Wetland #1 (Pond), Wetland #2 & #3 (Banks), Wetland #4 (far left)  
Impact Areas A, B, C, D, E



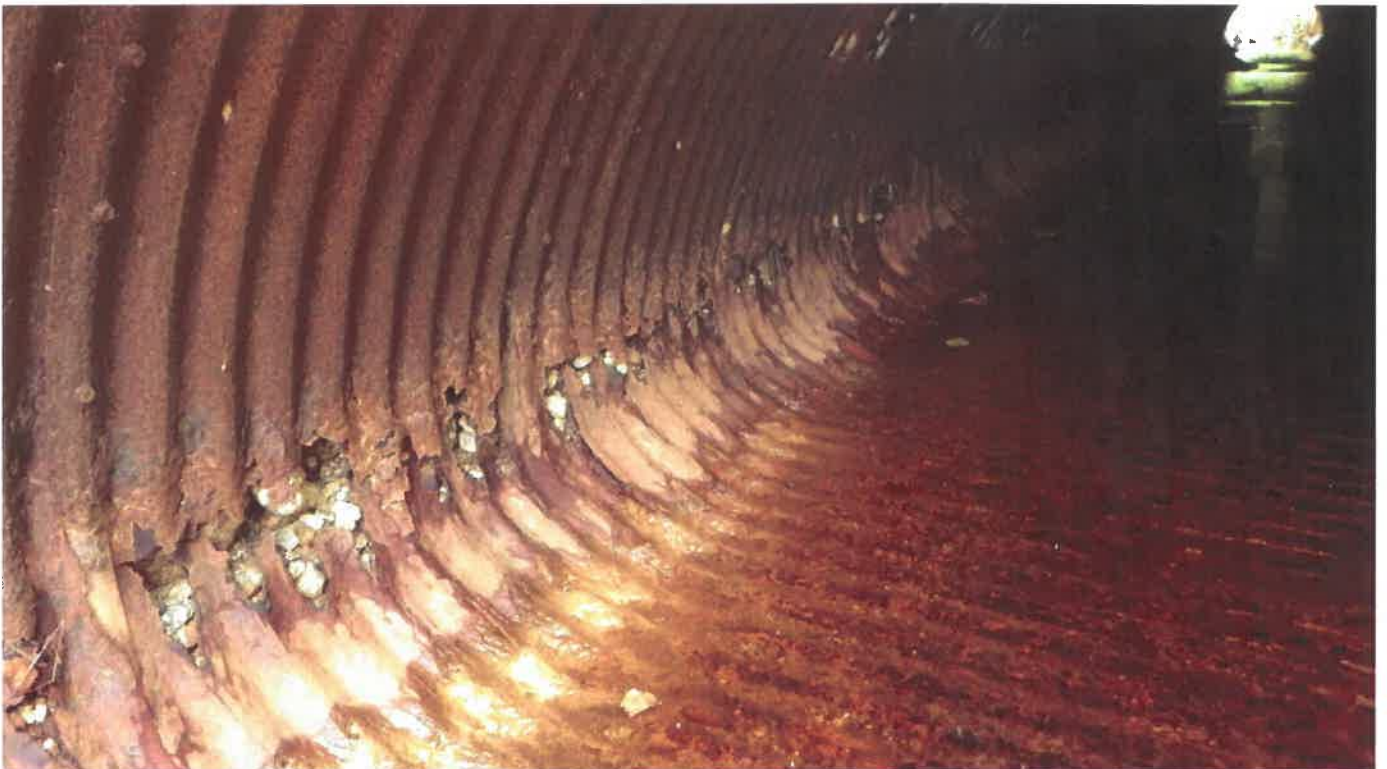
By NHDOT Bureau of Highway Design 3/20/2020

Culvert inlets, looking north  
Wetland #1 (Pond), Wetland #2 & #3 (Banks)  
Impact Areas A, B, D, E



By NHDOT Bureau of Highway Design 8/17/2018

Inside culvert, inlet side, looking downstream  
Illustrates poor condition, heavy rust extending above half the diameter



By NHDOT Bureau of Highway Design 8/17/2018

Inside culvert, inlet side, looking downstream  
Illustrates poor condition, holes in lower sides typical throughout both culverts



By NHDOT Bureau of Highway Design 3/20/2020

Culvert outlets

Wetland 10 (brook), Wetland #9 & #11 (Banks), Wetland #8 (intermittent stream in from left)

Impact Areas F, G, H, I, J, K, L



By NHDOT Bureau of Highway Design 3/20/2020

Culvert outlet area, looking south. Intermittent stream in from left

Wetland 10 (brook), Wetland #9 (Bank), Wetland #8 (intermittent stream)

Impact Areas I, J, K, L



By NHDOT Bureau of Highway Design 3/20/2020

Outlet channel, looking downstream  
Wetland #10 (brook), Wetland #9 & #11 (Banks)  
Impact Areas H, I, J



By NHDOT Bureau of Highway Design 3/20/2020

Access to outlet, looking south  
Wetland #9 & #11 (Banks), Wetland #8 (int. stream in from top), Wetland #7 (above int. stream)  
Impact Areas F, J, K, L (no impact to Wetland #7)



**Stoddard 42708****CONSTRUCTION SEQUENCE**

1. Perform any necessary clearing operations for access and staging.
2. Install perimeter sediment controls and install necessary temporary erosion controls as specified on the strategies sheet. Include all staging areas. Set up dewatering basin.
3. Place temporary protection such as mats or stone over geotextile where access roads cross wetlands.
4. Install water diversion at inlet and other sedimentation controls/BMP's as needed
5. Clean water bypass shall be through one of the existing pipes while work is being performed on the other pipe, unless otherwise approved as part of the Contractor's SWPPP.
6. Clean and inspect existing pipes.
7. Fill voids outside of pipes and areas of missing invert with grout.
8. Install cofferdam around inlet, clean water shall be directed through the existing pipes using temporary pipe or pumps, unless otherwise approved as part of the Contractor's SWPPP.
9. Install cofferdam around outlet.
10. Remove approximately 12 LF of existing pipes at inlet end.
11. Remove approximately 6 LF of existing pipes at outlet end.
12. Install cured in place liners.
13. Excavate and dewater proposed inlet headwall foundation area.
14. Construct inlet headwall and wing walls.
15. Place stone fill and streambed material on top of stone at inlet such that streambed matches the new liner invert.
16. Excavate and dewater proposed outlet headwall foundation area.
17. Construct outlet headwall and wing walls.
18. Place stone fill and streambed material on top of stone at outlet such that streambed matches the new liner invert.
19. Remove cofferdams and water diversion, and re-establish flow through culverts.
20. Place humus, seed, mulch, and temporary slope matting on the slopes around the new headwalls.
21. Remove temporary access road at outlet side.
22. Stabilize disturbed areas with seed, mulch, and temp slope matting (where steeper than 4:1).
23. Remove erosion and sediment controls.





Provide an explanation as to methods, timing, and manner as to how your project will meet standard permit conditions required in Env-Wt 307 (Env-Wt 311.03(b)(7)):

The project will be constructed in accordance with the NHDOT Standard Specifications for Road and Bridge Construction, 2016 Edition, and project specific Plans, Prosecution of Work requirements, and Special Provisions.

Project construction is expected to occur in Summer of 2021, with a total project duration of about 2 months.

Means and methods of construction and schedule of work are proposed by the Contractor and are subject to approval by NHDOT. Temporary works such as cofferdams and water diversions are designed by the Contractor and submitted to NHDOT for documentation in accordance with Section 105.02 of the Standard Specifications.

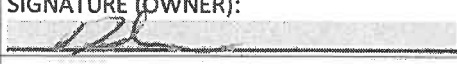
See the Construction Sequence included in the application.

