

STATE OF NEW HAMPSHIRE INTER-DEPARTMENT COMMUNICATION

DATE: August 23, 2023

FROM: Andrew O'Sullivan
Wetlands Program Manager

AT (OFFICE): Department of
Transportation

SUBJECT Dredge & Fill Application
Woodstock, 42534

Bureau of
Environment

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

Forwarded herewith is the application package prepared by NH DOT Bureau of Bridge Design for the subject major impact project. The proposed project consists of repairs to address scour issues at the Pier I (south) bridge pier of the Woodstock 195/093 Bridge over the Pemigewasset River located in Woodstock, NH. Up to 15 feet of scour has occurred since the bridge was built in 1975. Proposed repairs consist of driving an approximately 35' x 65' rectangular cofferdam constructed of steel sheet piles that will surround the footing of Pier 1 and will be filled with stone. Access to Pier I will be made from the eastern shoulder of Route 175, southeast of the southern bridge abutment, by creating a temporary access road down the slope and clean washed stone causeway across a portion of the Pemigewasset riverbank and stream bed to reach Pier 1.

A mixing zone has been prepared for approval as enclosed in the application.

This project was reviewed at the Natural Resource Agency Coordination Meeting on February 18, 2020, May 20, 2020, & November 17, 2021. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link:

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

NHDOT anticipates 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 for the project.

The lead people to contact for this project are David Scott, Bureau of Bridge Design (271-1613 or David.LScott@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 #727159**) in the amount of \$4,640.

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

AMO:
cc:
BOE Original
Town of Woodstock (4 copies via certified mail)
David Trubey, NH Division of Historic Resources (Cultural Review
Within)
Mike Dionne & Kevin Newton (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)

NHDES STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

NHDOT WOODSTOCK-LINCOLN 42534 BRIDGE SCOUR PROTECTION PROJECT BRIDGE NO. 195/093 NH ROUTE 175 OVER THE PEMIGEWASSET RIVER

Woodstock, New Hampshire



Application of:
New Hampshire Department of Transportation



Submitted to:
New Hampshire Department of Environmental Services (NHDES)

US Army Corps of Engineers

Submitted by:
AECOM

June 30, 2023

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**NHDES Wetland Permit
Application Form**



STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

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



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

APPLICANT'S NAME: New Hampshire Department of Transportation TOWN NAME: Woodstock

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 checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does the property contain a PRA? If yes, provide the following information:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> • Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04. 	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> • Protected species or habitat? <ul style="list-style-type: none"> ○ If yes, species or habitat name(s): Canada Lynx, Northern Long-eared Bat, Monarch Butterfly ○ NHB Project ID #: NHB22-1876 	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
• Bog?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Floodplain wetland contiguous to a tier 3 or higher watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Designated prime wetland or duly-established 100-foot buffer?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is the property within a Designated River corridor? If yes, provide the following information:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> • Name of Local River Management Advisory Committee (LAC): <input style="width: 50px;" type="text"/> • A copy of the application was sent to the LAC on Month: <input style="width: 20px;" type="text"/> Day: <input style="width: 20px;" type="text"/> Year: <input style="width: 20px;" type="text"/> 	

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For dredging projects, is the subject property contaminated? • If yes, list contaminant: N/A (no dredging is proposed for this project)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
For stream crossing projects, provide watershed size (see WPPT or Stream Stats): N/A	
SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))	
Provide a brief description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.	
<p>The proposed project consists of repairs to address scour issues at the Pier I (south) bridge pier of the Woodstock 195/093 Bridge over the Pemigewasset River located in Woodstock, NH. Up to 15 feet of scour has occurred since the bridge was built in 1975. Proposed repairs consist of driving an approximately 35' x 65' rectangular cofferdam constructed of steel sheet piles that will surround the footing of Pier 1 and will be filled with stone. Access to Pier I will be made from the eastern shoulder of Route 175, southeast of the southern bridge abutment, by creating a temporary access road down the slope and clean washed stone causeway across a portion of the Pemigewasset riverbank and stream bed to reach Pier 1. The temporary access road and clean washed stone causeway approach will be approximately 16' wide, with the causeway wrapping around the north, east, and south sides of the propose rectangular cofferdam. Clean washed stone will be placed on top of a geotextile fabric to separate the temporarily placed stone from the natural riverbed to create a relatively dry work area, with a double silt curtain wrapping around the northern and eastern portions of the limits of work to facilitate turbidity control. Since the rectangular cofferdam will occupy the same footprint as the original footing design for Pier 1, the project will only result in temporary impacts of approximately 11,600 square feet. Following repairs, the rectangular sheet pile cofferdam and stone will remain to protect Pier 1, but the temporary sheet piles, causeway, geotextile fabric, double silt curtains, and temporary access road will be removed. The streambed will be restored to the maximum extent practicable for temporary construction impacts (no changes in grading are anticipated from the use of the causeway). The temporary access road area and adjacent slope will be restored with native seed mix and native shrub and tree plantings. Please see project Narrative for additional details.</p>	
SECTION 3 - PROJECT LOCATION	
Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.	
ADDRESS: Bridge Pier to NH Route 175 (over the Pemigewasset River)	
TOWN/CITY: Woodstock	
TAX MAP/BLOCK/LOT/UNIT: Map 121 & 122, no parcel # available (Eastside Road)	
US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: Pemigewasset River <input type="checkbox"/> N/A	
(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places):	43.97969° North 71.67990° West

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a)) If the applicant is a trust or a company, then complete with the trust or company information.		
NAME: New Hampshire Department of Transportation (c/o David L. Scott, PE)		
MAILING ADDRESS: 7 Hazen Drive		
TOWN/CITY: Concord	STATE: NH	ZIP CODE: 03301
EMAIL ADDRESS: David.Scott@dot.nh.gov		
FAX: David.Scott@dot.nh.gov	PHONE: (603)271-2731	
ELECTRONIC COMMUNICATION: By initialing here: <u>DSL</u> 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.: Doyle-Breen, Jennifer		
COMPANY NAME: AECOM		
MAILING ADDRESS: 250 Apollo Drive		
TOWN/CITY: Chelmsford	STATE: MA	ZIP CODE: 01824
EMAIL ADDRESS: jennifer.doyle-breen@aecom.com		
FAX: 978-905-2101	PHONE: 978-905-2968	
ELECTRONIC COMMUNICATION: By initialing here: <u>JDB</u> , I hereby authorize NHDES to communicate all matters relative to this application electronically.		
SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b)) If the owner is a trust or a company, then complete with the trust or company information.		
<input checked="" type="checkbox"/> Same as applicant		
NAME: [REDACTED]		
MAILING ADDRESS: [REDACTED]		
TOWN/CITY: [REDACTED]	STATE: [REDACTED]	ZIP CODE: [REDACTED]
EMAIL ADDRESS: [REDACTED]		
FAX: [REDACTED]	PHONE: [REDACTED]	
ELECTRONIC COMMUNICATION: By initialing here [REDACTED], I hereby authorize NHDES to communicate all matters relative to this application electronically.		

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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):

Project activities will occur within the 250-foot Protected Shoreland (for site access), and the Pemigewasset River watercourse, adjacent Bank, and 100-year floodplain (for river access and repairs).

The jurisdictional areas within the project limits of work have been delineated by a NH CWS in accordance with Env-Wt 400 and data sheets have been included in this application. Jurisdictional limits are shown on the attached project plans.

SECTION 8 - AVOIDANCE AND MINIMIZATION

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

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

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

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

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

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

N/A - Mitigation is not required) (Please see Agency meeting minutes in Attachment K)

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))

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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 impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials). Temporary impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland						
	Scrub-shrub Wetland						
	Emergent Wetland						
	Wet Meadow						
	Vernal Pool						
	Designated Prime Wetland						
	Duly-established 100-foot Prime Wetland Buffer						
Surface Water	Intermittent / Ephemeral Stream						
	Perennial Stream or River	0	0		11,600	120	
	Lake / Pond						
	Docking - Lake / Pond						
	Docking - River						
Banks	Bank - Intermittent Stream						
	Bank - Perennial Stream / River					185	
	Bank / Shoreline - Lake / Pond						
Tidal	Tidal Waters						
	Tidal Marsh						
	Sand Dune						
	Undeveloped Tidal Buffer Zone (TBZ)						
	Previously-developed TBZ						
	Docking - Tidal Water						
TOTAL		0	0		11,600	305	

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




<input type="checkbox"/> MINIMUM IMPACT FEE: Flat fee of \$400.
<input type="checkbox"/> 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).
<input checked="" type="checkbox"/> MINOR OR MAJOR IMPACT FEE: Calculate using the table below:
Permanent and temporary (non-docking): 11,600 SF × \$0.40 = \$ 4,640
Seasonal docking structure: SF × \$2.00 = \$
Permanent docking structure: SF × \$4.00 = \$
Projects proposing shoreline structures (including docks) add \$400 = \$
Total = \$ 4,640
The application fee for minor or major impact is the above calculated total or \$400, whichever is greater = \$ 4,640




SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)
 Indicate the project classification.




<input type="checkbox"/> Minimum Impact Project	<input type="checkbox"/> Minor Project	<input checked="" type="checkbox"/> Major Project
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SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:


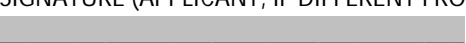





Initials:   	To the best of the signer's knowledge and belief, all required notifications have been provided.
--	--

Initials:   	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:   	The signer understands that: <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. • The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. • The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.
---	--

Initials:   	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): 	PRINT NAME LEGIBLY: David L. Scott	DATE: 8/21/2023
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): 	PRINT NAME LEGIBLY: 	DATE: 
SIGNATURE (AGENT, IF APPLICABLE): 	PRINT NAME LEGIBLY: 	DATE: 

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: 	PRINT NAME LEGIBLY: 
TOWN/CITY: 	DATE: 

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
3. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board.
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:

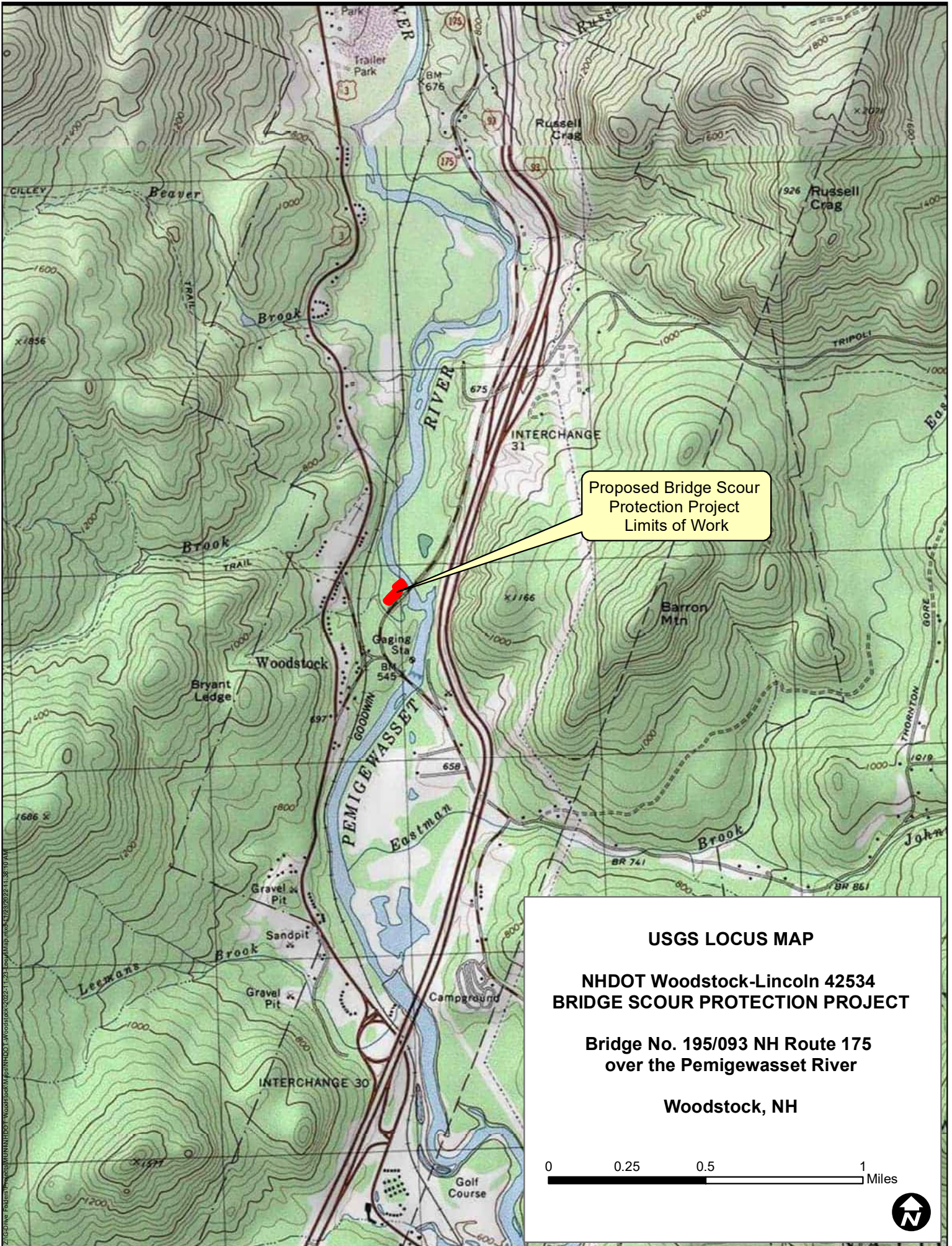
Submit the original permit application form bearing the signature of the Town/City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".

