

STATE OF NEW HAMPSHIRE INTER-DEPARTMENT COMMUNICATION

DATE: March 15, 2024

FROM: Joshua Brown
Wetlands Program Analyst

AT (OFFICE): Department of
Transportation

SUBJECT Dredge & Fill Application
Dover, 41824

Bureau of
Environment

TO Karl Benedict, Public Works Permitting Officer
New Hamp
shire 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 Turnpikes for the subject major impact project. The project involves the rehabilitation of the two NH Route 16 (Spaulding Turnpike) bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cocheco River in Dover. Proposed work includes superstructure replacement, replacement of bearings and expansion joints, and substructure repairs on each bridge. The bridges will be widened from 37.75 feet to 40 feet (rail-to-rail) and a small amount of roadway widening will occur at each bridge approach to match the existing pavement to the widened bridges. The project extends approximately 1,300 feet south of the bridges and approximately 1,000 feet north of the bridges along NH Route 16 to accommodate traffic control measures.

This project was reviewed at the Natural Resource Agency Coordination Meeting on June 21, 2023. 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: <https://www.dot.nh.gov/projects-plans-and-programs/programs/environmental-management-system/project-management-section-0>.

NHDOT anticipates and request that this project 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 required as the proposed work was determined to be self-mitigating.

Erosion Control Plans contained within this application should be considered final in accordance with Env-Wt 527.05(a).

The lead people to contact for this project are Sam Newsom, Bureau of Turnpikes (sam.b.newsom@dot.nh.gov) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-3226 or Andrew.O'Sullivan@dot.nh.gov).

A payment voucher has been processed for this application (Voucher #78334) in the amount of \$5,250.00.

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.

JRB;

cc:

BOE Original

Town of Dover (4 copies via certified mail)

Cocheco River LAC (1 copy via certified mail)

Mike Dionne & Kevin Newton, NH Fish & Game (via electronic notification)

Maria Tur, US Fish & Wildlife (via electronic notification)

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)

**NH Route 16 (Spaulding Turnpike) over the Cocheco River
Bridge Rehabilitation
Dover 41824**

NHDES WETLANDS PERMIT APPLICATION

Submitted for:



NH Department of Transportation
7 Hazen Drive
Concord, NH 03302

Prepared by:



GM2 Associates, Inc.
197 Loudon Road, Suite 310
Concord, NH 03301

March 2024

NH Route 16 (Spaulding Turnpike) over the Cocheco River
Bridge Rehabilitation
Dover 41824

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STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

Water Division / Land Resources Management
[Check the Status of your Application](#)



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

APPLICANT'S NAME:

TOWN NAME:

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

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

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))
Please use the [Wetland Permit Planning Tool \(WPPT\)](#), the Natural Heritage Bureau (NHB) [DataCheck Tool](#), the [Aquatic Restoration Mapper](#), or other sources to assist in identifying key features such as: [Priority Resource Areas \(PRAs\)](#), [protected species or habitats](#), coastal areas, designated rivers, or designated prime wetlands.

Has the required planning been completed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does the property contain a PRA? If yes, provide the following information: <ul style="list-style-type: none"> • Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHFG) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04. • Protected species or habitat? <ul style="list-style-type: none"> ○ If yes, species or habitat name(s): ○ NHB Project ID #: • Bog? • Floodplain wetland contiguous to a tier 3 or higher watercourse? • Designated prime wetland or duly-established 100-foot buffer? • Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone? 	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
Is the property within a Designated River corridor? If yes, provide the following information: <ul style="list-style-type: none"> • Name of Local River Management Advisory Committee (LAC): • A copy of the application was sent to the LAC on Month: Day: Year: 	<input type="checkbox"/> Yes <input type="checkbox"/> No

For dredging projects, is the subject property contaminated? • If yes, list contaminant:	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	<input type="checkbox"/> Yes <input type="checkbox"/> No
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For stream crossing projects, provide watershed size (see [WPPT](#) or Stream Stats):

SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))
 Provide a description of the project and the purpose of the project, the need for the proposed impacts to jurisdictional areas, an outline-of the scope of work to be performed, and whether impacts are temporary or permanent.

SECTION 3 - PROJECT LOCATION
 Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.

ADDRESS:

TOWN/CITY:

TAX MAP/BLOCK/LOT/UNIT:

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

(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places):

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))		
If the applicant is a trust or a company, then complete with the trust or company information.		
NAME:		
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 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))		
<input type="checkbox"/> 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. <i>JMR</i>		
SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))		
If the owner is a trust or a company, then complete with the trust or company information.		
<input type="checkbox"/> Same as applicant		
NAME:		
MAILING ADDRESS:		
TOWN/CITY:	STATE:	ZIP CODE:
EMAIL ADDRESS:		
FAX:	PHONE:	
ELECTRONIC COMMUNICATION: By initialing here, I hereby authorize NHDES to communicate all matters relative to this application electronically.		

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

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

SECTION 8 - AVOIDANCE AND MINIMIZATION

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

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

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

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

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

Mitigation Pre-Application Meeting Date: Month: Day: Year: 6/21/2023

N/A - Mitigation is not required

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

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

N/A – Compensatory mitigation is not required

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

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

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

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

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

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

JURISDICTIONAL AREA		PERM. SF	PERM. LF	PERM. ATF	TEMP. SF	TEMP. LF	TEMP. ATF
Wetlands	Forested Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Scrub-shrub Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Emergent Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Wet Meadow			<input type="checkbox"/>			<input type="checkbox"/>
	Vernal Pool			<input type="checkbox"/>			<input type="checkbox"/>
	Designated Prime Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Duly-established 100-foot Prime Wetland Buffer			<input type="checkbox"/>			<input type="checkbox"/>
Surface	Intermittent / Ephemeral Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Perennial Stream or River			<input type="checkbox"/>			<input type="checkbox"/>
	Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - River			<input type="checkbox"/>			<input type="checkbox"/>
Banks	Bank - Intermittent Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Bank - Perennial Stream / River			<input type="checkbox"/>			<input type="checkbox"/>
	Bank / Shoreline - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
Tidal	Tidal Waters			<input type="checkbox"/>			<input type="checkbox"/>
	Tidal Marsh			<input type="checkbox"/>			<input type="checkbox"/>
	Sand Dune			<input type="checkbox"/>			<input type="checkbox"/>
	Undeveloped Tidal Buffer Zone (TBZ)			<input type="checkbox"/>			<input type="checkbox"/>
	Previously-developed TBZ			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Tidal Water			<input type="checkbox"/>			<input type="checkbox"/>
TOTAL							

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

- MINIMUM IMPACT FEE:** Flat fee of \$400.
- NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION:** Flat fee of \$400 (refer to RSA 482-A:3, 1(c) for restrictions).
- MINOR OR MAJOR IMPACT FEE:** Calculate using the table below:

Permanent and temporary (non-docking):	SF	× \$0.40 =	\$
Seasonal docking structure:	SF	× \$2.00 =	\$
Permanent docking structure:	SF	× \$4.00 =	\$
Projects proposing shoreline structures (including docks) add \$400 =			\$
Total =			\$

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

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)

Indicate the project classification.

Minimum Impact Project

Minor Project

Major Project

SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials: <i>SBN</i>	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials: <i>SBN</i>	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: <i>SBN</i>	<p>The signer understands that:</p> <ul style="list-style-type: none"> • The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: <ol style="list-style-type: none"> 1. Deny the application. 2. Revoke any approval that is granted based on the information. 3. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1.
Initials: <i>SBN</i>	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

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

SIGNATURE (OWNER): <i>Sam Newsom</i>	PRINT NAME LEGIBLY: Sam Newsom	DATE: 3/8/24
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER):	PRINT NAME LEGIBLY:	DATE:
SIGNATURE (AGENT, IF APPLICABLE): <i>Jennifer Riordan</i>	PRINT NAME LEGIBLY: Jennifer Riordan	DATE: 3/7/24

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

As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

TOWN/CITY CLERK SIGNATURE: Exempt, State Agency per RSA 482-A:31(a)(1)	PRINT NAME LEGIBLY:
TOWN/CITY: Dover	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.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

Submit the original permit application form bearing the signature of the Town/City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".

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Supplemental Narrative

Project Description

The project involves the rehabilitation of the two NH Route 16 (Spaulding Turnpike) bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cocheco River in the City of Dover (refer to attached USGS location map). The existing bridges were constructed in 1957 and rebuilt in 1991. They are currently on the State's Red List.

The proposed work includes superstructure replacement, replacement of bearings and expansion joints, and substructure repairs on each bridge. The project extends approximately 1,300 feet south of the bridges and approximately 1,000 feet north of the bridges along NH Route 16 to accommodate traffic control measures. Construction will be phased to maintain traffic.

The bridges will be widened from 37.75 feet to 40 feet (rail-to-rail) and a small amount of roadway widening is proposed at each bridge approach to match the existing pavement to the widened bridges. The net increase in impervious surface is approximately 2,300 square feet. All work will be within the existing NHDOT right-of-way and no easements are required. Tree clearing along the southern bank of the river (approximately 8,000 square feet) is anticipated for the construction access roads.

The project proposes temporary impacts within the Cocheco River channel and bank, and a small amount of permanent impact to an emergent wetland. An access road, causeway, and crane pad will be required at each bridge location to conduct the bridge repair work. Cofferdams will be used to dewater the work area and direct river flow to the opposite side of the channel. A causeway is needed due to shallow bedrock in the channel. A trestle cannot be used since there is not enough soil to ensure pile stability. The causeway will consist of rock placed on geotextile fabric and will be removed after construction. Temporary cofferdams and causeways will be constructed prior to April 15th and will remain in place for the construction season. No new fill in the river will be placed between April 15th and June 1st to minimize impacts to migratory fish species. At the end of each construction season, the temporary fill in the river banks and channel will be removed.

In-water work is expected to take two seasons (one for the northbound bridge and one for the southbound bridge), with construction of the entire project occurring over three seasons. The northern side of the Cocheco River will not be interrupted during any phase of construction and will remain open and unobstructed throughout the duration of the project. If the causeway, cofferdam, or other temporary impacts in the southern side of the river result in disturbance to the natural streambed material, restoration of the channel will occur. Temporary fill will be removed and the river channel and banks will be restored to pre-existing conditions as noted in the Temporary Impact Restoration section below.

A small amount of permanent impact to an emergent wetland will result from a construction access road in the southeast bridge quadrant. The fill for the road will remain in place post-construction to allow for future bridge maintenance access, however the road will be seeded to re-establish vegetation.

Existing Conditions / Wetland Resources

The project area includes the Cocheco River, adjacent wetlands, mowed right-of-way, and forested areas. The Dover Community Trail crosses beneath the bridges above the northern bank of the river. The surrounding area mostly consists of forested land and wetlands with residential areas beyond. Several wetlands and small streams are located adjacent to the project. Traffic control measures will remain within the existing roadway and median and these wetland resource areas will not be impacted. Proposed wetland resource impacts are limited to the Cocheco River channel/banks and a narrow emergent wetland in the southeast bridge quadrant ("Wetland 1).

Conservation land is located on the northwest side of NH Route 16. The easement is held by the Dover Conservation Commission and includes the portion of the Dover Community Trail outside of the right-of-way. No impact to this conservation area is proposed.

The portion of the Cocheco River within the project area is mapped as a Zone A floodplain but there is no regulatory floodway, based on a review of the current FEMA Flood Insurance Rate Map. There are no floodplain wetlands within the project limits. The crossing is a Tier 3 crossing, based on watershed size. The Cocheco River is a NH Designated River and contains state-listed species (American eel).

The segment of the Cocheco River within the project area is non-tidal. The tidal limit is approximately 1.5 miles downstream of the project at the Cocheco Falls Dam.

Wetland resources were delineated in May 2022 and are summarized in the enclosed Wetland Delineation Report.

Wetland & Watercourse Impacts

Total permanent and temporary wetland and watercourse impacts are estimated at 13,125 square feet and 571 linear feet (summarized below). Approximately 247 square feet of permanent wetland impact is anticipated as a result of the construction access road southeast of Bridge No. 106/133. Impacts shown below include the entire footprint of anticipated impacts, some of which overlap between construction seasons. Final construction access and dewatering methods are at the discretion of the contractor and impacts will be minimized during construction if possible. The impacts shown below will occur from access road, causeway, crane pad, and cofferdam installation and include the footprint of the work area to be dewatered.

No permanent watercourse impacts are proposed. Temporary fill within the Cocheco River will be in place for no more than one construction season.

The small amount of permanent wetland impact that is proposed is necessary to allow for future maintenance access. The impact will occur within a narrow, mowed portion of the wetland and is located on an existing path that appears to be a former access road.

Proposed Wetland & Watercourse Impacts

	Permanent		Temporary	
	SF	LF	SF	LF
Emergent Wetland (PEM1E)	247	-	0	-
Perennial Stream (R3RBH)	0	0	12,452	356
Bank – Perennial Stream	0	0	426	215
Total	247	0	12,878	571

Impaired Waters

The segment of the Cocheco River within the project area is listed as impaired for pH, mercury, and E. coli. Temporary impacts to the Cocheco River are proposed, however these impacts are not anticipated to affect the listed impairments. The project involves the addition of approximately 2,300 square feet of pavement. Since the listed impairments are not related to transportation activities and roadway runoff, no impacts are anticipated.

There are no Class A or Outstanding Resource Waters within or adjacent to the project area.

Fisheries

The Cocheco River is designated as Essential Fish Habitat for Atlantic salmon. American eel, alewife, and blueback herring have also been documented in the river near the crossing. An Essential Fish Habitat (EFH) Assessment Worksheet was submitted to NOAA in December 2023. NOAA recommended several conservation measures for the project. Two of the recommended conservation measures were determined to be not feasible for the project. NOAA accepted NHDOT's justification for why these two recommendations aren't feasible (refer to enclosed correspondence between NHDOT and NOAA).

Consultation with the NH Fish and Game Department (NHFG) occurred regarding potential impacts to state-listed fish species (refer to enclosed correspondence). NHFG expressed concern regarding the cofferdam during construction and whether this partial obstruction of the river channel would increase water velocity and obstruct fish passage. A hydraulic analysis was completed to evaluate this potential impact. The crossing was analyzed under three conditions: average flow, 2-year storm with no obstructions, and 2-year storm with the cofferdam and causeway in place. It was determined that the 2-year storm with no obstructions increases the velocity through the crossing by approximately 3 feet per second (fps) compared to average flow. The addition of the causeway/cofferdam is expected to further increase the 2-year storm velocity by a negligible amount (around 0.1 fps). This is because the river is still allowed to rise. Since the river has significant area to spread out, the velocity does not substantially increase. It should be noted that, due to the causeway/cofferdam, the depth of the water during the 2-year storm is approximately 2 feet greater than what it would be without the causeway/cofferdam.

The above hydraulic analysis summary was provided to NHFG. After reviewing the assessment NHFG agreed that the project should result in limited impacts to these species based on estimated velocities. NHFG also recommended that no in-water work occur between April 15th and June 1st to minimize impacts to migratory fish species. This time-of-year restriction was discussed with NHFG and it was agreed that the temporary cofferdams and causeways will be constructed prior to April 15th and will remain in place for the construction season. No new fill in the river will be placed between April 15th and June 1st.

Temporary Impact Restoration

At the end of each construction season, temporary fill (including the causeways, crane pads, and cofferdams) within the Cocheco River channel and bank will be removed. The proposed fill within Wetland 1 will remain in place after construction. Once construction is complete, jurisdictional areas that are temporarily impacted will be restored to pre-existing conditions. This will include:

- Removal of fill to restore pre-existing topography.
- Replacing rocks/boulders along the edge of the channel and bank to stabilize any impacted areas.
- Restoring natural streambed material in any disturbed areas. Any material that is placed would need to match the existing streambed material (approximately 40% boulder, 40% cobble, and 20% sand/silt)
- Seeding any open soil areas above the bank to re-establish vegetation.

A Phase IA/IB archaeological survey was completed for the project area and two small Pre-Contact archaeological sites were identified in the southeast and southwest bridge quadrants. Both sites are located in upland (non-jurisdictional) areas. The NH Division of Historical Resources and the NHDOT Cultural Resources Program determined that the proposed access roads in these quadrants can be constructed if the archaeological sites and sensitivity areas are protected by geotextile fabric, fill, and

NH Route 16 (Spaulding Turnpike) over the Cocheco River
Bridge Rehabilitation
Dover 41824

timber matting. The geotextile fabric and fill will be left in place to prevent subsurface disturbance. The access roads/fill will be loamed and seeded so the area is stabilized. Since the archaeologically sensitive areas are not located within wetlands or watercourses, allowing the fill to remain will not result in any additional impacts.

Mitigation

An email received from NHDES on February 21, 2024 confirmed that the project as proposed does not require mitigation (refer to enclosed correspondence). A response from USACE is pending and will be forwarded upon receipt. The project and mitigation requirements were also discussed at the June 21, 2023 NHDOT Natural Resource Agency Coordination Meeting (refer to enclosed meeting minutes).

All watercourse impacts are temporary since the fill within the Cocheco River and banks will be in place for no more than one construction season. The small amount of permanent wetland impact that is proposed (247 square feet) is located within a non-PRA wetland.



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



Water Division/Land Resources Management
Wetlands Bureau

[Check the Status of your Application](#)

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

APPLICANT'S NAME: NHDOT

TOWN NAME: Dover

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

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

PART I: AVOIDANCE AND MINIMIZATION

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

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

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

WETLAND AND WATERCOURSE IMPACTS HAVE BEEN AVOIDED AND MINIMIZED WHERE POSSIBLE DURING THE PROJECT DESIGN. REPLACEMENT OF THE EXISTING BRIDGE SUBSTRUCTURES WOULD RESULT IN A LARGER AMOUNT OF IMPACT TO THE RIVER.

UNDER THE PROPOSED ALTERNATIVE (BRIDGE REHABILITATION), NO PERMANENT WATERCOURSE IMPACTS ARE PROPOSED. THE PROPOSED PERMANENT WETLAND AND TEMPORARY WATERCOURSE IMPACTS ARE NECESSARY TO ACCESS THE BRIDGES FOR THE REHABILITATION WORK. THE CONSTRUCTION ACCESS ROADS ARE LOCATED ON THE SOUTHERN SIDE OF THE COCHECO RIVER TO AVOID IMPACTS TO TWO INTERMITTENT STREAMS AND ASSOCIATED FORESTED WETLANDS ON THE NORTHERN SIDE OF THE RIVER. THE PROPOSED PERMANENT IMPACT TO WETLAND 1 IN THE SOUTHEAST BRIDGE QUADRANT IS LOCATED WITHIN A CLEARED (EMERGENT) PORTION OF THE WETLAND, ALONG AN EXISTING PATH/ACCESS ROAD.

THE PROPOSED TEMPORARY IMPACT WITHIN THE COCHECO RIVER IS THE ANTICIPATED AREA THAT THE CONTRACTOR WILL NEED TO ACCESS THE BRIDGES AND COMPLETE THE REPAIR WORK. IMPACTS HAVE BEEN MINIMIZED BY LIMITING THE WORK AREA TO THE SOUTHERN SIDE OF THE RIVER AND AVOIDING IMPACTS TO THE NORTHERN SIDE OF THE RIVER CHANNEL. IMPACTS WILL BE FURTHER MINIMIZED DURING CONSTRUCTION, IF POSSIBLE.

THE USE OF A TRESTLE FOR CONSTRUCTION ACCESS IN THE RIVER WOULD RESULT IN LESS IMPACT, HOWEVER A CAUSEWAY IS NEEDED DUE TO SHALLOW BEDROCK IN THE CHANNEL. A TRESTLE CANNOT BE USED SINCE THERE IS NOT ENOUGH SOIL TO ENSURE PILE STABILITY.

lrn@des.nh.gov or (603) 271-2147

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

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, crustacean, shellfish, and wildlife of significant value.

N/A - The project does not involve impacts to any marshes.

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

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

A causeway and crane pad at each bridge location will be required to conduct the bridge repair work. Temporary cofferdams will be used to dewater the work area and direct river flow to the opposite side of the channel until the causeways are removed. The in-water work is expected to take two construction seasons, with the causeways and cofferdams being removed between the construction seasons.

The northern side of the Cocheco River will not be interrupted during any phase of construction and will remain open and unobstructed throughout the duration of the project. All impacts to the Cocheco River are temporary. As such, no changes to the existing hydrologic connections are anticipated as a result of the rehabilitation of the existing bridges.

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.

There are no exemplary natural communities or vernal pools within or adjacent to the project area. The NH Natural Heritage Bureau (NHB) Report indicated that American eel, a state-listed species as Special Concern, is known to occur near the project area. Since the project would involve potential impacts to a state-listed wildlife species, consultation with the NH Fish and Game Department (NHFG) occurred (correspondence is enclosed). NHFG commented that flow within the river should be maintained during construction so that American eel, as well as alewife (Special Concern) and blueback herring (Special Concern), movement isn't restricted. Also, per NHFG recommendation, temporary cofferdams and causeways will be constructed prior to April 15th and will remain in place for the construction season. No new fill in the river will be placed between April 15th and June 1st to minimize impacts to migratory fish species. At the end of each construction season, the temporary fill in the river banks and channel will be removed.

The USFWS IPaC report indicated that northern long-eared bat (NLEB) and monarch butterfly may occur within the project area. A No Effect Determination for NLEB was received using the Rangewide Determination Key in IPaC (refer to enclosed correspondence).

The Cocheco River is designated as Essential Fish Habitat (EFH) for Atlantic salmon. An EFH Assessment was completed and submitted to the National Marine Fisheries Service in December 2023 (refer to enclosed correspondence).

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 US Coast Guard does not consider the segment of the Cocheco River within the project area to be a navigable water.

The northern side of the river channel will remain unobstructed throughout the duration of the project and the temporary causeways will be removed after each construction season. As such, recreational boating will not be impacted beyond temporary disruptions while construction is occurring.

Phased construction will be used to maintain two lanes of traffic in each direction. Impacts to traffic from the project will be temporary and no long-term disruptions are anticipated.

The Dover Community Trail crosses under the bridges to the north of the Cocheco River. Temporary closures of the trail may be required during construction. No permanent impacts to the trail are proposed.

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 project does involve impacts to floodplain wetlands. There are floodplain wetlands adjacent to the Cocheco River upstream and downstream of the NH Route 16 bridges. No impacts to these wetlands are anticipated as they are beyond the project limits.

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.

N/A - The project does not involve impacts to riverine forested wetland systems or scrub-shrub-marsh complexes.

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 result in a small amount of permanent fill within an emergent wetland (247 square feet). No permanent impacts are proposed to surface waters. Temporary fill will be placed in the river for construction of the causeways and removed at the end of each construction season. Since the project involves the rehabilitation of two existing stream crossings, impacts are unavoidable. Proposed permanent and temporary impacts that will occur from accessing the bridges have been minimized where possible.

Groundwater aquifer levels are not expected to be adversely affected by the project since the majority of wetland and watercourse impacts associated with the project are temporary. Erosion and sediment controls will be used during construction to minimize temporary impacts to water quality.

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 involve temporary impacts to the channel of the Cocheco River. Flow will be diverted to the north side of the river during construction, which will result in a narrower channel width. A hydraulic analysis was completed that showed that with the cofferdam and causeway in place, there would be a negligible increase in water velocity but the water depth during the 2-year storm would increase by approximately 2 feet. These impacts will be temporary during construction. The cofferdam and causeway will be removed after each construction season and the stream channel and banks will be restored to pre-existing conditions after construction is complete. No long-term impacts to the Cocheco River or its ability to handle runoff of waters is anticipated.

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

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

N/A - The project does not involve shoreline structures.

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

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

N/A - The project does not involve shoreline structures.

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

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

N/A - The project does not involve shoreline structures.

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

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

N/A - The project does not involve shoreline structures.

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

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

N/A - The project does not involve shoreline structures.

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

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

N/A - The project does not involve shoreline structures.

PART II: FUNCTIONAL ASSESSMENT
<p>REQUIREMENTS</p> <p>Ensure that project meets the requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).</p>
<p>FUNCTIONAL ASSESSMENT METHOD USED:</p> <p>US Army Corps of Engineers Highway Methodology Workbook Supplement</p>
<p>NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT: JENNIFER RIORDAN (CWS #269)</p>
<p>DATE OF ASSESSMENT: 12/22/2023</p>
<p>Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT:</p> <p><input checked="" type="checkbox"/></p>
<p>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:</p> <p><input checked="" type="checkbox"/></p> <p>Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.</p>



AVOIDANCE AND MINIMIZATION
WRITTEN NARRATIVE
Water Division/Land Resources Management
Wetlands Bureau
[Check the Status of your Application](#)



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

APPLICANT'S NAME: NHDOT

TOWN NAME: Dover

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

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

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

No. The project is a bridge rehabilitation project that does not involve the construction of a water access structure.

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

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

No

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

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

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

N/A - The project does not propose more than one acre of permanent wetland or watercourse impacts, or any permanent impacts to PRA wetlands.

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

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

Wetland and watercourse impacts have been avoided and minimized where possible during the project design. No permanent impacts to the Cocheco River or its functions are proposed. A small amount of permanent wetland impact is proposed to Wetland 1, southeast of the bridges. No permanent impacts to Wetland 1's functions are anticipated. Locating the construction access on the southern side of the Cocheco River avoids impacts to the intermittent streams and forested wetlands on the northern side of the river. The construction access road in the southeast bridge quadrant will cross through a narrow, mowed portion of Wetland 1 that is located on an existing path/former access road. The forested, higher functioning portion of Wetland 1 that is located south of the project will remain undisturbed.

Use of a trestle for construction access in the river would result in less impact, however a causeway is needed due to shallow bedrock in the channel. A trestle cannot be used since there is not enough soil to ensure pile stability. The causeway will consist of rock placed on geotextile fabric and will be removed after each construction season.

The Cocheco River provides habitat for several migratory fish species. Based on recommendations received from the NH Fish and Game Department, temporary cofferdams and causeways will be constructed prior to April 15th and will remain in place for the construction season. No new fill in the river will be placed between April 15th and June 1st to minimize impacts to migratory fish species.

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

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

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

A functional assessment was completed for the wetlands within the project area (functional assessment forms are enclosed).

The project will not result in any substantial impacts to wetland functions since the project involves only a small amount of permanent wetland impact and work areas within the Cocheco River will be restored once construction is complete. The flow of the Cocheco River will be diverted to the northern side of the channel during construction but flow will not be interrupted. Wetland 1 (southeast of the bridges) will have a small amount of permanent impact from the construction of the construction access road. This impact area is within a cleared portion of the wetland along a existing path/former access road.

Functions provided by the Cocheco River include ecological integrity, education potential, fish habitat, flood storage, noteworthiness, production export, shoreline anchoring, uniqueness/heritage, recreation, and wildlife habitat. All of these functions are provided at the principal level except education potential, flood storage, and production export. Wetland 1 provides nutrient trapping and sediment trapping at the principal level. Flood storage is also provided, but not at the principal level. Since the project only involves a small amount of permanent impact, no loss of wetland functions is anticipated.

**BUREAU OF ENVIRONMENT
CONFERENCE REPORT**

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: June 21, 2023

LOCATION OF CONFERENCE: Virtual meeting held via Zoom

ATTENDED BY:

NHDOT

Matt Urban
Andrew O’Sullivan
Mark Hemmerlein
Jim Commerford
Rhona Thomson
Kirk Mudgett
Arin Mills
Anthony Weatherbee
Jason Ayotte
Dillan Schmidt
David Scott

ACOE

Mike Hicks

USCG

Gary Croot

EPA

Absent

NHDES

Karl Benedict
Mary Ann Tilton
Chris Williams
Kristin Duclos

NHB

Ashley Litwinenko

NH Fish & Game

Mike Dionne
Kevin Newton

Federal Highway

Absent

US Fish & Wildlife

Absent

The Nature Conservancy

Absent

**NH Transportation &
Wildlife Workgroup**

Absent

**Consultants/ Public
Participants**

Kimberly Peace
Michael Leach
Rene LeBranche
Jenn Riordan
Tom Levins
Stephen Haas
Chris Fournier

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

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proposed structure does not meet the span requirement. The proposed culvert meets the remaining general design criteria under 904.01 and complies with the provisions of 904.07 to the maximum extent practicable. The proposed culvert would substantially improve hydraulic capacity and connectivity, aquatic organism passage, sediment transport, and geomorphic compatibility.

Karl Benedict stated that the chosen alternative and alternative design preparation make sense. He asked to verify whether the stream was calculated as tier 2 or tier 3, since the watershed size makes it a tier 2 but it's on the edge of a 100 year floodplain.