**SECTION 16 - REQUIRED CERTIFICATIONS ( Env-Wt 311.11)**

Initial each box below to certify:

Initials: KOM	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials: KOM	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: KOM	<p>The signer understands that:</p> <ul style="list-style-type: none"> <li>The submission of false, incomplete, or misleading information constitutes grounds for NHDES to:                     <ol style="list-style-type: none"> <li>Deny the application.</li> <li>Revoke any approval that is granted based on the information. And</li> <li>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.</li> </ol> </li> <li>The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.</li> <li>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 trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.</li> </ul>
Initials: KOM	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 17 - REQUIRED SIGNATURE (Env-Wt 311.04(d); Env-Wt 311.11)**

SIGNATURE (OWNER): 	PRINT NAME LEGIBLY: KIRK MUDGETT	DATE: 7/15/20
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): _____	PRINT NAME LEGIBLY: _____	DATE: _____
SIGNATURE (AGENT, IF APPLICABLE): _____	PRINT NAME LEGIBLY: _____	DATE: _____

[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

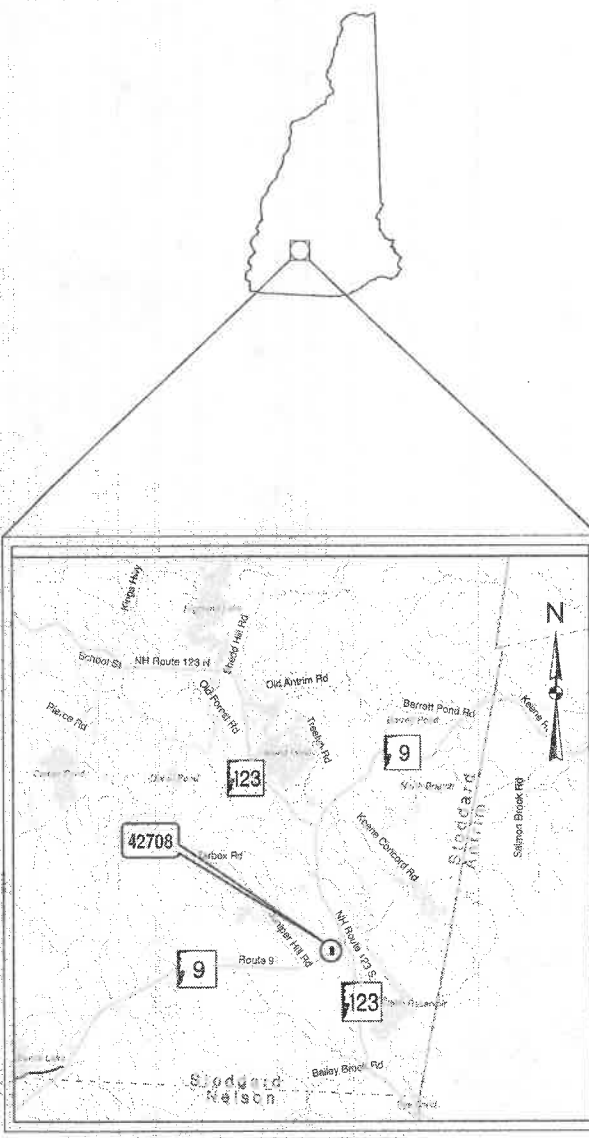
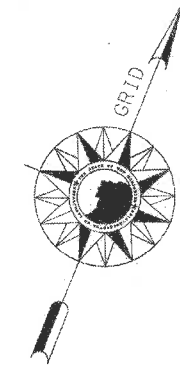
[www.des.nh.gov](http://www.des.nh.gov)



STATE OF NEW HAMPSHIRE  
 DEPARTMENT OF TRANSPORTATION  
**WETLANDS PLANS**  
**FEDERAL AID PROJECT**

X-A005(051)  
 N.H. PROJECT NO. 42708  
 NH Route 9

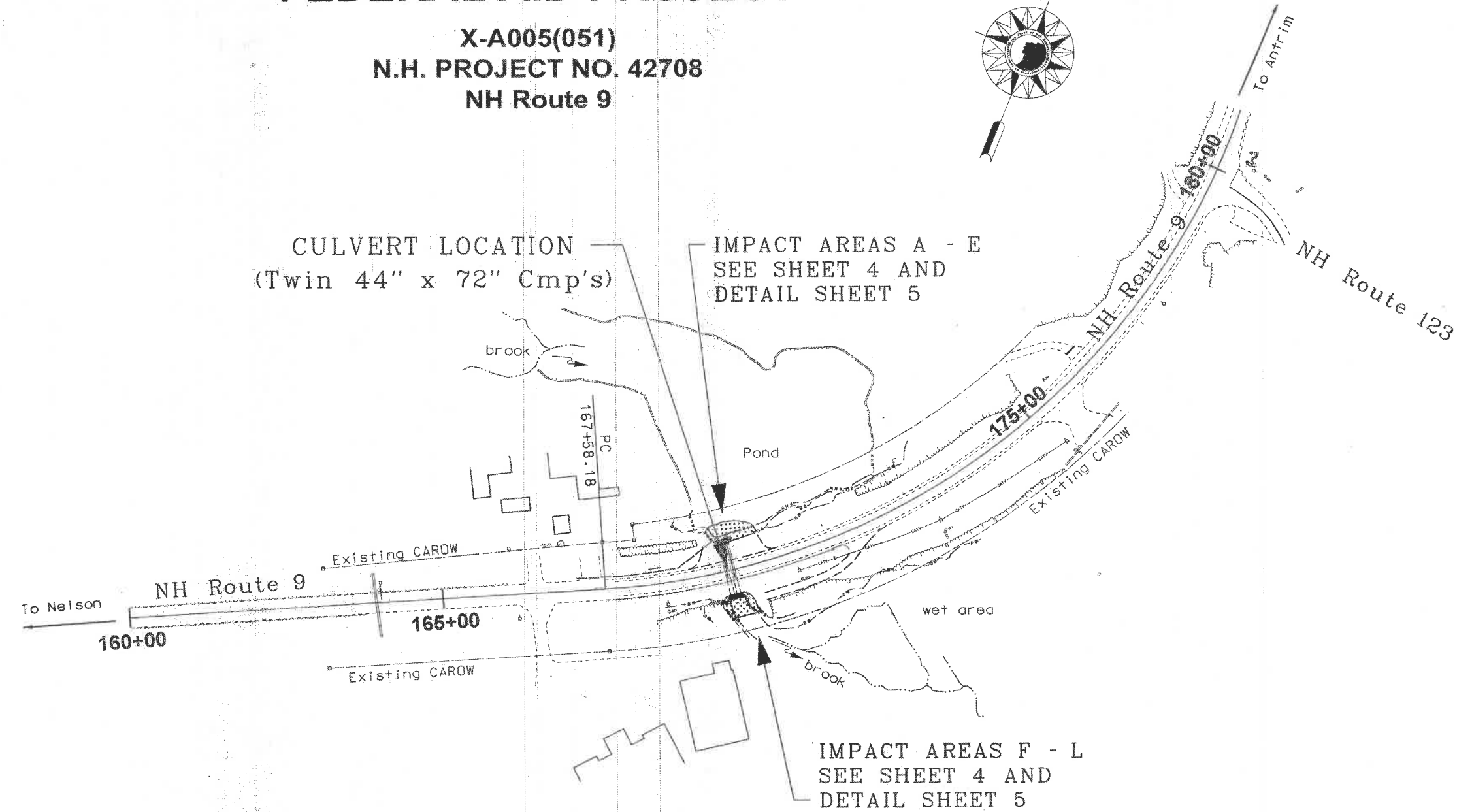
DESIGN DATA	
AVERAGE DAILY TRAFFIC 20 19	7,752
AVERAGE DAILY TRAFFIC 20 XX	N/A
PERCENT OF TRUCKS	8%
DESIGN SPEED	N/A
LENGTH OF PROJECT	550 FT