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USGS Location Map



Proposed Bridge Scour Protection Project Limits of Work


USGS LOCUS MAP

**NHDOT Woodstock-Lincoln 42534
BRIDGE SCOUR PROTECTION PROJECT**

**Bridge No. 195/093 NH Route 175
over the Pemigewasset River**

Woodstock, NH

0 0.25 0.5 1 Miles



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Attachment A
Minor and Major Projects



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: New Hampshire Department of Transportation TOWN NAME: Woodstock

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.

Multiple alternatives were evaluated for the proposed project. The combination of Repair Alternative 1 (permanent sheet pile with stone fill) and Access Alternative B (creating a temporary access road and sandbag causeway to approach from the southeast) were chosen as the preferred alternative. Although each of the alternatives evaluate had advantages and disadvantages, some of the advantages of the sheet pile with stone fill repair is that no hydraulic countermeasures would be required and this alternative would not require repeated access to the river for continual maintenance, resulting in less potential long-term impacts to water quality and benthic habitat. Access Alternative A lacked nearby staging and would involve working on a steep slope while Access Alternative C would require the longest causeway and Access Alternative E would be the most expensive option. Access Alternative D would require crossing the river and the installation of temporary culverts to maintain bypass flow.

Stream bed and bank impacts have been minimized to the extent practicable while meeting the project objective of maintaining bridge safety and stability. Alternatives are discussed further in the project Narrative in Attachment C.

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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: No marshes are present within the project limits of work.

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

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

The proposed Alternative B access is located outside (south of) the main river channel. Therefore, although temporary sheet pile and a washed clean stone causeway will be used to facilitate the project repairs by creating a temporary relatively dry work area, hydrologic flow within the main river channel will be maintained. Following construction, the rectangular sheet pile and stone will remain to protect the Pier 1 footing. However, the footprint of the proposed permanent sheet pile cofferdam is located within the same footprint as the stone fill that was part of the original design when the bridge was built and has since washed away and no changes to hydrologic connections in the vicinity of the project would occur following the repair work.

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.

Although the project will result in temporary impacts to the stream bed and bank, temporary impacts have been minimized and will be restored at the completion of the project. Permanent impacts have been reduced to include the original extent of the Pier I footprint when the bridge was originally constructed and are necessary to stabilize the structure from further scour and erosion. Protection of Pier I will also help reduce downstream sedimentation which could impact downgradient resources. No vegetated wetlands will be impacted by the project and no vernal pools are located within the project area. The New Hampshire Natural Heritage Bureau (NHB) determined that although an NHB record exists for the area, the project is not anticipated to impact rare species.

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 proposed scour stabilization project will have a positive effect on public commerce and roadway safety for travelers since the purpose of the project is to help protect the integrity of critical transportation infrastructure. Once completed, the proposed project will not impact navigation or recreation since all temporary structures will be removed and the work area will be restored to approximate preconstruction grades.

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.

N/A: The project will not impact floodplain vegetated wetlands.

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 limits of work do not contain Riverine Forested Wetlands 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.

N/A: There are no vegetated wetlands within the limits of work for the project and the project will not impact drinking water supplies or groundwater aquifer levels.

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

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

Up to 15 feet of scour has occurred in the vicinity of Pier I since the bridge was built in 1975. Calculations indicate that future scour could increase up to 17.5 feet below the existing streambed if no measures are implemented to stabilize the bridge pier. The purpose of the project is to help stabilize the stream channel in the vicinity of Pier I in order to help protect critical transportation infrastructure that carries Route 175 over the Pemigewasset River. The project will result in an increased ability of the channel to handle flooding events by helping to prevent scouring and erosion in the vicinity of Pier I and by helping to prevent downstream sedimentation caused by stream bed erosion.

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

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

The construction surface area of the proposed washed clean stone causeway has been minimized to the extent practicable in order to reduce temporary impacts to the riverbed while also allowing sufficient room for equipment passage. Other options explored included an elevated trestle on piles; however, installing and removing the piles would have resulted in additional impacts, an added level of difficulty, and increased costs to the project.

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: there currently is no docking at the site nor is the site conducive to docking.

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

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

The scour repairs will have no impact on the ability of abutting owners to use and enjoy their properties. The scour repairs will be located entirely adjacent to the existing bridge infrastructure with construction access being made from the southeast of the bridge, off of the eastern shoulder of Route 175.

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

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

The scour repairs will not impact the public's right to navigation, passage, or the use of the river for commerce or recreation. The scour repairs will be located entirely adjacent to the existing bridge infrastructure within the NHDOT Right of Way (ROW).

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.

There are no permanent shoreline structures associated with this project. The temporary access causeway will be comprised of clean washed stone that will be placed on top of a geotextile fabric to separate the temporarily placed stone from the natural riverbed. The causeway will be removed following the completion of construction activities. There is no aquatic vegetation present in the causeway alignment. Access has been located outside of main channel to minimize impacts. Also, the footprint for temporary work has been minimized to maximum extent practicable in order to minimize temporary disruption of wildlife and fish due to habitat displacement. Permanent impacts will be limited to replacing fill that was previously present, within the footprint of the original bridge pier. In addition, the project design includes the installation of temporary sheetpile to isolate the work area from the majority of river flow, which will minimize the potential for sediment resuspension and associated water quality impacts.

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.

The proposed access will require temporary removal of vegetation, but vegetation will be restored following construction with an herbaceous erosion control seed mix and plantings of native woody shrubs and trees. Please see Attachment E, Sheet 14.

PART II: FUNCTIONAL ASSESSMENT
<p>REQUIREMENTS 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: USACE Highway Methodology</p>
<p>NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT: TERRY RAMBORGER, CWS #013</p>
<p>DATE OF ASSESSMENT: 4/23/2020</p>
<p>Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT: <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: <input checked="" type="checkbox"/> Please see Attachment H.</p> <p>Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.</p>

**Avoidance and Mitigation
Written Narrative**

AVOIDANCE AND MINIMIZATION/MITIGATION

Although the project will result in temporary impacts to the stream bed, bank, and the 250-foot Protected Shoreland, these impacts have been minimized to the extent practicable during the project design process while meeting the project objective of maintaining bridge safety and stability for the travelling public and will be restored following the completion of repair activities. As discussed above, multiple alternatives were assessed, and the preferred alternative (Repair Alternative I and Access Alternative B) was selected since it provided a viable scour repair option while minimizing construction time and footprint in the river and other environmental impacts. Other options considered would have resulted in greater environmental impacts, increased construction time, increased costs, and/or safety issues.

Turbidity curtains will be installed to minimize sediment resuspension during construction activities. Perimeter erosion controls will be installed at the downslope edges of work along the access road and at the staging area to mitigate the potential for erosion and sedimentation impacts on the river and nearby isolated wetland. Use of a geotextile fabric below the stone will facilitate post-construction removal of the temporary fill. The causeway will contain the sand such that loose temporary fill is not anticipated to be necessary to construct the causeway, minimizing the possibility of material from migrating into the river.

Filling of the permanent cofferdam and other repair work in the vicinity of Pier I will occur within the area bounded by the western temporary sheet piles and causeway/dual turbidity curtains on the north and east to separate the work from the river. During construction, a turbidity monitoring plan will be implemented (**Appendix L**). All in-water work will occur in during the Army Corps of Engineers NH General Permit in-water work window of July 5 through October 1. This will decrease the chances of flood events inundating the project and washing fill material downstream. It will also not impact spawning seasons of most fish. The permanent rectangular cofferdam around Pier I would occupy a nominal volume as compared to the overall floodplain. It should be noted that the permanent cofferdam will occupy the same footprint and volume as the original pier design. Weather will be monitored during construction, and equipment will be removed from the river during large, forecasted precipitation events, so that water in the river can overtop the sheet piles and utilize the flood storage volume inside of the temporary sheet piles.

Following construction activities, site restoration will be performed within two restoration zones: Zone #1 for areas within the limits of work below TOB/OHW (bank and stream channel) and Zone #2 for areas within the limits of work above TOB/OHW (southeastern slope area).

Zone #1 restoration will consist of the removal of stone, geotextile fabric, and temporary sheet piles. Pre-construction riverbed and bank grades will be re-established to approximate pre-construction conditions and the double turbidity curtains will be removed. Materials removed will be disposed of offsite in accordance with all applicable regulations and requirements.

Zone #2 restoration consists of the removal of the temporary access road and approximately 6" of grade followed by approximately 6" of clean loam to be replaced in areas that are disturbed within the zone. Final grading will be performed to restore the southeastern slope to pre-construction contours. Once final grading is complete, the area as shown on the restoration plan (**Appendix A**, Sheet 15) will be seeded with a New England Erosion Control/Restoration Mix for Dry Sites seed mix or equivalent. This seed mix typically contains the following species: Red Fescue (*Festuca rubra*), Canada Wild Rye (*Elymus canadensis*), Annual Ryegrass (*Lolium multiflorum*), Perennial Ryegrass (*Lolium perenne*), Little Bluestem (*Schizachyrium scoparium*), Indian Grass (*Sorghastrum nutans*), Switch Grass (*Panicum virgatum*), and Upland Bentgrass (*Agrostis perennans*). This type of seed mix provides a selection of native and naturalized grasses to quickly revegetate and stabilize dry and recently disturbed sites and is typically used for road cuts, pipelines, steeper slopes, and areas requiring quick cover during the ecological restoration process. Following seeding, Zone #2 will be stabilized in the areas shown on the plans in **Appendix A**, Sheet 15 (with the exception of the riprap area near the south bridge abutment) with a fully biodegradable erosion control blanket, such as North American Green's BioNet SC150BN or equivalent. Once erosion control blankets are in place, Zone #2 will be planted with shrub and tree species that are currently found on the southeastern embankment, including: staghorn sumac (*Rhus typhina*), alternateleaf dogwood (*Cornus alternifolia*), red maple (*Acer rubrum*), paper birch (*Betula papyrifera*), grey birch (*Betula populifolia*), and Northern red oak (*Quercus rubra*). Please see **Appendix A**, Sheet 15 for restoration details.

Supplemental Narrative

1.0 INTRODUCTION

The following project narrative is provided as a supplement to the wetlands permit application forms and attachments contained in this application package.

The New Hampshire Department of Transportation (NHDOT) is planning a project for the Woodstock 195/093 bridge to implement repairs due to river erosion. The Woodstock 195/093 Bridge over the Pemigewasset River is located in the Town of Woodstock in Grafton County, New Hampshire. It is a two-lane concrete bridge that carries Route 175 and was constructed in 1975. The bridge is comprised of three-span (34.5 feet wide) I-beams with a concrete deck (IBC type) and has an overall length of 315 feet. The bridge spans are 97, 121, and 97 feet long with abutments and two piers supported on steel H-Piles. Based on the Design Plans, the piles range in length from 115 to 120 ft.