Jim Commerford clarified that the watershed area would make it tier 2, but proximity to the 100 year floodplain combined with the identified species would make it tier 3.

Karl agreed and thanked Jim for the verification. His next comment was to ask whether wetland impact area 2 (upstream of the culvert) is accurately classified as palustrine emergent versus riverine? The lake level is 250 and the wetland area seems to be within that. The photos also show it within lake level. He requested to please verify whether impact area 2 is palustrine emergent or riverine. If these are PEM wetlands adjacent to a tier 3 stream, it could be a priority resource area, and permanent impacts would require mitigation just for those permanent impacts. So it would be helpful to dial that in relative to what the classification is, and note potential for priority resource area based on that.

Kevin Newton stated that coordination with Fish and Game was initiated a little over a month ago and it looks like DOT has incorporated Fish and Game comments on this.

Mike Dionne had no additional comments, other than appreciating the upgrade to this culvert.

Mike Hicks (ACOE) suggested making sure that NLEB analysis was done after April. A new procedure came out through IPaC, so he commented to make sure the new D key was used.

Andrew O'Sullivan stated that Jean Brochi from EPA was not on the call. Gary Croot (USCG) was on the call and didn't have any concerns with the crossing. Jamie Sikora (FHWA) was not on the call. NHB had a conflict and could not attend the meeting, but no concerns were identified with earlier coordination.

Dover, 41824 (Non-Fed):

Jenn Riordan (GM2) introduced the state funded project and provided an overview of the environmental resources and anticipated impacts. The project involves the proposed rehabilitation of the two bridges that carry NH Route 16 (Spaulding Turnpike) over the Cocheco River in Dover. Bridge No. 106/133 carries the northbound lane and Bridge No. 105/133 carries the southbound lane. Both bridges were constructed in 1957 and were rebuilt in 1991. They are currently on the State's Red List and are in need of repair. Proposed work includes the replacement of the superstructures, bearings, and expansion joints and repair of the existing substructures. Each bridge has three piers. The abutments are located above the bank. No new, permanent structures or riprap are proposed in the river.

Phased construction is proposed to maintain traffic. The project area extends approximately 1,400 feet to the south and approximately 1,100 feet to the north for traffic control measures, which will include median cross-overs. The bridges will be widened from 37'-9" to 40'. This will require minor roadway widening at each bridge approach to match the existing pavement to the wider bridges. Temporary impacts in the river are anticipated for construction access to perform the bridge work. Construction will occur in phases over three seasons.

Final design is expected to begin in August or September 2023, with the wetlands permit application being submitted in fall 2023. The project is scheduled to be advertised for construction in winter/spring 2024 with construction starting in late summer 2024.

Wetland resources include the Cocheco River (channel and banks), which is a Tier 3 crossing, NH Designated River, and has a Protected Shoreland. Two intermittent streams are located north of the bridges and will not be impacted by the project. A wetland is located southeast of the bridges. Temporary impacts to this wetland and the river are anticipated for construction of the access road.

GM2 initiated coordination with the Cocheco River Local Advisory Committee and will be sending updated project information.

Several impaired waters are located within the project area and nearby (Cocheco River, Indian Brook, and Berry Brook). The project is within a MS4 area. Net increase in impervious surface is estimated at 2,322 square feet. The total area of disturbance is 25,484 square feet (0.59 acres). This includes the temporary traffic control areas in the median. No stormwater treatment is currently proposed. No new drainage or modifications to point source discharges are proposed. Even though the total area of disturbance is less than 1 acre, a Construction Stormwater Pollution Prevention Plan (SWPPP) will be included in the environmental commitments due to the adjacent watercourse.

The NHB report included American eel (state-listed special concern). The USFWS IPaC report included northern long-eared bat and monarch butterfly. A No Effect determination was received for northern long-eared bat. The anticipated federal listing of tri-colored bat is being kept in mind. Tree clearing restrictions may be used to address USFWS requirements. The Cocheco River is designated as Essential Fish Habitat (EFH). An EFH assessment will be completed during the permitting phase.

The Dover Community Trail crosses under the bridges on the north side of the river. The City asked to be kept informed of any trail closures during construction. Conservation land is located northeast of the project area but no impacts are anticipated. There is a Zone A floodplain along the Cocheco River. The floodplain is contained within the river through the project area and doesn't extend beyond the channel. The US Coast Guard was contacted and responded that the river is non-navigable in the project area. The project is in a coastal zone community but no coordination is anticipated to be required under the Coastal Zone Management Act since the project is not federally funded and is expected to be covered under a USACE Section 404 General Permit. Invasive species are present throughout the project area. An invasive species management plan will be included in the environmental commitments.

Temporary impacts to the Cocheco River channel and banks are anticipated during construction. An access road, causeway and crane pad will be required on each side of the river to conduct the bridge repair work. Cofferdams will be used to dewater the work area and direct river flow to the opposite side of the channel. A causeway is needed due to shallow bedrock in the channel. A trestle can't be used since there isn't enough soil to ensure pile stability. The causeway will consist of rock placed on geotextile fabric and will be removed after construction. The temporary fill will be in place for no more than one construction season. In-water work is expected to take two seasons (one for the northbound side and one for the southbound side). Total impacts are estimated at 21,452 square feet and 693 linear feet (summarized below).

The project will be a Major Impact and will fall under Env-Wt 904.09 (rehabilitation of a Tier 3 crossing).

	Causeway / Access Road	Dewatering	Total
Bank	457 SF / 113 LF	205 SF / 238 LF	662 SF / 351 LF
Channel	7,093 SF / 109 LF	13,075 SF / 233 LF	20,168 SF / 342 LF
Wetland	622 SF	0 SF	622 SF
		Total	21,452 SF / 693 LF

The meeting was then opened for comments and discussion.

Karl Benedict (NHDES)

- Recommend water quality review through DES watershed program for causeway placement
- Deferred to Kristin Duclos

Kristin Duclos (NHDES)

- Is the Cocheco River tidal in the project area?
 - Jenn Riordan replied no, the tidal limit is further downstream.
- Are any permanent access roads proposed?
 - Jenn Riordan responded no. Access roads will be temporary during construction.
 - Andy O (NHDOT) confirmed no mitigation as all impacts are temporary and DES confirmed no mitigation is anticipated.

Chris Williams (NHDES Coastal Program)

- No concerns. The project as described is not subject to CZM jurisdiction.

Mary Ann Tilton (NHDES)

- No concerns

Kevin Newton (NH Fish & Game)

- Time of year restrictions will be recommended for fish

- Will cofferdams increase velocity and have potential to cause bank erosion? Tom L stated work would be done during low flow and water flow is dam controlled causing water flow to be regulated. No bank erosion is anticipated.

Mike Dionne (NH Fish & Game)

- Recommended time of year restriction for in-water work is April 15th to July 1st for anadromous fish Recommend loud/impactful work be minimized during this time for herring.
 - Tom Levins mentioned that the causeway would need to be in place at the start of the construction phase (early summer) and would be in place until the fall. The full construction season is needed.
- Suggested meeting with the NH Fish & Game Marine Division to further discuss the project. The herring run has been down in the past few years and they want to protect the resource.
- Mentioned concern with velocity increases during storm events with the reduced channel width during construction. Herring move upstream through the project area.
 - Andy Sullivan suggested looking at flow data and regional curves to estimate the 2-year storm.

Mike Hicks (USACE)

- What is the magnitude of impact below ordinary high water?
 - Jenn Riordan responded that the total channel impacts are over 20,000 square feet.
- Any special aquatic sites in project area? Jenn R responded there is not.
- Asked if plans could be provided with a brief narrative on impacts. Mike will send this to Taylor Bell (USACE) to determine if mitigation might be necessary.

Gary Croot (USCG)

- No comments

Mark Hemmerlein (NHDOT)

- The plans should show the slope lines for the construction access road.

Moultonborough, 40639 (X-A004(447)):

Jason Ayotte (NHDOT) and Kimberly Peace (Hoyle Tanner) introduced the project- this is the first NR meeting for the project. NH Route 25 (Whittier Highway) is minor arterial roadway along the northwest side of Lake Winnepesaukee connecting Meredith to Ossipee through Moultonborough and Center Harbor and serves as an east-west connection between the I-93 and NH Route 16 corridors. Within the project area (Lake Shore Drive West to Lake Shore Drive East in Moultonborough) the roadway carries 16,200 vehicles per day (2020 AADT) at posted speeds ranging from 30 to 45 mph. The 2008 "NH Route 25 Corridor Study" prepared by the Lakes Region Planning Commission evaluated existing and future conditions along NH Route 25 in Center Harbor and Moultonborough, identified safety and capacity concerns and provided recommendations for vehicular and pedestrian improvements. Specific improvements were identified for the intersections of NH Route 25 with Lake Shore Drive (West) and Glidden Road. Improvements to these intersections, along with Lake Shore Drive (East) intersection and

Jennifer Riordan

From: Benedict, Karl <Karl.D.Benedict@des.nh.gov>
Sent: Wednesday, February 21, 2024 12:15 PM
To: Jennifer Riordan
Cc: Mills, Arin
Subject: [WARNING-EXT]RE: RE: Dover 41824 - Mitigation Follow-up

Hello,

I did get a chance to coordinate with our mitigation program to confirm that the change of 274 square ft. of permanent fill would not result in associated mitigation for the project.

Please reach out with any additional questions. Thanks

Karl Benedict, Public Works Subsection Supervisor
Land Resources Management
Water Division, NH Department of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302
Phone: (603) 271-4194
Fax: (603) 271-6588
Email: Karl.Benedict@des.nh.gov



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We greatly appreciate your feedback. Please take a moment to fill out our 3-minute [NHDES-LRM customer satisfaction survey](#).

From: Jennifer Riordan <JRiordan@GM2INC.COM>
Sent: Monday, February 19, 2024 1:51 PM
To: Benedict, Karl <Karl.D.Benedict@des.nh.gov>
Cc: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Subject: FW: RE: Dover 41824 - Mitigation Follow-up

EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Hi Karl,

Below is some correspondence with USACE regarding mitigation for the Spaulding Turnpike over the Cocheco River bridge rehabilitation project (NHDOT Project No. 41824). At the June 2023 Natural Resource Agency Meeting, the project was presented as having only temporary wetland & watercourse impacts. The proposed work has since changed to include approximately 247 SF of permanent fill within a narrow, emergent wetland adjacent to the highway. This is for a construction access road that NHDOT is proposing to leave in place to allow for future maintenance access. The temporary fill within the Cocheco River for the causeway and cofferdam will be in place for no more than one construction season (this has not changed since the project was last discussed with NHDES).

We are planning to submit the Wetlands Permit application within the next month and I wanted to confirm that no mitigation is required prior to submitting the application. Attached is a project narrative and draft impact plan. Please let me know if you need anything further.

Thanks,

Jenn

JENNIFER RIORDAN, CWS, CPESC

P 603.856.7854 | C 603.724.4950



From: Hicks, Michael C CIV USARMY CENAE (USA) <Michael.C.Hicks@usace.army.mil>
Sent: Monday, February 19, 2024 11:32 AM
To: Lefebvre, Lindsey E CIV USARMY CENAE (USA) <Lindsey.E.Lefebvre@usace.army.mil>
Cc: Jennifer Riordan <JRiordan@GM2INC.COM>
Subject: RE: [WARNING-EXT] RE: Dover 41824 - Mitigation Follow-up

Lindsey,

Below is new information on the mitigation for this project, asking to confirm if the project still does not require mitigation.

Jennifer, I assume the NHDES has these changes, as well.

Thanks,
Mike

From: Jennifer Riordan <JRiordan@GM2INC.COM>
Sent: Monday, February 19, 2024 9:38 AM
To: Hicks, Michael C CIV USARMY CENAE (USA) <Michael.C.Hicks@usace.army.mil>
Subject: [Non-DoD Source] RE: [WARNING-EXT] RE: Dover 41824 - Mitigation Follow-up

Hi Mike,

There has been a change in proposed impacts on the Spaulding Turnpike Bridge project (Dover 41824) and I wanted to follow-up regarding mitigation requirements. In my previous email and at the June 2024 NHDOT Natural Resource Agency meeting, the project proposed only temporary wetland and watercourse impacts. Now NHDOT is proposing to leave the construction access roads in place to allow for future maintenance access. This will result in 247 SF of permanent impact within an emergent wetland adjacent to the highway. All fill within the Cocheco River for the causeways and cofferdams will be removed so no permanent watercourse impacts are proposed.

Attached is an updated plan and project summary. I'd like to confirm that the project still does not require mitigation. Please let me know if you need any further information.

Thanks,

Jenn

JENNIFER RIORDAN, CWS, CPESC

P 603.856.7854 | C 603.724.4950



From: Hicks, Michael C CIV USARMY CENAE (USA) <Michael.C.Hicks@usace.army.mil>

Sent: Thursday, October 19, 2023 12:50 PM

To: Jennifer Riordan <JRiordan@GM2INC.COM>

Subject: [WARNING-EXT] RE: Dover 41824 - Mitigation Follow-up

Jennifer,

It looks like there are no permanent impacts and no work in SAS or SAV since the Cocheco is not tidal up there, therefore I don't expect any mitigation required by the Corps. No S. 408, either since you are above the dam in Dover.

Thanks,

Mike

From: Jennifer Riordan <JRiordan@GM2INC.COM>

Sent: Wednesday, October 18, 2023 1:37 PM

To: Hicks, Michael C CIV USARMY CENAE (USA) <Michael.C.Hicks@usace.army.mil>

Subject: [Non-DoD Source] FW: Dover 41824 - Mitigation Follow-up

Hi Mike,

Just following up on this email. Please let me know if you need any further project information.

Thanks,

Jenn

JENNIFER RIORDAN, CWS, CPESC

P 603.856.7854 | C 603.724.4950



From: Jennifer Riordan

Sent: Wednesday, August 23, 2023 12:46 PM

To: 'Hicks, Michael C CIV USARMY CENAE (USA)' <Michael.C.Hicks@usace.army.mil>

Cc: 'Mills, Arin' <Arin.J.Mills@dot.nh.gov>; Newsom, Sam <Sam.B.Newsom@dot.nh.gov>; Weatherbee, Anthony <Anthony.N.Weatherbee@dot.nh.gov>; Sargent, John <John.A.Sargent@dot.nh.gov>; Darren Blood <DBlood@GM2INC.COM>; Tom Levins <TLevins@GM2INC.COM>; OSullivan, Andrew <Andrew.M.OSullivan@dot.nh.gov>

Subject: Dover 41824 - Mitigation Follow-up

Hi Mike,


As requested at the June 21st NHDOT Natural Resource Agency Coordination Meeting, attached are plans, impact numbers, and a narrative for the Dover 41824 project (NH Route 16 bridges over the Cochecho River). We are looking to confirm that the impacts are considered temporary and no mitigation will be required.

I should note that the Southbound construction phase access route has been changed since the June Natural Resource Meeting. The plans presented at the meeting showed the access route and causeway for the Southbound construction phase on the north side of the river. After further evaluation of this access route and the existing topography, it was determined that impacts to the nearby wetlands would be necessary to construct the temporary access road. Locating the access road in the southwest bridge quadrant will reduce wetland impacts. In addition, all temporary impacts in the river channel will occur within the southern portion of the channel, instead of on both sides. There is some overlap of the impact areas between the two construction phases. The impact table in the attached document shows the impacts for each phase and doesn't account for the overlap. The temporary fill will be removed between construction seasons (i.e., the Southbound phase will be constructed during one season, temporary fill will be removed for the winter and put in place for the Northbound phase during the next construction season, and then removed again once all work is complete).

Please let me know if you have questions or need any further information on the project.

Thanks,

Jenn

 CT RI NH MA NY FL www.gm2inc.com	JENNIFER RIORDAN, CWS, CPESC Senior Environmental Scientist P 603.856.7854 C 603.724.4950
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NH Route 16 (Spaulding Turnpike) over the Cocheco River
Bridge Rehabilitation
Dover 41824

WETLAND DELINEATION REPORT

Prepared for:



NH Department of Transportation
7 Hazen Drive
Concord, NH 03302

Prepared by:



GM2 Associates, Inc.



January 2024

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- B. Wetland Determination Data Forms
- C. NHDES Functional Assessment Worksheets

1.0 INTRODUCTION

This report provides a summary of the wetland resources that were delineated for the NH Route 16 (Spaulding Turnpike) crossing over the Cocheco River in Dover, New Hampshire. The project involves the rehabilitation of the two existing Spaulding Turnpike bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cocheco River.

2.0 METHODOLOGY

The study area for the wetland delineation included approximately 150 feet west (upstream) and 150 east (downstream) of the crossing and approximately 530 feet north and 630 feet south of the crossing. The entire project area extends approximately 1,000 feet north of the bridges, to the Sixth Street bridge, and approximately 1,300 feet south of the bridges for traffic control during construction. Since no impacts beyond the existing roadway and median are proposed further from the bridges, the wetland delineation focused on the area under and adjacent to the bridges and did not extend to the northern and southern project limits (refer to Wetland Delineation Map in Appendix A for the wetland delineation limits).

The delineation was completed on May 27, 2022 by Jennifer Riordan (NH Certified Wetland Scientist #269) and Ethan Maskiell of GM2 Associates, Inc. (GM2). Wetlands were delineated in accordance with the US Army Corps of Engineers (USACE) 1987 Methodology and the USACE Northcentral and Northeast Regional Supplement (2012). Individually-labeled flags were placed in the field to designate the wetland resource boundaries and the flags were survey located. Where applicable, individually-labeled ordinary high water (OHW) and top of bank (TOB) flags were also placed within the study area and survey located. USACE wetland determination data forms were completed on December 5, 2023 and are included in Appendix B.

Federal wetland classifications were assigned in accordance with “Classification of Wetlands and Deepwater Habitats of the United States” (Federal Geographic Data Committee, 2013). Wetland functions were assessed in accordance with the USACE New England District Highway Methodology Workbook Supplement (1999). NH Department of Environmental Services Functional Assessment worksheets were completed and are included in Appendix C.

The wetland delineation was conducted during abnormally dry conditions, based on a review of the U.S. Drought Monitor map.

3.0 SITE DESCRIPTION

The study area includes the Cocheco River, adjacent wetlands and small streams, mowed right-of-way, and forested areas. To the northwest of the bridges is an intermittent stream and a forested wetland that flows into the Cocheco River near the Southbound bridge. Northeast of the project area is a second intermittent stream that flows into the Cocheco River near the Northbound bridge. There is an upland forested area southwest of the bridges. The area southeast of the bridges includes a forested/emergent wetland near NH Route 16 with an area of undeveloped forest closer to the Northbound bridge and the Cocheco River. Beyond the study area, there are blocks of fragmented forest interspersed with residential areas. Tree species within the forested areas include white pine (*Pinus strobus*), northern red oak (*Quercus rubra*), eastern hemlock (*Tsuga canadensis*), shagbark hickory (*Carya ovata*), and black locust (*Robinia pseudoacacia*).

The project area beyond the wetland delineation limits consists of paved highway and mowed shoulders and median. Several wetlands and streams that were not delineated are located beyond the project limits. A forested wetland and intermittent stream northwest of the bridges and an intermittent stream northeast of the bridges

continue north beyond the project limits. A stream is located southwest of the bridges and a forested wetland and a floodplain wetland are located southeast of the project limits. Approximate locations of these resources are shown on the included Wetland Delineation Map.

The portion of the Cocheco River within the project area is mapped as a Zone A floodplain but there is no regulatory floodway, based on a review of the current FEMA Flood Insurance Rate Map. The segment of the Cocheco River within the project area is non-tidal. The tidal limit is approximately 1.5 miles downstream of the project at the Cocheco Falls Dam.

4.0 SUMMARY OF WETLAND RESOURCES

4.1. Cocheco River (Flag Series A & B and OHW)

Classification:

riverine, upper perennial, rock bottom, permanently flooded (R3RBH)

The top of bank of the Cocheco River (Flag Series A-1 to A-2, A-14 to A-20, A-17A to A-18A, and B-1 to B-10) was delineated as it flows from west to east at the crossing. Ordinary high water was also flagged. The segment of the Cocheco River under and adjacent to the bridges varies from approximately 120 feet to 140 feet wide. During the site visit in May 2022, the water was approximately 2 to 3 feet deep with deeper areas approximately 5 to 6 feet deep. The substrate consists of approximately 40% boulders and 40% cobbles with approximately 10% sand and 10% silt. The banks are approximately 2 to 4 feet tall with rocks and riprap near the bridges and vegetated, slightly eroded banks upstream and downstream of NH Route 16.

Vegetation adjacent to the northern bank of the river (Flag Series A) includes white pine, northern red oak, eastern hemlock, common mugwort (*Artemisia vulgaris*), Japanese knotweed (*Fallopia japonica*), oriental bittersweet (*Celastrus orbiculatus*), and glossy buckthorn (*Frangula alnus*). Vegetation adjacent to the southern bank of the river (Flag Series B) includes black locust, shagbark hickory, Virginia creeper (*Parthenocissus quinquefolia*), silky dogwood (*Cornus amomum*), glossy buckthorn, and oriental bittersweet.



Functions provided by the Cocheco River include ecological integrity, education potential, fish habitat, flood storage, noteworthiness, production export, shoreline anchoring, uniqueness/heritage, recreation, and wildlife habitat. All of these are provided at the principal level except education potential, flood storage, and production export.

Cocheco River
View south towards Flag Series B (southern bank)
Photo taken 5/27/22

4.2 Wetland 5 & Intermittent Stream 10 (Flag Series A and OHW)

Classification:

palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated (PFO1E)
riverine, intermittent, streambed (R4SB)

Wetland 5 (Flag Series A-3 to A-13) and Intermittent Stream 10 are located north of the Cocheco River and west of NH Route 16. The stream flows from north to south into the Cocheco River. It is connected to Intermittent Stream 6 through a culvert under the Dover Community Trail. At the time of the site visit, the stream had approximately 1 to 3 inches of flowing water. The substrate consists of sand and gravel with some cobbles and small rocks. Vegetation within Wetland 5 includes shagbark hickory, silky dogwood, sensitive fern (*Onoclea sensibilis*), and common jewelweed (*Impatiens capensis*), with northern red oak and Virginia creeper at the wetland edge.

Wetland 5 and its associated intermittent stream provide flood storage, groundwater recharge, nutrient trapping, sediment trapping, and shoreline anchoring. None of these functions are provided at a principal level.



Wetland 5/Intermittent Stream
10 (Flag Series A) northwest of
bridges
View north
Photo taken 5/27/22

4.3 Wetland 8 & Intermittent Stream 9 (Flag Series A and OHW)

Classification:

palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated (PFO1E)
riverine, intermittent, streambed (R4SB)

Wetland 8 (Flag Series A-21 to A-37 and A-1A to A-16A) and Intermittent Stream 9 are located north of the Cocheco River and east of NH Route 16. The stream flows parallel to the highway, under a pedestrian bridge, and into the Cocheco River just east of the NH Route 16 Northbound bridge. Most of the area adjacent to Intermittent Stream 9 is upland, except for a narrow riparian wetland area (Wetland 8) located between the stream and NH Route 16, approximately 200 feet north of the Northbound bridge.

At the time of the site visit, approximately 1 to 3 inches of water was flowing in the stream channel. The substrate primarily consists of sand, rocks, and some bedrock. The banks are approximately 2 to 5 feet tall with eroded areas near the Cocheco River. Vegetation includes green ash (*Fraxinus pennsylvanica*), smooth arrowwood (*Viburnum dentatum*), highbush blueberry (*Vaccinium corymbosum*) sensitive fern, and cinnamon fern (*Osumundastrum cinnamomeum*), with Japanese knotweed near the Cocheco River.

Intermittent Stream 9 and Wetland 8 provide flood storage, groundwater recharge, nutrient trapping, sediment trapping, and shoreline anchoring. All of these functions are provided at the principal level except nutrient trapping.



Intermittent Stream 9 (Flag Series A) northeast of bridges
View north
Photo taken 5/27/22

4.4 Wetland 1 (Flag Series C)

Classification:

palustrine, emergent, persistent, seasonally flooded/saturated (PEM1E)

palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated (PFO1E)

Wetland 1 (Flag Series C) includes an emergent/forested wetland located southeast of the bridges adjacent to NH Route 16 Northbound. The wetland had saturated soils and areas with 1 to 2 inches of standing water during the May 2022 site visit. The emergent portion is located at the narrow northern extent of the wetland. The forested portion is located south of the emergent area and it continues south and southeast beyond the study area.

Vegetation in the emergent portion includes meadow buttercup (*Ranunculus acris*), green bulrush (*Scirpus atrovirens*), soft rush (*Juncus effusus*), and grasses. Red maple (*Acer rubrum*) and glossy buckthorn are located at the edge. The forested portion is vegetated with red maple, speckled alder (*Alnus incana*), highbush blueberry, and sensitive fern.

Wetland 1 functions include flood storage, nutrient trapping, and sediment trapping. Of these, nutrient trapping and sediment trapping are provided at the principal level.

Dover 41824 Wetland Delineation Report
NH Route 16 (Spaulding Turnpike) over the Cocheco River
Bridge Rehabilitation



Wetland 1 (Flag Series C)
emergent portion
View south
Photo taken 5/27/22



Wetland 1 (Flag Series C)
forested portion
View west
Photo taken 5/27/22

4.5 Intermittent Stream 6 and Wetland 7 (Flag Series D and OHW)

Classification:

palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated (PFO1E)
riverine, intermittent, streambed (R4SB)

Intermittent Stream 6 is located north of the bridges, on the west side of NH Route 16. The stream flows from north to south and had approximately 1 inch of flowing water during the May 2022 site visit. The banks of the stream are approximately 4 to 6 feet tall and are vegetated with white oak (*Quercus alba*), northern red oak, and slippery elm (*Ulmus rubra*). The substrate consists of sand and silt with organic debris and some cobbles. Intermittent Stream 6 connects to Wetland 5/Intermittent Stream 10 through a 36-inch culvert under the Dover Community Trail.

Wetland 7 (Flag Series D) is a forested wetland that is associated with Intermittent Stream 6. The wetland begins near the northern edge of the study area and continues further north along the west side of the NH Route 16. Areas of the wetland had approximately 1 to 2 inches of standing water at the time of the site visits. Vegetation within the wetland includes red maple, winterberry (*Ilex verticillata*), and sensitive fern.

Functions provided by Wetland 7 and Intermittent Stream 6 include flood storage, groundwater recharge, nutrient trapping, sediment trapping, shoreline anchoring, and wildlife habitat. All of these are provided at the principal level except nutrient trapping and wildlife habitat.



Intermittent Stream 6 (OHW)
View northeast
Photo taken 5/27/22



Wetland 7 (Flag Series D)
forested portion
View west
Photo taken 5/27/22

5.0 STREAM CROSSING ASSESSMENT

The two four-span bridges to be rehabilitated carry NH Route 16 Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) over the Cocheco River. The watershed size at the crossing is approximately 110,605 acres (172.82 mi²), making it a Tier 3 crossing. The Cocheco River is also a NH Designated River. In accordance with Env-Wt 900, a stream crossing assessment was conducted utilizing a combination of field observations and desktop analysis using aerial imagery and LiDAR data available from NH GRANIT. Field measurements of bankfull width, maximum bankfull depth, and flood prone width were not able to be taken at the time of the site visits on May 27, 2022 and December 5, 2023 due to the depth and width of the river.

The Dover Community Trail, two intermittent streams connected to the river, areas of forested wetland, forested upland, and mowed right-of-way are located on the northern side of the Cocheco River. The southern side has an upland forested area to the southwest and a forested/emergent wetland to the southeast. Vegetation along the edge of the river includes white pine, northern red oak, eastern hemlock, black locust, shagbark hickory, Japanese knotweed, silky dogwood, and glossy buckthorn.

Stream crossing assessment measurements of bankfull width and flood prone width were completed using NH GRANIT LiDAR data for two segments of the river: the NH Route 16 crossing, located approximately 150 feet to approximately 350 feet upstream of the bridges; and a reference reach located approximately 4,700 feet (0.9 mi) upstream of the bridges. The widths that were determined using desktop data and maps were consistent with field observations. During site visits, the flood prone width was observed to be only slightly wider than bankfull width, given site topography. The predicted bankfull width based on the New Hampshire 2005 Regional Hydraulic Geometry Curves is 155 feet, which is also consistent with the values measured using LiDAR maps.