LOCATION MAP

CULVERT LOCATION  
 (Twin 44" x 72" Cmp's)

IMPACT AREAS A - E  
 SEE SHEET 4 AND  
 DETAIL SHEET 5



IMPACT AREAS F - L  
 SEE SHEET 4 AND  
 DETAIL SHEET 5

DATE 5/2020  
 DATE 7/20/20  
 JUN  
 CAC  
 DRAWN BY  
 CHECKED BY

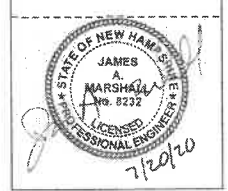
INDEX OF SHEETS

- 1 FRONT SHEET
- 2-3 STANDARD SYMBOLS SHEETS
- 4 WETLAND IMPACT PLAN
- 5 WETLAND IMPACT DETAILS
- 6.7 CULVERT PROFILES
- 8 DRAINAGE DETAILS
- 9 EROSION CONTROL STRATEGIES
- 10 EROSION CONTROL PLAN

Wetland Delineation per ENV-Wt 406 by:  
 NHDOT (Sarah Large) 11/25/2019

Per Wetland Plans Rule(s)  
 Env-Wt 311.05

Plans Prepared by:  
 Christopher Carucci, PE



DATE 7/20/20

**TOWN OF STODDARD**  
 COUNTY OF CHESHIRE

SCALE: 1" = 100'

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE CONSTRUCTION PLANS

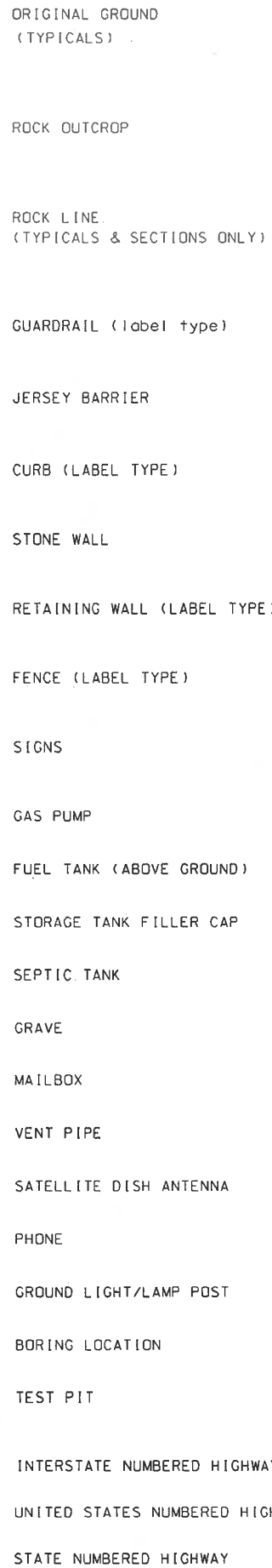
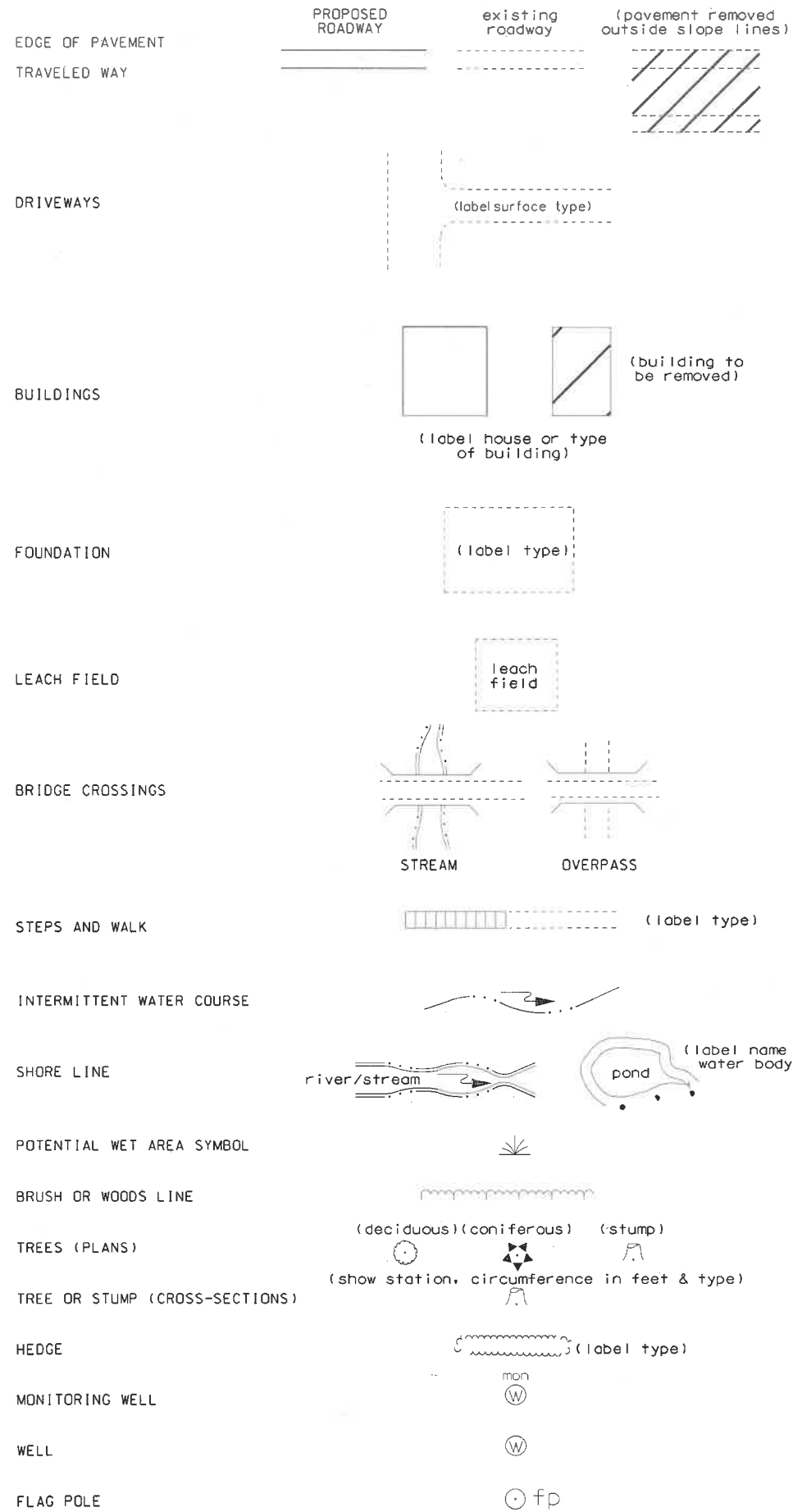


NH Route 9  
 Culvert Rehabilitation  
 Wetland Impact Plans

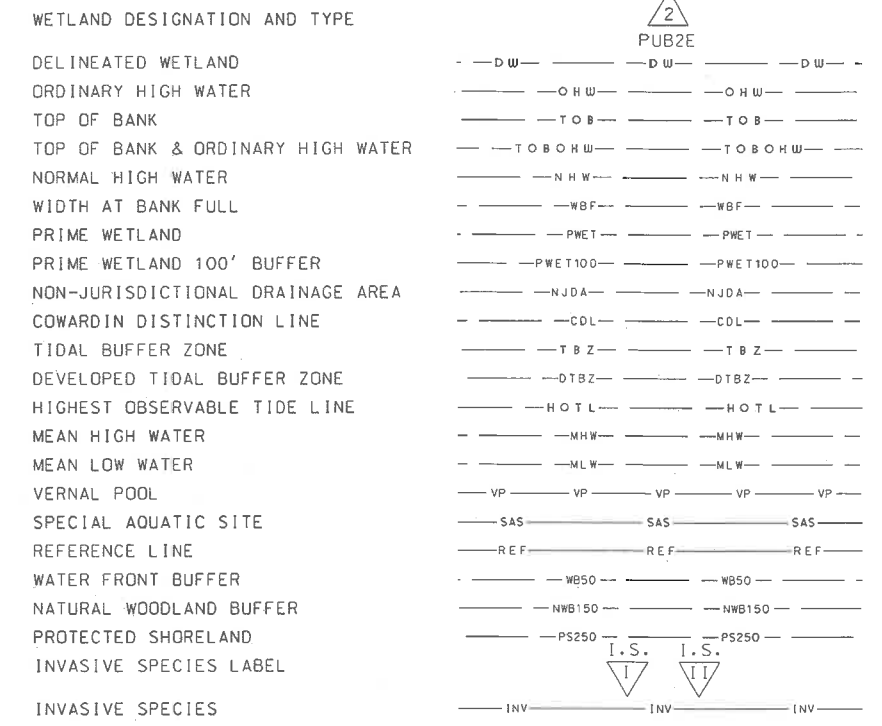
FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
X-A005(051)	42708	1	10