Sediments have been continuously deposited upstream, resulting in the lateral migration of the river toward the southwest and scouring of the southern pier (Pier 1). Up to 15 feet of scour has occurred since the bridge was built. Pier 1 had 8.5 feet of embedment, including 4.5 feet of Class A Stone Fill (D50), but this has since washed away at the upstream fascia. The upstream pile cap is undermined, and the steel H-piles are vertically exposed up to 4.5 feet and riprap at the south abutment is sloughing. Heavy bank erosion has also occurred upstream with large trees toppled and washed out. Calculations indicate that future scour could increase up to 17.5 feet below the existing streambed if no measures are implemented to stabilize the bridge pier.

The most recent NHDOT Bridge Inspection Report (5/30/2018) lists the deck and superstructure rating as 7 and the substructure as 5, although the recent Underwater Substructure Reports by Terracon (2018 and 2019) identify a substructure rating of 4, as well as Channel and Channel Protection rated as 4. More intense flow events brought on by climate change are projected to increase the need for this fortification. The purpose of the proposed project is to address these bridge scour issues. The selected alternative for scour repairs includes installing a permanent sheet pile cofferdam around the pier where scour has occurred to a depth below future calculated scour depth, and then backfilling the void inside of the sheet pile with stone. The permanent fill proposed will be replaced within the footprint of the original fill at the pier and therefore will not involve a new permanent impact. Access for construction will include construction of a temporary gravel access road from the southeast side of NH Route 175, down

the existing embankment to a temporary causeway across the bank and a portion of the stream bed to access the south pier (Pier I). Following repairs, the temporary causeway, gravel access road, and other temporary project elements will be removed, and the area restored as discussed below. No permanent impacts to Waters of the US would occur as a result of this bridge repair project.

2.0 PROPOSED ACTION

The proposed project consists of Pier I (south pier) scour repair and mitigation, which includes Repair Alternative 1 and Access Alternative B (as discussed below in the Alternatives Analysis section and as shown on the project plans in **Appendix A**). Main staging will be located within an existing open area located immediately to the northeast of the bridge on the east side of Route 175 (**Appendix A**) in an area that is currently open and would not require the removal of vegetation. The entire project limits of work are located within the existing highway right of way. Access to Pier I will be made from the southeast of the bridge (off the eastern shoulder of Route 175) by the construction of an approximately 16' wide temporary gravel road down the slope northward to a temporary stone causeway. The causeway would cross the southern bank and the southern portion of the river channel to reach the Pier I work area. The causeway would be underlain by temporary geotextile fabric. The causeway working surface width would vary slightly by location, from approximately 15 feet wide to approximately 16 feet wide. The eastern and northern periphery of the causeway would be constructed via a clean washed stone placed on top of geotextile fabric to form a working surface. The base width of the causeway would vary somewhat based on changes in topography/bathymetry along its course (**Appendix A**). The stone placed for the causeway will be washed to minimize introduction of fine material to the river. The placement of geotextile fabric between the riverbed and the new causeway material will facilitate removal at the completion of construction.

River flows would be directed around the work area by the installation of temporary sheet piles that would connect the southern bank of the river (on the west side of the bridge) to the permanent sheet pile cofferdam around the pier, with flows guided slightly further northward by another short section of temporary sheet pile. The sheet piles and causeway will help to create a relatively dry work environment.

A dual turbidity curtain would be installed and wrap from the northern end of the last temporary sheet pile section, eastward parallel with the permanent rectangular cofferdam and causeway section, and then turn southward across the southern portion of the stream channel, parallel with the causeway, up the bank to the Top of Bank/Ordinary High-Water line.

Repairs at Pier 1 will consist of driving an approximately 35-foot by 65-foot rectangular cofferdam constructed of steel sheet piles. The rectangular cofferdam will completely surround the footing of Pier 1 within the pier's originally constructed footprint and will be filled with stone and capped with a 6" concrete slab. Locating the dewatering area located away from the wetlands, river, or buffer zone is not possible for this project. It is not feasible to pump the dewatering effluent to the north side of the bridge to the staging area due to the size of the pump that would be required to transfer the water upslope and across the bridge as far as the staging area, which is approximately 1,280 feet north.

Following repairs, the permanent rectangular sheet pile cofferdam, stone, and concrete cap will remain to protect Pier 1, but the causeway, temporary sheet pile sections, and geotextile fabric will be removed. The bank and streambed will be restored to the maximum extent practicable for temporary construction impacts and the dual turbidity curtain will be removed. The temporary gravel access road on the southeastern slope will be removed, pre-construction grading restored (with loam surface added as necessary), the area seeded with an erosion control seed mix, the slope stabilized with fully biodegradable erosion control blankets, and then planted with native shrub and tree species as discussed in detail below. A detailed anticipated construction sequence is provided in **Appendix J** and additional details regarding the proposed project activities are provided in this narrative and in the attachments.

3.0 WORK TIMING AND SEQUENCE

The proposed project construction is currently planned to take place from July 5, 2024 to October 1, 2024 so work can be conducted within the anticipated low flow period.

The proposed construction will require the temporary closure of Eastside Road (NH 175) for the approximate duration of one week in order to accommodate a crane on the bridge to install the cofferdam. A detour plan will be prepared to direct traffic around the work zone during this road closure. The detour plan will include a map detailing the proposed route around the closed area as well as the specific traffic control signing, and temporary devices required along the route. For the most efficient and direct detour, Daniel Webster Hwy, N Station Road, S Station Road, and Eastside Road would be utilized for a detour.

The proposed work sequence generally includes: the establishment traffic control, construction of a temporary gravel access road down the southeast embankment, temporary and permanent sheet pile installation west of the bridge from the bridge deck, double turbidity curtain installation, installation of a temporary causeway across the bank and a portion of the stream bed, temporary removal of the detour, completion of the remainder of sheet pile installation and pier repairs, reinstate temporary detour for use of crane, removal of temporary sheet piles, temporary causeway, and double silt curtain (re-establishing pre-construction substrate contours as needed), removal of the temporary gravel access road and restoration of the southeastern embankment with a native herbaceous seed mix and woody native shrub and tree species, and removal of signalization and temporary barriers. A detailed construction sequence is provided in **Appendix J**.

4.0 ALTERNATIVES ANALYSIS

Alternatives assessed for the project included two categories of alternatives: repair alternatives and access alternatives.

Repair alternatives included the following:

Repair Alternative I: Permanent Steel Sheet Pile Installed Below Scour Depth

This repair alternative includes filling the scour hole with gravel inside an enclosed cofferdam. The advantage of this construction alternative is that no hydraulic countermeasures would be required. This alternative would not require repeated access to the river for periodic maintenance, resulting in less potential long-term impacts to water quality and benthic habitat. This option is anticipated to be located within approximately 65 linear feet and 2,275 square feet within the river channel, although this impact would not be a new impact since the extent of the enclosed cofferdam would be located within the original fill footprint of the pier when the bridge was first constructed. No permanent impacts are anticipated at the riverbank. The estimated cost for this repair alternative is approximately \$547,000.

Repair Alternative II: Concrete with Rip-Rap Hydraulic Countermeasures

This repair alternative included filling the scour hole with concrete. However, a cofferdam would be required for the concrete work and additional riprap required to stabilize the area would extend beyond the original pier footprint. Permanent disturbance for this option is anticipated at 100 linear feet and 4,900 square feet within the river channel. No permanent impacts are anticipated at the riverbank. The estimated cost for this repair alternative is approximately \$566,700.

Repair Alternative III: Concrete with A-Jacks Hydraulic Countermeasures

Similar to Repair Alternative II above, this repair alternative included filling the scour hole with concrete and a cofferdam would be required for the concrete work. Instead of additional rip-rap as described for Repair Alternative II above, A-Jacks would be used to stabilize the area around the pier. However, this would also result in fill extending beyond the original pier footprint. Permanent disturbance for this option is anticipated at 100 linear feet and 4,900 square feet within the river channel. No permanent impacts are anticipated at the riverbank. The estimated cost for this repair alternative is approximately \$657,400.

Repair Alternative I was selected as the preferred repair alternative since it provides a permanent scour countermeasure with the least amount of permanent environmental impacts and lowest cost between the three repair alternatives.

Five access alternatives were considered as part of this project and are denoted “Alternative A” through “Alternative E”. Access Alternative B was selected as the preferred access alternative. These alternatives are described below:

Access Alternative A: Southwest Temporary Road/Upstream Causeway

This access alternative includes constructing a temporary access road southwest of the bridge off of Route 175 which would be oriented generally parallel to the west side of the bridge to reach the Pier 1 area to the north. This alternative is anticipated to result in approximately 45 linear feet of temporary bank impact, 110 linear feet of temporary channel impact, 5,150 square feet of temporary channel impact, and a cost of \$450,000.

Access Alternative B (Preferred Alternative): Southeast Temporary Road/Downstream Causeway

This access alternative (the selected alternative) includes constructing a temporary access road southeast of the bridge off of Route 175 which would be oriented generally parallel to the east side of the bridge to reach the Pier 1 area to the north. This alternative is anticipated to result in approximately 185 linear feet of temporary bank impact, 120 linear feet of temporary channel impact, 11,600 square feet of temporary bank and channel impact, and a cost of \$390,000.

Access Alternative C: Existing Access Trail Widening/Northeast Downstream Causeway

This access alternative includes using the existing access trail located immediately to the east of Route 175 (to reach the river) and then installing a causeway across the riverbed along the east side of the bridge, which would then turn to the west to access Pier 1. Several culverts (minimum diameter of 60 inches) would be installed to help maintain flows while the causeway is in place. This alternative is anticipated to result in approximately 25 linear feet of temporary bank impact, 90 linear feet of temporary channel impact, 15,000 square feet of temporary channel impact, and a cost of \$400,000.

Access Alternative D: Existing Access Trail Widening/Northwest Upstream Causeway

This access alternative includes using the existing access trail along the east side of Route 175 to reach the river. From the northern bank of the river, a temporary causeway would be installed to follow the bank westward under the bridge, then turning southward and running along the west side of the bridge, turning eastward to access the Pier 1 area. Three culverts would be placed at specific locations along the causeway to help maintain the passage of flows. This alternative is anticipated to result in approximately 65 linear feet of temporary bank impact, 210 linear feet of temporary channel impact, 18,500 square feet of temporary channel impact, and a cost of \$360,000.

Access Alternative E: Existing Access Trail Widening/Northeast Downstream Trestle

This access alternative includes using the existing access trail located immediately to the east of Route 175 (to reach the river) and then installing a temporary elevated access trestle along the east side of the bridge, which would then turn to the west to access Pier 1. The trestle would be supported by piles and removed following the completion of construction activities. This alternative is anticipated to result in approximately 25 linear feet of temporary bank impact, 90 linear feet of temporary channel impact, 9,000 square feet of temporary channel impact, and a cost of \$702,500.

Access Alternatives A was dismissed due to safety concerns related to steepness for the access route and lack of area for staging. Access Alternative C was dismissed since it would have resulted in the longest stretch of causeway across the active flow of the river. Access Alternative D was dismissed since it would also have resulted in a longer causeway of temporary fill within the river and require multiple culverts to pass flows. Access Alternative E was dismissed due to high construction costs, longer construction time, and difficulty removing the support piles once construction is complete.

Access Alternative B was chosen as the preferred alternative in part since it included a modified temporary access for three sides of the permanent cofferdam instead of four sides (reducing temporary stream bed impacts) and would require less in-stream temporary fill than Alternative D. Based on extensive collaboration at Natural Resource Agency Coordination Meetings and site visits on February 19, May 20, and May 29, 2020, and November 17, 2021, the selected construction Access Alternative B was developed to minimize work in flowing water and thereby

mitigate the potential for turbidity impacts during construction. Together with the preferred Repair Alternative I, these two alternatives comprise the proposed project.