Maximum bankfull depth was calculated for the stream assessment using the New Hampshire 2005 Regional Hydraulic Geometry Curves. Water depth observed at the time of the site visits ranged from approximately 2 to 6 feet and the average bankfull depth observed in the field appeared consistent with the value predicted by the regional hydraulic curves (5.06 feet).

Substrate at the crossing location consists of approximately 40% boulder, 40% cobble, 10% sand, and 10% silt, based on field observations. Tables 5-1 and 5-2 provide a summary of the stream measurements.

**Table 5-1
 Cocheco River – Crossing Location (NH Route 16 bridges)**

	Estimated Bankfull Width (Feet)*	Estimated Max Bankfull Depth (Feet)**	Estimated Flood Prone Width (Feet)*
Cross Section 1	168	5.06	207
Cross Section 2	139	5.06	226
Cross Section 3	148	5.06	378
Average	151.6	5.06	270.3

*Bankfull width and flood prone width were estimated using LiDAR elevation data in GRANIT, combined with aerial photographs, FEMA floodplain maps, and site observations.

**Maximum bankfull depth was estimated using the New Hampshire 2005 Regional Hydraulic Geometry Curves.

**Table 5-2
 Cocheco River – Reference Reach**

	Estimated Bankfull Width (Feet)*	Estimated Max Bankfull Depth (Feet)**	Estimated Flood Prone Width (Feet)*
Cross Section 1	147	5.06	163
Cross Section 2	104	5.06	135
Cross Section 3	181	5.06	257
Average	144	5.06	185

*Bankfull width and flood prone width were estimated using LiDAR elevation data in GRANIT, combined with aerial photographs, FEMA floodplain maps, and site observations.

**Maximum bankfull depth was estimated using the New Hampshire 2005 Regional Hydraulic Geometry Curves.

The following values were calculated from the above measurements. Sinuosity was measured along an approximately 2.5-mile-long segment of the river in GIS using LiDAR elevation data and orthoimagery.

- Average entrenchment ratio
 - Crossing Location: 1.80 (range of 1.23 to 2.55)
 - Reference Reach: 1.28 (range of 1.11 to 1.42)
- Average width to depth ratio
 - Crossing Location: 30.0 (range of 29.2 to 33.2)
 - Reference Reach: 28.5 (range of 20.6 to 35.8)
- Sinuosity = 1.11

Given the above measurements and general field observations, it appears that the Rosgen classification for the Cocheco River at the crossing location is Type B. The segment of the river at the reference reach also has the characteristics of a Type B stream although it has a lower entrenchment ratio than the crossing location.

6.0 REFERENCES

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Federal Geographic Data Committee. 2013. *Classification of wetlands and deepwater habitats of the United States*. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Army Corps of Engineers New England District. 1999. *The Highway Methodology Workbook Supplement: Wetland Functions and Values*. NEDEP-360-1-30a.












APPENDIX A

Wetland Delineation Map



:HWODQGV ZHUH GHOLQHDWHG E\ -
 RI *0 \$VVRFLDWHV ,QF RQ OD\
 ZLWK WKH 86 \$UP\ &RUSV RI (QJ
 0HWKRGRORJ\ DQG WKH 86\$&(1RU
 5HJLRQDO 6XSSOHPHQW

/HJHQG

-  'HOLQHDWHG :H VODQQ
-  7RS RI %DQN
-  2UGLQDU\ +LJK DWHU
-  /LPLW RI :HWOD QG
-  'HOLQHDWLRQ
-  QQLIHU 5LRUGDQ & \$WODQ
-  \$S SUFLRUDWH F
-  L'RW FFRUJHG
-  QHHUV 86\$&(
-  KEHQW 86\$&(1RU
-  1RW)ODJJHG



YH

APPENDIX B

Wetland Determination Field Data Forms

Project/Site: Dover 41824 City/County: Dover/Strafford Sampling Date: 12/5/23
 Applicant/Owner: NHDOT State: NH Sampling Point: C-Wet
 Investigator(s): J. Riordan, E. Maskiell Section, Township, Range: _____
 Landform (hillside, terrace, etc.): toe of roadside slope Local relief (concave, convex, none): convex Slope %: <2
 Subregion (LRR or MLRA): LRR R Lat: 43.205 Long: 70.897 Datum: _____
 Soil Map Unit Name: BzB - Buxton silt loam, 3 to 8 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland C</u>
---	--

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ___ Surface Water (A1) ___ Water-Stained Leaves (B9) <u>X</u> High Water Table (A2) ___ Aquatic Fauna (B13) <u>X</u> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5)
---	--

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>5</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 surface water approximately 2 feet away

VEGETATION – Use scientific names of plants.

Sampling Point: C-Wet

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u><i>Acer rubrum</i></u>	38	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B) Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. <u><i>Betula populifolia</i></u>	3	No	FAC	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	<u>41</u>	=Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u><i>Alnus incana</i></u>	20	Yes	FACW	
2. <u><i>Vaccinium corymbosum</i></u>	10	Yes	FACW	
3. <u><i>Betula populifolia</i></u>	3	No	FAC	
4. <u><i>Spiraea latifolia</i></u>	3	No	FACW	
5. _____				
6. _____				
7. _____				
	<u>36</u>	=Total Cover		
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				
1. <u><i>Onoclea sensibilis</i></u>	38	Yes	FACW	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>38</u>	=Total Cover		
<u>Woody Vine Stratum</u> (Plot size: <u>30'</u>)				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
1. <u>None</u>				
2. _____				
3. _____				
4. _____				
				Hydrophytic Vegetation Present? Yes <u>X</u> No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point C-Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/2	100					Mucky Loam/Clay	organic material
2-6	10YR 4/2	100					Loamy/Clayey	
6-14	10YR 4/2	95	10YR 4/6	5	C	M	Loamy/Clayey	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Mesic Spodic (A17)
- (MLRA 144A, 145, 149B)**
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- High Chroma Sands (S11) (LRR K, L)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR K, L)
- Red Parent Material (F21) (MLRA 145)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Red Parent Material (F21) (outside MLRA 145)
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Project/Site: Dover 41824 City/County: Dover/Strafford Sampling Date: 12/5/23
 Applicant/Owner: NHDOT State: NH Sampling Point: C-Up
 Investigator(s): J. Riordan, E. Maskiell Section, Township, Range: _____
 Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope %: <2
 Subregion (LRR or MLRA): LRR R Lat: 43.205 Long: 70.897 Datum: _____
 Soil Map Unit Name: BzB - Buxton silt loam, 3 to 8 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: C-Up

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u><i>Pinus strobus</i></u>	38	Yes	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>14.3%</u> (A/B)
2. <u><i>Acer rubrum</i></u>	20	Yes	FAC	
3. <u><i>Quercus rubra</i></u>	20	Yes	FACU	
4. <u><i>Carya ovata</i></u>	10	No	FACU	
5. _____				
6. _____				
7. _____				
	<u>88</u>	=Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u><i>Fagus grandifolia</i></u>	20	Yes	FACU	Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>3</u> x 2 = <u>6</u> FAC species <u>23</u> x 3 = <u>69</u> FACU species <u>100</u> x 4 = <u>400</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>126</u> (A) <u>475</u> (B) Prevalence Index = B/A = <u>3.77</u>
2. <u><i>Acer rubrum</i></u>	3	No	FAC	
3. <u><i>Carya ovata</i></u>	3	No	FACU	
4. <u><i>Pinus strobus</i></u>	3	No	FACU	
5. <u><i>Vaccinium corymbosum</i></u>	3	No	FACW	
6. _____				
7. _____				
	<u>32</u>	=Total Cover		
<u>Herb Stratum</u> (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u><i>Dendrolycopodium obscurum</i></u>	3	Yes	FACU	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u><i>Pinus strobus</i></u>	3	Yes	FACU	
3. <u>Unknown grass</u>	3	Yes		
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>9</u>	=Total Cover		
<u>Woody Vine Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>None</u>				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
				Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point C-Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 4/2	50	10YR 4/3	50			Loamy/Clayey	
4-12	10YR 5/4	98	10YR 6/4	2			Loamy/Clayey	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Mesic Spodic (A17)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- High Chroma Sands (S11) **(LRR K, L)**
- Loamy Mucky Mineral (F1) **(LRR K, L)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) **(LRR K, L)**
- Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- Coast Prairie Redox (A16) **(LRR K, L, R)**
- 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- Polyvalue Below Surface (S8) **(LRR K, L)**
- Thin Dark Surface (S9) **(LRR K, L)**
- Iron-Manganese Masses (F12) **(LRR K, L, R)**
- Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- Red Parent Material (F21) **(outside MLRA 145)**
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:
 10YR 4/3 50% included in 0-4 matrix, 10YR 6/4 2% included in 4-12 matrix

Project/Site: Dover 41824 City/County: Dover/Strafford Sampling Date: 12/5/23
 Applicant/Owner: NHDOT State: NH Sampling Point: D-Wet
 Investigator(s): J. Riordan, E. Maskiell Section, Township, Range: _____
 Landform (hillside, terrace, etc.): toe of roadside slope Local relief (concave, convex, none): convex Slope %: <2
 Subregion (LRR or MLRA): LRR R Lat: 43.207 Long: 70.896 Datum: _____
 Soil Map Unit Name: SfC - Suffield silt loam, 8 to 15 percent slopes NWI classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland D</u>
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) <u>X</u> High Water Table (A2) ___ Aquatic Fauna (B13) <u>X</u> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 surface water approximately 3 feet away

VEGETATION – Use scientific names of plants.

Sampling Point: D-Wet

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u><i>Acer rubrum</i></u>	63	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B) Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
	63	=Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. <u><i>Acer rubrum</i></u>	38	Yes	FAC	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
2. <u><i>Ilex verticillata</i></u>	20	Yes	FACW		
3. <u><i>Cornus amomum</i></u>	3	No	FACW		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
	61	=Total Cover			
Herb Stratum (Plot size: <u>5'</u>)					
1. <u><i>Onoclea sensibilis</i></u>	63	Yes	FACW		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
	63	=Total Cover			
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. <u>None</u>	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
	=Total Cover				
Hydrophytic Vegetation Present?				Yes <u>X</u> No _____	

Remarks: (Include photo numbers here or on a separate sheet.)

Project/Site: Dover 41824 City/County: Dover/Strafford Sampling Date: 12/5/23
 Applicant/Owner: NHDOT State: NH Sampling Point: D-Up
 Investigator(s): J. Riordan, E. Maskiell Section, Township, Range: _____
 Landform (hillside, terrace, etc.): roadside slope Local relief (concave, convex, none): convex Slope %: 5
 Subregion (LRR or MLRA): LRR R Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: SfC - Suffield silt loam, 8 to 15 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: D-Up

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: <u> 30' </u>)																				
1. <u>Pinus strobus</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u> 0 </u> (A) Total Number of Dominant Species Across All Strata: <u> 3 </u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u> 0.0% </u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	<u>3</u>	<u>No</u>	<u>FACW</u>																	
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
	<u>23</u>	=Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u> 0 </u></td> <td>x 1 = <u> 0 </u></td> </tr> <tr> <td>FACW species <u> 3 </u></td> <td>x 2 = <u> 6 </u></td> </tr> <tr> <td>FAC species <u> 0 </u></td> <td>x 3 = <u> 0 </u></td> </tr> <tr> <td>FACU species <u> 29 </u></td> <td>x 4 = <u> 116 </u></td> </tr> <tr> <td>UPL species <u> 0 </u></td> <td>x 5 = <u> 0 </u></td> </tr> <tr> <td>Column Totals: <u> 32 </u></td> <td>(A) <u> 122 </u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = <u> 3.81 </u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u> 0 </u>	x 1 = <u> 0 </u>	FACW species <u> 3 </u>	x 2 = <u> 6 </u>	FAC species <u> 0 </u>	x 3 = <u> 0 </u>	FACU species <u> 29 </u>	x 4 = <u> 116 </u>	UPL species <u> 0 </u>	x 5 = <u> 0 </u>	Column Totals: <u> 32 </u>	(A) <u> 122 </u> (B)	Prevalence Index = B/A = <u> 3.81 </u>	
Total % Cover of:	Multiply by:																			
OBL species <u> 0 </u>	x 1 = <u> 0 </u>																			
FACW species <u> 3 </u>	x 2 = <u> 6 </u>																			
FAC species <u> 0 </u>	x 3 = <u> 0 </u>																			
FACU species <u> 29 </u>	x 4 = <u> 116 </u>																			
UPL species <u> 0 </u>	x 5 = <u> 0 </u>																			
Column Totals: <u> 32 </u>	(A) <u> 122 </u> (B)																			
Prevalence Index = B/A = <u> 3.81 </u>																				
Sapling/Shrub Stratum (Plot size: <u> 15' </u>)																				
1. <u>Quercus alba</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <u> </u> 1 - Rapid Test for Hydrophytic Vegetation <u> </u> 2 - Dominance Test is >50% <u> </u> 3 - Prevalence Index is ≤3.0 ¹ <u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. _____																				
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
	<u>3</u>	=Total Cover																		
Herb Stratum (Plot size: <u> 5' </u>)																				
1. <u>Pinus strobus</u>	<u>3</u>	<u>Yes</u>	<u>FACU</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <u> </u> No <u> X </u>																
2. <u>Unknown grass</u>	<u>3</u>	<u>Yes</u>																		
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
12. _____																				
	<u>6</u>	=Total Cover																		
Woody Vine Stratum (Plot size: <u> 30' </u>)																				
1. <u>Celastrus orbiculatus</u>	<u>3</u>	<u>No</u>	<u>FACU</u>																	
2. _____																				
3. _____																				
4. _____																				
	<u>3</u>	=Total Cover																		

Remarks: (Include photo numbers here or on a separate sheet.)

APPENDIX C

NHDES Functional Assessment Worksheets



WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management
Wetlands Bureau



[Check the Status of your Application](#)

RSA/Rule: RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

APPLICANT LAST NAME, FIRST NAME, M.I.: **NHDOT**

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the [Avoidance and Minimization Written Narrative \(NHDES-W-06-089\)](#) and the [Avoidance and Minimization Checklist \(NHDES-W-06-050\)](#) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)	
ADJACENT LAND USE: Highway, recreational trail, wetlands, upland forest	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 0	
SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Jennifer Riordan (CWS #269)	
DATE(S) OF SITE VISIT(S): 5/27/2022, 12/5/2023	DELINEATION PER ENV-WT 406 COMPLETED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
CONFIRM THAT THE EVALUATION IS BASED ON: <input checked="" type="checkbox"/> Office and <input checked="" type="checkbox"/> Field examination.	
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"): <input checked="" type="checkbox"/> USACE Highway Methodology. <input type="checkbox"/> Other scientifically supported method (enter name/ title):	

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SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
WETLAND ID: Cocheco River	LOCATION: (LAT/ LONG) 43.207/70.897
WETLAND AREA: Unknown	DOMINANT WETLAND SYSTEMS PRESENT: riverine
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? unknown	COWARDIN CLASS: R3RBH
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No if not, where does the wetland lie in the drainage basin? middle	IS THE WETLAND PART OF: <input type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island? IS THE WETLAND HUMAN-MADE? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PROPOSED WETLAND IMPACT TYPE: [REDACTED]	PROPOSED WETLAND IMPACT AREA: [REDACTED]
SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
<p>The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:</p> <ol style="list-style-type: none"> 1. Ecological Integrity (from RSA 482-A:2, XI) 2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value) 3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat) 4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration) 5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge) 6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat) 7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient Removal) 8. Production Export (Nutrient) (from USACE Highway Methodology) 9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics) 10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention) 11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization) 12. Uniqueness/Heritage (from USACE Highway Methodology) 13. Wetland-based Recreation (from USACE Highway Methodology: Recreation) 14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat) <p>First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE <i>The Highway Methodology Workbook Supplement</i>. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in <i>The Highway Methodology Workbook Supplement</i>, "functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society, from a local, regional, and/or national perspective". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.</p>	

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No	N/A - Assessed under Section 4	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
13	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

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SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3rd Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					
2					
3					
4					
5					

SECTION 6 - STREAM RESOURCES SUMMARY

DESCRIPTION OF STREAM: upper perennial	STREAM TYPE (ROSGEN): B
HAVE FISHERIES BEEN DOCUMENTED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	DOES THE STREAM SYSTEM APPEAR STABLE? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
OTHER KEY ON-SITE FUNCTIONS OF NOTE:	

The following table can be used to compile data on stream resources. “Important Notes” are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The Cocheco River is ecologically important to the area
2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10, 11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Dover Community Trail is within project area but nearest parking and access area is limited
3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3, 4, 5, 6, 10, 12, 14, 16, 17	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Cocheco River is large and provides aquatic life habitat
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1, 6, 8, 9, 13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Floodplain wetlands are not located within project area. Wetlands within project area are small and provide little storage.
5	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1, 6, 7	<input type="checkbox"/> Yes <input type="checkbox"/> No	Little opportunity for groundwater recharge in project area
6	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Listed as EFH for Atlantic salmon. American eel (special concern) also occurs in area.
7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1, 2, 3, 6, 7	<input type="checkbox"/> Yes <input type="checkbox"/> No	Limited riparian wetlands in project area
8	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4, 6, 10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Nutrient production/export not largely evident within project area
9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2, 9	<input type="checkbox"/> Yes <input type="checkbox"/> No	River is accessible by trail, but portion in project area is beneath NH Route 16
10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1, 6, 8, 10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Project area has limited riparian wetland area
11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1, 2, 3, 4, 6, 9, 12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Banks associated with Cocheco River provide stabilization
12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7, 11, 14, 16, 17, 19, 22, 27	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Cocheco River and nearby community trail make this an important wetland to the area
13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2, 5, 8, 9, 10, 11, 12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Nearby Dover Community trail access and conservation area
14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3, 6, 8, 17	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Deer observed near river. Cocheco River provides important aquatic organism habitat.
SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)				
<input checked="" type="checkbox"/> Wildlife and vegetation diversity/abundance list.				
<input checked="" type="checkbox"/> Photograph of wetland.				

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- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
- For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04. Please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.



WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management
Wetlands Bureau



[Check the Status of your Application](#)

RSA/Rule: RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

APPLICANT LAST NAME, FIRST NAME, M.I.: **NHDOT**

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the [Avoidance and Minimization Written Narrative \(NHDES-W-06-089\)](#) and the [Avoidance and Minimization Checklist \(NHDES-W-06-050\)](#) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)	
ADJACENT LAND USE: Highway, undeveloped, recreational trail	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): ~50	
SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Jennifer Riordan (CWS #269)	
DATE(S) OF SITE VISIT(S): 5/27/2022, 12/5/2023	DELINEATION PER ENV-WT 406 COMPLETED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
CONFIRM THAT THE EVALUATION IS BASED ON: <input checked="" type="checkbox"/> Office and <input checked="" type="checkbox"/> Field examination.	
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"): <input checked="" type="checkbox"/> USACE Highway Methodology. <input type="checkbox"/> Other scientifically supported method (enter name/ title):	

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SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
WETLAND ID: Flag Series C	LOCATION: (LAT/ LONG) 43.206/70.897
WETLAND AREA: Unknown	DOMINANT WETLAND SYSTEMS PRESENT: palustrine
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? 0	COWARDIN CLASS: PEM1E, PFO1E
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No if not, where does the wetland lie in the drainage basin? [REDACTED]	IS THE WETLAND PART OF: <input type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island? IS THE WETLAND HUMAN-MADE? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PROPOSED WETLAND IMPACT TYPE: [REDACTED]	PROPOSED WETLAND IMPACT AREA: [REDACTED]
SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
<p>The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:</p> <ol style="list-style-type: none"> 1. Ecological Integrity (from RSA 482-A:2, XI) 2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value) 3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat) 4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration) 5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge) 6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat) 7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient Removal) 8. Production Export (Nutrient) (from USACE Highway Methodology) 9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics) 10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention) 11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization) 12. Uniqueness/Heritage (from USACE Highway Methodology) 13. Wetland-based Recreation (from USACE Highway Methodology: Recreation) 14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat) <p>First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE <i>The Highway Methodology Workbook Supplement</i>. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in <i>The Highway Methodology Workbook Supplement</i>, "functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society, from a local, regional, and/or national perspective". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.</p>	

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland is between highway and developed residential area
2	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland is beside a busy highway and generally inaccessible
3	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland located between developed areas, not associated with a watercourse
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5, 7, 9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Wetland is adjacent to highway
5	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1	<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland is not associated with a watercourse and offers little recharge potential
6	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	No known T/E species or critical habitat in vicinity of wetland
7	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3, 5, 8	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Wetland most likely traps nutrients from highway and surrounding upland runoff
8	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7	<input type="checkbox"/> Yes <input type="checkbox"/> No	Forested portion densely vegetated
9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland is adjacent to busy highway
10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1, 2, 6	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Wetland traps sediments and toxicants from nearby highway and nearby uplands
11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland is not associated with shorelines/streambanks
12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	22	<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland located adjacent to busy highway and contains various invasive species
13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Signs of a walking path near wetland, not easily accessible
14	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7	<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland location does not provide effective wildlife habitat

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SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3rd Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					
2					
3					
4					
5					

SECTION 6 - STREAM RESOURCES SUMMARY

DESCRIPTION OF STREAM: <input type="text"/>	STREAM TYPE (ROSGEN): <input type="text"/>
HAVE FISHERIES BEEN DOCUMENTED? <input type="checkbox"/> Yes <input type="checkbox"/> No	DOES THE STREAM SYSTEM APPEAR STABLE? <input type="checkbox"/> Yes <input type="checkbox"/> No
OTHER KEY ON-SITE FUNCTIONS OF NOTE: <input type="text"/>	

The following table can be used to compile data on stream resources. “Important Notes” are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
13	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

- Wildlife and vegetation diversity/abundance list.
- Photograph of wetland.
- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
- For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04. Please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.



WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

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Wetlands Bureau



[Check the Status of your Application](#)

RSA/Rule: RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

APPLICANT LAST NAME, FIRST NAME, M.I.: **NHDOT**

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the [Avoidance and Minimization Written Narrative \(NHDES-W-06-089\)](#) and the [Avoidance and Minimization Checklist \(NHDES-W-06-050\)](#) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)	
ADJACENT LAND USE: Highway, undeveloped, recreational trail, Cocheco River	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): ~50-60	
SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Jennifer Riordan (CWS #269)	
DATE(S) OF SITE VISIT(S): 5/27/2022, 12/5/2023	DELINEATION PER ENV-WT 406 COMPLETED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
CONFIRM THAT THE EVALUATION IS BASED ON: <input checked="" type="checkbox"/> Office and <input checked="" type="checkbox"/> Field examination.	
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"): <input checked="" type="checkbox"/> USACE Highway Methodology. <input type="checkbox"/> Other scientifically supported method (enter name/ title):	

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SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
WETLAND ID: Flag Series D and Flag Series A	LOCATION: (LAT/ LONG) 43.208/70.896
WETLAND AREA: Unknown	DOMINANT WETLAND SYSTEMS PRESENT: riverine, palustrine
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? 1	COWARDIN CLASS: R4SB, PFO1E
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No if not, where does the wetland lie in the drainage basin? middle	IS THE WETLAND PART OF: <input type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island? IS THE WETLAND HUMAN-MADE? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PROPOSED WETLAND IMPACT TYPE: [REDACTED]	PROPOSED WETLAND IMPACT AREA: [REDACTED]
SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
<p>The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:</p> <ol style="list-style-type: none"> 1. Ecological Integrity (from RSA 482-A:2, XI) 2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value) 3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat) 4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration) 5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge) 6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat) 7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient Removal) 8. Production Export (Nutrient) (from USACE Highway Methodology) 9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics) 10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention) 11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization) 12. Uniqueness/Heritage (from USACE Highway Methodology) 13. Wetland-based Recreation (from USACE Highway Methodology: Recreation) 14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat) <p>First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE <i>The Highway Methodology Workbook Supplement</i>. Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in <i>The Highway Methodology Workbook Supplement</i>, "functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society, from a local, regional, and/or national perspective". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.</p>	

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland is adjacent to busy highway - there is a nearby walking trail and crossing (A) but wetland is mostly inaccessible
3	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4, 8, 15, 17	<input type="checkbox"/> Yes <input type="checkbox"/> No	Streams associated with wetlands are shallow and intermittent
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4, 5, 7, 8, 9, 10, 13, 15 (D), 16	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Wetlands are adjacent to highway and at the bottom of a slope with a high banked intermittent stream channel in the southern portion
5	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1, 7, 9 (D), 15	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Wetlands and streams have size and ability to serve as a groundwater recharge with connection to Cocheco River
6	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	No known T/E species or critical habitat within vicinity of wetland
7	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3, 5, 8, 14	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Wetlands proximity to the highway provides opportunity for nutrient trapping
8	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetlands are close to highway and provide little food
9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	Located on the side of a busy highway. Tall/thick vegetation and steep banks limit access from nearby walking trail
10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1, 2, 3, 5, 6, 10, 11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Wetlands location and intermittent streams provide opportunity for trapping
11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1, 2, 3, 4, 6, 12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The intermittent streams show signs of heavy erosion downstream in the southern portion of the wetlands
12	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	22	<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetlands are generally inaccessible and in close proximity to the highway
13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1 (A)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Wetland is near Dover Community Trail but proximity to highway makes it unsuitable for recreation

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14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6, 7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Western edge of Flag Series D and eastern edge of Flag Series A is bordered by large forested upland, but proximity to highway and amount of invasive plants species make it less effective habitat
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SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3rd Ed.*, 2016, published by the New Hampshire Fish and Game Department; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
2	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
3	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
4	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
5	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

SECTION 6 - STREAM RESOURCES SUMMARY

DESCRIPTION OF STREAM: Intermittent, shallow	STREAM TYPE (ROSGEN): [REDACTED]
HAVE FISHERIES BEEN DOCUMENTED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DOES THE STREAM SYSTEM APPEAR STABLE? <input type="checkbox"/> Yes <input type="checkbox"/> No

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OTHER KEY ON-SITE FUNCTIONS OF NOTE: [REDACTED]				
The following table can be used to compile data on stream resources. "Important Notes" are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.				
FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No	Stream resources assessed under Section 4	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
2	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
3	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
4	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
5	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
6	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
7	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
8	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
9	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
10	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
11	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
12	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
13	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
14	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]	<input type="checkbox"/> Yes <input type="checkbox"/> No	[REDACTED]
SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)				
<input checked="" type="checkbox"/> Wildlife and vegetation diversity/abundance list. <input checked="" type="checkbox"/> Photograph of wetland.				

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- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
- For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04. Please refer to the [Coastal Area Worksheet \(NHDES-W-06-079\)](#) for more information.



/HJHQG

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'RYHU

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Stream Crossing Rules (Env-Wt 900) TECHNICAL REPORT

The project involves the rehabilitation of the two NH Route 16 (Spaulding Turnpike) bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cocheco River in Dover, NH. Each bridge is a 4-span structure consisting of a reinforced concrete deck and six rolled steel beams. The superstructure is supported by concrete abutments and piers. The bridges were originally constructed in 1957 and rebuilt in 1991. They are currently in poor condition and on the State's Red List. The proposed work includes superstructure replacement, replacement of bearings and expansion joints, and substructure repairs on each bridge. The bridges will be widened from 37.75 feet to 40 feet (rail-to-rail) and a small amount of roadway widening is proposed at each bridge approach to match the existing pavement to the widened bridges.

Since the project involves the rehabilitation of existing Tier 3 crossings, this report addresses the applicable stream crossing rules under Env-Wt 904.09.

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

Env-Wt 904.09(a) - The repair, rehabilitation, or replacement of tier 3 stream crossings shall be limited to existing legal crossings where the tier classification is based only on the size of the contributing watershed.

The NH Route 16/Cocheco River bridges are existing, legal crossings. They are Tier 3 crossings based on watershed size (110,605 acres). Also, the crossings are within a Designated River Corridor, 100-year floodplain, and an area with records of protected species. The segment of the Cocheco River that is crossed by the project is non-tidal.

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

Env-Wt 904.09(c)(1) – The existing crossing does not have a history of causing or contributing to flooding that damages the crossing or other human infrastructure or protected species.

The existing crossing does not have a known history of causing or contributing to flooding that causes damage to surrounding properties, infrastructure, or protected species habitat.

Env-Wt 904.09(c)(2)(a) – The proposed stream crossing will meet the general criteria specified in Env-Wt 904.01

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 project is not anticipated to be a barrier to sediment transport. The proposed impacts within the river are temporary and will be restored once construction is complete.