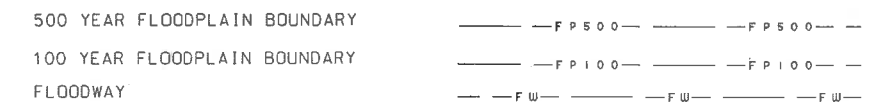
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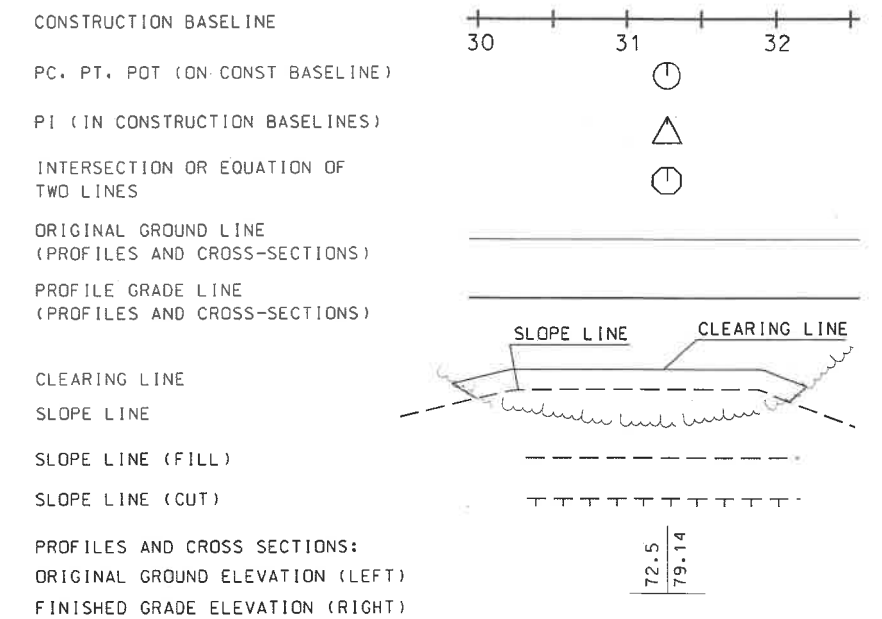
# SHORELAND - WETLAND



# FLOODPLAIN / FLOODWAY



# ENGINEERING



STATE OF NEW HAMPSHIRE				
STOODARD				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
<b>STANDARD SYMBOLS</b>				
REVISION DATE	DCN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	std symb	42708	2	10



### DRAINAGE

MANHOLE		
CATCH BASIN	cb	(existing)  (PROPOSED)
DROP INLET	di	
DRAINAGE PIPE (existing)		(label size & type)
DRAINAGE PIPE (PROPOSED)		(label size & type)
UNDERDRAIN (existing) W/ FLUSHING BASIN	fb	(label size & type)
UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN		(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	bnd	(PROPOSED)
STATE LINE/ TOWN LINE MONUMENT	S/L	T/L
NHDOT PROJECT MARKER		
IRON PIPE OR PIN	ip	
DRILL HOLE IN ROCK	dh	
TAX MAP AND LOT NUMBER		156 14 1642/341 6.80 Ac. ±
PROPERTY PARCEL NUMBER		12
HISTORIC PROPERTY		

### UTILITIES

TELEPHONE POLE		
POWER POLE		
JOINT OCCUPANCY		
MISCELLANEOUS/UNKNOWN POLE		
GUY POLE OR PUSH BRACE		
LIGHT POLE		
LIGHT ON POWER POLE		
LIGHT ON JOINT POLE		
POLE STATUS: REMOVE, LEAVE, PROPOSED, OR TEMPORARY AS APPLICABLE e.g.:		
RAILROAD		
RAILROAD SIGN		
RAILROAD SIGNAL		
UTILITY JUNCTION BOX		
OVERHEAD WIRE		
UNDERGROUND UTILITIES		
WATER (on existing lines label size, type and note if abandoned)		
SEWER		
TELEPHONE		
ELECTRIC		
GAS		
LIGHTING		
INTELLIGENT TRANSPORTATION SYSTEM		
FIBER OPTIC		
WATER SHUT OFF		
GAS SHUT OFF		
HYDRANT		
MANHOLES		
SEWER		
TELEPHONE		
ELECTRICAL		
GAS		
UNKNOWN		

### TRAFFIC SIGNALS / ITS

MAST ARM (existing)		
OPTICOM RECEIVER		
OPTICOM STROBE		
TRAFFIC SIGNAL		
PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT		
SIGNAL CONDUIT		
CONTROLLER CABINET		
METER PEDESTAL		
PULL BOX		
LOOP DETECTOR (QUADRUPOLE)		
LOOP DETECTOR (RECTANGULAR)		
CAMERA POLE (CCTV)		
FIBER OPTIC DELINEATOR		
FIBER OPTIC SPLICE VAULT		
ITS EQUIPMENT CABINET		
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	
DRAINAGE NOTE	
EROSION CONTROL NOTE	
FENCING NOTE	
GUARDRAIL NOTE	
ITS NOTE	
LIGHTING NOTE	
TRAFFIC SIGNAL NOTE	





**LEGEND**

TYPE OF WETLAND IMPACT	SHADING/HATCHING	#	WETLAND DESIGNATION NUMBER
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)		#	WETLAND IMPACT LOCATION
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)		#	WETLAND MITIGATION AREA
TEMPORARY IMPACTS			MITIGATION

WETLAND CLASSIFICATION CODES	
PUB23	PALUSTRINE, UNCONSOLIDATED BOTTOM, SAND / MUD
BANK	BANK
PSS/F01E	PALUSTRINE, SHRUB SCRUB, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PSS1E	PALUSTRINE, SHRUB SCRUB, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
R2UB12	RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, COBBLE GRAVEL / SAND
R4SB34	RIVERINE, INTERMITTENT, STREAMBED, COBBLE GRAVEL / SAND