5.0 RESOURCES PRESENT AND PROPOSED IMPACTS

Resources present within the project limits of work include the Pemigewasset River watercourse (R2UBH (riverine, lower perennial, unconsolidated bottom, permanently flooded)), adjacent Bank, 100-year floodplain, and the 250-foot Protected Shoreland (for site access). No vegetated wetlands or vernal pools are present within the project limits of work. The jurisdictional areas within the project limits of work have been delineated by a NH CWS in accordance with Env-Wt 400 and data sheets and a Wetlands Functional Assessment Worksheet have been included in this application in **Appendix C**. Jurisdictional limits are shown on the attached project plans in **Appendix A**.

The project involves temporary fill in Waters of the US to construct a temporary access causeway, install temporary sheet piling, and develop a relatively dry area in the river to implement the scour repairs. The project will only include temporary impacts since the permanent rectangular cofferdam surrounding Pier I will be located within the original footprint of the Pier I fill and same volume when the bridge was originally constructed. Temporary impacts to the Pemigewasset River watercourse (area within the limits of work below Top of Bank (TOB)/Ordinary High-Water (OHW)) include approximately 11,600 square feet and approximately 120 linear feet (measured in a line parallel with the general river flow) as a result of the temporary placement of the access causeway, temporary sheet piles, and dual turbidity curtains. Temporary impacts to Bank include approximately 185 linear feet within the limits of work (south bank of the river). Temporary sheet piles along the western periphery of the limits of work span approximately 102 feet in total length (approximately 70 linear feet from the south bank to the southwestern corner of the permanent rectangular sheet pile cofferdam and approximately 32 linear feet from the northwestern corner of the permanent cofferdam northward to meet the start of the dual turbidity curtain). The turbidity curtain will be approximately 300 linear feet in length as shown on the project plans, following the outside of the clean washed stone dike. The temporary causeway will occupy approximately 6,900 square feet within the limits of work below TOB/OHW and run an approximate length of 200 feet from the TOB/OHW to the northwestern corner of the permanent rectangular cofferdam.

Temporary impacts to the 250-foot Protected Shoreland include the removal of staghorn sumac (*Rhus typhina*), birches (*Betula* spp.) a few small red oaks (*Quercus rubra*), and herbaceous plant species to facilitate the construction of the temporary gravel access road along the southeastern slope. However, vegetation within the limits of work at the southeastern slope will be restored as discussed further below. The total soil area planned for disturbance is less than one acre in size, and therefore coverage under the US EPA Construction General Permit for stormwater runoff will not be required. The project is not anticipated to have more than a negligible impact on water quality. To further mitigate any potential impacts to the water quality, best management practices such as flow diversion sheet piles, conducting work during low flow periods, and sediment and erosion controls will also be implemented. During Natural Resource Agency meetings held in 2020 and 2021, NH DES (Lori Sommer) confirmed that mitigation would not be required for the placement of permanent fill within the footprint of the original fill placed to protect the bridge pier.

Once constructed, the project will not interfere with the aesthetic interests of the general public, since the scour repair remedy is consistent with the overall aesthetics of the bridge. The proposed project also will not interfere with or obstruct public rights of passage or access on the Pemigewasset River. The project will benefit the general public's safety since the purpose of the project is to address scour issues which increase the soundness of critical transportation infrastructure that carries Route 175. The proposed project would not affect the watershed hydrology and would therefore have no impact on surface or groundwater quantity. The project is anticipated to have a net positive impact on water quality by decreasing erosion, and thereby reducing the amount of sediment that enters receiving waters and add to the TSS and nutrient loads in the watershed.

The proposed project is not located in a tidal area or lacustrine environment experiencing substantial waves. The project will not substantially alter the flow patterns of the Pemigewasset River where work is proposed. Flows will continue around Pier I as they have when the bridge was originally built. The purpose of the proposed project is to modify river hydraulics and erosive processes to minimize future erosion and damage to bridge pier infrastructure. The proposed project will not impact vegetated wetlands but will have temporary impacts to the riverbed as a result of the installation of a temporary sheet pile cofferdam and temporary causeway to facilitate repair activities. As indicated in this application, all temporary impacts will be restored and the footprint of the proposed rectangular permanent sheet pile cofferdam within

the riverbed will occupy the originally constructed footprint of the bridge. As a result, the proposed project will not negatively impact the river's functions and values. The proposed project will not impact the value of any sites included in the National Register of Natural Landmarks since the Pemigewasset River is not included in the list for New Hampshire. The project area does not include any national wilderness areas or designated national rivers or similarly designated areas pursuant to state or municipal laws. The proposed project would not change the hydrology of the Pemigewasset River or its tributaries; all of the water would continue to flow in the current watershed in the same river and stream channels.

6.0 PROJECT-SPECIFIC REQUIREMENTS (ENV-WT 500)

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

6.1 Env-Wt 527.02: Approval Criteria for Public Highways

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

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

Please see the applicable discussion below in Section 6.3.

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

The proposed bridge pier repair project is consistent with the above referenced statutes. In accordance with RSA 482-A:1 “Finding of Public Purpose,” the proposed project is consistent with the interests of the general public regarding the preservation of natural resources. As discussed in this application, no substantial adverse impacts to the functions and values of stream channel hydraulic capacity, groundwater recharge, recreation, etc. will occur as a result of the proposed bridge pier repair project. The characteristics and functions of Pemigewasset River will be preserved in accordance with RSA 483 “NH Rivers Management and Protection Program. The proposed project will comply with RSA 483-B “Shoreland Water Quality Protection Act”. A Shoreland Permit will be subsequently submitted for the project. The project has complied with RSA 212-A “Endangered Species Conservation Act” through coordination with the USFWS and NH NHB to identify any rare species of concern that may be located within the project area and take appropriate measures to avoid any adverse impacts. No rare species will be impacted by the proposed project.

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

The purpose of the project is to improve public safety through the repair of the structurally deficient bridge Pier I.

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

The project will not cause a displacement of flood storage wetlands (none exist within the project limits of work) or cause a diversion of stream flows impacting abutting landowner property.

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

The project will not increase off-site flood stages. The post-construction condition will match the original bridge design.

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

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

Please see Sections 1.0, 2.0, and 5.0 above in this narrative.

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

(1) Document existing site conditions;

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

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

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

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

Please see the project plans in **Appendix A**. These plans meet the specifications of these requirements.

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

The proposed work will occur within the limits of the existing Route 175 right of way as depicted on the project plans in **Appendix A**.

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

Todd Dwyer (AECOM), NH Professional Engineer # 14667, developed the project plans.

(e) An erosion control plan that shows:

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

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

Erosion controls and the project limits of work are shown on the project plans in **Appendix A**.

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

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

No significant function wetlands are located in the vicinity of the proposed bridge repair activities. Although the USFWS official species list includes Canada Lynx (*Lynx canadensis*), Northern Long-Eared Bat (*Myotis septentrionalis*) (NLEB), and Monarch Butterfly (*Danaus plexippus*), no critical habitats were present within the project area (**Attachment I**) and the project will not impact these species. The project has been designed to minimize impacts to the Pemigewasset River.

(b) Minimize impacts to wetland and riparian function;

No wetlands are located within the limits of work, and none will be affected by the project. Riparian functions will not be impacted by the project. Project impacts have been minimized to the extent practicable while still meeting the project objectives of maintaining the safety of the travelling public. This permit application also complies with Env-Wt 311.07(a).

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

The overall hydrology and function of the Pemigewasset River to the remaining aquatic resources will not be adversely impacted. Project restoration has been designed such that post-construction conditions will closely approximate pre-construction conditions.

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

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

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

The proposed project will not result in a loss of flood storage capacity. The proposed permanent rectangular sheet pile cofferdam protecting Pier I will occupy the same footprint and volume as the original bridge design.

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

Temporary erosion controls such as silt socks and a dual turbidity curtain will be installed and maintained throughout construction to prevent sediment or turbid water from entering areas outside of the limits of work.

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

Once the proposed bridge pier repairs are completed, the limits of work will be restored, including native woody plantings of the same species that are currently present within the upland (Protected Shoreland) areas to be disturbed. Please see Section 12.0 for details.

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

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

As mentioned in this narrative and as described in **Attachments E and L** of this permit package, temporary erosion controls will be implemented throughout the bridge pier repairs to protect adjacent areas. Stream flow will be directed around the project area via temporary sheet piles along the western periphery of the limits of work and a dual turbidity curtain will protect from sediment migration/turbidity on the northern and eastern periphery of the limits of work.

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

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

7.0 WETLAND FUNCTIONAL ASSESSMENT SUMMARY

A Wetland Functional Assessment (WFA) Worksheet was completed for the project (**Appendix B**). No vernal pools are present within the project area. The project does not involve impacts to vegetated wetlands but will involve work within a Riverine system (Cowardin class R2UBH). The Riverine system (Pemigewasset River) has a known history of fisheries and provides a scenic vista from Route 175 above. The system is dynamic and active as evidenced by observations of erosion and deposition and evidence of periodic flooding events including dislodged trees and root systems and woody and herbaceous debris along the high water/flood extent elevations. Please see additional details regarding functions values provided by the Riverine system in **Appendix C**.

8.0 AGENCY COORDINATION

The project team has held four meetings to date for the project with agencies: February 18, 2020, May 20, 2020, a site visit on May 29, 2020, and November 17, 2021.

In addition to AECOM, the following agencies were present for each meeting:

- **February 18, 2020:** NHDOT Bureau of Environment, NHDOT Bureau of Bridge Design, NH Fish and Game Department, NHDES Wetlands Bureau, US Army Corps of Engineers
- **May 20, 2020:** NHDOT Bureau of Environment, NHDOT Bureau of Bridge Design, NH Fish and Game Department, The Nature Conservancy, NHDES Wetlands Bureau, US Army Corps of Engineers
- **May 29, 2020** (site visit): NHDOT Bureau of Environment, NHDOT Bureau of Bridge Design, NHDOT Bureau of Construction, and NHDES Wetlands Bureau
- **November 17, 2021:** NHDOT Bureau of Environment, NHDOT Bureau of Bridge Design, NH Fish and Game Department, The Nature Conservancy, NHDES Wetlands Bureau, US Army Corps of Engineers, US EPA, and the Federal Highway Administration

Details of the four meetings are provided in the meeting minutes in **Appendix B**.

The project team has coordinated with the Woodstock Conservation Commission regarding the project and no official comments have been submitted to the project team to date. The US Army Corps of Engineers (Mike Hicks), US EPA (Jeanie Brochi), and the Nature Conservancy (Pete Stickler) have indicated that they have no questions or comments at this time.

9.0 RARE SPECIES REVIEW COORDINATION

The New Hampshire Natural Heritage Bureau (NHB) was consulted for this project. NHB indicated in a response letter (**Appendix D**) that although there was an NHB record (e.g., rare wildlife, plant, and/or natural community) present in the vicinity of the project, they do not expect that it will be impacted by the proposed project.

The US Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) screening tool was used to determine that the proposed project area is located within the range of the federally endangered northern long-eared bat (NLEB) and the federally threatened small whorled pogonia. USFWS has confirmed that the proposed project was included within an Incidental Take Statement (ITS) which addresses reinitiated consultation on projects within the scope of the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat. The ITS is located on the USFWS's website using the following link:

<https://www.fws.gov/sites/default/files/documents/Final%20Amendment%20to%202018%20FHWA%20Bat%20PBO%20March%202023.pdf>

Consultation with the USFWS resulted in a “No Effect” determination for NLEB under the 2018 Federal Highway Administration, Federal Rail Administration, and Federal Transit Administration Programmatic Biological Opinion. A bat-bridge assessment was conducted on May 25, 2022 (**Appendix E**). No direct observations of bats or auditory confirmations were made to indicate the presence of bats. Similarly, no indirect indicators of bat usage were observed, including guano deposits or bat-associated urine staining. No direct or indirect observations were made by AECOM during a previous inspection of this same bridge on November 4, 2019. Additionally, the USFWS has confirmed that the proposed project is not anticipated to jeopardize the continued existence of the NLEB, therefore, consultation with USFWS regarding the NLEB species is concluded and further coordination with USFWS is not required.

Due to the transitory nature of bat use, a negative result in one year does not guarantee that bats will not use the structure in subsequent years. Therefore, the bat habitat assessments conducted by AECOM on May 25, 2022, are valid for a maximum of two years prior to conducting any work below the deck surface. If bats are discovered using the bridge following

this submittal, the NH DOT District Environmental Manager will be contacted and coordination with the USFWS would need to be initiated in order to identify and implement avoidance and minimization measures.