Temporary fill will be placed in the river channel for the construction of causeways for construction access. Cofferdams will be used to dewater the work area and flow will be diverted to the north side of the river. This could cause temporary impacts to sediment

transport during construction. The fill, causeway, and cofferdam will be removed at the end of each of the two in-water work seasons and the work area will be restored to pre-existing conditions. Since the fill is temporary, no permanent barriers to sediment transport are anticipated as a result of the project.

2. *Not restrict high flows and maintain existing low flows;*

The proposed rehabilitation will not change the opening of the existing crossings. Since the existing bridges maintain existing low flows and do not restrict high flows, no impacts are anticipated.

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

The project will not disrupt aquatic organism passage beyond construction since no changes to the bridges are proposed and the crossings currently allow full aquatic organism passage. The temporary causeway and associated fill in the river channel and banks will be removed at the end of each construction season.

If the temporary impacts in the river result in disturbance to the natural streambed material, restoration of the channel will occur. Temporary fill will be removed and the river channel and banks will be restored to pre-existing conditions.

4. *Not cause an increase in the frequency of flooding or overtopping of banks;*

Since the proposed work only includes temporary impacts with no permanent fill within the river channel or banks, no increase in the frequency of flooding or overtopping of banks is anticipated.

5. *Maintain or enhance geomorphic compatibility by:*

- a) Minimizing the potential for inlet obstruction by sediment, wood, or debris;***
- and***
- b) Preserving the natural alignment of the stream channel;***

The existing openings of the bridges will remain the same and the existing alignment of the stream channel will be preserved, so the project is anticipated to maintain geomorphic compatibility.

6. *Preserve watercourse connectivity where it currently exists;*

The existing watercourse connectivity within the project area will not be altered.

Temporary flow diversion during construction will allow the river to flow on the north side, preserving watercourse connectivity throughout the duration of the project.

7. *Restore watercourse connectivity where:*

- a) Connectivity previously was disrupted as a result of human activity(ies); and***
- b) Restoration of connectivity will benefit aquatic organisms upstream or downstream of the crossing, or both;***

N/A

8. *Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and*

The bridge rehabilitation is not anticipated to increase water velocity at the crossing. A hydraulic analysis determined that the addition of the temporary causeway/cofferdam is expected to increase the 2-year storm velocity by a negligible amount (around 0.1 fps) during the in-water work seasons. Any temporary impacts to the bank and channel will be stabilized and restored to pre-existing conditions once construction is complete.

No increases in erosion, aggradation, or scouring upstream or downstream of the crossing are anticipated.

9. *Not cause water quality degradation.*

Impacts to water quality and turbidity could occur from the construction of the causeways in the river and from soil disturbance adjacent to the river. These impacts will be minimized by installing cofferdams and directing river flow to the opposite side of the channel. Erosion and sediment controls will be used to minimize impacts from adjacent work areas.

Potential contaminant releases could result from construction equipment operating within and adjacent to the river. As described above, in-water work areas will be dewatered so that construction equipment is not located within flowing water.

The bridges will be widened from 37.75 feet to 40 feet (rail-to-rail) and a small amount of roadway widening is proposed at each bridge approach to match the existing pavement to the widened bridges. The net increase in impervious surface is approximately 2,300 square feet. This minor increase in impervious surface is not anticipated to cause water quality degradation.

Env-Wt 904.09(c)(2)(b) – The proposed stream crossing will maintain or enhance the hydraulic capacity of the stream crossing

Since no changes to the openings of the bridges are proposed, the existing hydraulic capacity at the crossing will be maintained.

Env-Wt 904.09(c)(2)(c) – The proposed stream crossing will maintain or enhance the capacity of the crossing to accommodate aquatic organism passage

The proposed rehabilitation work will maintain the capacity of the crossings to accommodate aquatic organism passage. Since the project could result in temporary disruptions to aquatic organism passage during construction, coordination with the NH Fish and Game Department (NHFG) occurred. NHFG expressed concern regarding the cofferdam during construction and whether this partial obstruction of the river channel would increase water velocity and obstruct fish passage. A hydraulic analysis was completed to evaluate this potential impact. The crossing was analyzed under three conditions: average flow, 2-year storm with no obstructions, and 2-year storm with the cofferdam and causeway in place. It was determined that the 2-year storm with no obstructions increases the velocity through the crossing by approximately 3 feet per second (fps) compared to average flow. The addition of the causeway/cofferdam is expected to further increase the 2-year storm velocity by a negligible amount (around 0.1 fps). This is because the river is still allowed to rise. Since the river has significant area to spread out, the velocity does not substantially increase. It should be noted that, due to the causeway, the depth of the water during the 2-year storm is approximately 2 feet greater than what it would be without the causeway.

NH Route 16 (Spaulding Turnpike) over the Cocheco River
Bridge Rehabilitation
Dover 41824

The hydraulic analysis summary was provided to the NH Fish and Game Department (NHFG). After reviewing the assessment NHFG agreed that the project should result in limited impacts to these species based on estimated velocities. NHFG also recommended that no in-water work occur between April 15th and June 1st to minimize impacts to migratory fish species. This time-of-year restriction was discussed with NHFG and it was agreed that the temporary cofferdams and causeways will be constructed prior to April 15th and will remain in place for the construction season. No new fill in the river will be placed between April 15th and June 1st.

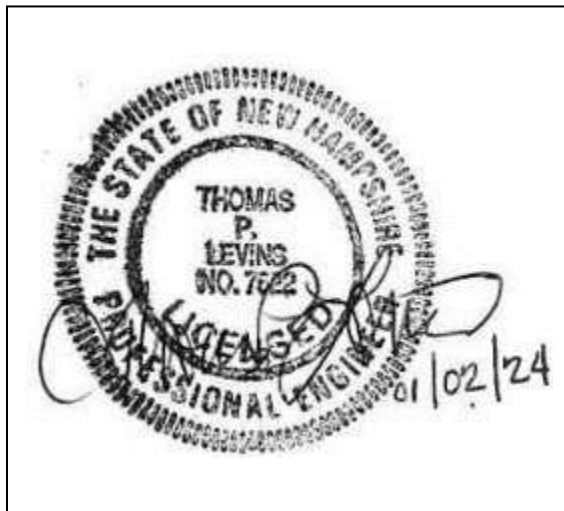
Env-Wt 904.09(c)(2)(d) – The proposed stream crossing will maintain or enhance the connectivity of the stream reaches upstream or downstream of the crossing

The project will maintain the connectivity of the Cocheco River. During construction, a cofferdam will be used to temporarily dewater the work area and flow will be diverted to the north side of the river. Watercourse connectivity will be maintained throughout the duration of construction.

Env-Wt 904.09(c)(2)(e) – The proposed stream crossing will not cause or contribute to the increase in the frequency of flooding or overtopping of the banks upstream or downstream of the crossing

The existing crossing does not have a history of flooding or overtopping. Since the proposed rehabilitation will maintain the hydraulic capacity of the crossing, no increase in the frequency of flooding or overtopping of banks is anticipated.

As required by Env-Wt 904.09(c), this report has been certified by a Professional Engineer.



Certified By:
Thomas P. Levins, PE



WETLANDS PERMIT APPLICATION STREAM CROSSING WORKSHEET

Water Division/Land Resources Management
Wetlands Bureau



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

This worksheet can be used to accompany Wetlands Permit Applications when proposing stream crossings.

SECTION 1 - TIER CLASSIFICATIONS	
Determine the contributing watershed size at USGS StreamStats .	
Note: Plans for tier 2 and 3 crossings shall be designed and stamped by a professional engineer who is licensed under RSA 310-A to practice in New Hampshire.	
Size of contributing watershed at the crossing location: 110,605 acres	
<input type="checkbox"/> Tier 1: A tier 1 stream crossing is a crossing located on a watercourse where the contributing watershed size is less than or equal to 200 acres.	
<input type="checkbox"/> Tier 2: A tier 2 stream crossing is a crossing located on a watercourse where the contributing watershed size is greater than 200 acres and less than 640 acres.	
<input checked="" type="checkbox"/> Tier 3: A tier 3 stream crossing is a crossing that meets any of the following criteria: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> On a watercourse where the contributing watershed is more than 640 acres. <input checked="" type="checkbox"/> Within a designated river corridor unless: <ul style="list-style-type: none"> a. The crossing would be a tier 1 stream based on contributing watershed size, or b. The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT. <input checked="" type="checkbox"/> Within a 100-year floodplain (see Section 2 below). <input checked="" type="checkbox"/> In a jurisdictional area having any protected species or habitat (NHB DataCheck). <input type="checkbox"/> In a prime wetland or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706. Review the Wetlands Permit Planning Tool (WPPT) for town prime wetland and prime wetland buffer maps to determine if your project is within these areas. 	
<input type="checkbox"/> Tier 4: A tier 4 stream crossing is a crossing located on a tidal watercourse.	
SECTION 2 - 100-YEAR FLOODPLAIN	
Use the FEMA Map Service Center to determine if the crossing is located within a 100-year floodplain. Please answer the questions below:	
<input type="checkbox"/> No: The proposed stream crossing <i>is not</i> within the FEMA 100-year floodplain.	
<input checked="" type="checkbox"/> Yes: The proposed project <i>is</i> within the FEMA 100-year floodplain. Zone = A Elevation of the 100-year floodplain at the inlet: N/A feet (FEMA EI. or Modeled EI.)	
SECTION 3 - CALCULATING PEAK DISCHARGE	
Existing 100-year peak discharge (Q) calculated in cubic feet per second (CFS): 12,000 CFS	Calculation method: USGS StreamStats
Estimated bankfull discharge at the crossing location: 3,600 CFS	Calculation method: StreamStats (2yr)

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➡ **Note: If tier 1, then skip to Section 10** ⬅

SECTION 4 - PREDICTED CHANNEL GEOMETRY BASED ON REGIONAL HYDRAULIC CURVES
For tier 2, tier 3 and tier 4 crossings only.

Bankfull Width: 155 feet Mean Bankfull Depth: 5.06 feet

Bankfull Cross Sectional Area: 785 square feet (SF)

SECTION 5 - CROSS SECTIONAL CHANNEL GEOMETRY: MEASUREMENTS OF THE EXISTING STREAM WITHIN A REFERENCE REACH
For tier 2, tier 3 and tier 4 crossings only.

Describe the reference reach location: approximately 0.9 miles upstream of crossing

Reference reach watershed size: 110,605 acres

Parameter	Cross Section 1 Describe bed form run (e.g. pool, riffle, glide)	Cross Section 2 Describe bed form run (e.g. pool, riffle, glide)	Cross Section 3 Describe bed form run (e.g. pool, riffle, glide)	Range
Bankfull Width *	147 feet	104 feet	181 feet	104-181 feet
Bankfull Cross Sectional Area	SF	SF	SF	SF
Mean Bankfull Depth **	5.06 feet	5.06 feet	5.06 feet	5.06 feet
Width to Depth Ratio	29.1	20.6	35.8	20.6-35.8
Max Bankfull Depth	feet	feet	feet	feet
Flood Prone Width *	163 feet	135 feet	257 feet	135-257 feet
Entrenchment Ratio	1.11	1.30	1.42	1.11-1.42

Use **Figure 1** below to determine the measurements of the Reference Reach Attributes

*Bankfull width and flood prone width were estimated using LiDAR elevation data in GRANIT, combined with aerial photographs, FEMA floodplain maps, and site observations.

**Maximum bankfull depth was estimated using the New Hampshire 2005 Regional Hydraulic Geometry Curves

Field observations were consistent with the measurements made using desktop data & maps and predicted values using Regional Hydraulic Geometry Curves. Water depths observed during the site visits ranged from approximately 2 to 6 feet and the average bankfull depth appeared consistent with the predicted value of 5.06 feet. During site visits, the flood prone width was observed to be only slightly wider than bankfull width, given site topography.

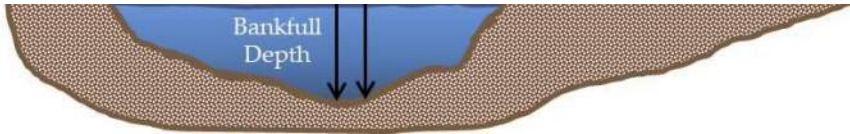


Figure 1: Determining the Reference Reach Attributes.

SECTION 6 - LONGITUDINAL PARAMETERS OF THE REFERENCE REACH AND CROSSING LOCATION
For tier 2, tier 3 and tier 4 crossings only.

Average Channel Slope of the Reference Reach: 0.002

Average Channel Slope at the Crossing Location: 0.004

SECTION 7 - PLAN VIEW GEOMETRY
 Note: Sinuosity is measured a distance of at least 20 times bankfull width, or 2 meander belt widths.
For tier 2, tier 3 and tier 4 crossings only.

Sinuosity of the Reference Reach: 1.11

Sinuosity of the Crossing Location: 1.11	
SECTION 8 - SUBSTRATE CLASSIFICATION BASED ON FIELD OBSERVATIONS	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
% of reach that is bedrock:	█ %
% of reach that is boulder:	40 %
% of reach that is cobble:	40 %
% of reach that is gravel:	█ %
% of reach that is sand:	10 %
% of reach that is silt:	10 %
SECTION 9 - STREAM TYPE OF REFERENCE REACH	
<i>For tier 2, tier 3 and tier 4 crossings only.</i>	
Stream Type of Reference Reach:	B

Refer to Rosgen Classification Chart (Figure 2) below:

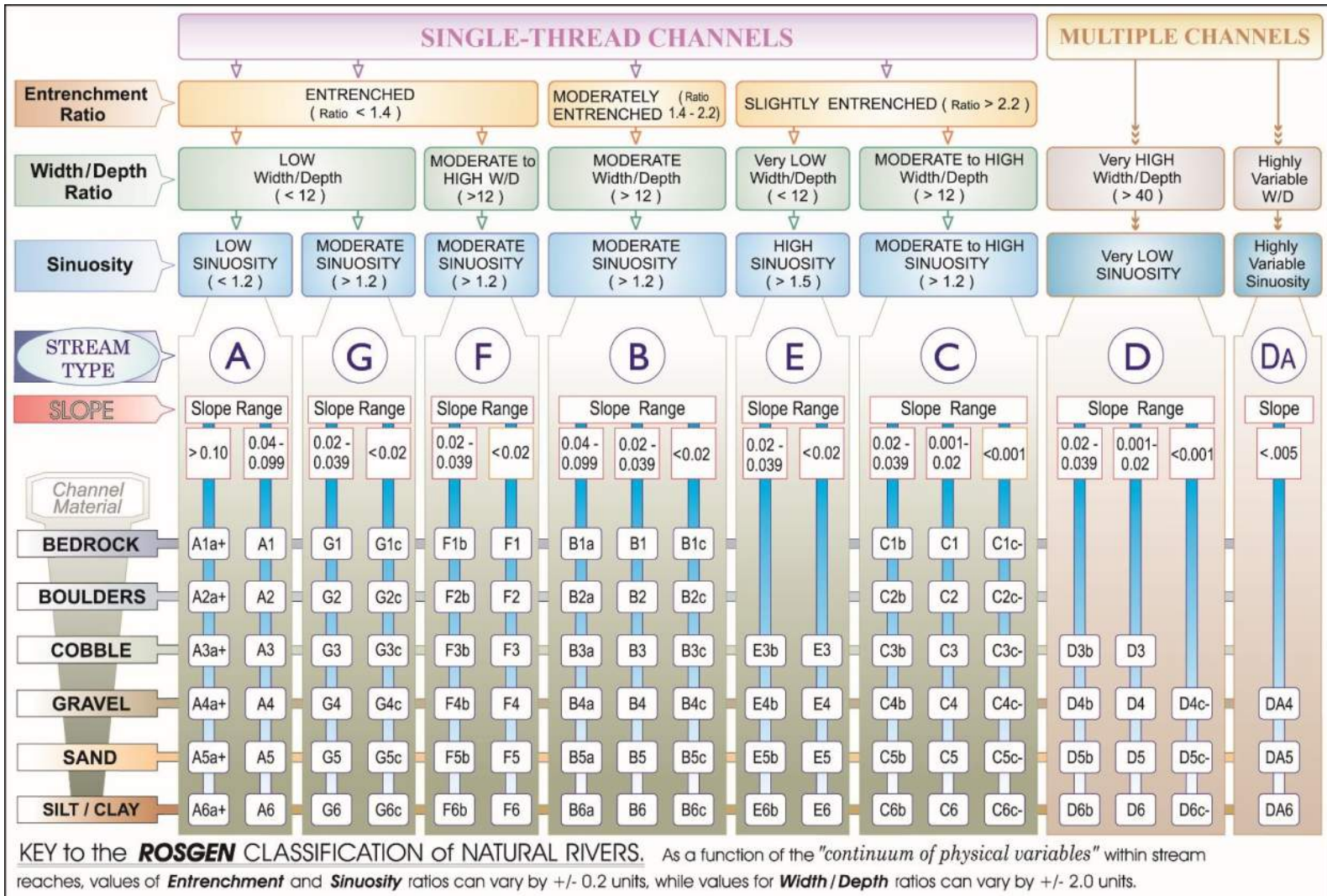


Figure 2: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 10 - CROSSING STRUCTURE METRICS					
Existing Conditions	Existing Structure Type: <input checked="" type="checkbox"/> Bridge span <input type="checkbox"/> Pipe arch <input type="checkbox"/> Open-bottom culvert <input type="checkbox"/> Closed-bottom culvert <input type="checkbox"/> Closed-bottom culvert with stream simulation <input type="checkbox"/> Other: <input type="checkbox"/>				
	Existing Crossing Span: 267 feet <i>(perpendicular to flow)</i>		Culvert Diameter: N/A feet Inlet Elevation: El. N/A feet		
	Existing Crossing Length: 75.5 feet <i>(parallel to flow)</i>		Outlet Elevation: El. N/A feet Culvert Slope: N/A		
Proposed Conditions	Proposed Structure Type:	Tier 1	Tier 2	Tier 3	Alternative Design
	Bridge Span	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Pipe Arch	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Closed-bottom Culvert	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
	Open-bottom Culvert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Closed-bottom Culvert with stream simulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Proposed Structure Span: 267 (existing) feet <i>(perpendicular to flow)</i>		Culvert Diameter: N/A feet Inlet Elevation: El. N/A feet		
Proposed Structure Length: 80 feet <i>(parallel to flow)</i>		Outlet Elevation: El. N/A feet Culvert Slope: N/A			
Proposed Entrenchment Ratio:* N/A - (existing) <i>For Tier 2, Tier 3 and Tier 4 Crossings Only. To accommodate the entrenchment ratio, floodplain drainage structures may be utilized.</i>					

* Note: Proposed Entrenchment Ratio must meet the minimum ratio for each stream type listed in **Figure 3**, otherwise the applicant must address the Alternative Design criteria listed in Env-Wt 904.10.

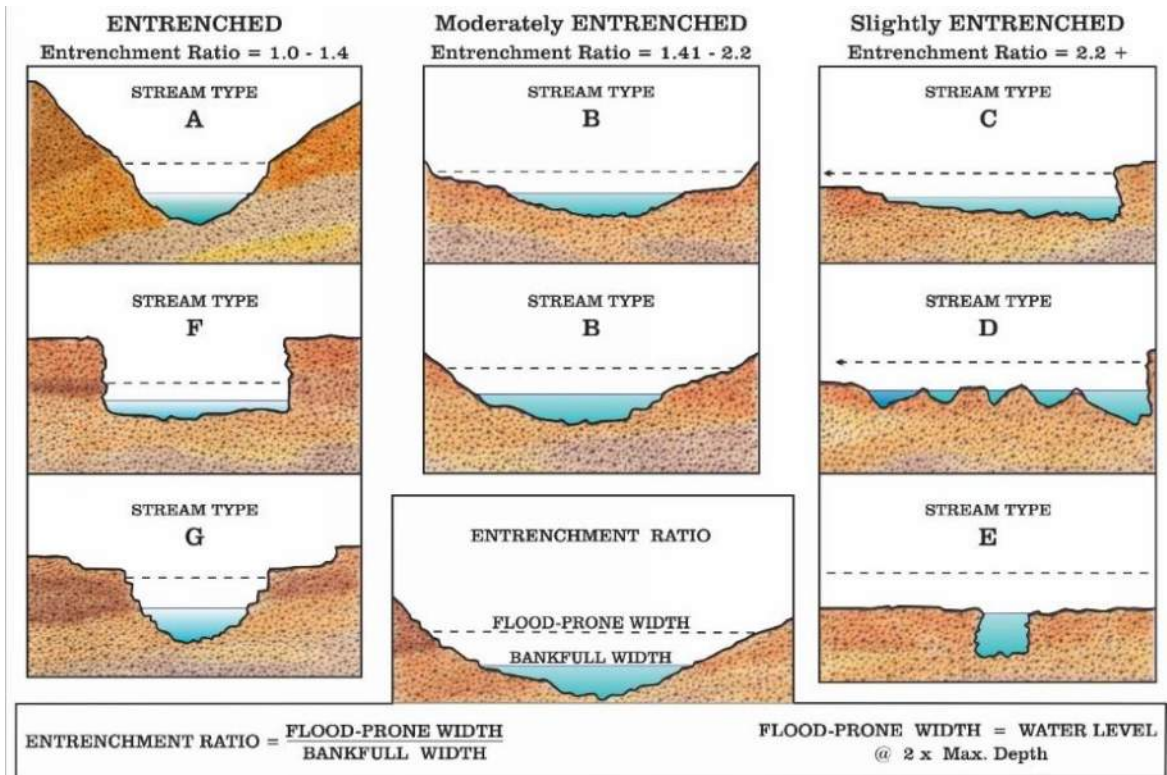


Figure 3: Reference from Applied River Morphology, Rosgen, 1996.

SECTION 11 - CROSSING STRUCTURE HYDRAULICS		
	Existing	Proposed
100 year flood stage elevation at inlet:	55.52	55.52 (existing)
Flow velocity at outlet in feet per second (FPS):	8.63	8.63 (existing)
Calculated 100 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		12,000
Calculated 50 year peak discharge (Q) for the <i>proposed</i> structure in CFS:		12,000 (existing)
SECTION 12 - CROSSING STRUCTURE OPENNESS RATIO		
<i>For tier 2, tier 3 and tier 4 crossings only.</i>		
Crossing Structure Openness Ratio* = N/A		
* Openness box culvert = (height x width)/length		
Openness round culvert = (3.14 x radius ²)/length		
SECTION 13 - GENERAL DESIGN CONSIDERATIONS		
Env-Wt 904.01 requires all stream crossings to be designed and constructed according to the following requirements. Check each box if the project meets these general design considerations.		
All stream crossings shall be designed and constructed so as to:		
<input checked="" type="checkbox"/> Not be a barrier to sediment transport.		
<input checked="" type="checkbox"/> Prevent the restriction of high flows and maintain existing low flows.		
<input checked="" type="checkbox"/> Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.		
<input checked="" type="checkbox"/> Not cause an increase in the frequency of flooding or overtopping of banks.		
<input checked="" type="checkbox"/> Maintain or enhance geomorphic compatibility by:		

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

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

b. Preserving the natural alignment of the stream channel.

Preserve watercourse connectivity where it currently exists.

Restore watercourse connectivity where:

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

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

Not cause erosion, aggradation, or scouring upstream or downstream of the crossing.

Not cause water quality degradation.

SECTION 14 - TIER-SPECIFIC DESIGN CRITERIA

Stream crossings must be designed in accordance with the tier specific design criteria listed in Part Env-Wt 904.

The proposed project meets the tier specific design criteria listed in Part Env-Wt 904 and each requirement has been addressed in the plans and as part of the wetland application.

SECTION 15 - ALTERNATIVE DESIGN

NOTE: If the proposed crossing does not meet all of the general design considerations, the tier specific design criteria, or the minimum entrenchment ratio for each given stream type listed in **Figure 3**, then an alternative design plan and associated requirements must be addressed pursuant to Env-Wt 904.10.

I have submitted an alternative design and addressed each requirement listed in Env-Wt 904.10.

Jennifer Riordan

From: Benedict, Karl <Karl.D.Benedict@des.nh.gov>
Sent: Thursday, January 4, 2024 12:42 PM
To: Jennifer Riordan
Subject: [WARNING-EXT]RE: Dover 41824 - NHDOT Spaulding Turnpike Bridges over the Cocheco River - Stream Crossing Assessment

Hi Jennifer,

The approach taken for the prepared Stream Crossing Worksheet appears logical and adequate for this location. I would request that a narrative be provided that would indicate that the field observations generally compare to the metrics that were determined for the bankfull width/depth/floodprone width using the desktop tools. Ex. Verify the depths appear consistent to the predicted data (looks like 5' deep and width approx.). If additional streambed simulation materials will need to be used, then the specs. for the proposed material would be needed, and permit Conditions would require consistency with the reference reach. It is generally helpful of plans/notes specify re-use of existing materials. The NHDES staff has coordinated for preview of the proposed materials in field prior to placement in the past, and could coordinate if helpful.

Thanks for sending the complete worksheet and the information and approach seem logical. Glad to coordinate for any further questions.

Karl Benedict, Public Works Subsection Supervisor
Land Resources Management
Water Division, NH Department of Environmental Services
29 Hazen Drive, PO Box 95
Concord, NH 03302
Phone: (603) 271-4194
Fax: (603) 271-6588
Email: Karl.Benedict@des.nh.gov



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[Like us on Facebook!](#)

We greatly appreciate your feedback. Please take a moment to fill out our 3-minute [NHDES-LRM customer satisfaction survey](#).

From: Jennifer Riordan <JRiordan@GM2INC.COM>
Sent: Wednesday, January 3, 2024 2:27 PM
To: Benedict, Karl <Karl.D.Benedict@des.nh.gov>
Subject: Dover 41824 - NHDOT Spaulding Turnpike Bridges over the Cocheco River - Stream Crossing Assessment

EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Hi Karl,

We are preparing the Wetlands Permit application for the Dover 41824 NHDOT bridge rehabilitation project (NH Route 16 bridges over the Cocheco River). NHDOT asked that I get confirmation from you on our modified stream crossing assessment. Due to the river depth, width, and water velocity, we were not able to safely collect field measurements on bankfull width, bankfull depth, and flood prone width and we did not complete a pebble count. We obtained approximate bankfull and flood prone widths using a combination of LiDAR elevation data, aerial photographs, FEMA

floodplains maps, and site observations. Bankfull depth was estimated using the NH Regional Hydraulic Curves. The substrate classification was based on general field observations instead of completing a pebble count.

I've attached a stream crossing worksheet that summarizes our data. Since the project involves rehabilitation of two existing bridges rather than replacing or constructing a new crossing, I made the assumption that a modified stream crossing assessment would be adequate. NHDOT asked that I confirm with you so there are no issues during permitting. The project does not involve any permanent impacts within the Cocheco River. All proposed impacts are temporary for construction access and dewatering. If restoration of the streambed is needed for the temporary impact areas, I assume the contractor would be able to use material that was moved during construction or would match what is in the adjacent streambed. I think it is unlikely that they would need a large amount of new streambed material that would rely on pebble count data.

Please let me know if you need any further information.

Thanks for your help,

Jenn



JENNIFER RIORDAN, CWS, CPESC

Senior Environmental Scientist

P 603.856.7854

C 603.724.4950

Memo

NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

To: Jennifer Riordan, GM2 Associates, Inc.
197 Loudon Road, Suite 310
Concord, NH 03301

From: NHB Review, NH Natural Heritage Bureau

Date: 5/9/2023 (valid until 05/09/2024)

Re: Review by NH Natural Heritage Bureau

Permits: NHDES - Shoreland Standard Permit, NHDES - Wetland Standard Dredge & Fill - Minor, USACE - General Permit

NHB ID: NHB23-1332 Town: Dover Location: Spaulding Turnpike over Cocheco River
Description: NHDOT Project No. 41824. The project involves rehabilitation of the two NH Route 16 bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cocheco River in Dover. The existing bridges were constructed in 1957 and rebuilt in 1991 and are currently on the State's Red List. Proposed work includes superstructure replacement, replacement of bearing and expansion joints, and substructure repairs on each bridge. Construction will be phased in order to maintain traffic. Temporary impacts in the river channel may be required for construction access. This is an update to NHB22-1015.

cc: NHFG Review

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

Comments NHB: No comments at this time.

F&G: Please refer to NHFG consultation requirements below.

Vertebrate species

State¹ Federal Notes

American Eel (<i>Anguilla rostrata</i>)	SC	--	Contact the NH Fish & Game Dept (see below).
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¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section below.

Disclaimer: 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

Memo

NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

for certain species. An on-site survey would provide better information on what species and communities are indeed present.