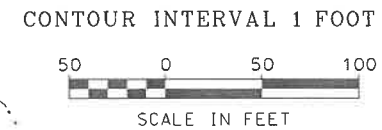
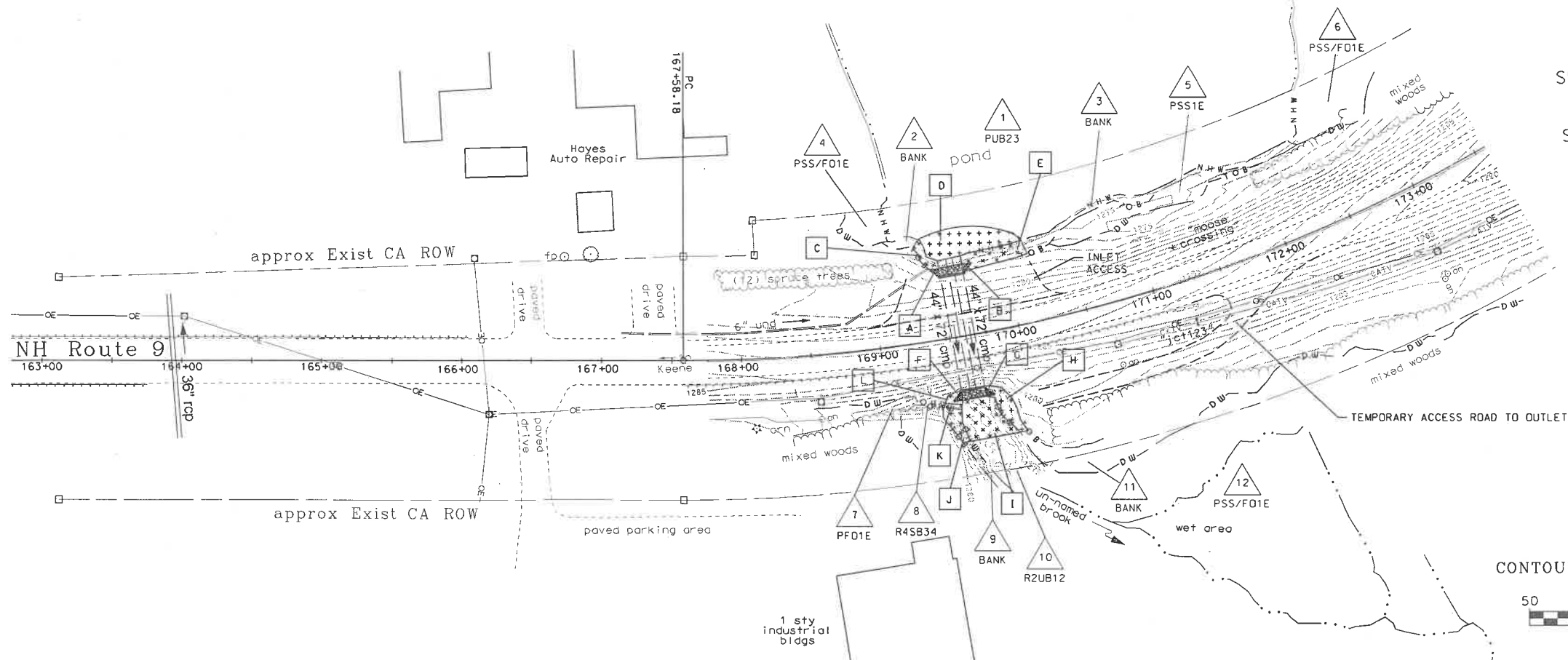
WETLAND IMPACT SUMMARY													
WETLAND NUMBER	WETLAND CLASSIFICATION	LOCATION	AREA IMPACTS						LINEAR STREAM IMPACTS FOR MITIGATION				
			PERMANENT				TEMPORARY		PERMANENT				
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.D.E. (WETLAND)		SF	LF	BANK LEFT LF	BANK RIGHT LF	CHANNEL LF		
2	BANK	A	20	8									
3	BANK	B	24	7							0		
2	BANK	C					150	24					
1	PUB23	D					1107	84					
3	BANK	E					488	46					
9	BANK	F	28	9							0		
11	BANK	G	27	9							0		
11	BANK	H					351	44					
10	R2UB12	I					855	30					
9	BANK	J					250	30					
8	R4SB34	K					41	13					
9	BANK	L					62	12					
<b>TOTAL</b>			<b>99</b>	<b>33</b>	<b>0</b>	<b>0</b>	<b>3304</b>	<b>283</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

PERMANENT IMPACTS: 99 SF  
 TEMPORARY IMPACTS: 3,304 SF  
 TOTAL IMPACTS: 3,403 SF

**CULVERT REHABILITATION:**  
 STA 169+59.5 (56' LT TO 45' RT) TWIN 44" X 72" CMP ARCH PIPES REMOVE MITERED ENDS AND PORTIONS OF EXISTING PIPES AS SHOWN IN THE PLANS OR AS DIRECTED. SLOPLINE REMAINING PORTIONS OF EXISTING PIPES WITH CURED IN PLACE LINERS. CONSTRUCT HEADWALLS AT INLET AND OUTLET. SEE DETAILS ELSEWHERE IN THE PLANS.

SEE CULVERT PROFILE FOR CULVERT INVERTS

SEE DETAIL SHEET FOR PROPOSED CONTOURS AND LARGER VIEW OF IMPACT AREAS.



STATE OF NEW HAMPSHIRE STODDARD			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
<b>WETLAND IMPACT PLANS</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
42708wetplans	42708	4	10

REVISIONS AFTER PROPOSAL  
 STATION  
 STATION  
 DATE  
 NUMBER  
 DATE 3/20  
 DATE 7/20/20  
 DATE  
 SDR PROCESSED  
 NEW DESIGN  
 SHEET CHECKED  
 AS BUILT DETAILS