NH Fish and Game (NHFG) has indicated that there are wood turtles in the vicinity of the project site. As a result, the project will avoid the use of welded plastic or 'biodegradable plastic' netting or thread (e.g. polypropylene) in erosion control matting (blankets) since there are numerous documented cases of snakes, turtles, waterfowl and other wildlife being trapped and killed in erosion control matting with synthetic netting and thread. An erosion control berm or white Filtrexx Degradable Woven Silt Socks or similar non-plastic erosion control will be used at the toe of the slope as shown in **Appendix A**, Sheets 13 and 14. Fully biodegradable woven organic material (e.g. coco or jute matting such as North American Green SC150BN or equivalent) erosion control blankets will be employed for slope stabilization as shown in **Appendix A**, Sheet 14. In addition, since the angularity of riprap may impede the movement of turtles in the vicinity of the project, no riprap is proposed to be used on the banks.

10.0 HISTORIC/ARCHAEOLOGICAL RESOURCES REVIEW

AECOM Cultural Resources staff conducted a Phase 1A Assessment of the project site in 2021 which documented that the area to the southeast of the bridge where temporary construction access will occur is recently made land with no archaeological potential. The New Hampshire Division of Historical Resources (NHDHR) concurred with the results of the Phase 1A Assessment. The bridge is less than 50 years old and meets the conditions of the Interstate Exemption in the Section 106 Programmatic Agreement.

A Phase 1B Archaeological assessment was completed on the northeast side of the river near a previously considered access alternative and currently proposed staging area. The Phase 1B identified a post-contact cultural feature associated with the Woodstock Lumber Company Mill operation (27-GR-0324). As proposed, the project will not impact any of these resources, however the project commits to installing high visibility fencing prior to construction to ensure protection of the adjacent extant mill resources as approved by NHDHR. Additional details regarding historical and archaeological review are provided in **Appendix C**.

11.0 HYDROLOGIC AND HYDRAULIC DISCUSSION

The permanent fill to be replaced at the bridge pier will restore fill that was originally placed during the construction of the bridge in 1975 and is not anticipated to increase the base flood elevation. For these reasons, the repairs will not increase the flood elevation or have a significant or adverse impact on the floodplain.

Construction is scheduled to take place between the months July through September, when low flows are typically anticipated. Flow statistics were analyzed at a nearby USGS gage during these months. Daily flows were analyzed to determine the likelihood of the flow rates to occur during this time. The flows modeled were 1,910 cfs and 680 cfs. The analysis of the flow records at the USGS Gaging Station (No.01075000 – Pemigewasset River at Woodstock, NH) taken over 56 years between 1940 and 2020, indicates that 50% of the years, the daily flows have exceeded 1,910 cfs at least once during the period from July 15 to October 1. Additionally, the records indicate that 88% of the years, daily flows within the July 15 to October 1 period, may be greater than 680 cfs at least once.

An SRH-2D model was created to reflect a three-sided temporary/permanent cofferdam to allow localized work under dry conditions under Span 1 and construction access from a temporary access road and causeway in the southeast quadrant of the bridge site. Two scenarios were modeled corresponding to the low flows determined. The upstream boundary was set to the designated flow rates of 680 cfs and 1,910 cfs. The downstream boundary condition was set to the constant elevation of 615 ft. The top of the north and south sheet pile/cofferdam walls and causeway were set at elevations with 1'-0" freeboard above the anticipated water surface elevation. The area where construction will be performed between the southwest abutment and Pier 1 will be enclosed at or above the predicted water surface elevations of the higher determined flow scenarios.

The results indicated that the velocities under the modelled scenario would increase in the main river channel to the north of the work area. This is expected due to the constriction in the channel caused by the sheet pile wall and cofferdam. The modelling results predict that the predicted velocities in the main river for flows 680 and 1,910 cfs, would be approximately 8 feet per second (fps) and 12 fps, respectively, for the modeled scenarios. The proposed work would include an additional sheet pile extending north from the permanent cofferdam, which was

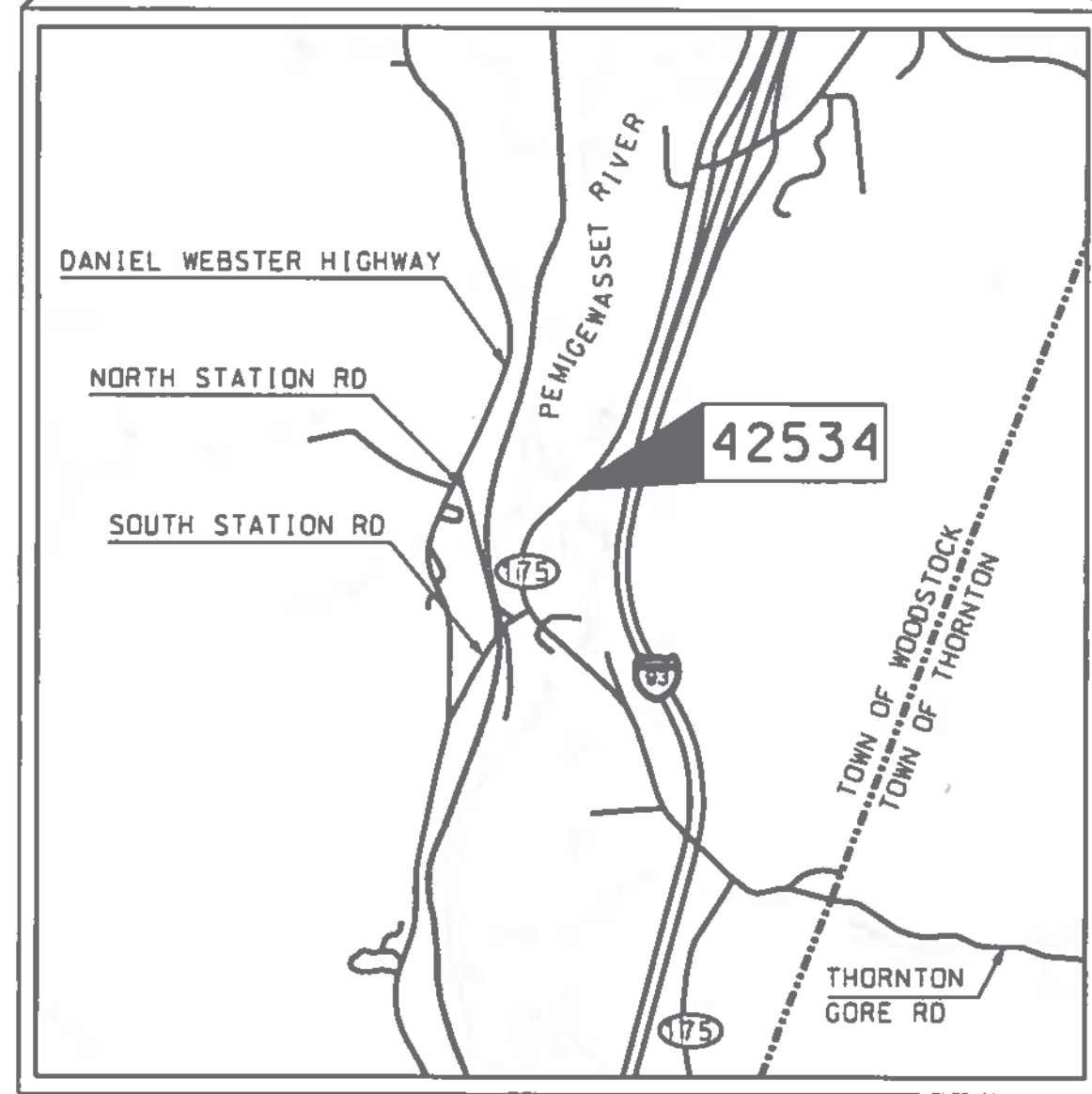
modelled through the SRH-2D model. The model was used to simulate the temporary construction conditions for Pier 1 Rehabilitation. Hydraulic variables were extracted from the model results for two scenarios. Scenario 1 is the average seasonal flow at 680 cfs. Scenario 2 is the median high seasonal flow of 1,910 cfs. The results indicated that the most significant impact is a scour depth of 0.3 feet occurring at Pier 2 during Scenario 2 (**Appendix K**). It is possible that some erosion of the sandbar to the west of the existing bridge may occur. However, the work would occur during a limited time period of July 5 to October 1 during typical low-flow periods, which will minimize erosion potential. The extent of erosion to the sand bar is difficult to predict, however the sandbar is a dynamic system that already likely experiences changes on an annual basis, given the lack of well-established vegetation on the sandbar, such as mature trees.

Appendix A
Site Plans

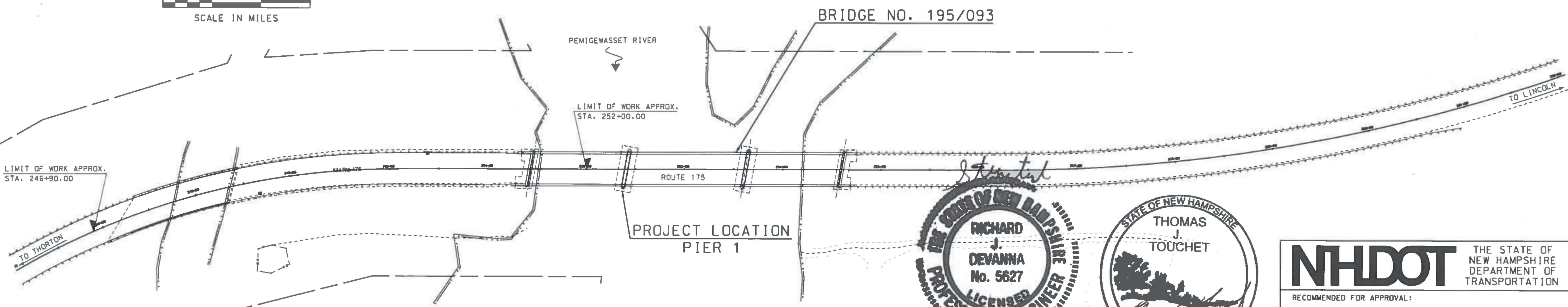
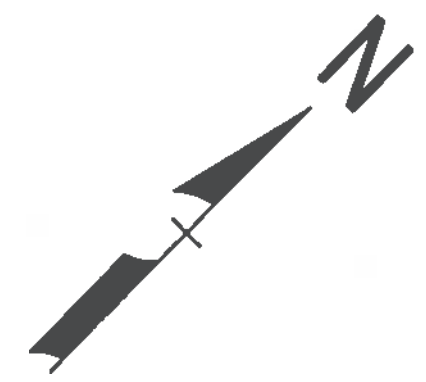
STATE OF NEW HAMPSHIRE
 DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS
FEDERAL AID PROJECT