IMPORTANT: NHFG Consultation

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to <https://wildlife.state.nh.us/wildlife/environmental-review.html>. All requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent by mail, and **must include the NHB DataCheck results letter number and “Fis 1004 consultation request” in the subject line.**

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification*, *permit by rule*, *permit by notification*, *routine roadway registration*, *docking structure registration*, or *conditional authorization by rule*), coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email NHFGreview@wildlife.nh.gov, and include the NHB DataCheck results letter number and “review request” in the email subject line.

Contact NH Fish & Game at (603) 271-0467 with questions.

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Monday, December 4, 2023 12:49 PM
To: Jennifer Riordan; Tom Levins
Cc: Weatherbee, Anthony; Newsom, Sam; Sargent, John; Martin, Rebecca
Subject: [WARNING-EXT]FW: NHB23-1332 DOT Project 41824 Spaulding Turnpike Bridge No.106/133

Below is the final review from NHFG, which concludes our review for state listed species.

~ Arin

From: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>
Sent: Monday, December 4, 2023 11:40 AM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Cc: FGC: NHFG review <NHFGreview@wildlife.nh.gov>; Winters, Melissa <Melissa.J.Winters@wildlife.nh.gov>; Dionne, Michael <Michael.A.Dionne@wildlife.nh.gov>; Duclos, Kristin <Kristin.L.Duclos@des.nh.gov>; Diessner, Calvin <Calvin.G.Diessner@des.nh.gov>
Subject: NHB23-1332 DOT Project 41824 Spaulding Turnpike Bridge No.106/133

Good morning,

New Hampshire Fish and Game has completed review of materials submitted for consultation for NHB23-1332, prepared by the New Hampshire Department of Transportation and GM2 Associates, Inc. The proposed project includes superstructure replacement, replacement of bearings and expansion joints, and substructure repairs on NHDOT Bridge No.106/133 located on the Spaulding Turnpike over the Cocheco River, in Dover, NH.

Applications associated with this review:

- NHDES – Wetland Standard Dredge & Fill – Minor (not yet filed)
- NHDES – Shoreland Standard Permit (not yet filed)

Please provide permit numbers if obtained.

Based on the NHB datacheck results letter and the information provided in the submission, we request the following recommended permit conditions. THESE RECOMMENDED PERMIT CONDITIONS ARE APPLICABLE TO ALL STATE PERMITS LISTED ABOVE.

- **Please include recommended permit conditions in final plan sheets plans as written below (updated highlighted text as applicable) and provide to NHDES and cc NHFG for final review. Permit reviewers will adopt/include NHFG permit conditions in the permit if approved.**

New Hampshire Fish and Game – Recommended Permit Conditions NHB23-1332

1. American Eel (State species of special concern), Blueback Herring (State species of special concern), and Alewife (State species of special concern) occur within the vicinity of the project area. All operators and personnel working on or entering the site shall be made aware of the potential presence of this species.
2. In water work, such as the construction and removal of the proposed causeway(s), shall occur outside of April 15th and June 1st window to minimize potential impacts to migrating American eel, Blueback Herring, and Alewife.

3. All manufactured erosion and sediment control products, with the exception of turf reinforcement mats, utilized for, but not limited to, slope protection, runoff diversion, slope interruption, perimeter control, inlet protection, check dams, and sediment traps shall not contain plastic, or multifilament or monofilament polypropylene netting or mesh with an opening size of greater than 1/8 inches.
4. All observations of threatened or endangered species on the project site shall be reported immediately to the NHFG nongame and endangered wildlife environmental review program by phone at 603-271-2461 and by email at NHFGreview@wildlife.nh.gov, with the email subject line containing the NHB DataCheck tool results letter assigned number, the project name, and the term Wildlife Species Observation.
5. Photographs of the observed species and nearby elements of habitat or areas of land disturbance shall be provided to NHFG in digital format at the above email address for verification, as feasible.
6. In the event a threatened or endangered species is observed on the project site during the term of the permit, the species shall not be disturbed, handled, or harmed in any way prior to consultation with NHFG and implementation of corrective actions recommended by NHFG.
 - a. Site operators shall be allowed to relocate wildlife encountered if discovered within the active work zone if in direct harm from project activities. Wildlife shall be relocated in close proximity to the capture location but outside of the work zone and in the direction the individual was heading. NHFG shall be contacted immediately if this action occurs.
7. NHFG, including its employees and authorized agents, shall have access to the property during the term of the permit.

NHFG has completed our review of materials submitted for consultation under FIS 1004. No further coordination with NHFG is requested, and the final recommendations have been transmitted to the applicable permitting agency. Questions or concerns on NHFG recommendations must follow FIS 1004.12. Note that NHFG recommendations may be withdrawn pursuant to FIS 1004.13.

Sincerely,

Kevin Newton
Wildlife Biologist
NH Fish and Game Department
Wildlife Division
11 Hazen Drive, Concord NH 03301
Phone: 603-271- 5860

New Hampshire Fish and Game requirements for environmental review consultation can be found at: https://gencourt.state.nh.us/rules/state_agencies/fis1000.html. ALL requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent hardcopy by mail. **The NHB datacheck results letter number needs to be included in the email subject line to read as "NHBxx-xxxx_Project Name_FIS 1004 Consultation Submittal".**

The requirements for consultation (Fis 1004) shall not apply to the following: statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule. Review requests for these projects or other project types should be submitted to NHFGreview@wildlife.nh.gov or can be sent hardcopy by mail – email or mail subject line for these review requests should read "NHBxx-xxxx_Project Name_ Env. Review Request".

Please provide shapefiles/KMZ/KMLs of the project site (and relevant features if applicable) with your submittal. Review statements provided in the NHB Datacheck Results letter for additional guidance.

Jennifer Riordan

From: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>
Sent: Wednesday, November 29, 2023 10:46 AM
To: Mills, Arin
Cc: Jennifer Riordan; Martin, Rebecca; FGC: NHFG review; Winters, Melissa; Dionne, Michael
Subject: RE: Fis 1004 Consultation Request NHB23-1332 for DOT Project Dover 41824

Hi Arin,

Yes, if the causeway is constructed and removed outside of the April 15th and June 1 window, impacts to herring and American eel should be minimized. The out-of-water work during this time should not impact these species.

If there are no other questions or concerns, I will formalize NHFG comments and provide those to your team shortly.

Thanks,

Kevin

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Wednesday, November 29, 2023 10:31 AM
To: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>
Cc: Jennifer Riordan <jriordan@gm2inc.com>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>; FGC: NHFG review <NHFGreview@wildlife.nh.gov>; Winters, Melissa <Melissa.J.Winters@wildlife.nh.gov>; Dionne, Michael <Michael.A.Dionne@wildlife.nh.gov>
Subject: RE: Fis 1004 Consultation Request NHB23-1332 for DOT Project Dover 41824

Kevin. Thank you for following-up on this. I reached out to the engineer and they have an additional question/clarification.

Could the causeway be put in-place prior to April 15th? Any activity that utilizes the access area (causeway) that was constructed prior to April 15 would be outside of the water.

~ Arin

From: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>
Sent: Wednesday, November 29, 2023 9:55 AM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Cc: Jennifer Riordan <jriordan@gm2inc.com>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>; FGC: NHFG review <NHFGreview@wildlife.nh.gov>; Winters, Melissa <Melissa.J.Winters@wildlife.nh.gov>; Dionne, Michael <Michael.A.Dionne@wildlife.nh.gov>
Subject: RE: Fis 1004 Consultation Request NHB23-1332 for DOT Project Dover 41824

Hi Arin,

Thanks for coordinating this information. After reading the assessment, NHFG agrees there should be limited impact to river herring and American eel based on estimated velocities resulting from the causeway.

I think this question may have come up in the natural resources meeting, but what is the anticipated timing of the construction and removal of the causeway(s) in the river? Looking back at the meeting notes, Tom Levins indicated the causeway would need to be in place by the start of early summer. It would be optimal if any in-water construction or deconstruction occurs outside of the April 15 – June 1 migratory window. Please let me know if this is possible.

Thanks,

Kevin

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Tuesday, November 28, 2023 7:33 AM
To: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>; FGC: NHFG review <NHFGreview@wildlife.nh.gov>
Cc: Jennifer Riordan <jriordan@gm2inc.com>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Subject: RE: Fis 1004 Consultation Request NHB23-1332 for DOT Project Dover 41824

Hello Kevin. Per your request our engineer in Turnpikes, Tony Weatherbee, was able to run a hydraulics analysis for a 2-year storm for the river. I have attached the analysis here. I hope this provides the information you are looking for.

Please review and let me know if you have any additional questions or concerns.

~ Arin

From: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>
Sent: Tuesday, October 17, 2023 3:25 PM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>; FGC: NHFG review <NHFGreview@wildlife.nh.gov>
Cc: Jennifer Riordan <jriordan@gm2inc.com>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Subject: RE: Fis 1004 Consultation Request NHB23-1332 for DOT Project Dover 41824

Hi Arin,

I'm not sure why, but this was lost in the shuffle over here. Luckily, I am familiar with this proposal as it was discussed as you indicated below during the June 21, 2023 Natural Resource Agency Meeting. I will reach out to some of our fisheries biologist so that we can get you some comments on this project as it relates to American Eel.

Sorry for the delay.

Kevin

Kevin Newton
Wildlife Biologist
NH Fish and Game Department
Wildlife Division
11 Hazen Drive, Concord NH 03301
Phone: 603-271- 5860

New Hampshire Fish and Game requirements for environmental review consultation can be found at: https://gencourt.state.nh.us/rules/state_agencies/fis1000.html. ALL requests for consultation and submittals should be sent via email to NHFGreview@wildlife.nh.gov or can be sent hardcopy by mail. **The NHB datacheck results letter number needs to be included in the email subject line to read as "NHBxx-xxxx_Project Name_FIS 1004 Consultation Submittal".**

The requirements for consultation (Fis 1004) shall not apply to the following: statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule. Review requests for these projects or other project types should be submitted to NHFGreview@wildlife.nh.gov or can be sent hardcopy by mail – email or mail subject line for these review requests should read “NHBxx-xxxx_Project Name_ Env. Review Request”.

Please provide shapefiles/KMZ/KMLs of the project site (and relevant features if applicable) with your submittal. Review statements provided in the NHB Datacheck Results letter for additional guidance.

From: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Sent: Tuesday, October 17, 2023 2:57 PM
To: FGC: NHFG review <NHFGreview@wildlife.nh.gov>
Cc: Jennifer Riordan <jriordan@gm2inc.com>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Subject: RE: Fis 1004 Consultation Request NHB23-1332 for DOT Project Dover 41824

Hello. I have not received a response from this. Just wondering if you have any questions to assist with the review?

~ Arin

From: Mills, Arin
Sent: Monday, August 28, 2023 8:03 AM
To: FGC: NHFG review <NHFGreview@wildlife.nh.gov>
Cc: Jennifer Riordan <jriordan@gm2inc.com>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Subject: Fis 1004 Consultation Request NHB23-1332 for DOT Project Dover 41824

Attached is the detailed information relating to DOT state funded Turnpikes project Dover 41824 for rehab of two bridges which carry NH-16 over the Cocheco River. This project was reviewed at the June 21, 2023 Natural Resource Agency meeting.

In the attached memo you will notice a slight change in the access road from what was presented at the June Nat Res meeting. The northern access was evaluated further and the wetlands & stream in the NW quadrant would have been impacted. There are no wetlands in the SW quadrant so this access was chosen instead. All impacts are temporary and construction will be phased, as also noted in the attached report.

The project requires Essential Fish Habitat (EFH) review which will be completed at a later date. DOT intends to address the NHFG Fisheries comments on herring later, once EFH coordination is complete. This report is to address the wildlife species in the NHB report (American eel).

Please reach out with any questions.

Arin Mills
Senior Environmental Manager, Operations Management
NH Department of Transportation
Bureau of Environment
7 Hazen Drive, Concord, NH 03302
Ph: (603)271-0187
Arin.j.mills@dot.nh.gov

Federal Interagency Comment Form

Date: 01/03/24

Project: Bridge Rehab Over Cocheco River in Dover

Appl No.: NHDOT Dover 41824

Commenting Agency: NOAA/NMFS/GARFO/HCD

Action Agency Project Manager: Arin Mills

Waterway: Cocheco River

Activity: The proposed project involves the rehabilitation of the two NH Route 16 (Spaulding Turnpike) bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cocheco River in Dover, NH. Proposed work includes superstructure replacement, replacement of bearings and expansion joints, and substructure repairs on each bridge. The project extends approximately 1,400 feet south of the bridges and approximately 1,100 feet north of the bridges along NH Route 16 to accommodate traffic control measures during construction. Temporary access roads, along with temporary causeways in the Cocheco River, will be necessary during construction to gain access to the bridge piers. Cofferdams will be used to dewater work areas within the river.

ESSENTIAL FISH HABITAT (EFH)

Project may adversely affect EFH.

ESSENTIAL FISH HABITAT CONSERVATION RECOMMENDATIONS: (Note: EFH CRs require a response from the federal action agency within 30 days of receipt or 10 days before a permit is issued if CRs are not included as a special condition of the permit. In addition, a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920 (j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the above EFH determination or EFH conservation recommendations.)

1. Design and construct activities (all devices, work, etc.) in streams with diadromous fish to minimize turbidity and sedimentation, acoustic impacts, obstructions and restrictions, and to provide a zone of passage that allows fish to safely navigate up and downstream. To accomplish this:
 - a. Permittees should conduct work when the stream or tide is waterward of the work and plan for unexpected high flows.
 - b. Appropriate soil erosion, sediment and turbidity controls (“controls”), e.g., cofferdams, should be used and maintained in effective operating condition during construction to obtain dry work conditions, and all exposed soil and other fills, as well as any work below the OHWM or HTL, should be permanently stabilized at the earliest practicable date and before controls are removed.
 - c. Controls should be secured during storm events to avoid unintended loss of material and potential associated adverse effects to fisheries resources.
 - d. Work that produces greater than minimal turbidity or sedimentation should not be done during the TOY restriction from April 15 to June 1, unless performed behind sealed cofferdams.
 - e. To minimize adverse effects to fish and shellfish, controls should not encroach:
 - >25% of the stream width measured from the OHWM in non-tidal streams with diadromous fish during the diadromous TOY restriction from April 15 to June 1.
 - f. Safe, timely and effective downstream passage should be maintained throughout all projects with diadromous fish.
 - g. Controls should be removed upon completion of work, but not until all exposed soil and other fills, as well as any work waterward of OHW, are permanently stabilized. Sediment and debris collected should be removed and placed at an upland location in a manner that will prevent erosion into a waterway or wetland.
 - h. Controls in streams should be installed and removed during the same TOY work window and should not be left in place during TOY restrictions.
 - i. Noise-generating work in diadromous streams should not occur within the diadromous fish TOY restriction from April 15 to June 1 unless it is properly isolated e.g., work should occur behind sealed, dewatered cofferdams, in the dry. This is to avoid impeding fish migration. Passage should be maintained during migration.
2. All impacted areas should be restored to preconstruction conditions and grades.

Recommendations "e" and "h" were determined to be not be feasible by NHDOT. NOAA accepted NHDOT's justification for not meeting these recommendations (refer to the following email correspondence).

3. Compensatory mitigation should be provided commensurate with the amount and type of temporary and permanent adverse effects to any non-tidal Special Aquatic Sites that are not restored to preconstruction conditions.

FISH AND WILDLIFE COORDINATION ACT COMMENTS

ENDANGERED SPECIES

Threatened or endangered species under the jurisdiction of NMFS may be present in the project area. The federal action agency will be responsible for determining whether the proposed action may affect listed species. If they determine that the proposed action may affect a listed species, they should submit their determination of effects, along with justification and a request for concurrence to the attention of the Section 7 Coordinator, NMFS, Greater Atlantic Regional Fisheries Office, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930 or nmfs.gar.esa.section7@noaa.gov.

OTHER:

Provide a copy of the permit when issued.

Prepared by: Kaitlyn Shaw **date:** 01/03/24

Mills, Arin

From: Kaitlyn Shaw - NOAA Federal <kaitlyn.shaw@noaa.gov>
Sent: Tuesday, January 16, 2024 12:47 PM
To: Mills, Arin
Cc: Hicks, Michael C CIV USARMY CENAE (USA); Martin, Rebecca
Subject: Re: [Non-DoD Source] Re: EFH Assessment for NHDOT Dover 41824 Bridge Rehab Over Cocheco River

EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Hello,

When we provide conservation recommendations, we need a response. You have provided a response and justification as to why the conservation recommendations cannot be met, and have noted that; 1. There will be no additional encroachment during the TOY restriction, 2. The causeway being constructed and removed outside the April 15th and June 1st window effectively minimizes impacts to fish species. I do not see a need for a meeting to discuss this, as I've accepted your decision regarding the CR's you are unable to meet and have requested that you share the permit with the conditions you are able to meet when it is issued.

Can you confirm what the intended purpose of the meeting is?

Best,
Kaitlyn

On Tue, Jan 16, 2024 at 12:10 PM Mills, Arin <Arin.J.Mills@dot.nh.gov> wrote:

I agree Mike as these 2 conditions provide issue from a construction standpoint, as mentioned.

Kaitlyn. Would you be available to meet (virtual)? I can facilitate setting something up. Few dates/times to consider:

- Wed, 1/17- p.m.
- Thurs, 1/18- a.m. or p.m.
- Fri, 1/19- a.m.
- Mon, 1/22- a.m. or p.m.

Let me know your preference and I will set something up.

Arin Mills

Senior Environmental Manager, Operations Management

NH Department of Transportation

Bureau of Environment

7 Hazen Drive, Concord, NH 03302

Ph: (603)271-0187

Arin.j.mills@dot.nh.gov

From: Hicks, Michael C CIV USARMY CENAE (USA) <Michael.C.Hicks@usace.army.mil>
Sent: Tuesday, January 16, 2024 11:01 AM
To: Kaitlyn Shaw - NOAA Federal <kaitlyn.shaw@noaa.gov>; Mills, Arin <Arin.J.Mills@dot.nh.gov>
Cc: Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Subject: RE: [Non-DoD Source] Re: EFH Assessment for NHDOT Dover 41824 Bridge Rehab Over Cocheco River

EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Kaitlyn and Arin,

I believe we need to have a conversation on these 2 conditions in question.

Thanks,

Mike Hicks

USACE

978-318-8157

From: Kaitlyn Shaw - NOAA Federal <kaitlyn.shaw@noaa.gov>
Sent: Tuesday, January 16, 2024 10:12 AM
To: Mills, Arin <Arin.J.Mills@dot.nh.gov>
Cc: Hicks, Michael C CIV USARMY CENAE (USA) <Michael.C.Hicks@usace.army.mil>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>
Subject: [Non-DoD Source] Re: EFH Assessment for NHDOT Dover 41824 Bridge Rehab Over Cocheco River

Arin,

Thank you for your response. As you note, some of the conditions were already included in your materials. Please send a copy of the permit when issued.

Best,

Kaitlyn

On Thu, Jan 11, 2024 at 1:17 PM Mills, Arin <Arin.J.Mills@dot.nh.gov> wrote:

Kaitlyn,

Thank you for your response to the EFH review for the Dover 41824 project. I have reviewed the conservation recommendations with both NHDOT engineers in Turnpikes as well as our Construction staff and generally we can commit to the recommendations provided. Construction limitations make two of the recommendations, e and h, not feasible. Below I have provided justification on why these measures are not feasible for this project.

e. To minimize adverse effects to fish and shellfish, controls should not encroach:

- *>25% of the stream width measured from the OHWM in non-tidal streams with diadromous fish during the diadromous TOY restriction from April 15 to June 1.*

- The contractor needs access to the center pier for materials and machinery located about 50% of the width of the river through construction of causeway. This was the same access used for the 1990 widening project of the bridges. As part of the Departments coordination with NH Fish & Game (NHFG), attached, velocity calculations determined a 2-year storm increases the velocity through the crossing by approximately 3 fps and adding the causeway changed the velocity by a negligible amount (~ 0.1 fps). There will be no additional encroachment during the TOY restriction.

h. Controls in streams should be installed and removed during the same TOY work window and should not be left in place during TOY restrictions.

- The contractor needs to be allowed to construct the causeway before the TOY restriction and needs to remain in place until it comes out at the end of the construction season. Starting construction on the causeway after June 1 will not provide the contractor

enough time to replace the bridge superstructure and have the roadway open before winter. They need to be able to use the causeway during the TOY restriction in order to stay out of the water while replacing the superstructure.

I further wanted to provide the Department coordination with the NHFG as it relates to diadromous fish species in the area. Through coordination it was concluded so long as the causeway is constructed and removed outside the April 15th and June 1st window impacts to fish species will be minimized.

Please review the information provided and feel free to reach out if you have additional questions I can assist with. I look forward to hearing more from you on this.

Arin Mills

Senior Environmental Manager, Operations Management

NH Department of Transportation

Bureau of Environment

7 Hazen Drive, Concord, NH 03302

Ph: (603)271-0187

Arin.j.mills@dot.nh.gov

From: Kaitlyn Shaw - NOAA Federal <kaitlyn.shaw@noaa.gov>

Sent: Wednesday, January 3, 2024 3:36 PM

To: Mills, Arin <Arin.J.Mills@dot.nh.gov>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>; Hicks, Michael C CIV USARMY CENAE (USA) <Michael.C.Hicks@usace.army.mil>

Subject: Re: EFH Assessment for NHDOT Dover 41824 Bridge Rehab Over Cocheco River

EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Hi Arin,

Happy New Year! Please find the conservation recommendations for the Route 16 project attached. Some of these are already being met, but given the larger temporary impacts associated with this project, and because the area of passage was not expressed as a percentage, I thought it would be useful to provide the complete recommendations. Let me know if you have any questions.

Please either provide a response to the recommendations or send the permit when authorized to close out our records. If the project is revised in such a manner that affects the basis for this determination, re-initiation of the consultation may be necessary.

Best,

Kaitlyn Shaw (she/ her)

Marine Habitat Resource Specialist

Habitat and Ecosystem Services Division

NOAA/ National Marine Fisheries Service

On Thu, Dec 14, 2023 at 2:08 PM Mills, Arin <Arin.J.Mills@dot.nh.gov> wrote:

Kaitlyn,

Attached is an EFH assessment worksheet for the above referenced project. This is a state (NH) funded project and a wetland permit under the PGP will be obtained.

Can you please review and let me know if you have any additional questions or concerns for the project. I look forward to hearing back from you on this project.

Thank you.

Arin Mills

Senior Environmental Manager, Operations Management

NH Department of Transportation

Bureau of Environment

7 Hazen Drive, Concord, NH 03302

Ph: (603)271-0187

Arin.j.mills@dot.nh.gov

NOAA ESA Section 7 Mapper Report

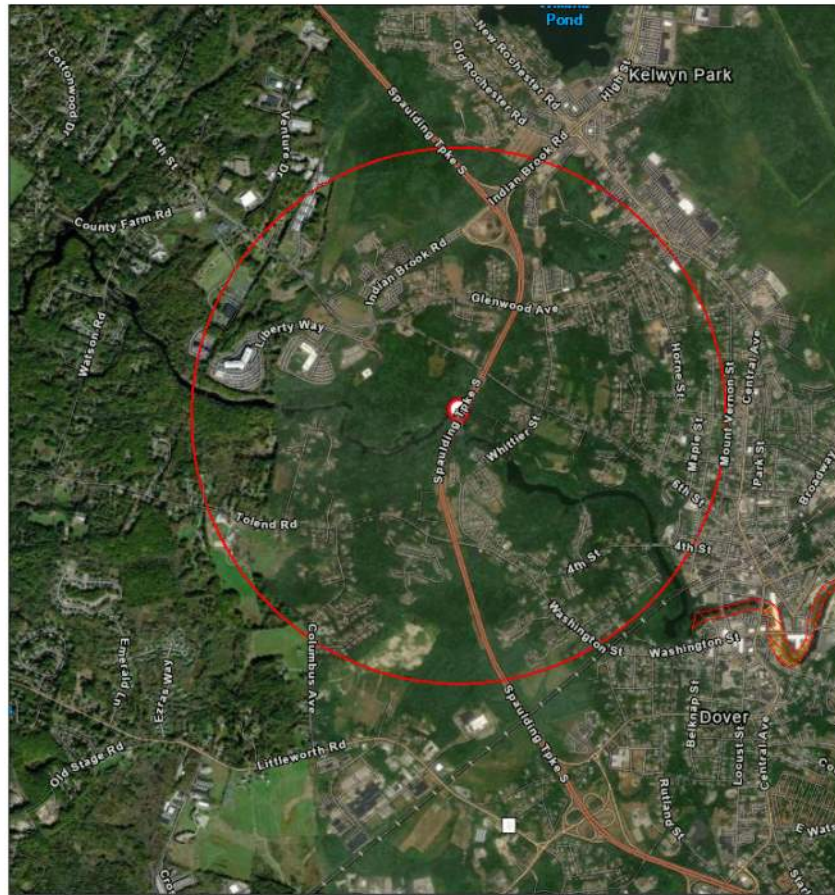





Action Area & Overlapping S7 Consultation Areas - Dover 41824

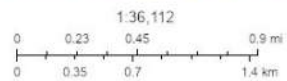
Area of Interest (AOI) Information

Area : 2,009.02 acres

Jan 4 2024 15:42:50 Eastern Standard Time



-  Atlantic Sturgeon
-  Shortnose Sturgeon
-  In or Near Critical Habitat



Mapx, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METY, NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Summary

Name	Count	Area(acres)	Length(mi)
Project Area	1	7.35	N/A
Atlantic Sturgeon	0	0	N/A
Shortnose Sturgeon	0	0	N/A
Atlantic Salmon	0	0	N/A
Sea Turtles	0	0	N/A
Atlantic Large Whales	0	0	N/A
In or Near Critical Habitat	0	0	N/A

Project Area

#	FID	NoteType	Name	Notes	created_us
1	0	0	No Data	No Data	EMASKIELL

#	created_da	last_edite	last_edi_1	Shape_Leng	Shape_Area	Area(acres)
1	5/30/2023, 8:00 PM	EMASKIELL	5/30/2023, 8:00 PM	2065.95709714	56047.561992	7.35



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

In Reply Refer To:
Project Code: 2024-0031686
Project Name: Dover 41824

January 02, 2024

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

To Whom It May Concern:

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

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

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see [Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service \(fws.gov\)](#).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

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 Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

OFFICIAL SPECIES LIST

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

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2024-0031686

Project Name: Dover 41824

Project Type: Bridge - Maintenance

Project Description: The project involves the rehabilitation of the two NH Route 16 (Spaulding Turnpike) bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cocheco River in the City of Dover. The existing bridges were constructed in 1957 and rebuilt in 1991. They are currently on the State's Red List.

The proposed work includes superstructure replacement, replacement of bearings and expansion joints, and substructure repairs on each bridge.

The project extends approximately 1,400 feet south of the bridges and approximately 1,100 feet north of the bridges along NH Route 16 to accommodate traffic control measures.

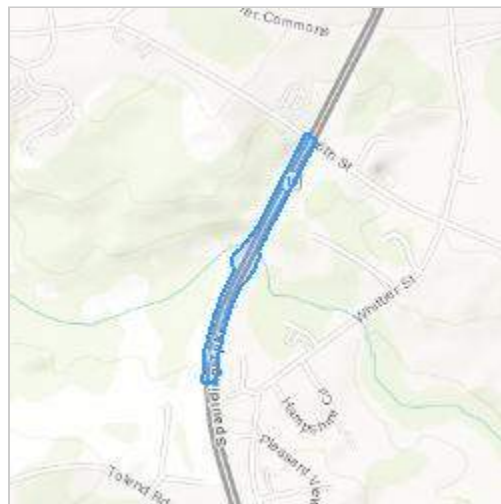
The bridges will be widened from 37.75 feet to 40 feet and a small amount of roadway widening is proposed at each bridge approach to match the existing pavement to the widened bridges. The net increase in impervious surface is approximately 2,300 square feet. All work will be within the existing NHDOT right-of-way. A small amount of tree clearing (approximately 8,000 square feet) is anticipated for construction of the temporary access roads.

Temporary impacts to the Cocheco River channel and banks are anticipated during construction. An access road, causeway, and crane pad will be required at each bridge location to conduct the bridge repair work. Cofferdams will be used to dewater the work area and direct river flow to the opposite side of the channel.