REVISIONS AFTER PROPOSAL

STATION

STATION

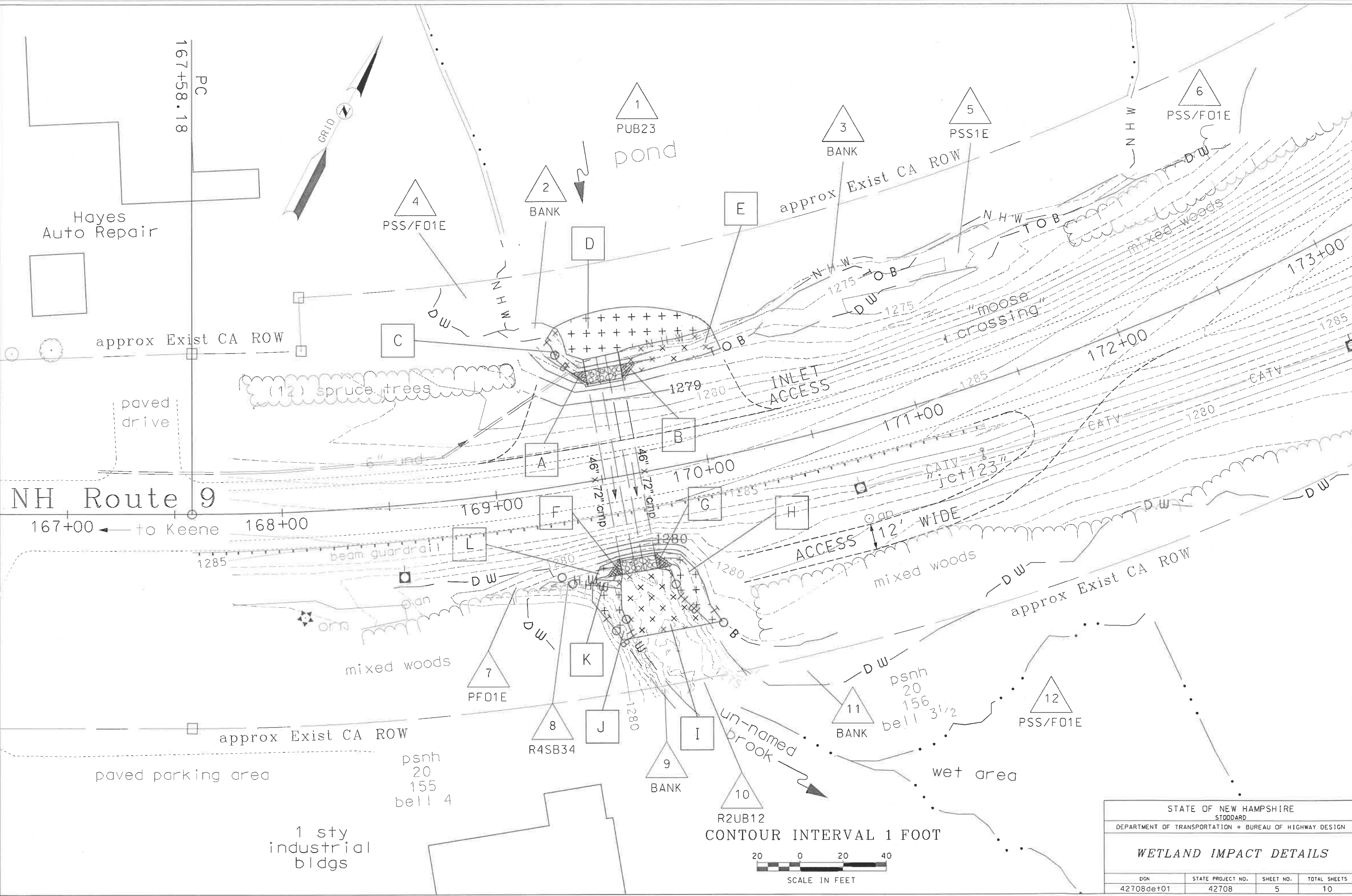
DATE

NUMBER

DATE DATE DATE DATE

SDR PROCESSED  
NEW DESIGN  
SHEET CHECKED  
AS BUILT DETAILS

DESCRIPTION	STATION	STATION	DATE	NUMBER	DATE	DATE	DATE



STATE OF NEW HAMPSHIRE STOODARD			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
<b>WETLAND IMPACT DETAILS</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
42708det01	42708	5	10



REVISIONS AFTER PROPOSAL

STATION

STATION

DATE

NUMBER

DATE

DATE

DATE

DATE

DATE

DESCRIPTION

STATION

STATION

DATE

NUMBER

DATE

DATE

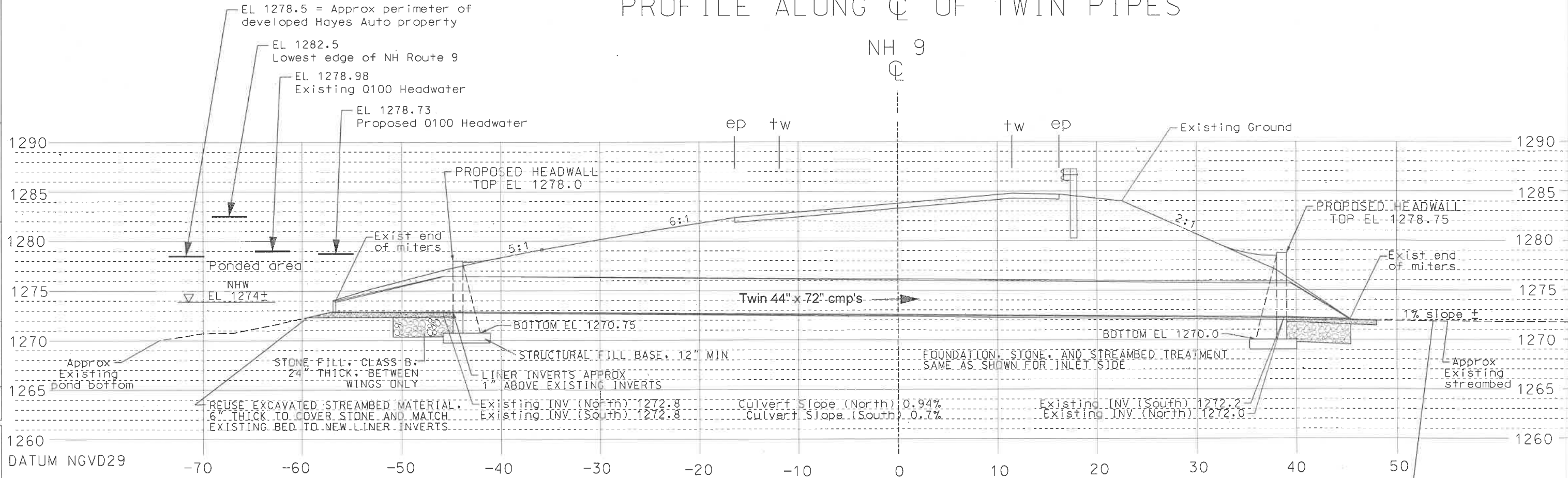
DATE

DATE

DATE

# PROFILE ALONG Q OF TWIN PIPES

NH 9  
Q



## PROPOSED REHABILITATION

- REMOVE MITERED ENDS
- CONSTRUCT HEADWALLS
- REHABILITATE EXISTING PIPE WITH CURED-IN-PLACE LINERS
- SHORTENS CROSSING FROM 102' TO 84'

Existing incised channel continues to approx 75' from culvert outlets then disperses into diffuse palustrine wetland

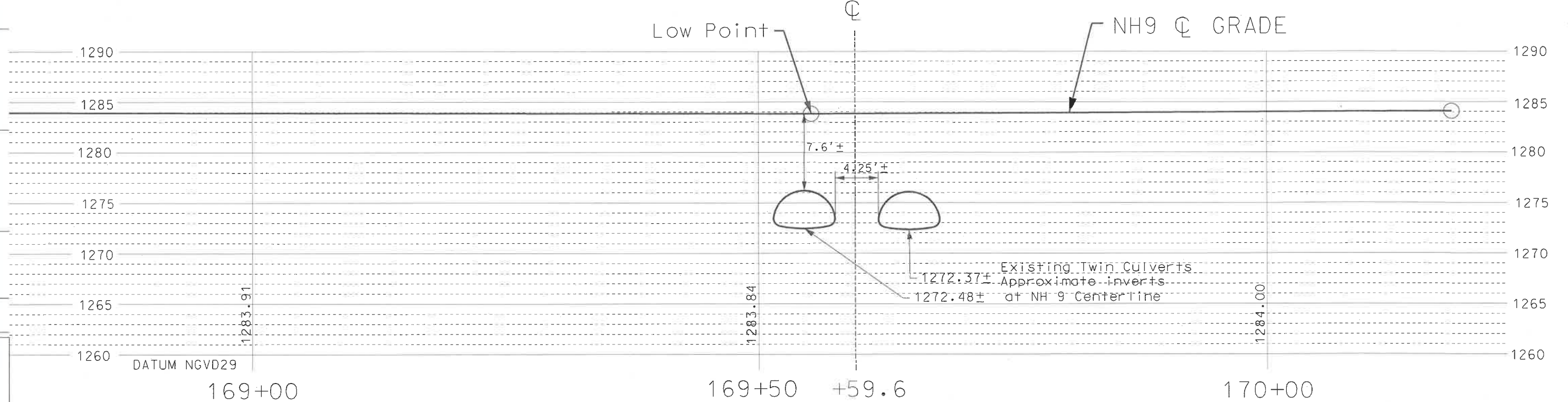


STATE OF NEW HAMPSHIRE STOODARD			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
<b>CULVERT PROFILE</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
42708pro_1.10 scale	42708	6	10