X-A004(896)
 NH PROJECT NO. 42534
 NH ROUTE 175

DESIGN DATA	
AVERAGE DAILY TRAFFIC 2022	513
PERCENT OF TRUCKS	10%
DESIGN SPEED	35 MPH
LENGTH OF PROJECT	3340 FT

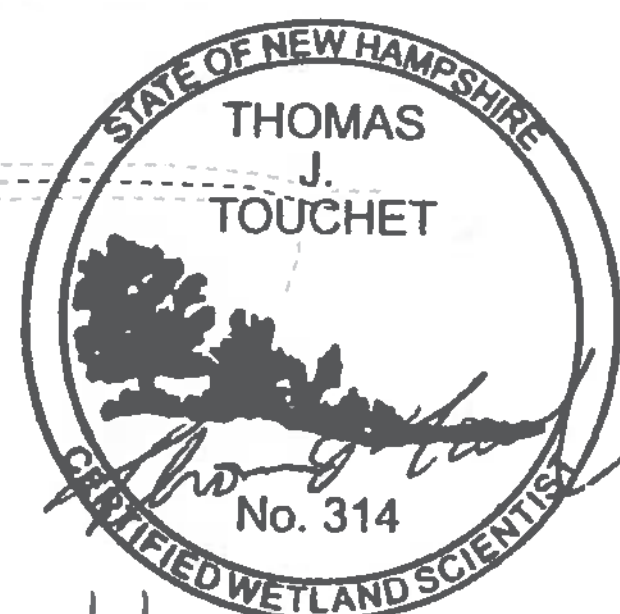
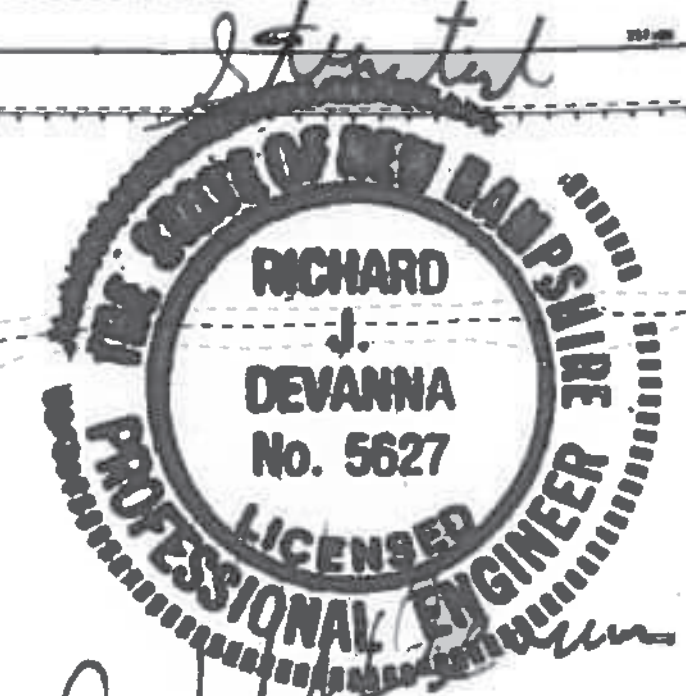


LOCATION MAP
 SCALE IN MILES



SCALE IN FEET

TOWN OF WOODSTOCK
 COUNTY OF GRAFTON
 SCALE: 1" = 50'-0"



Richard J. Devanna
 8.9.23

Thomas J. Touchet
 8/9/23

DATE 7/2023
 DATE 7/2023
 DRAWN BY J. McQUAID
 CHECKED BY R. DEVANNA

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
X-A004(896)	42534	1	21



GENERAL NOTES

- ① FOR STANDARD PLANS, SEE DEPARTMENT OF TRANSPORTATION WEB SITE AT: WWW.NH.GOV/DOT/ORG/PROJECTDEVELOPMENT/HIGHWAYDESIGN/STANDARDPLANS/INDEX.HTM.
- ② HIGH TENSION OVERHEAD TRANSMISSION LINES ARE LOCATED THROUGHOUT THE PROJECT WITH CROSSINGS AT VARIOUS LOCATIONS AND RUNNING ALONG THE ROAD THROUGHOUT THE PROJECT EVEN ON REGULAR POLES. THE CONTRACTOR IS ADVISED THAT EXTREME CAUTION WILL BE REQUIRED IN THE OPERATION OF EQUIPMENT, ESPECIALLY CRANES AND PILE DRIVING EQUIPMENT.
- ③ MODIFY SUPERELEVATION ON EXISTING CURVES BY THE USE OF A LEVELING COURSE TO THE RATES INDICATED ON THE PLANS OR AS ORDERED.
- ④ EXISTING DELINEATORS AND WITNESS MARKERS THAT ARE REMOVED AND DETERMINED BY THE ENGINEER TO BE IN ACCEPTABLE CONDITION SHALL BE RESET (SUBSIDIARY). ADDITIONAL DELINEATORS AND WITNESS MARKERS ORDERED WILL BE PAID UNDER THE APPROPRIATE ITEMS OF THE CONTRACT.
- ⑤ NO EXISTING MONUMENTS, BOUNDS, OR BENCHMARKS SHALL BE DISTURBED WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.
- ⑥ PERFORM ALL WORK WITHIN THE EXISTING RIGHT-OF-WAY, UNLESS OTHERWISE SHOWN ON THE PLANS OR AS ORDERED BY THE ENGINEER.
- ⑦ REMOVE UNPROTECTED PROJECT MARKERS (SUBSIDIARY).
- ⑧ BATHYMETRIC SURVEY DATA FOR THIS PROJECT WAS CONDUCTED BY: GM2 ON OCT. 25, 2019 AND APRIL 22, 2020. COORDINATES ARE NEW HAMPSHIRE STATE PLANE COORDINATES OF NAD83. VERTICAL DATUM IS NAVD 88. SURVEY DATA FOR THIS PROJECT WAS CONDUCTED BY: GM2 ON APRIL 22, 2020 TO OBTAIN WETLANDS DATA ON SE AND SW SIDE OF BRIDGE AND ROADWAY AND LIMITED ROADWAY TOPOGRAPHY SOUTH OF BRIDGE. SURVEY DATA ALSO BY NHDOT ON SEPT. 2, 2022. TOPOGRAPHY DATA OUTSIDE THE RIVER SOUTHWEST OF THE BRIDGE. BOOK# 13006. COORDINATES ARE NEW HAMPSHIRE STATE PLANE COORDINATES OF NAD83. VERTICAL DATUM IS NAVD 88. THE WHITE MOUNTAIN NATIONAL FOREST LIDAR PROJECT INFORMATION WAS USED TO OBTAIN THE LAND TOPOGRAPHY DATA OUTSIDE THE RIVER NORTHEAST OF THE BRIDGE.
- ⑨ QUANTITIES FOR EMBANKMENT AND EXCAVATION FOR SLOPE ROUNDINGS AS SHOWN ON THE TYPICALS HAVE NOT BEEN CALCULATED AND ARE NOT INCLUDED IN THE QUANTITY SUMMARIES, AND ARE CONSIDERED SUBSIDIARY TO THE APPROPRIATE 203 ITEMS.

THE FOLLOWING GENERAL NOTES
WILL BE USED ON THIS PROJECT:

①	○	○	④	⑤	⑥	⑦	⑧	⑨	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE PAGE
2	INDEX OF SHEETS AND GENERAL NOTES
3-4	STANDARD SYMBOLS
	BRIDGE PLANS
5	GENERAL PLAN AND ELEVATION
6	PROJECT NOTES AND SUMMARY OF QUANTITIES
7	TEMPORARY ACCESS ROAD PLAN
8	SITE PLAN - PERMANENT PIER COFFERDAM
9	TEMPORARY CAUSEWAY SECTIONS
10	PERMANENT PIER COFFERDAM SECTIONS AND DETAILS
11	SCOUR REPAIR DETAILS
12	WETLAND IMPACT PLAN
13-14	EROSION CONTROL PLAN
15	ACCESS ROAD RESTORATION PLAN
16	CONTRACTOR LAYDOWN AREA
	TRAFFIC CONTROL PLANS
17-18	TEMPORARY TRAFFIC CONTROL
19	CONSTRUCTION SIGN SUMMARY
20	DETOUR PLAN
21	CONSTRUCTION DETOUR SIGN SUMMARY