The NHDOT project number is 41824.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.2064515,-70.89681513505622,14z>



Counties: Strafford County, New Hampshire



ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, 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: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: GM2 Associates Inc.
Name: Ethan Maskiell
Address: 197 Loudon Road
Address Line 2: Suite 310
City: Concord
State: NH
Zip: 03301
Email: emaskiell@gm2inc.com
Phone: 6038567854

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army Corps of Engineers



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

In Reply Refer To:
Project code: 2024-0031686
Project Name: Dover 41824

January 02, 2024

Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Record of project representative's no effect determination for 'Dover 41824'

Dear Ethan Maskiell:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on January 02, 2024, for 'Dover 41824' (here forward, Project). This project has been assigned Project Code 2024-0031686 and all future correspondence should clearly reference this number. **Please carefully review this letter.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project has reached the determination of "No Effect" on the northern long-eared bat. To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A

consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (See § 402.17).

Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no consultation with the Service is required (ESA §7). If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13].

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate

You may coordinate with our Office to determine whether the Action may affect the animal species listed above and, if so, how they may be affected.

Next Steps

Based upon your IPaC submission, your project has reached the determination of “No Effect” on the northern long-eared bat. If there are no updates on listed species, no further consultation/coordination for this project is required with respect to the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place to ensure compliance with the Act.

If you have any questions regarding this letter or need further assistance, please contact the New England Ecological Services Field Office and reference Project Code 2024-0031686 associated with this Project.

Action Description

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

1. Name

Dover 41824

2. Description

The following description was provided for the project 'Dover 41824':

The project involves the rehabilitation of the two NH Route 16 (Spaulding Turnpike) bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cocheco River in the City of Dover. The existing bridges were constructed in 1957 and rebuilt in 1991. They are currently on the State's Red List.

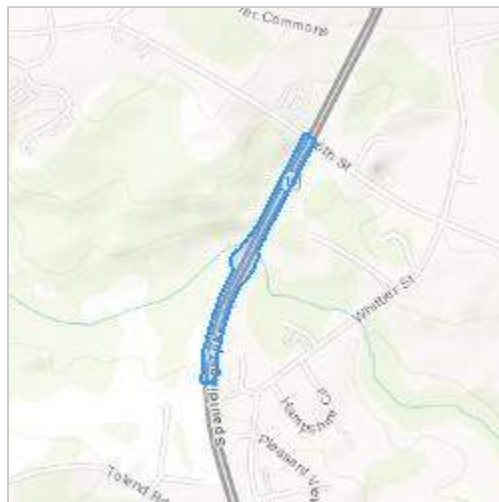
The proposed work includes superstructure replacement, replacement of bearings and expansion joints, and substructure repairs on each bridge. The project extends approximately 1,400 feet south of the bridges and approximately 1,100 feet north of the bridges along NH Route 16 to accommodate traffic control measures.

The bridges will be widened from 37.75 feet to 40 feet and a small amount of roadway widening is proposed at each bridge approach to match the existing pavement to the widened bridges. The net increase in impervious surface is approximately 2,300 square feet. All work will be within the existing NHDOT right-of-way. A small amount of tree clearing (approximately 8,000 square feet) is anticipated for construction of the temporary access roads.

Temporary impacts to the Cocheco River channel and banks are anticipated during construction. An access road, causeway, and crane pad will be required at each bridge location to conduct the bridge repair work. Cofferdams will be used to dewater the work area and direct river flow to the opposite side of the channel.

The NHDOT project number is 41824.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.2064515,-70.89681513505622,14z>



DETERMINATION KEY RESULT

Based on the information you provided, you have determined that the Proposed Action will have no effect on the Endangered northern long-eared bat (*Myotis septentrionalis*). Therefore, no consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required for those species.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. The proposed action does not intersect an area where the northern long-eared bat is likely to occur, based on the information available to U.S. Fish and Wildlife Service as of the most recent update of this key. If you have data that indicates that northern long-eared bats are likely to be present in the action area, answer "NO" and continue through the key.

Do you want to make a no effect determination?

Yes

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: GM2 Associates Inc.
Name: Ethan Maskiell
Address: 197 Loudon Road
Address Line 2: Suite 310
City: Concord
State: NH
Zip: 03301
Email: emaskiell@gm2inc.com
Phone: 6038567854

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army Corps of Engineers

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Activities with Minimal Potential to Cause Effects

Date Reviewed: 7/1/2023
(Desktop or Field Review Date)

This project uses only State funded; however project activities listed below comply with the PA.

Project Name: Dover

State Number: 41824

FHWA Number: N/A

Environmental Contact: Arin Mills
Email Address: Arin.J.Mills@dot.nh.gov

DOT Project Manager: Sam Newsom

Project Description: The project involves the rehabilitation of the two NH Route 16 (Spaulding Turnpike) Bridges that carry Northbound (Bridge No. 106/133) and Southbound (Bridge No. 105/133) traffic over the Cochecho River in the City of Dover. The existing bridges were constructed in 1957 and rebuilt in 1991 and are currently on the State’s Red List. Proposed work includes superstructure replacement, replacement of bearings and expansion joints, and substructure repairs on each bridge. Additional project information is attached.

Please select the applicable activity/activities:

Highway and Roadway Improvements	
<input checked="" type="checkbox"/>	1. Modernization and general highway maintenance that may require additional highway right-of-way or easement , including: k. Construction of turning lanes and pockets, auxiliary lanes (e.g. truck climbing, acceleration and deceleration lanes) and shoulder widening where only placement of fill material is involved, or within an area previously disturbed by vertical and horizontal construction activities. <i>Choose an item.</i>
<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
Bridge and Culvert Improvements	
<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, that may require minor additional right-of-way or easement , including: a. replacement or maintenance of non-historic bridges <i>Choose an item.</i>
<input type="checkbox"/>	8. Historic bridge maintenance activities within the limits of existing right-of-way, including: <i>Choose an item.</i> <i>Choose an item.</i>
<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)
Bicycle and Pedestrian Improvements	
<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
<input type="checkbox"/>	13. Recreational trail maintenance when done on existing alignment

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Activities with Minimal Potential to Cause Effects

<input type="checkbox"/>	14. Construction of bicycle lanes and shared use paths and facilities within the existing right-of-way
Railroad Improvements	
<input type="checkbox"/>	15. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, provided no historic railroad features are impacted , 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
Other Improvements	
<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.

The project involves rehabilitation of two bridges, both are not eligible for the National Register as they meet the criteria for inclusion under the Program Comment for Common Post-1945 Bridges. While most of the proposed project activities occur within areas of previously disturbed soils, small Pre-Contact archaeological sites were found off the southeast and southwest bridge quadrants. NHDHR and NHDOT Cultural Resources Program has determined that the proposed temporary access roads in these quadrants can be constructed if the archaeological sites and sensitivity areas (highlighted in purple on the accompanying map) are protected by geotextile fabric, fill and timber matting. The Geotech and fill should be left in place to prevent subsurface disturbance.

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?	No	NHDHR R&C # assigned?	<u>N/A</u>
Please identify public outreach effort contacts; method of outreach and date:	<u>Sent Initial Contact Letter to Dover Heritage Commission on 4/5/2022 (no response received). City officials were also contacted via email in April 2022 and April 2023.</u>		

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

<input type="checkbox"/>	No Potential to Cause Effects	<input checked="" type="checkbox"/>	No Historic Properties Affected
This finding serves as the Section 106 Memorandum of Effect. No further coordination is necessary.			
<input type="checkbox"/>	This project does not 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:			
<i>Sheila Charles</i>		11/2/2023	

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Activities with Minimal Potential to Cause Effects

NHDOT Cultural Resources Staff

Date

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

Project sponsors should not predetermine a Section 106 finding under the assumption 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.



**US Army Corps
of Engineers**®
New England District

**Appendix B
New Hampshire General Permits
Required Information and USACE Section 404 Checklist**

USACE Section 404 Checklist

1. Attach any explanations to this checklist. Lack of information could delay a USACE 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 3 for information on single and complete projects.
4. Contact USACE at (978) 318-8832 with any questions.
5. The information requested below is generally required in the NHDES Wetland Application. See page 61 for NHDES references and Admin Rules as they relate to the information below.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See the following to determine if there is an impaired water in the vicinity of your work area. * https://nhdes-surface-water-quality-assessment-site-nhdes.hub.arcgis.com/ https://www.des.nh.gov/water/rivers-and-lakes/water-quality-assessment https://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx	X*	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X*	
2.2 Are there proposed impacts to tidal SAS, prime wetlands, or priority resource areas? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www4.des.state.nh.us/NHB-DataCheck/ .	X*	
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	X*	
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	unknown	
2.7 What is the area of the proposed fill in wetlands?	247 square feet	
2.8 What % of the overall project sire will be previously and proposed filled wetlands?	unknown	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www4.des.state.nh.us/NHB-DataCheck/ . USFWS IPAC website: https://ipac.ecosphere.fws.gov/	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"> • PDF: https://wildlife.state.nh.us/wildlife/wap-high-rank.html. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 31?	X	
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X*	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?		N/A - no flood storage loss anticipated
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the RPR Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 37 GC 14(d) of the GP document**	X	
6. Minimal Impact Determination (for projects that exceed 1 acre of permanent impact)	Yes	No
Projects with greater than 1 acre of permanent impact must include the following: <ul style="list-style-type: none"> • Functional assessment for aquatic resources in the project area. • On and off-site alternative analysis. • Provide additional information and description for how the below criteria are met. 		N/A - The project does not involve more than 1 acre of permanent impact.
6.1 Will there be complete loss of aquatic resources on site?		
6.2 Have the impacts to the aquatic resources been avoided and minimized to the greatest extent practicable?		
6.3 Will all aquatic resource function be lost?		
6.4 Does the aquatic resource (s) have regional significance (watershed or ecoregion)?		
6.5 Is there an on-site alternative with less impact?		
6.6 Is there an off-site alternative with less impact?		
6.7 Will there be a loss to a resource dependent species?		
6.8 Are indirect impacts greater than 1 acre within and adjacent to the project area?		
6.9 Does the proposed mitigation replace aquatic resource function for direct, indirect, and cumulative impacts?		

*Although this checklist utilizes state information, its submittal to USACE is a federal requirement.

** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

USACE Section 404 Checklist (Appendix B) Supplemental Information

- 1.1.** The segment of the Cocheco River within the project area is listed as impaired for pH, mercury, and E. Coli. The Central Ave Dam segment of the Cocheco River approximately 1,100 feet downstream of the project area is listed as impaired for pH and mercury. Horn Brook (approximately 3,500 west of the project area) and Unnamed Brook (approximately 2,700 feet southeast of the project area) are listed as impaired for mercury. Indian Brook (approximately 3,800 feet west of the project area) and Berry Brook (approximately 4,000 feet east of the project area) are listed as impaired for chloride, mercury, and E. Coli. All data listed and reviewed on the NHDES 2020/2022 Surface Water Quality Assessment Viewer.
- 2.1.** The project involves the rehabilitation of the two NH Route 16 bridges over the Cocheco River.
- 2.2.** A state species of special concern, American eel (*Anguilla rostrata*), has been documented in the Cocheco River and Berry Brook within the vicinity of the project area. The project does not propose any permanent wetland or watercourse impacts.
- 2.4.** Temporary impacts and clearing on the southern bank of the Cocheco River are proposed for causeway installation and construction access. Once construction is complete, the project area will be restored to pre-existing conditions and allowed to revegetate.
- 2.7.** Approximately 247 SF of permanent fill in an emergent wetland southwest of the bridges is proposed. The project will also result in approximately 12,878 SF of temporary impact.
- 3.1.** The NH Natural Heritage Bureau (NHB) Report indicated that American eel (*Anguilla rostrata*), a state species of special concern, occurs within the vicinity of the project. No documented occurrences are located within the project limits. NH Fish and Game (NHFG) also indicated that blueback herring (state species of special concern) and alewife (state species of special concern) occur within the vicinity of the project. NHFG provided several recommendations (refer to enclosed NHB and NHFG correspondence) to minimize impacts to these species. No documented plant species or exemplary natural communities were included in the NHB report.

The USFWS IPaC report indicated that northern long-eared bat (NLEB) and monarch butterfly may occur within the project area. A No Effect Determination for NLEB was received using the Rangewide Determination Key in IPaC.

- 4.1.** The segment of the Cocheco River within the project area is mapped as a Zone A floodplain but there is no regulatory floodway, based on a review of the FEMA Flood Insurance Rate Map. Since most impacts associated with the project are temporary, no loss of flood storage is anticipated.

Dover 41824
NH Route 16 Bridges over Cocheco River
Photographs



Photo 1.
View northwest of
Bridge No. 106/133
(Northbound) and
Bridge No. 105/133
(Southbound)
Photo taken 4/23/20



Photo 2.
View south of
bridges, Cocheco
River, and Dover
Community Trail
Photo taken 4/23/20



Photo 3.
View northwest of
Bridge No. 106/133
(Northbound)
Photo taken 5/27/22



Photo 4.
View southeast of
Bridge No. 105/133
(Southbound),
looking toward
proposed causeway
& cofferdam area
Photo taken 5/27/22



Photo 5.
SE bridge quadrant
View southwest
towards proposed
temporary
construction access
road area
Photo taken 12/5/23



Photo 6.
SW bridge quadrant
View southeast
towards proposed
temporary
construction access
road area
Photo taken 12/5/23



Photo 7.
Substrate near south
bank of Cocheco
River
View north
Photo taken 12/5/23



Photo 8.
Wetland 1,
Permanent Impact
Area A - Proposed
construction access
road area
Photo taken 5/27/22

Construction Sequence

Phase 1 & 2 (Bridge No. 105/133)

1. Install perimeter controls.
2. Perform necessary clearing operations for temporary access road southwest of bridges.
3. Construct temporary access road.
4. Install cofferdam to dewater work area in river channel and direct river flow to the north side of the river prior to April 15th. Construct temporary causeway and crane pad.
5. Construct traffic control.
6. Construct substructure repairs/superstructure replacement and widening in two phases.
7. Remove traffic control.
8. Remove causeway, crane pad, and cofferdam (to be completed after June 1st).
9. Conduct final stabilization of disturbed areas.

Phase 3 & 4 (Bridge No. 106/133)

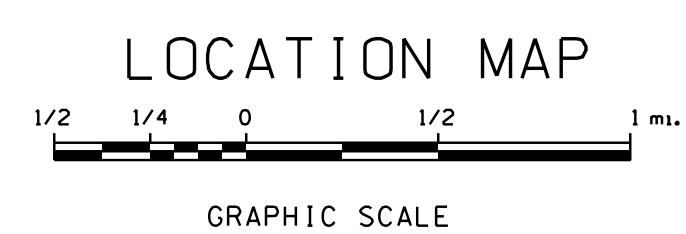
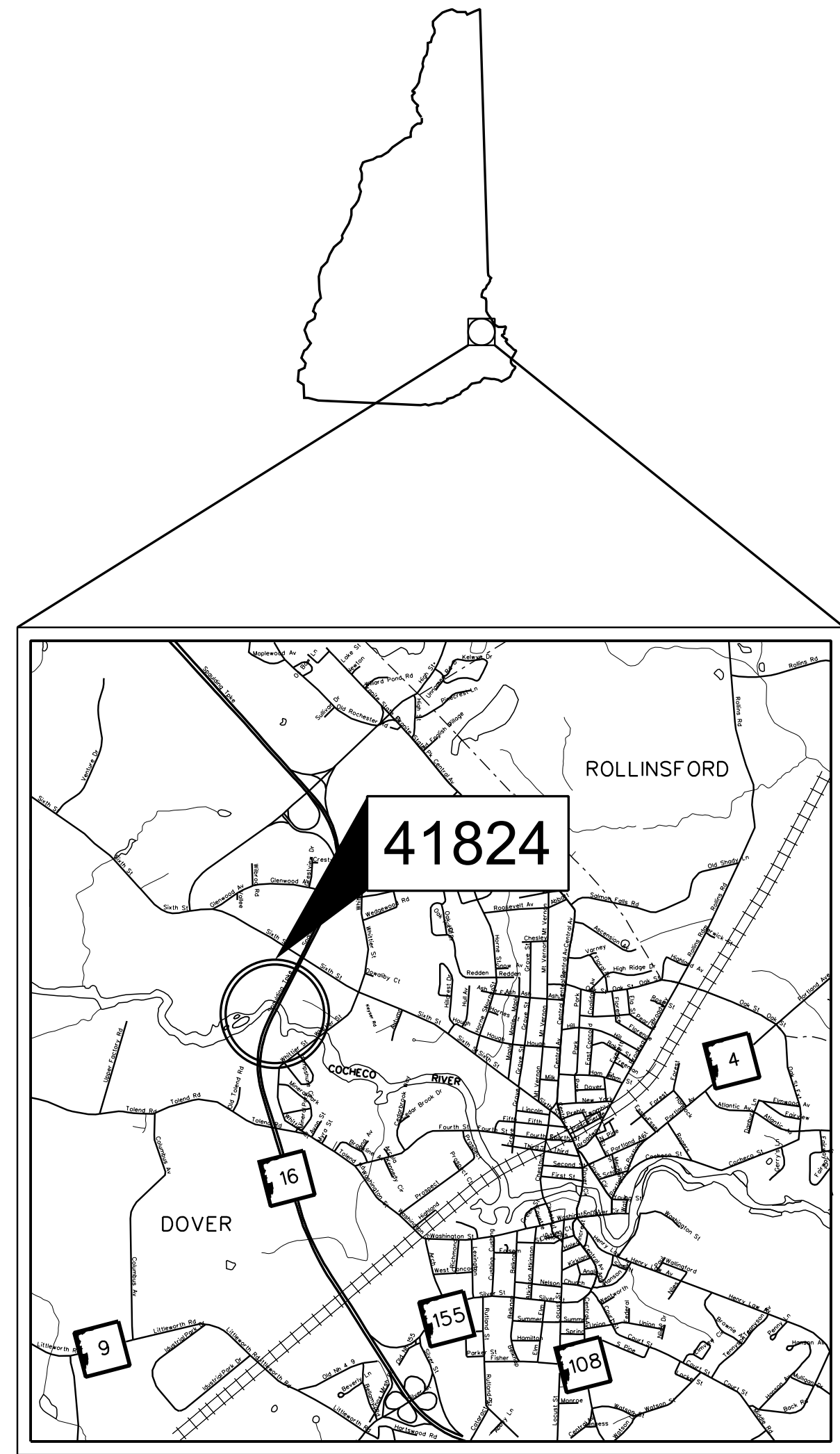
10. Perform necessary clearing operations for construction access road southeast of bridges.
11. Construct access road.
12. Install cofferdam to dewater work area in river channel and direct river flow to the north side of the river prior to April 15th. Construct temporary causeway and crane pad.
13. Construct traffic control.
14. Construct substructure repairs/superstructure replacement and widening in two phases.
15. Remove traffic control.
16. Remove causeway, crane pad, and cofferdam (to be completed after June 1st).
17. Conduct final stabilization and restoration of disturbed areas.
18. Remove perimeter controls.

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

WETLAND PLANS
BRIDGE RECONSTRUCTION PROJECT

N.H. PROJECT NO. 41824
NH ROUTE 16/SPAULDING TURNPIKE OVER COCHECO RIVER
BRIDGE NO. 105/133 & 106/133

DESIGN DATA	
AVERAGE DAILY TRAFFIC 20 22	22,000
AVERAGE DAILY TRAFFIC 20 --	--
PERCENT OF TRUCKS	--
DESIGN SPEED	70 MPH
LENGTH OF PROJECT	2600 FT

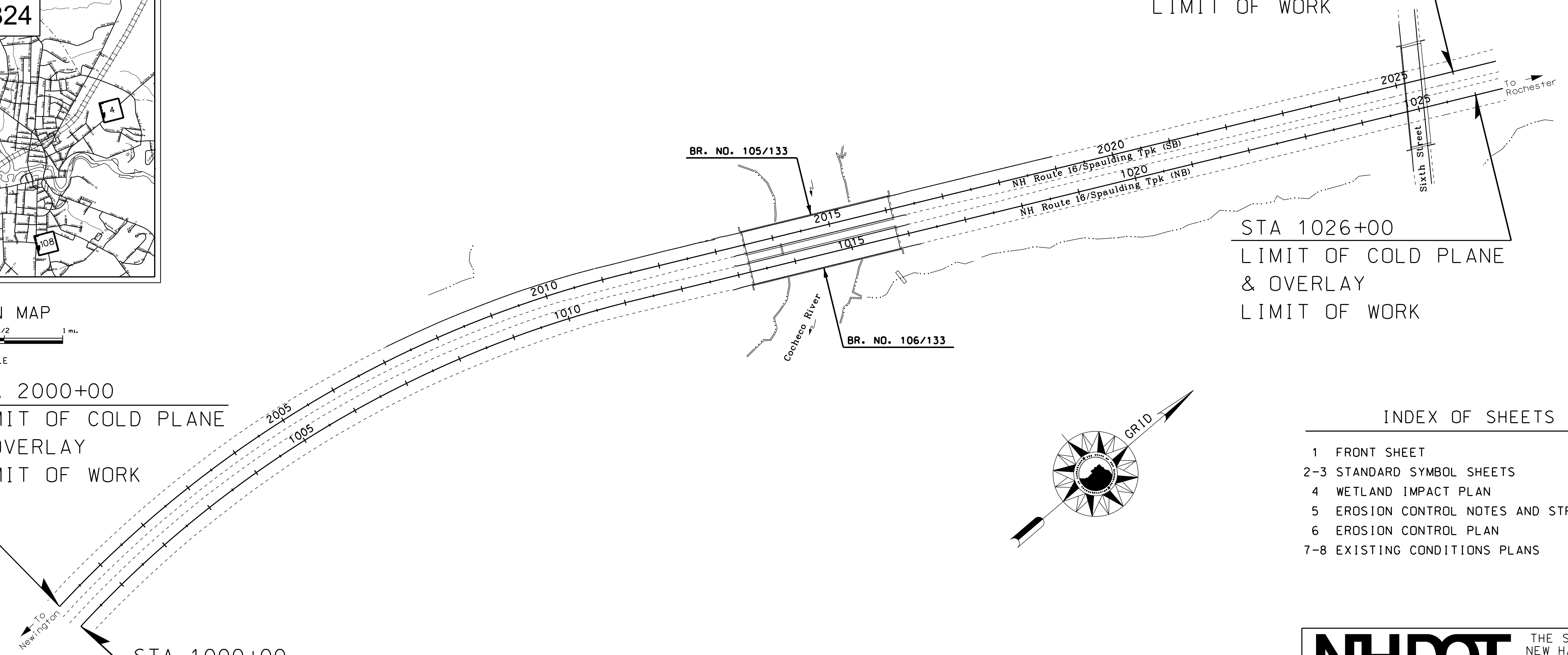


STA 2000+00
LIMIT OF COLD PLANE
& OVERLAY
LIMIT OF WORK

STA 1000+00
LIMIT OF COLD PLANE
& OVERLAY
LIMIT OF WORK

STA 2026+00
LIMIT OF COLD PLANE
& OVERLAY
LIMIT OF WORK

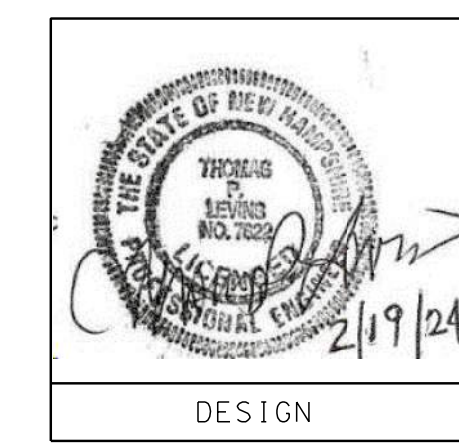
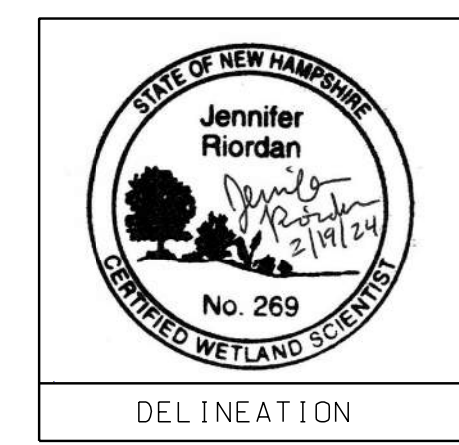
STA 1026+00
LIMIT OF COLD PLANE
& OVERLAY
LIMIT OF WORK



INDEX OF SHEETS

1	FRONT SHEET
2-3	STANDARD SYMBOL SHEETS
4	WETLAND IMPACT PLAN
5	EROSION CONTROL NOTES AND STRATEGIES
6	EROSION CONTROL PLAN
7-8	EXISTING CONDITIONS PLANS

DRAWN BY: C. SWEET
CHECKED BY: J. MERCER
DATE: 3/7/2024
DATE: 3/7/2024



TOWN OF DOVER
COUNTY OF STRAFFORD

SCALE: 1" = 100'