# NH ROUTE 9 PROFILE

NH 9 PROFILE  
CROSSING STA 169+59.6



SDR PROCESSED	DATE	DATE	DATE	DATE	DATE	DATE
NEW DESIGN	JUN	3/20				
SHEET CHECKED	CAC	7/20/20				
AS BUILT DETAILS						

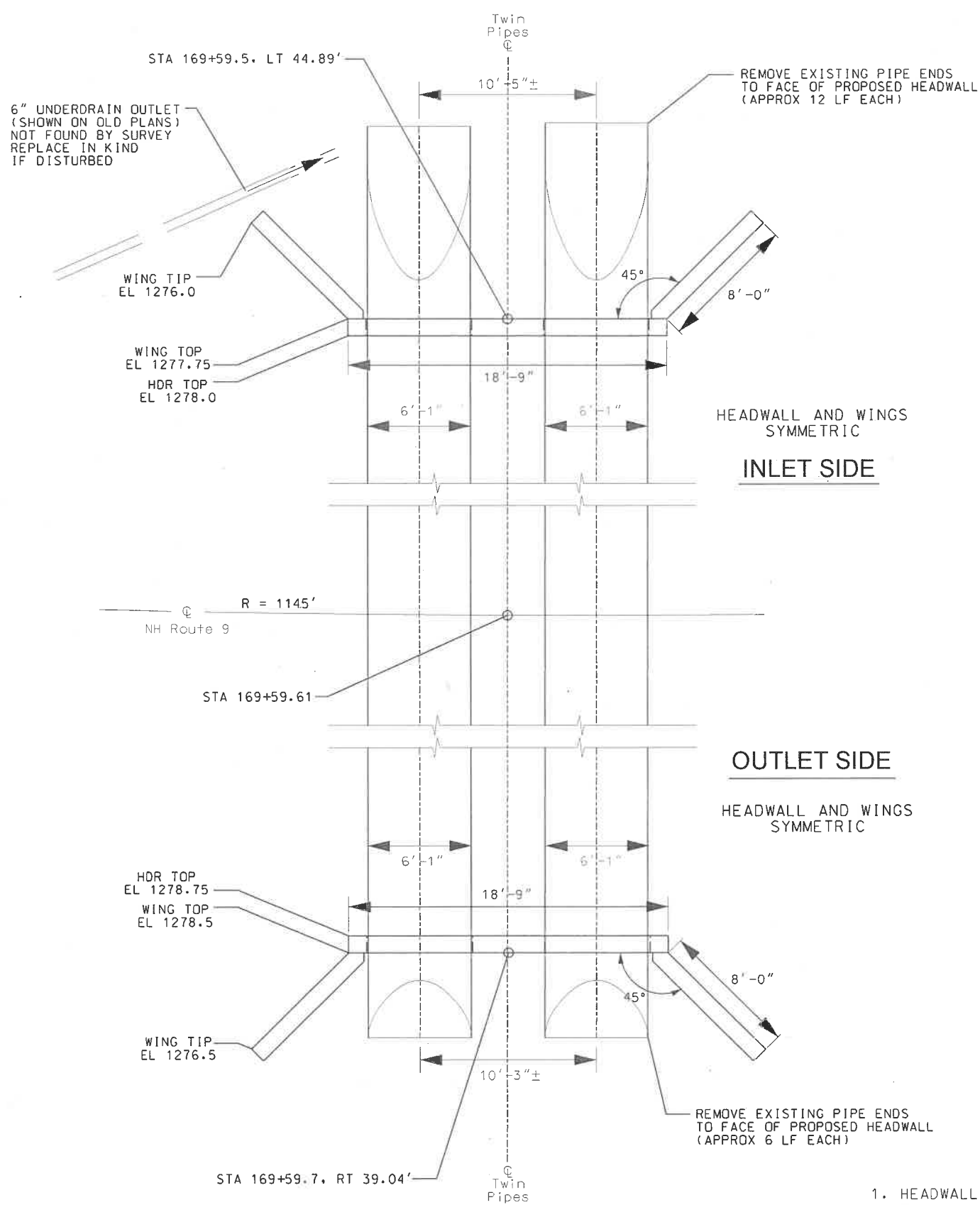


STATE OF NEW HAMPSHIRE STODDARD			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
<b>NH ROUTE 9 PROFILE</b>			
DCN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
42708pro_2_10 scale	42708	7	10



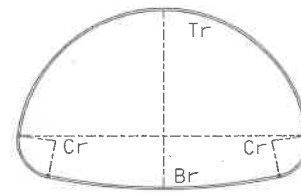


SDR PROCESSED	DATE	5/20/20
NEW DESIGN	DATE	7/20/20
SHEET CHECKED	DATE	
AS BUILT DETAILS	DATE	



**HEADWALL DETAILS**

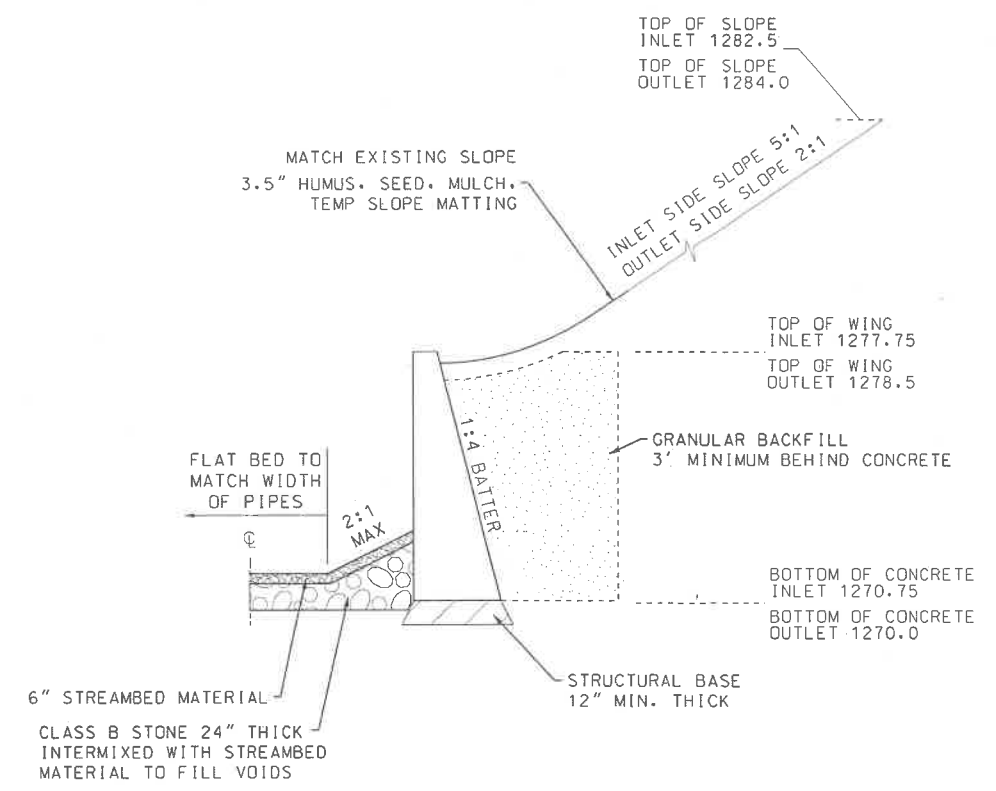
1" = 4'