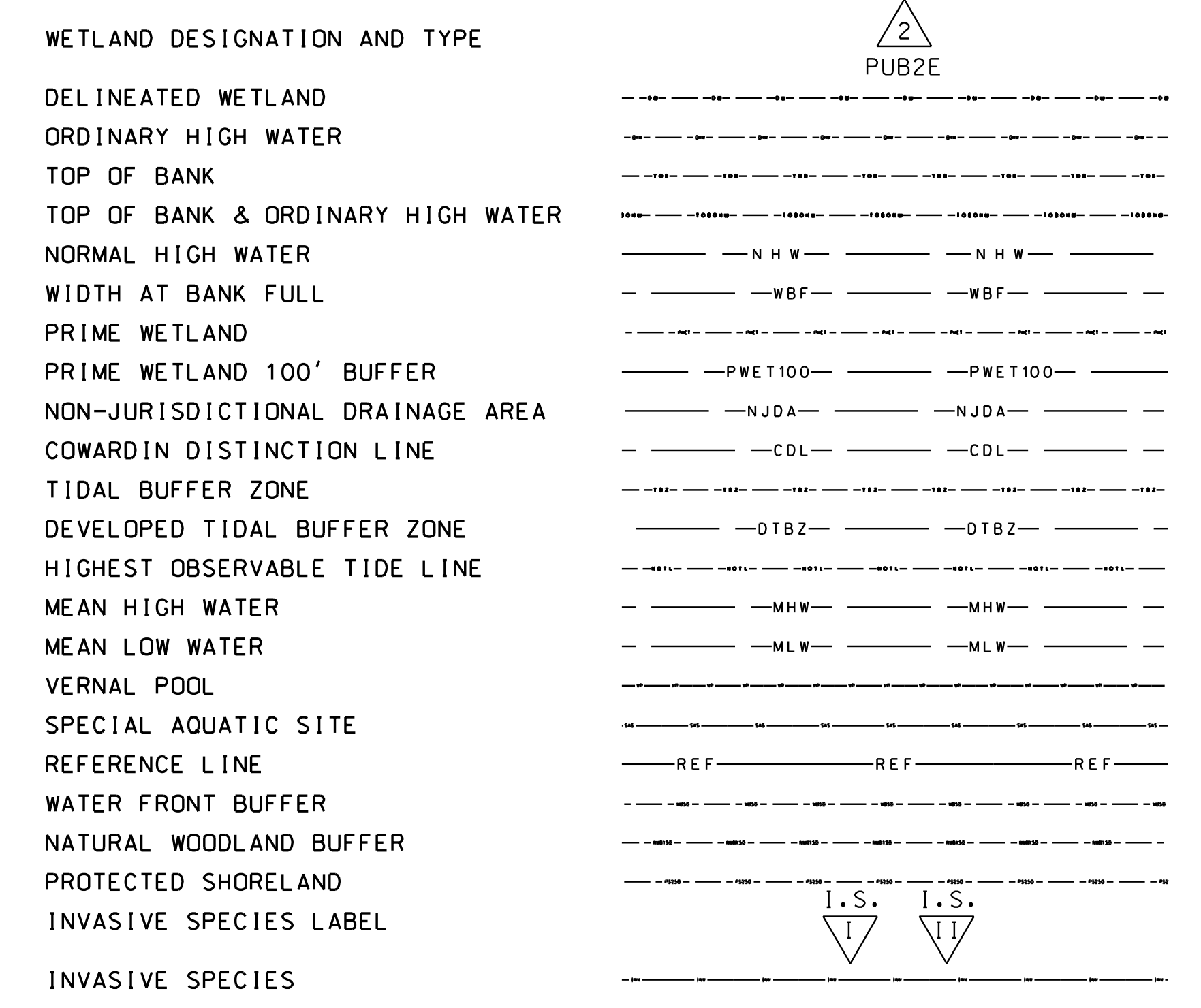
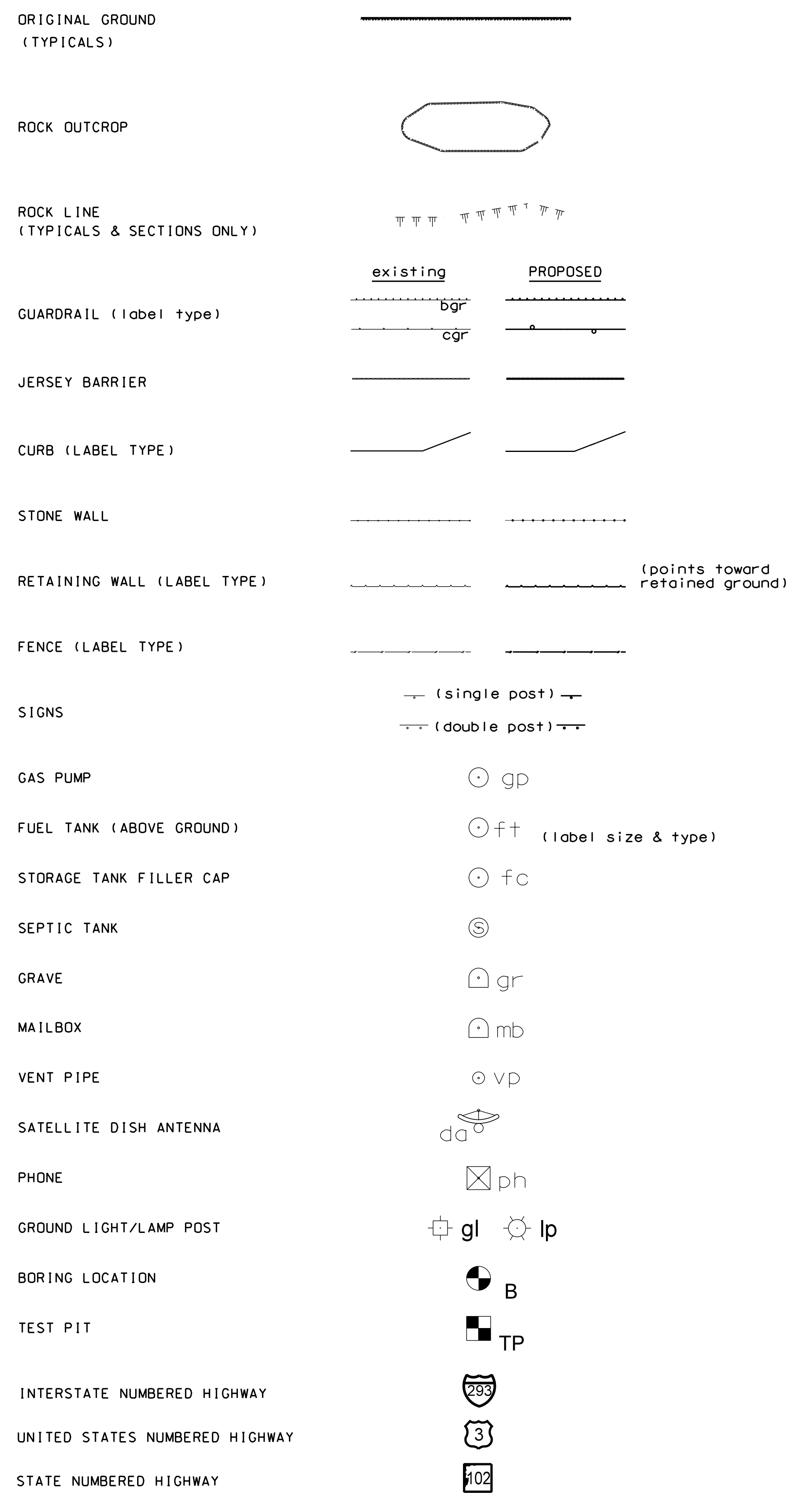
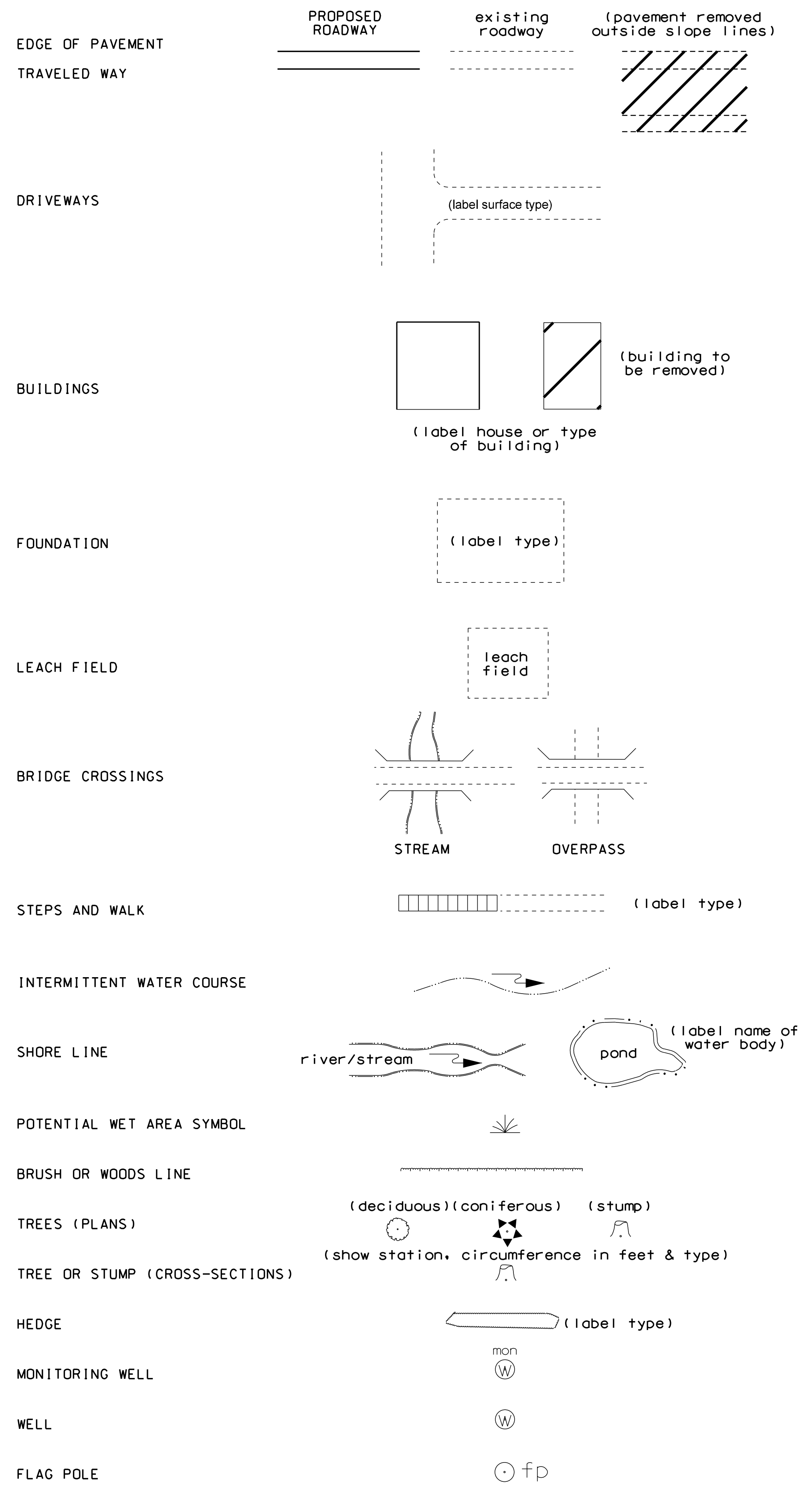
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SHEET CHECKED	NAME3	DATE	DATE1	DATE	DATE2	DATE	DATE3
AS BUILT DETAILS		DATE		DATE		DATE	

STATE OF NEW HAMPSHIRE WOODSTOCK			
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF BRIDGE DESIGN			
INDEX OF SHEETS AND GENERAL NOTES			
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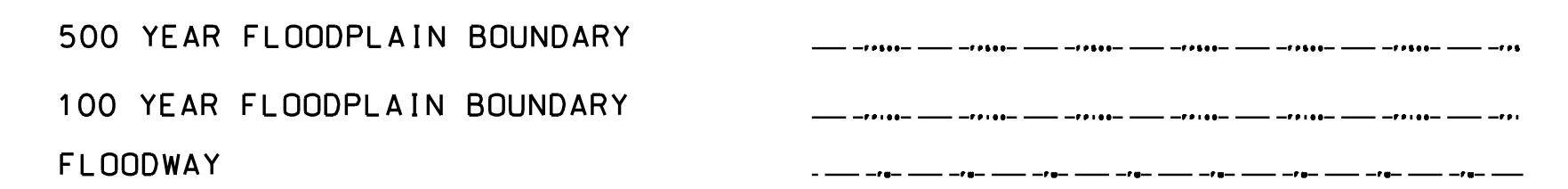
GENERAL

SHORELAND - WETLAND

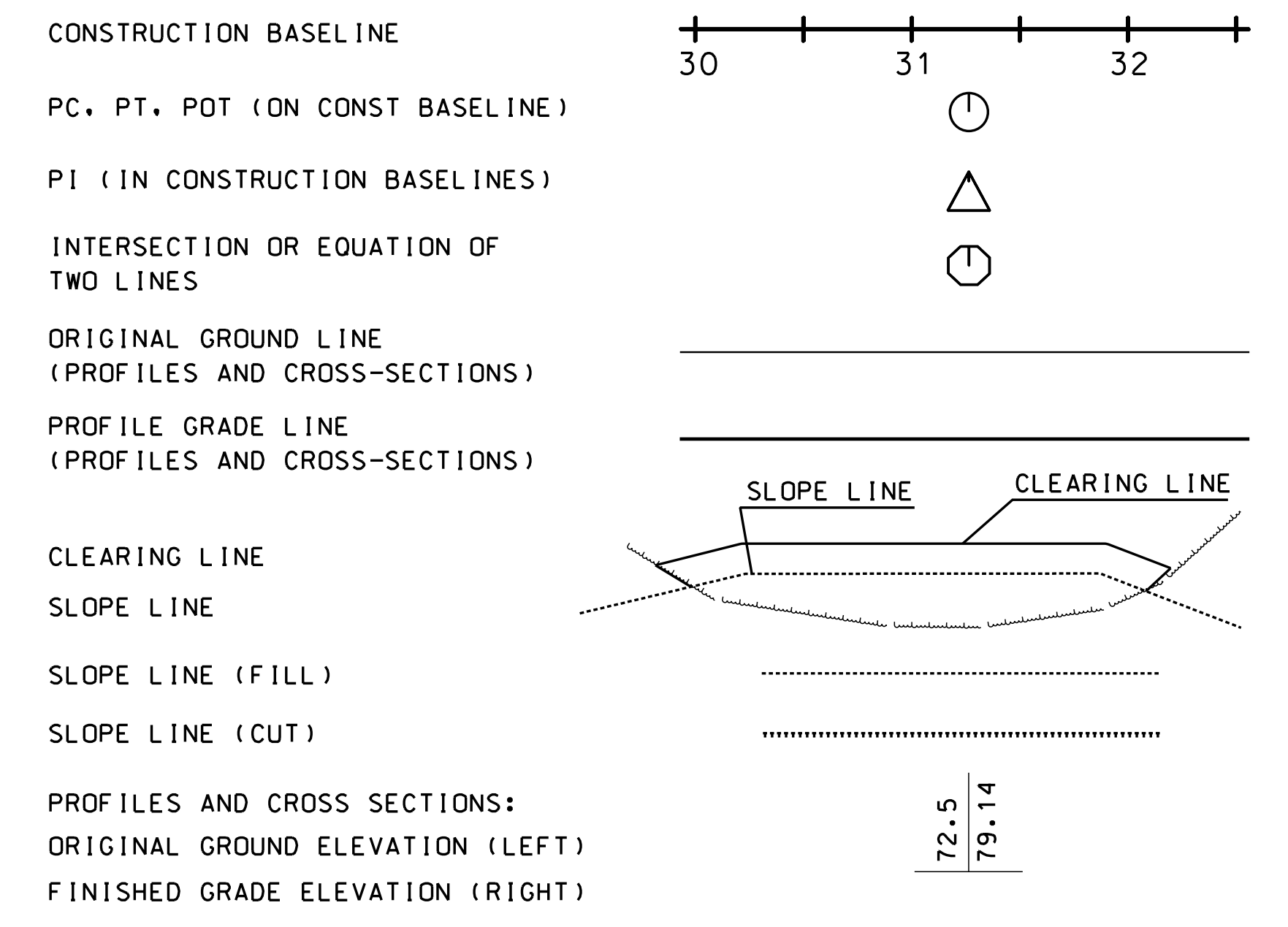
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	AS BUILT DETAILS	DATE	DATE1	DATE	DATE2	DATE	DATE3	DATE
SHEET CHECKED	NUMBER	DATE	DATE1	DATE	DATE2	DATE	DATE3	DATE
	STATION	DATE	DATE1	DATE	DATE2	DATE	DATE3	DATE
	STATION	DATE	DATE1	DATE	DATE2	DATE	DATE3	DATE
	DESCRIPTION	DATE	DATE1	DATE	DATE2	DATE	DATE3	DATE
REVISIONS AFTER PROPOSAL	STATION	DATE	DATE1	DATE	DATE2	DATE	DATE3	DATE