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE CONSTRUCTION PLANS



NH DOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

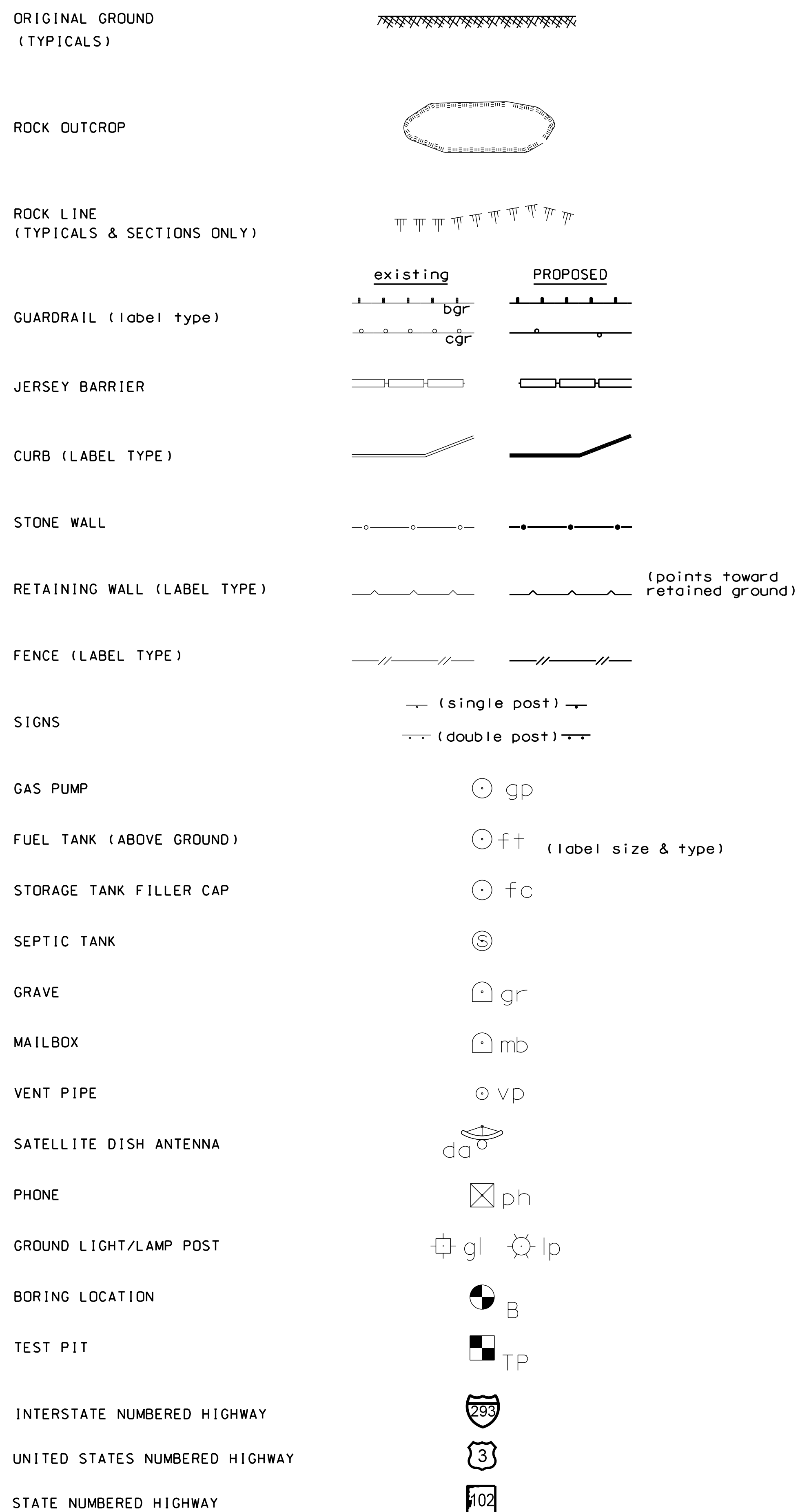
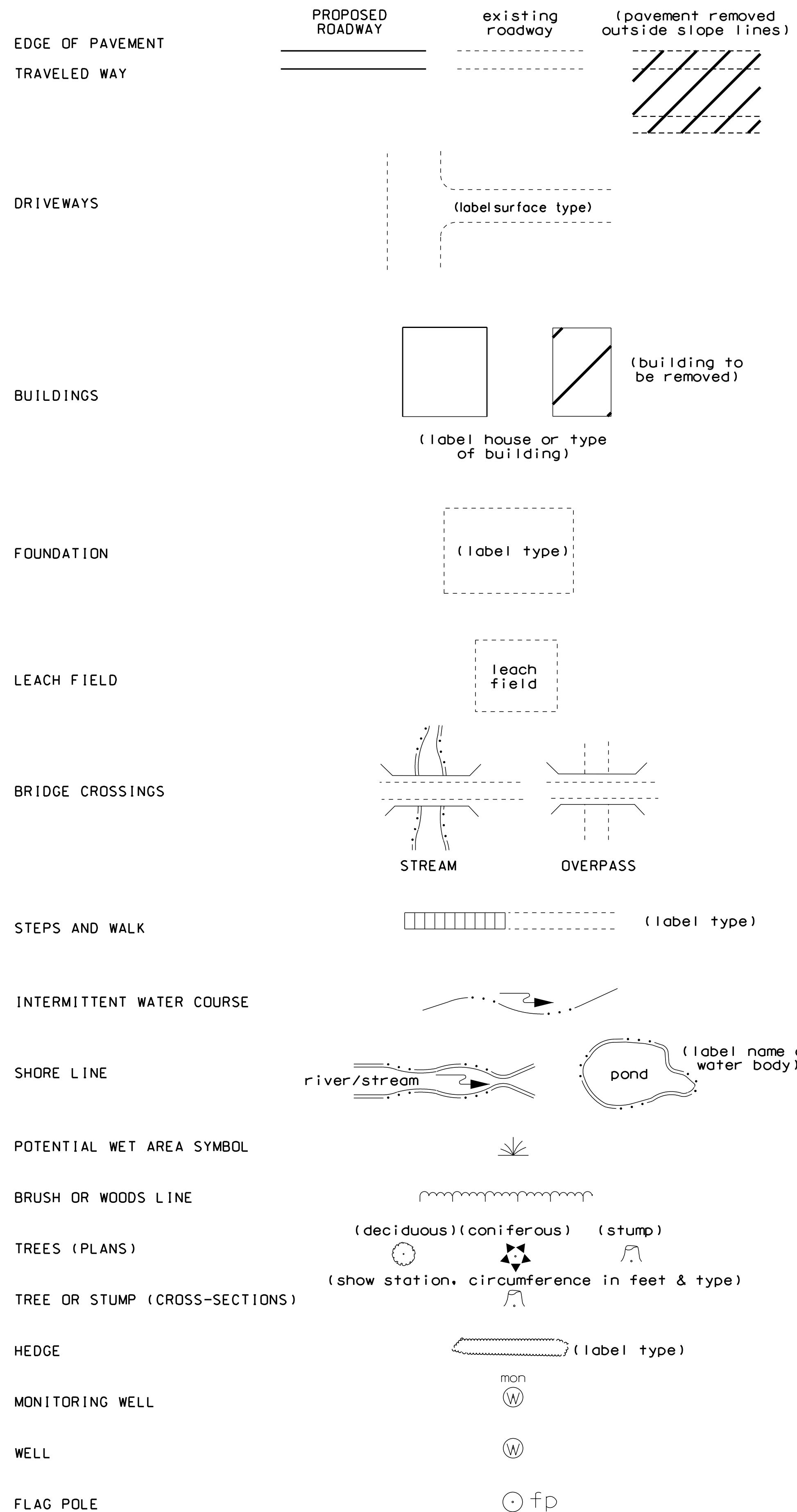
DIRECTOR OF PROJECT DEVELOPMENT DATE

APPROVED:

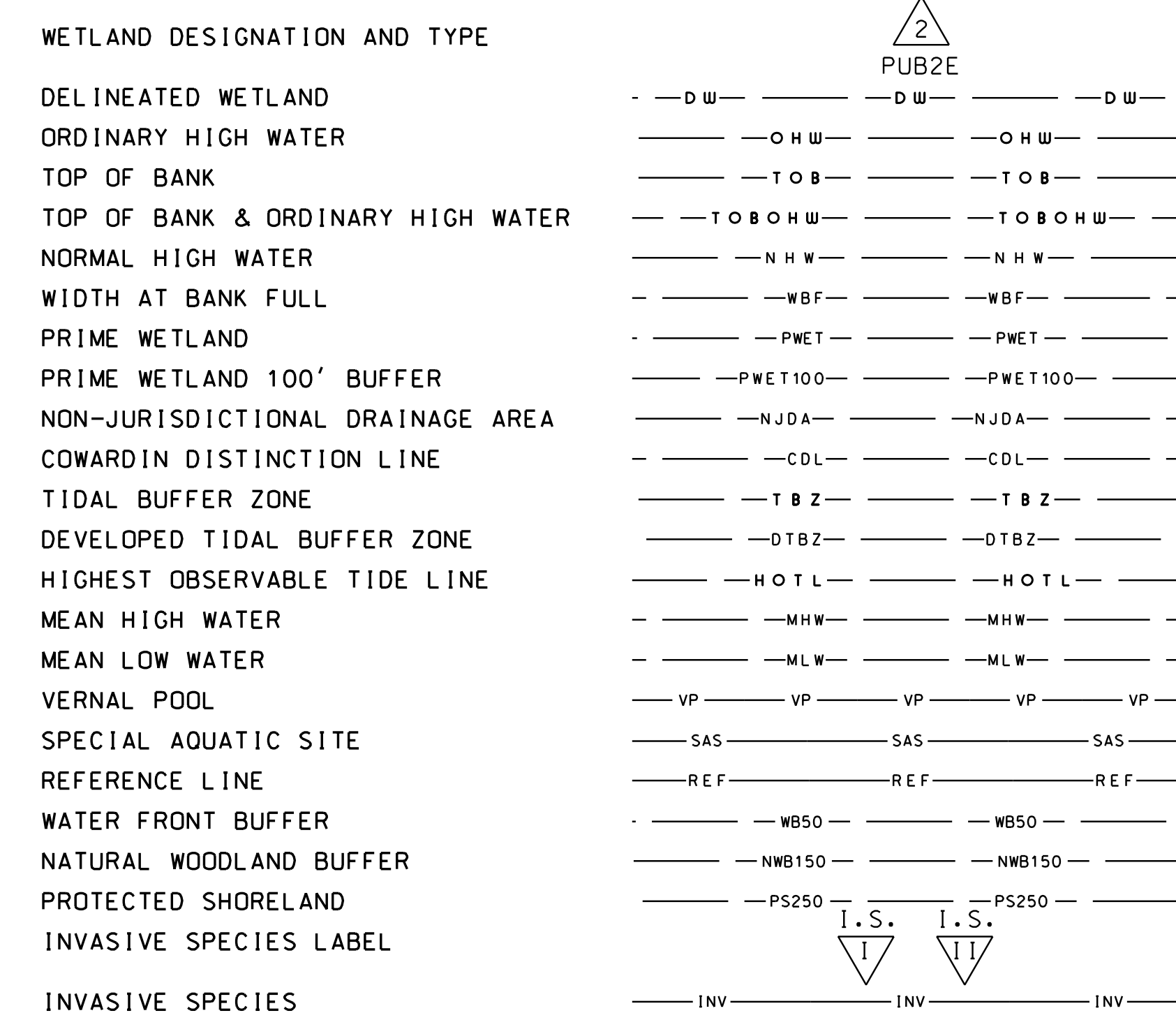
ASSISTANT COMMISSIONER AND CHIEF ENGINEER DATE

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
--	41824	1	8

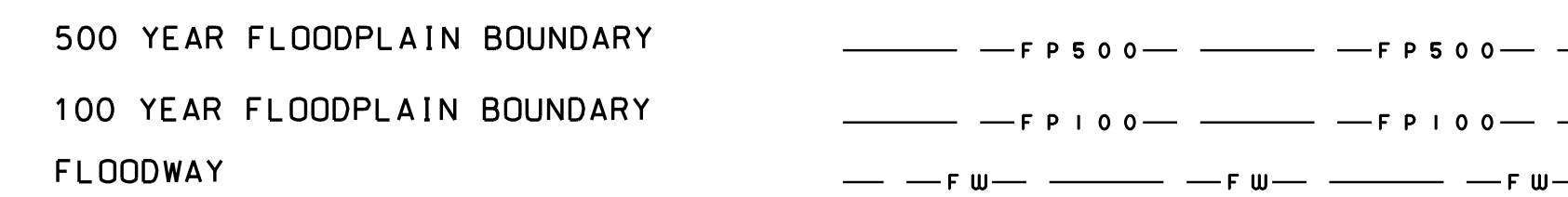
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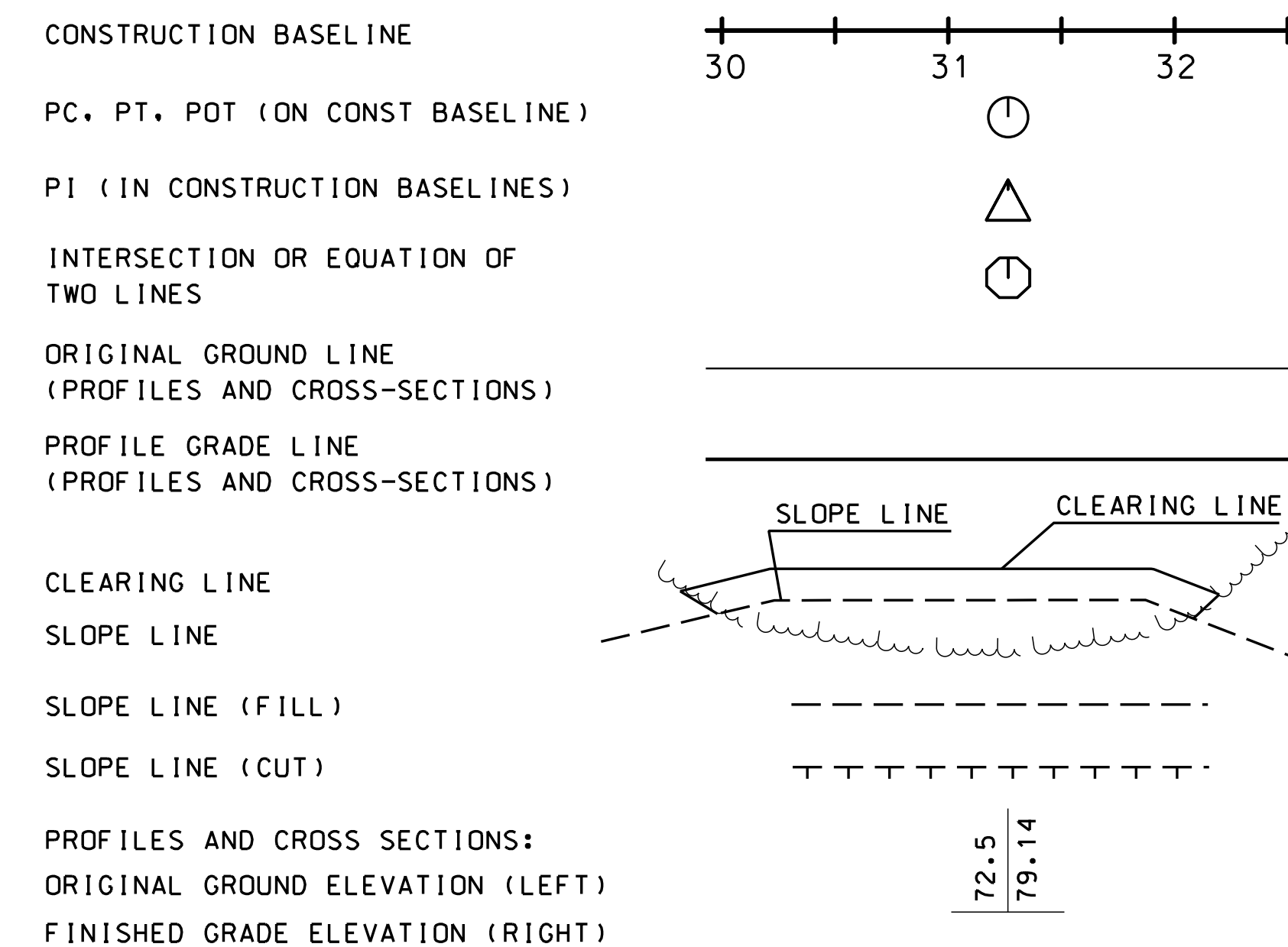
SHORELAND - WETLAND



FLOODPLAIN / FLOODWAY

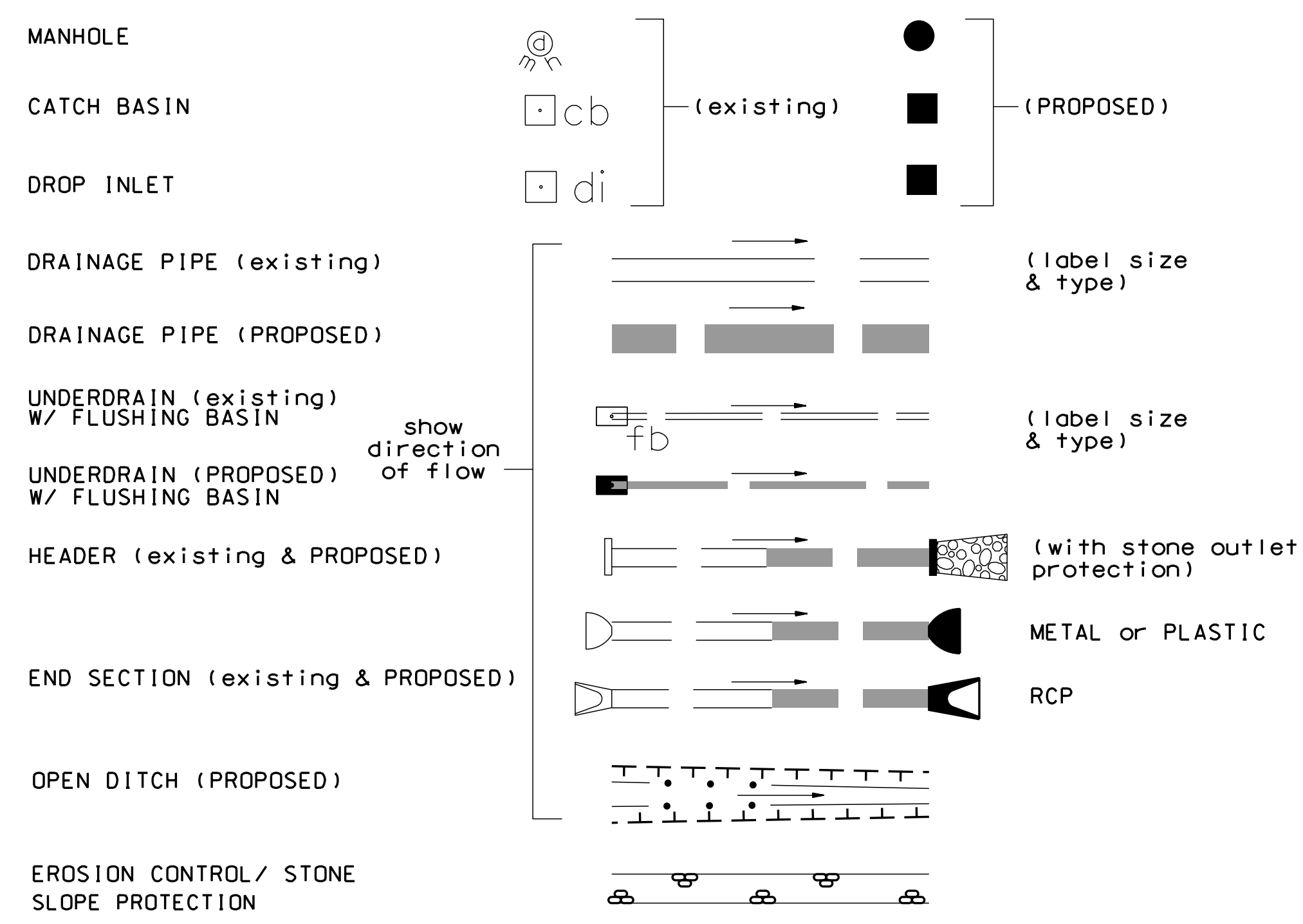


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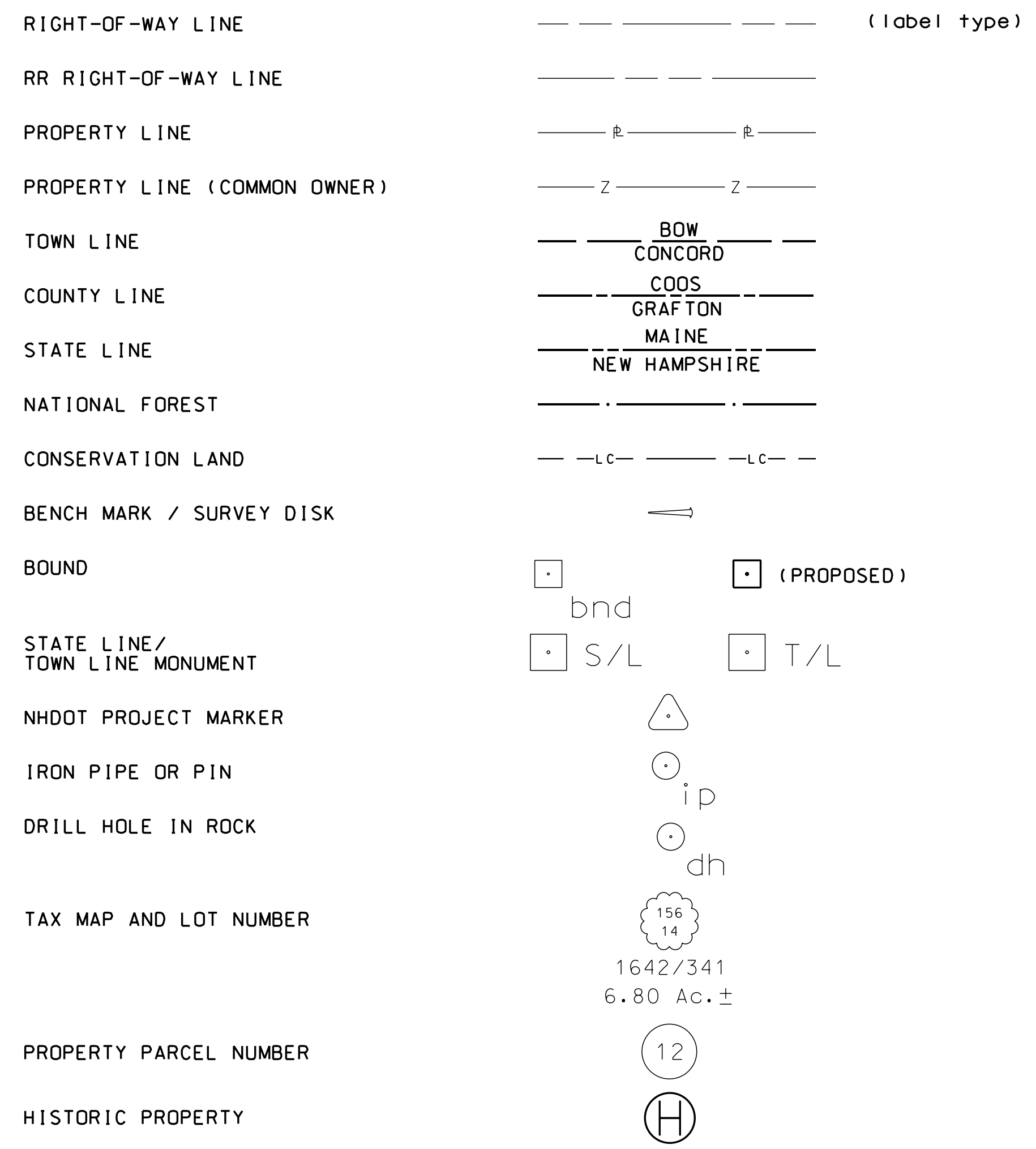


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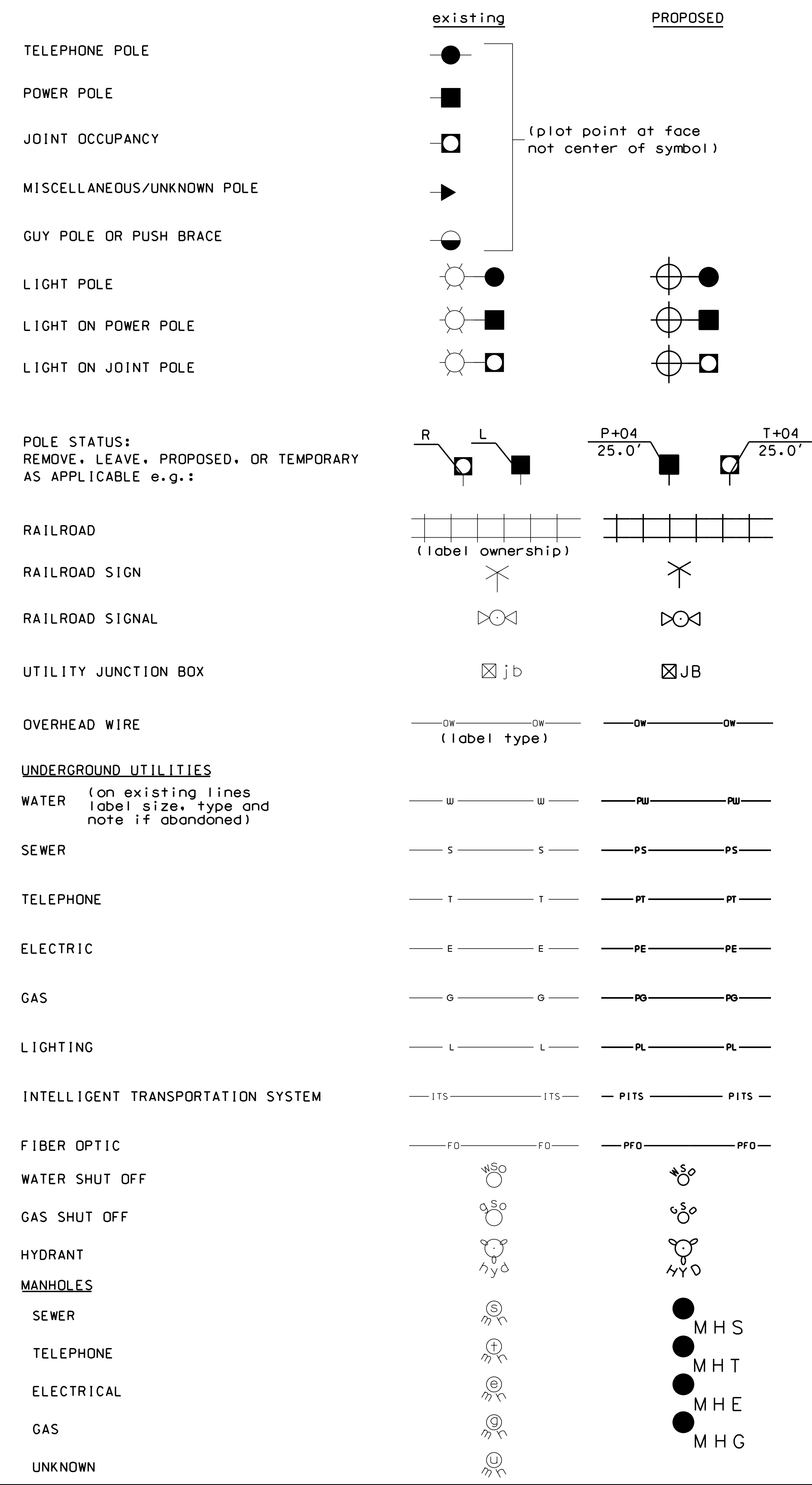
DRAINAGE