**Existing 44 x 72 cmp arch  
Original Dimensions:**

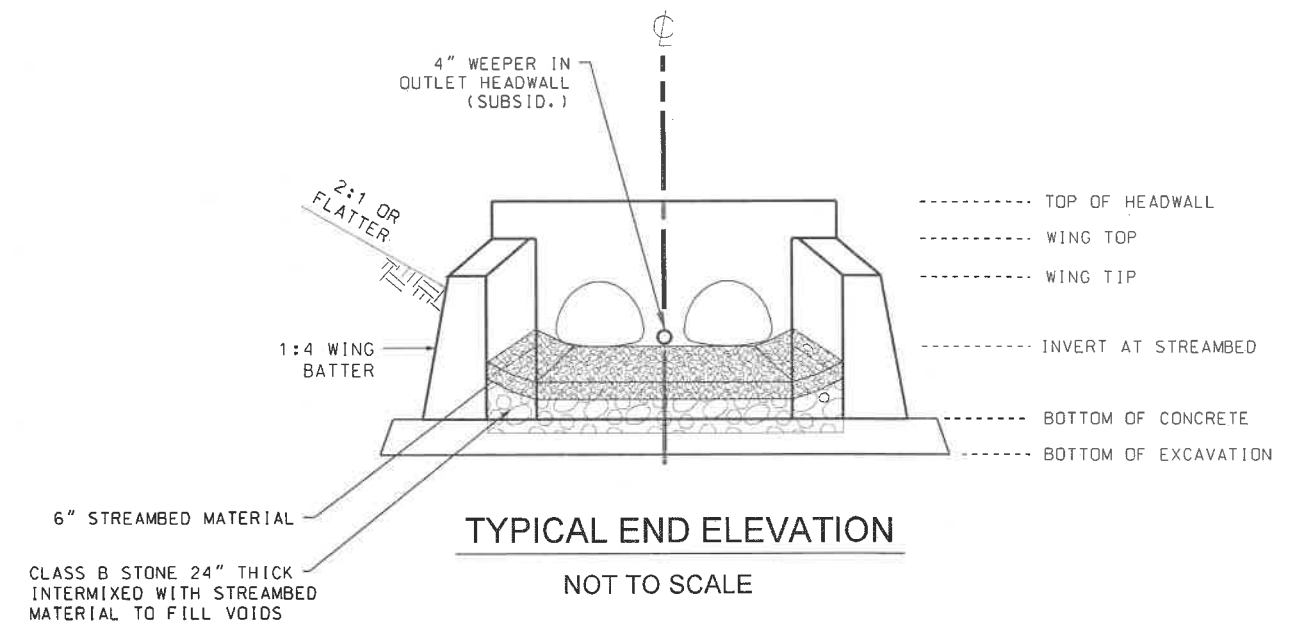
NOT TO SCALE

2 2/3 x 1/2 corrugations  
span = 72.2"  
rise = 44.4"  
Tr = 36.31"  
Br = 142.94"  
Cr = 9"  
Area = 17.52 SF



**TYPICAL WING SECTION**

NOT TO SCALE



**TYPICAL END ELEVATION**

NOT TO SCALE

1. HEADWALL REINFORCEMENT AND OTHER DETAILS NOT SHOWN SHALL MEET APPLICABLE REQUIREMENTS FOR NHDOT STANDARD PC-9 HEADWALLS (STANDARD HW-2, PLATE 4).
2. PLACE STONE FOUNDATION PROTECTION BETWEEN WINGS ONLY.
3. EXTEND STREAMBED MATERIAL TO MAKE A SMOOTH TRANSITION FROM PIPE INVERTS TO EXISTING STREAMBED, SEE CULVERT PROFILE.

STATE OF NEW HAMPSHIRE STODDARD			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
<b>DRAINAGE DETAILS</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
42708detail_HW	42708	8	10



# 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-WO 1500 REQUIREMENTS ([HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM](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% VEGETATIVE 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<sup>th</sup> AND MAY 1<sup>st</sup> 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<sup>th</sup>, OR WHICH ARE DISTURBED AFTER OCTOBER 15<sup>th</sup>, 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<sup>th</sup>, OR WHICH ARE DISTURBED AFTER OCTOBER 15<sup>th</sup>, SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
    - (C) AFTER NOVEMBER 30<sup>th</sup> 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-WO 1505.02 AND ENV-WO 1505.05.
    - (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WO 1505.05) AND INCLUDING THE REQUIREMENTS OF NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30<sup>th</sup>.

## 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<sup>st</sup> THROUGH NOVEMBER 30<sup>th</sup>, 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-WO 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-WO 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-WO 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 MATRICES (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-WO 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-WO 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 <sup>2</sup>				ROLLED EROSION CONTROL BLANKETS <sup>3</sup>			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES <sup>1</sup>												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES <sup>1</sup>	YES <sup>1</sup>	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 STODDARD			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
<b>EROSION CONTROL STRATEGIES</b>			
REVISION DATE	DCN	STATE PROJECT NO.	SHEET NO. TOTAL SHEETS
12-21-2015	erosstrat	42708	9 10



REVISIONS AFTER PROPOSAL

STATION

STATION

DATE

NUMBER

DATE

SDR PROCESSED

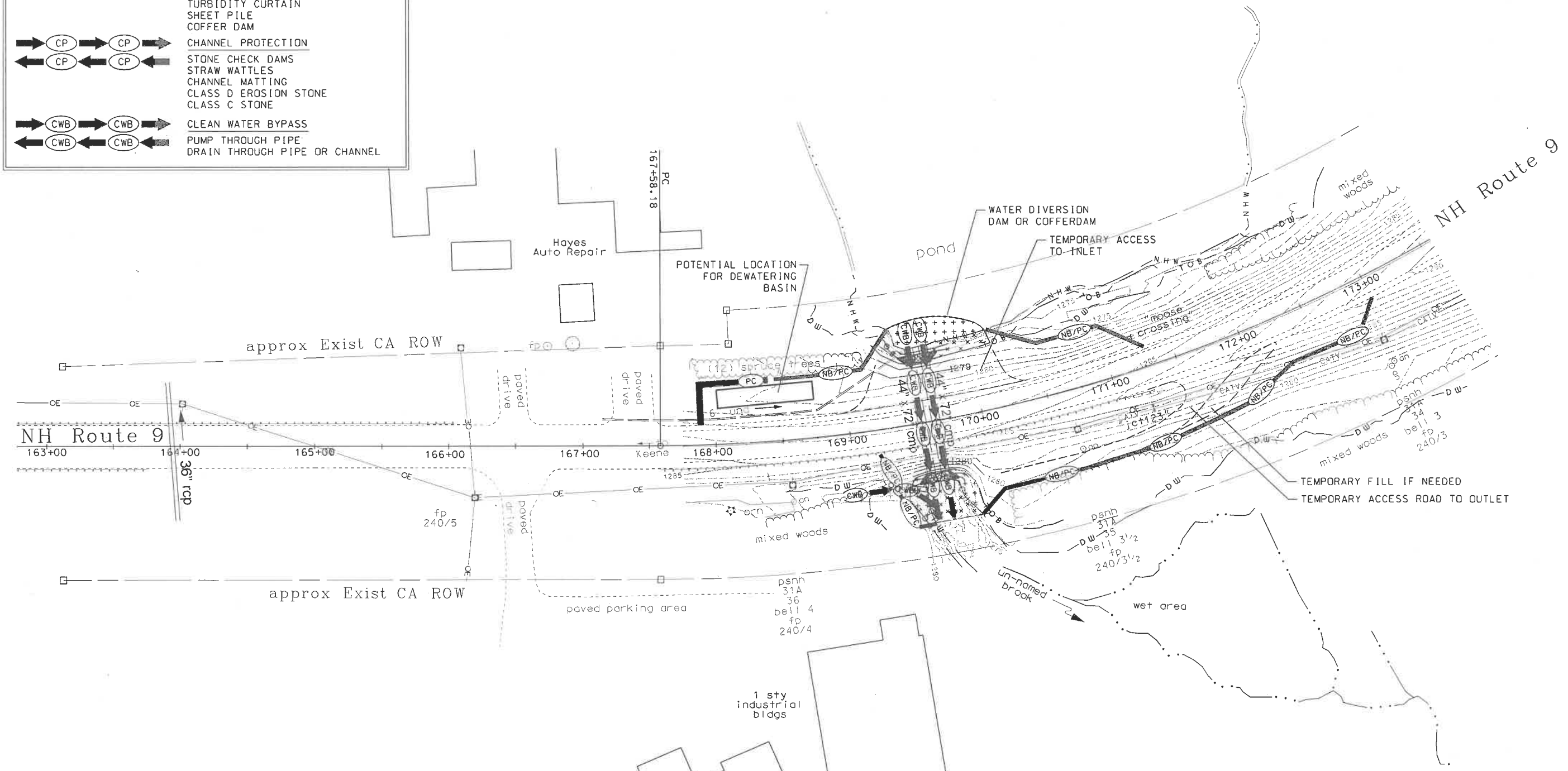
NEW DESIGN

SHEET CHECKED

AS BUILT DETAILS

### EROSION CONTROL PLAN LEGEND

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



CONTOUR INTERVAL 1 FOOT



STATE OF NEW HAMPSHIRE STODDARD			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
<b>EROSION CONTROL PLAN</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
42708ercplans	42708	10	10