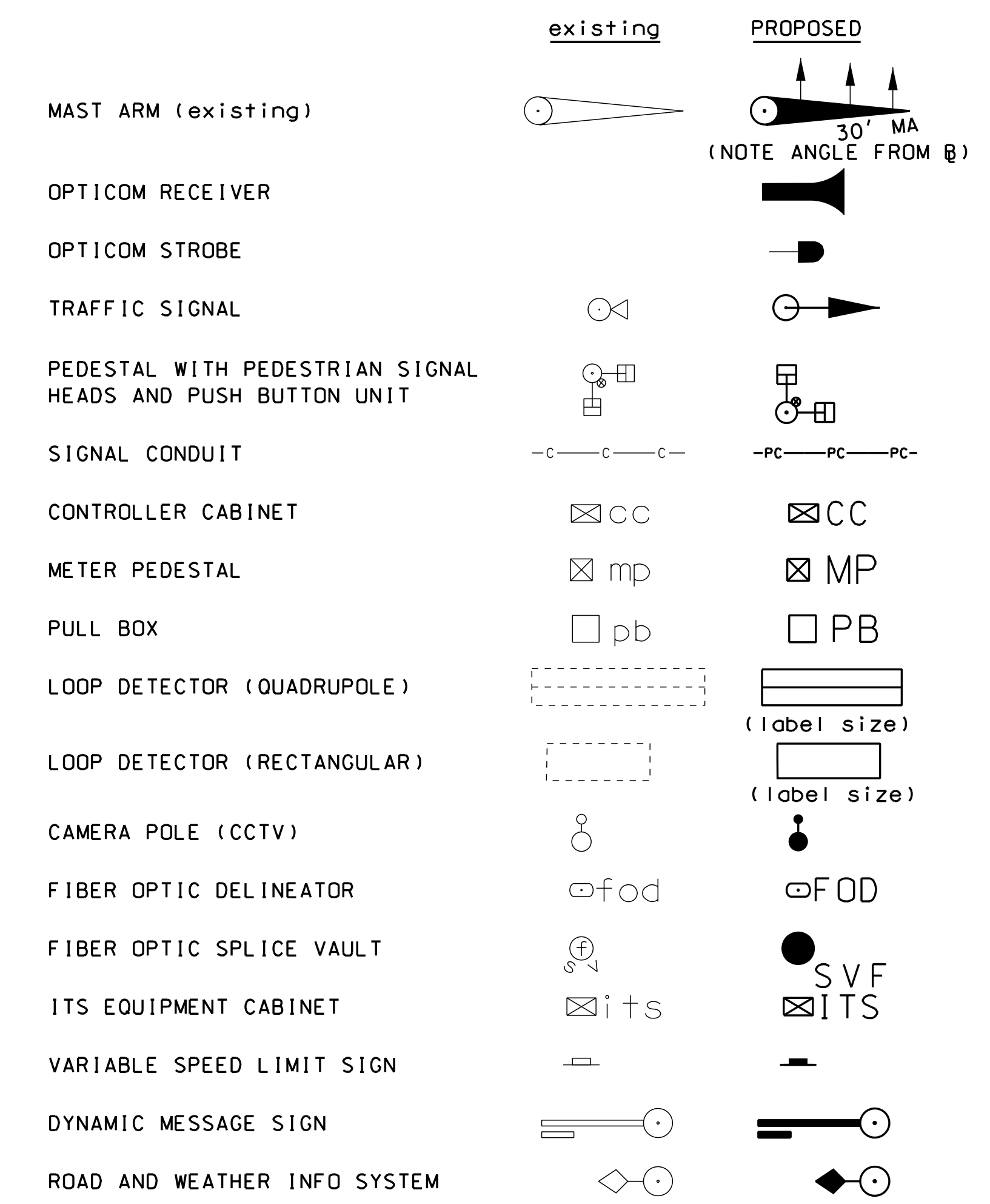
BOUNDARIES / RIGHT-OF-WAY



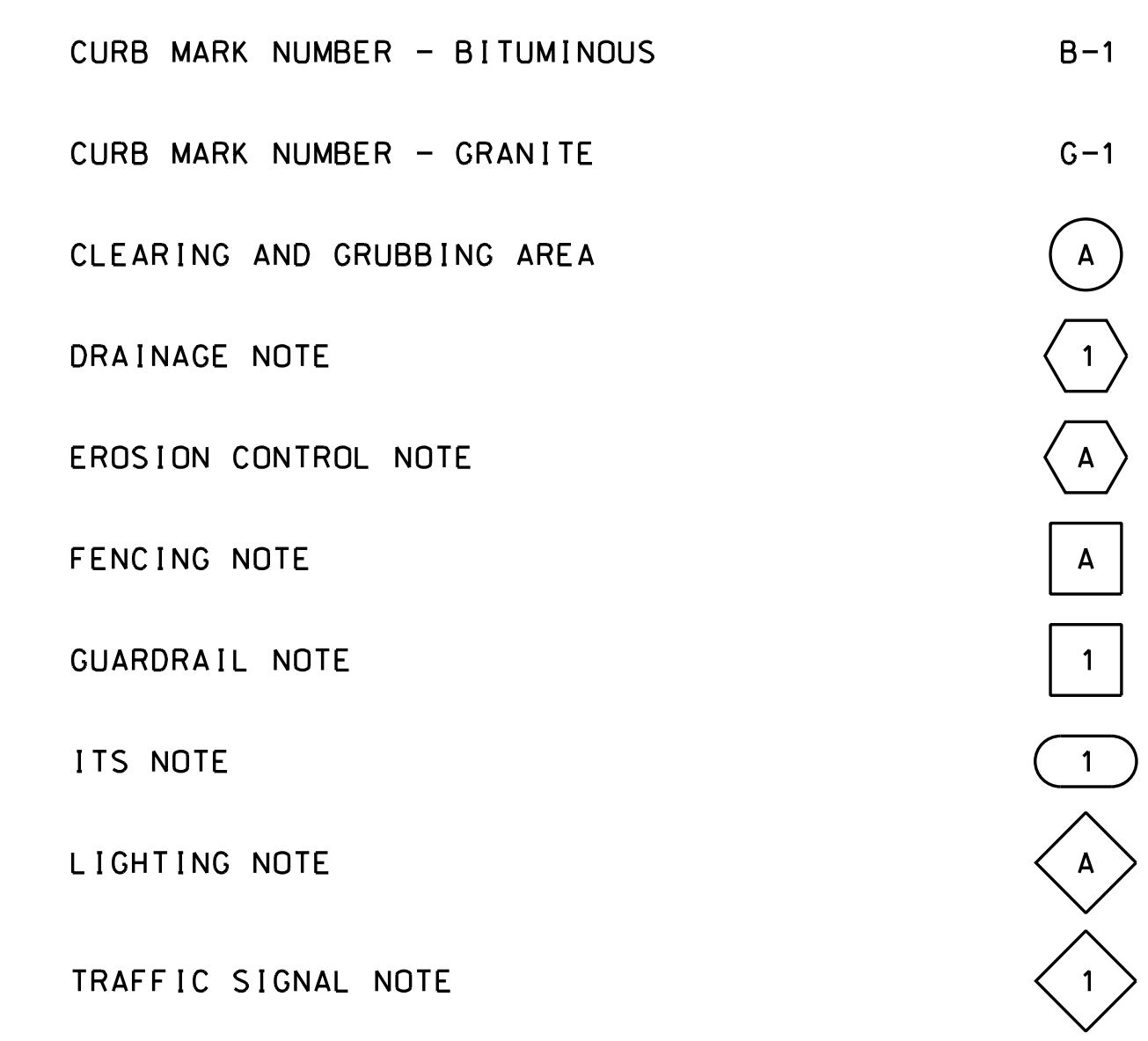
UTILITIES



TRAFFIC SIGNALS / ITS



CONSTRUCTION NOTES



STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
STANDARD SYMBOLS				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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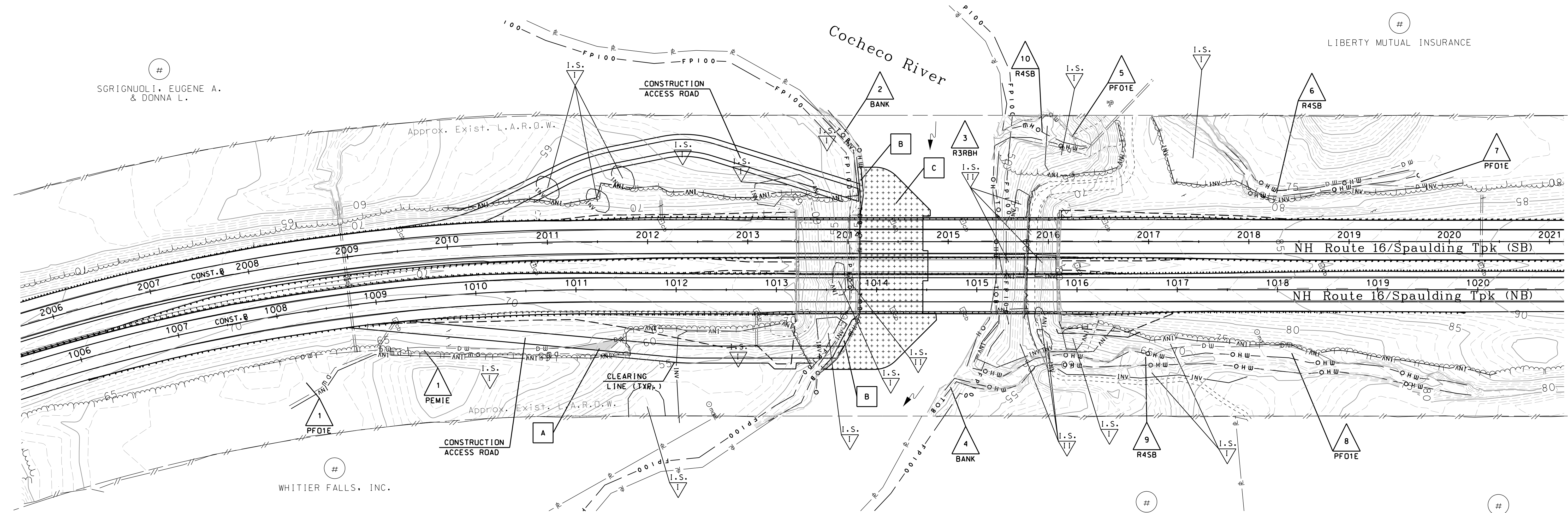
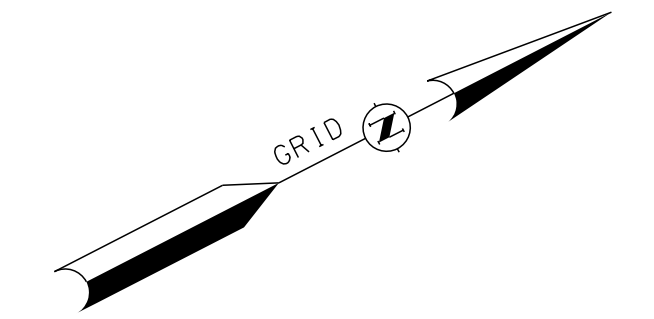
SDR PROCESSED C. SWEET DATE 2/19/2024
 NEW DESIGN S. HILL DATE 2/19/2024
 SHEET CHECKED J. MERCER DATE 2/19/2024
 AS BUILT DETAILS

WETLAND IMPACT SUMMARY											
WETLAND NUMBER	WETLAND CLASSIFICATION	LOCATION	AREA IMPACTS			LINEAR STREAM IMPACTS			LINEAR STREAM IMPACTS		
			TEMPORARY		PERMANENT	TEMPORARY			PERMANENT		
			N.H.W.B. (NON-WETLAND)	N.H.W.B. & A.C.O.E. (WETLAND)		BANK LEFT	BANK RIGHT	CHANNEL	BANK LEFT	BANK RIGHT	CHANNEL
1	PEMIE	A			247						
2	BANK	B	426			215					
3	R3RBH	C		12452				356			
TOTAL			426	12452	247	215	0	356	0	0	0

PERMANENT IMPACTS: 247 SF
 TEMPORARY IMPACTS: 12878 SF
 TOTAL IMPACTS: 13125 SF

PERMANENT STREAM IMPACTS: 0 LF
 TEMPORARY STREAM IMPACTS: 571 LF
 TOTAL STREAM IMPACTS: 571 LF

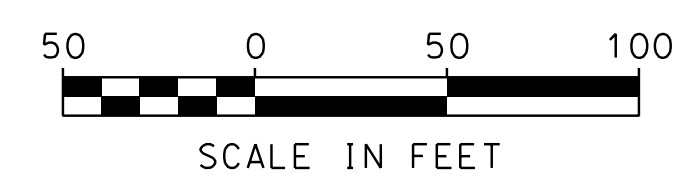
WETLANDS WERE DELINEATED BY JENNIFER RIORDAN (CWS #269) OF GM2 ASSOCIATES, INC. ON MAY 27, 2022 IN ACCORDANCE WITH THE US ARMY CORPS OF ENGINEERS (USACE) 1987 METHODOLOGY AND THE USACE NORTHCENTRAL AND NORTHEAST REGION SUPPLEMENT (2012).



WETLAND CLASSIFICATION CODES	
PEMIE	PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED/SATURATED
PFO1E	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
R3RBH	RIVERINE, UPPER PERENNIAL, ROCK BOTTOM, PERMANENTLY FLOODED
R4SB	RIVERINE, INTERMITTENT, STREAMBED

LEGEND	
TYPE OF WETLAND IMPACT	SHADING/HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	[Diagonal hatching]
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	[Solid grey]
TEMPORARY IMPACTS	[Dotted pattern]
	[Diagonal hatching]

- # WETLAND DESIGNATION NUMBER
- # WETLAND IMPACT LOCATION
- # WETLAND MITIGATION AREA
- MITIGATION



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

WETLAND IMPACT PLAN

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41824_WetlandImpacts	41824	4	8



SGRIGNUOLI, EUGENE A. & DONNA L.

LIBERTY MUTUAL INSURANCE

WHITIER FALLS, INC.

STEARNS, CASEY J. & SERVICE, ANDREA L.

ALADDIN DEVELOPMENT CORPORATION

EROSION CONTROL NOTES AND STRATEGIES

1. Erosion Control/Stormwater Control Selection, Sequencing and Maintenance
 - 1.1. Comply with RSA 485-A:17 Terrain Alteration.
 - 1.2. Install and maintain all erosion control/stormwater controls in accordance with the New Hampshire Stormwater Management Manual, Volume 3, Erosion and Sediment Controls During Construction, December 2008 (BMP Manual), available from the NH Department of Environmental Services (NHDES).
 - 1.3. Install erosion control/stormwater control measures prior to the start of work and in accordance with the manufacturer's recommendations.
 - 1.4. Select erosion control/stormwater control measures based on the size and nature of the project and physical characteristics of the site, including slope, soil type, vegetative cover, and proximity to jurisdictional areas.
 - 1.5. Install perimeter controls prior to earth disturbing activities.
 - 1.6. Install stormwater treatment ponds and drainage swales before rough grading the site.
 - 1.7. Clean, replace, and augment stormwater control measures and infiltration basins as necessary to prevent sedimentation beyond project limits throughout the project duration.
 - 1.8. Inspect erosion and sediment control measures in accordance with Section 645 of the specifications, weekly, and within 24 hours (during normal work hours), of any storm event greater than 0.25 inches of rain in a 24-hour period.
 - 1.9. Contain stockpiles with temporary perimeter controls. Protect inactive soil stockpiles with soil stabilization measures (temporary erosion control seed mix and mulch, soil binder) or cover them with anchored tarps. If the stockpile is to remain undisturbed for more than 14 days, mulch the stockpile.
 - 1.10. Maintain temporary erosion and stormwater control measures in place until the area has been permanently stabilized.
 - 1.11. An area is considered stable if one of the following has occurred:
 - Base course gravels have been installed in areas to be paved;
 - A minimum of 85% vegetative growth has been established;
 - A minimum of 3" of non-erosive material such as stone or rip-rap has been installed;
 - Temporary slope stabilization has been properly installed (see Table 1).
 - 1.12. Direct runoff to temporary practices until permanent stormwater infrastructure is constructed and stabilized.
 - 1.13. 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.
 - 1.14. Plan activities to account for sensitive site conditions
 - Sequence construction to limit the duration and area of exposed soils.
 - Clearly flag areas to be protected in the field and provide construction barrier to prevent trafficking outside of work areas.
 - Protect and maximize existing native vegetation and natural forest buffers between construction activities and sensitive areas.
 - When work is undertaken in a flowing watercourse, implement stream flow diversion methods prior to any excavation or filling activity.
 - 1.15. Utilize storm drain inlet protection to prevent sediment from entering a storm drainage system prior to the permanent stabilization of the contributing disturbed area.
 - 1.16. Use care to ensure that sediments do not enter any existing catch basins during construction. Place temporary inlet protection at inlets in areas of soil disturbance that are subject to sedimentation.
 - 1.17. Construct, stabilize, and maintain temporary and permanent ditches in a manner that will minimize scour. Direct temporary and permanent ditches to drain to sediment basins or stormwater collection areas.
 - 1.18. Supplement channel protection measures with perimeter control measures when ditch lines occur at the bottom of long fill slopes. Install the perimeter controls on the fill slope to minimize the potential for fill slope sediment deposits in the ditch line.
 - 1.19. Divert sediment laden water away from drainage inlet structures to the extent possible.
 - 1.20. Install sediment barriers and sediment traps at drainage inlets to prevent sediment from entering the drainage system.
 - 1.21. Clean catch basins, drainage pipes, and culverts if significant sediment is deposited.
 - 1.22. Construct and stabilize dewatering infiltration basins prior to any excavation that may require dewatering.
 - 1.23. Place and stabilize temporary sediment basins or traps at locations where concentrated flow (channels and pipes) discharge to the surrounding environment from areas of unstabilized earth disturbing activities.
 - 1.24. Stabilize, to appropriate anticipated velocities, conveyance channels or pumping systems needed to convey construction stormwater to basins and discharge locations prior to use.
 - 1.25. Size temporary sediment basins to contain the 2-year, 24 hour storm event.
 - 1.26. Size temporary sediment traps to contain 3,600 cubic feet of storage for each acre of drainage area.
 - 1.27. Construct detention basins to accommodate the 2-year, 24-hour storm event.
2. Construction Planning
 - 2.1. Divert off site runoff or clean water away from the construction activities to reduce the volume that needs to be treated on site.
 - 2.2. Divert storm runoff from upslope drainage areas away from disturbed areas, slopes and around active work areas to a stabilized outlet location.
 - 2.3. Construct impermeable barriers, as necessary, to collect or divert concentrated flows from work or disturbed areas.
 - 2.4. Locate staging areas and stockpiles outside of wetlands jurisdiction.
 - 2.5. Do not store, maintain, or repair mobile heavy equipment in wetlands, unless equipment cannot be practicably removed and secondary containment is provided.
 - 2.6. Provide a water truck to control excessive dust, at the discretion of the Contract Administrator.
3. Site Stabilization
 - 3.1. Stabilize all areas of unstabilized soil as soon as practicable, but no later than 45 days after initial disturbance.
 - 3.2. Limit unstabilized soil to a maximum of 5 acres unless documentation is provided that demonstrates that cuts and fills are such that 5 acres is unreasonable.
 - 3.3. Use erosion control seed mix in all inactive construction areas that will not be permanently seeded within two weeks of disturbance and prior to September 15th of any given year in order to achieve vegetative stabilization prior to the end of the growing season.
 - 3.4. Apply, and reapply as necessary, soil tackifiers in accordance with the manufacturer's specifications to minimize soil and mulch loss until permanent vegetation is established.
 - 3.5. Stabilize basins, ditches and swales prior to directing runoff to them.
 - 3.6. Stabilize roadway and parking areas within 72 hours of achieving finished grade.
 - 3.7. Stabilize cut and fill slopes within 72 hours of achieving finished grade.
 - 3.8. When temporarily stabilizing soils and slopes, utilize the techniques outlined in Table 1.
 - 3.9. Stabilize all areas that can be stabilized prior to opening up new areas to construction activities.
 - 3.10. Utilize Table 1 when selecting temporary soil stabilization measures.
 - 3.11. Divert off-site water through the project in an appropriate manner so as not to disturb the upstream or downstream soils, vegetation or hydrology beyond the permitted area.
 - 3.12. Install and maintain construction exits anywhere traffic leaves a construction site onto a public right-of-way.
 - 3.13. Sweep all construction related debris and soil from the adjacent paved roadways, as necessary.

4. Slope Protection
 - 4.1. Intercept and divert storm runoff from upslope drainage areas away from unprotected and newly established areas and slopes to a stabilized outlet or conveyance.
 - 4.2. Consider how groundwater seepage on cut slopes may impact slope stability and incorporate appropriate measures to minimize erosion.
 - 4.3. Convey storm water down the slope in a stabilized channel or slope drain.
 - 4.4. The outer face of the fill slope should be in a loose, ruffled condition prior to turf establishment.
5. Winter Construction
 - 5.1. To minimize erosion and sedimentation impacts, limit the extent and duration of winter excavation and earthwork activities. The maximum amount of disturbed earth shall not exceed a total of 5 acres from May 1st through November 30th, 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 contractor's Critical Path Method (CPM) schedule, and the contractor has adequate resources available to ensure that environmental requirements will be met.
 - 5.2. Construction performed any time between November 30th and May 1st of any year is considered winter construction. During winter construction:
 - Stabilize all proposed vegetation areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, in accordance with Table 1.
 - Stabilize all ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, in accordance with Table 1.
 - Protect incomplete road surfaces, where base course gravels have not been installed, and where work has stopped for the season after November 30th, in accordance with Table 1.
 - Unless a winter construction plan has been approved by NHDOT, conduct winter excavation and earthwork such that no more than 1 acre of the project is without stabilization any one time.
6. Wildlife Protection Measures
 - 6.1. Report all observations of threatened and endangered species on the project site to the Department's Bureau of Environment by phone at 603-271-3226 or by email at Bureau16@dot.nh.gov, indicating in the subject line the project name, number, and that a threatened/endangered species was found.
 - 6.2. Photograph the observed species and nearby elements of habitat or areas of land disturbance and provide them to the Department's Bureau of Environment at the above email address.
 - 6.3. In the event that a threatened or endangered species is observed on the project during work, the species shall not be disturbed, handled, or harmed prior to receiving direction from the Bureau of Environment.
 - 6.4. Utilize wildlife friendly erosion control methods when:
 - Erosion control blankets are used,
 - A protected species or habitat is documented,
 - The proposed work is in or adjacent to a priority resource area, and/or when specifically requested by NHB or NHF&G

GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES
TABLE 1

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES ²				ROLLED EROSION CONTROL BLANKETS ³			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES ¹												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES ¹	YES ¹	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:

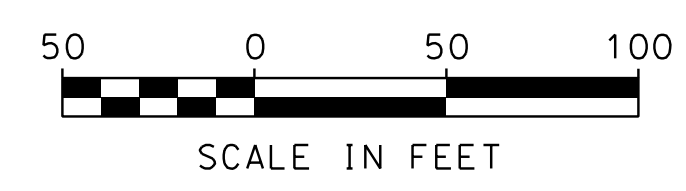
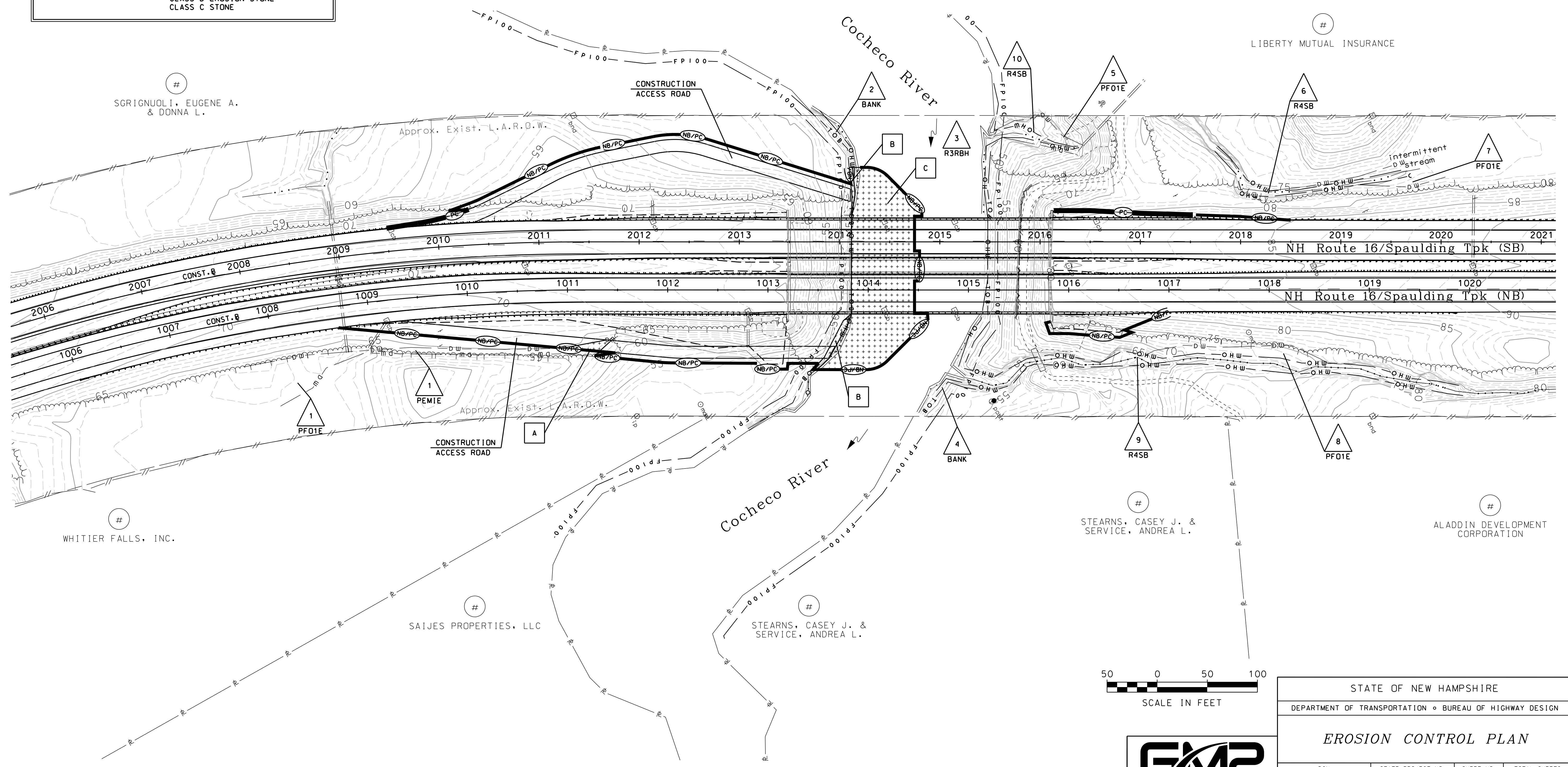
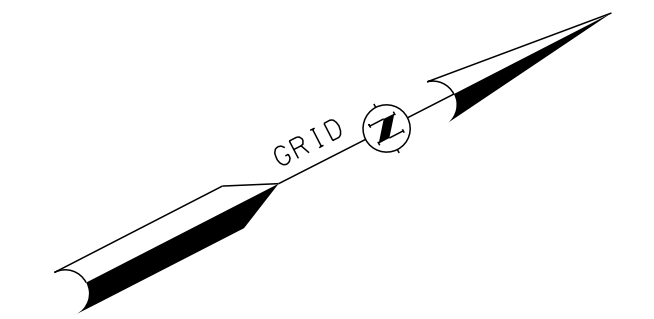
1. All slope stabilization options assume a slope length ≤ 10 times the horizontal distance component of the slope, in feet.
2. Do not apply products containing polyacrylamide (PAM) directly to, or within 100 feet of any surface water without NHDES approval.
3. Install all methods in Table 1 per the manufacturer's recommendation for time of year and steepness of slope.

SDR PROCESSED C. SWEET DATE 2/15/2024
 NEW DESIGN S. HILL DATE 2/15/2024
 SHEET CHECKED J. MERCER DATE 2/15/2024
 AS BUILT DETAILS

REVISIONS AFTER PROPOSAL
 STATION
 DATE
 NUMBER

EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	CHANNEL PROTECTION STONE CHECK DAMS STRAW WATTLES CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE

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		

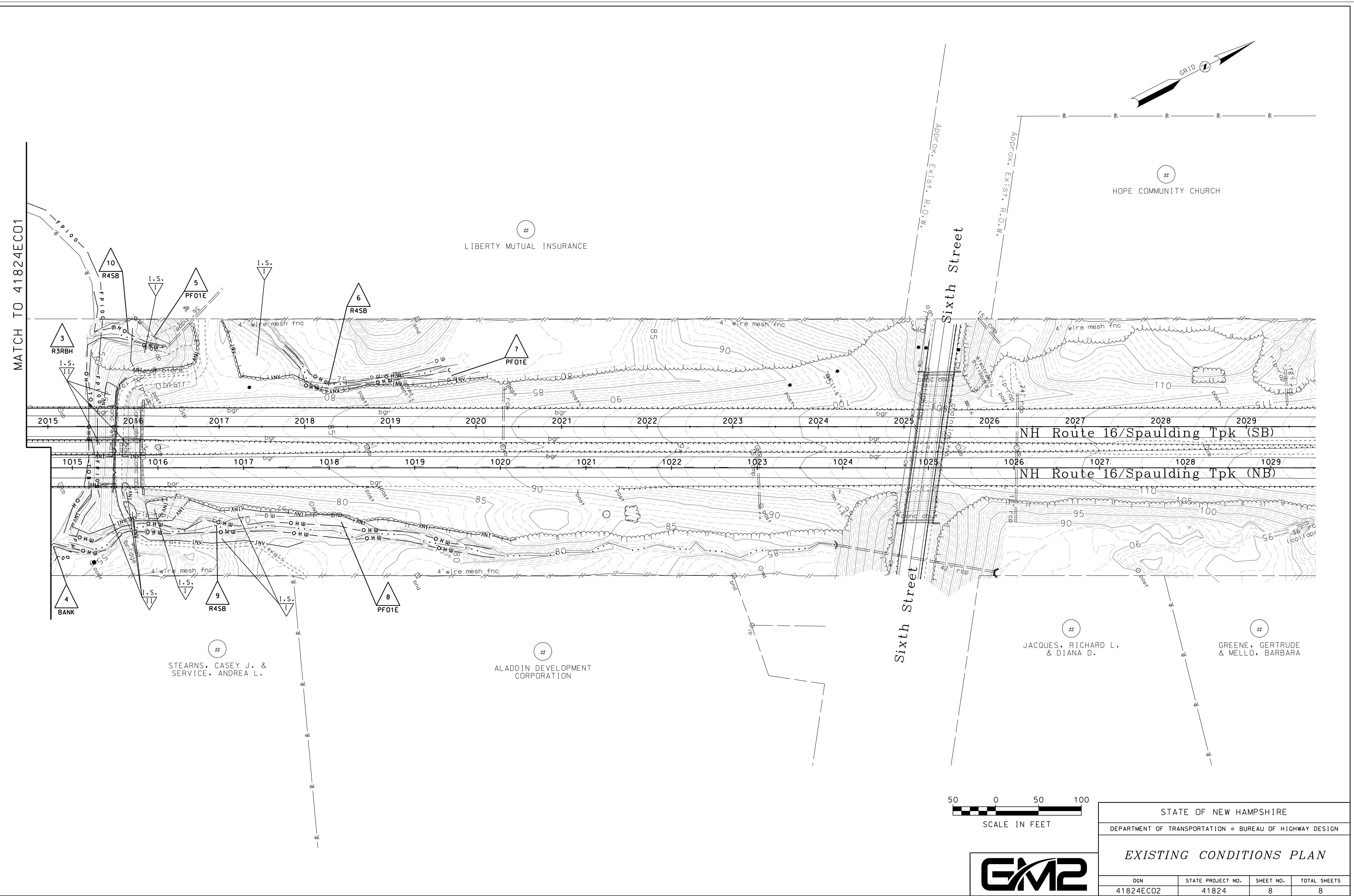


STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
EROSION CONTROL PLAN			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41824EROC	41824	6	8



SDR PROCESSED	C. SWEET	DATE	2/15/2024
NEW DESIGN	S. HILL	DATE	2/15/2024
SHEET CHECKED	J. MERCER	DATE	2/15/2024
AS BUILT DETAILS		DATE	

NUMBER	DATE	STATION	STATION	DESCRIPTION



STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
EXISTING CONDITIONS PLAN			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
41824EC02	41824	8	8