FLOODPLAIN / FLOODWAY



ENGINEERING



STATE OF NEW HAMPSHIRE WOODSTOCK			
DEPARTMENT OF TRANSPORTATION • BUREAU OF BRIDGE DESIGN			
STANDARD SYMBOLS (1 OF 2)			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
42534SYMB1.dgn	42534	3	21

DRAINAGE

MANHOLE		(existing)		(PROPOSED)
CATCH BASIN		cb		
DROP INLET		di		
DRAINAGE PIPE (existing)				(label size & type)
DRAINAGE PIPE (PROPOSED)				(label size & type)
UNDERDRAIN (existing) W/ FLUSHING BASIN		fb		(label size & type)
UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN				(with stone outlet protection)
HEADER (existing & PROPOSED)				METAL or PLASTIC
END SECTION (existing & PROPOSED)				RCP
OPEN DITCH (PROPOSED)				
EROSION CONTROL / STONE SLOPE PROTECTION				

BOUNDARIES / RIGHT-OF-WAY

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

UTILITIES

TELEPHONE POLE		existing		PROPOSED
POWER POLE				
JOINT OCCUPANCY				(plot point at face not center of symbol)
MISCELLANEOUS/UNKNOWN POLE				
GUY POLE OR PUSH BRACE				
LIGHT POLE				
LIGHT ON POWER POLE				
LIGHT ON JOINT POLE				
POLE STATUS: REMOVE, LEAVE, PROPOSED, OR TEMPORARY AS APPLICABLE e.g.:				
RAILROAD		(label ownership)		
RAILROAD SIGN				
RAILROAD SIGNAL				
UTILITY JUNCTION BOX		jb		JB
OVERHEAD WIRE		OW (label type)		
UNDERGROUND UTILITIES				
WATER (on existing lines label size, type and note if abandoned)				
SEWER				
TELEPHONE				
ELECTRIC				
GAS				
LIGHTING				
INTELLIGENT TRANSPORTATION SYSTEM				
FIBER OPTIC				
WATER SHUT OFF				
GAS SHUT OFF				
HYDRANT				
MANHOLES				
SEWER				MHS
TELEPHONE				MHT
ELECTRICAL				MHE
GAS				MHG
UNKNOWN				

TRAFFIC SIGNALS / ITS

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

CONSTRUCTION NOTES

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

STATE OF NEW HAMPSHIRE WOODSTOCK			
DEPARTMENT OF TRANSPORTATION • BUREAU OF BRIDGE DESIGN			
STANDARD SYMBOLS (2 OF 2)			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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REVISIONS AFTER PROPOSAL

STATION

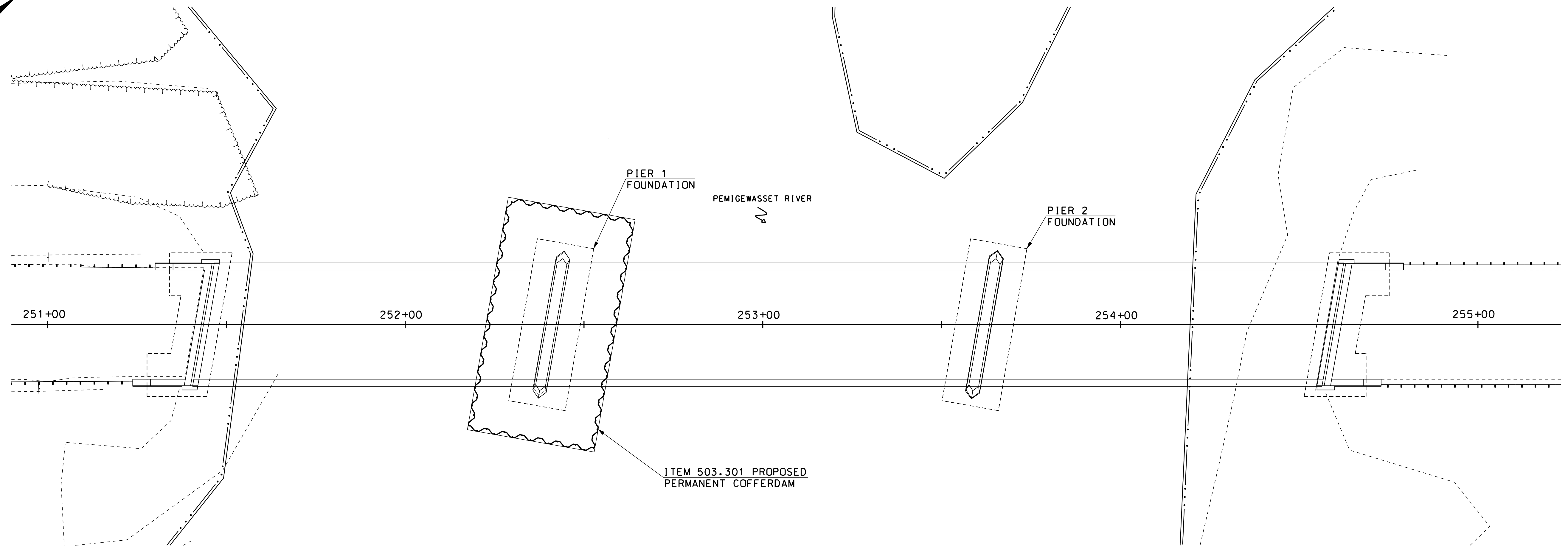
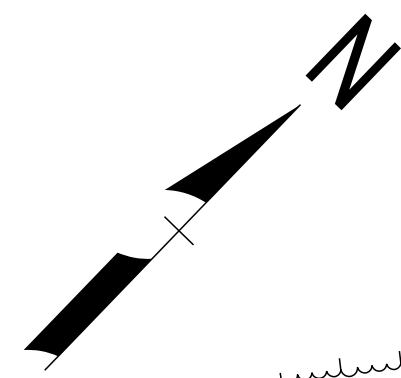
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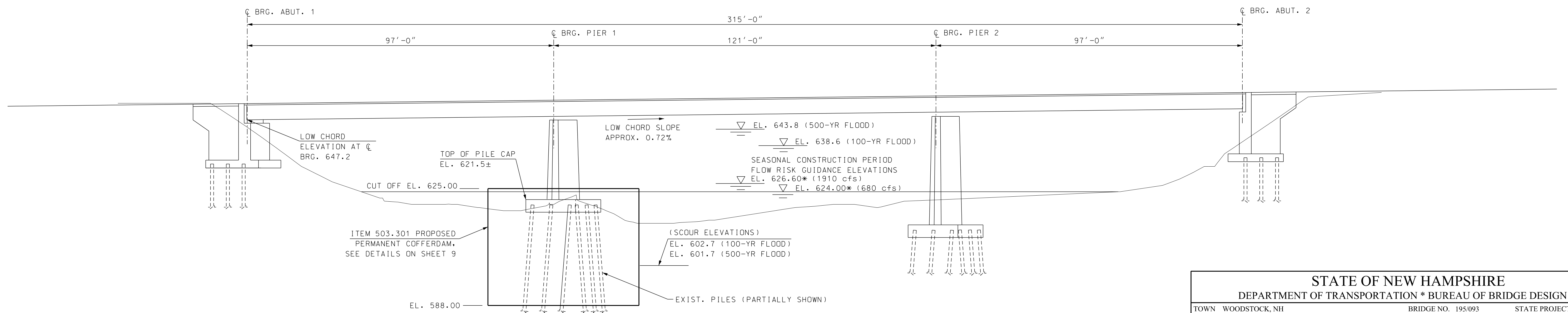
NUMBER

DATE DATE1 DATE2 DATE3

SDR PROCESSED NAME1 NAME2 NAME3 AS BUILT DETAILS



PLAN



* WATER SURFACE ELEVATIONS ARE APPROXIMATE AT THE UPSTREAM FACE OF COFFERDAM (TOP OF PERMANENT EL. 625.0)(TOP OF TEMPORARY EL. 627.6).

ELEVATION

NOTE: TEMPORARY CAUSEWAY NOT SHOWN

SHEET SCALE
1/16" = 1'-0"

STATE OF NEW HAMPSHIRE										
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN										
TOWN WOODSTOCK, NH			BRIDGE NO. 195/093			STATE PROJECT 42534				
LOCATION NH RTE 175 OVER PEMIGWASSET RIVER										
GENERAL PLAN AND ELEVATION									BRIDGE SHEET	
									1 of 17	
REVISIONS AFTER PROPOSAL		BY	DATE	CHECKED	BY	DATE	FIGURE			
		DESIGNED	TD, BH	06/2023	CHECKED	RJD	06/2023			
		DRAWN	JBM	06/2023	CHECKED	RJD	06/2023			
		QUANTITIES		CHECKED						
		ISSUE DATE	FEDERAL PROJECT NO.			SHEET NO.	TOTAL SHEETS			
		REV. DATE	X-A004(896)			5	21			

MATERIALS AND SPECIFICATIONS:

- CONCRETE: CONCRETE COFFERDAM CAP = 4,000 PSI, ITEM 520.1 CONCRETE CLASS A
- REINFORCEMENT: AASHTO M 55 (ASTM A185 & ASTM A884) WELDED WIRE FABRIC GRADE 60 (EPOXY COATED)
- STRUCTURAL STEEL: AASHTO M223 (ASTM A572) GRADE 50 UNCOATED STRUCTURAL BOLTS TO CONFORM TO ASTM F3125 GRADE A325. GALVANIZED NUTS USED WITH A325. BOLTS TO BE ASTM A563. GALVANIZED WASHERS TO CONFORM TO ASTM F436 GALVANIZED.
- STEEL SHEET PILES: AASHTO M202 (ASTM A572) GRADE 60 UNCOATED.
- COFFERDAM TIE RODS: AASHTO M31 (ASTM A615) Fy = 80 KSI GALVANIZED COUPLERS, NUTS, AND WASHERS USED IN CONJUNCTION WITH TIE RODS SHALL BE GALVANIZED AND SHALL BE OF THE MATERIAL RECOMMENDED BY THE MANUFACTURER. COUPLERS AND NUTS SHALL HAVE CAPACITY GREATER THAN 100% OF THE BAR'S PUBLISHED ULTIMATE STRENGTH.
- UNCOATED STEEL COMPONENTS SHALL BE ELECTRICALLY ISOLATED FROM GALVANIZED STEEL COMPONENTS, INCLUDING BOLTS, NUTS, WASHERS, AND THREADED RODS, THROUGH THE USE OF NYLON WASHERS AND SLEEVES.

NOTES:

- THE TOP OF CAUSEWAY PRESENTED FOR PERMITTING PURPOSES IS SHOWN AT EL 627.60 AND PROVIDES APPROXIMATELY 1' OF FREEBOARD ABOVE THE 50% CONSTRUCTION PERIOD FLOW EXCEEDANCE VENT ELEVATION RISK GUIDANCE AS DEFINED BELOW. FINAL PROPOSED CONSTRUCTION ACCESS IS AT THE CONTRACTOR'S RESPONSIBILITY AND RISK.
- THE 626.6 WATER SURFACE ELEVATION CORRESPONDS TO A FLOW RATE OF 1910 CFS. IT IS ANTICIPATED THAT THE PIER SCOUR REPAIR CONSTRUCTION WILL BE CONDUCTED BETWEEN JULY 15 AND OCTOBER 1. USGS GAUGING STATION RECORDS, TAKEN OVER A 56 YEAR PERIOD BETWEEN 1940 TO 2020, INDICATE THAT 50% OF THE YEARS, THE DAILY FLOWS HAVE EXCEEDED 1910 CFS AT LEAST ONCE DURING THE PERIOD FROM JULY 15 TO OCTOBER 1. ADDITIONALLY, AN ELEV. 624.0 CORRESPONDS TO A FLOW RATE OF 680 CFS AND WITHIN THE SAME ABOVE PERIOD OF TIME THE USGS GAUGING STATION RECORDS INDICATE THAT, 88% OF THE YEARS, DAILY FLOWS WITHIN THE JULY 15 TO OCTOBER 1 PERIOD MAY BE GREATER THAN 680 CFS AT LEAST ONCE.
- TEMPORARY ACCESS ROAD, CAUSEWAY AND TEMPORARY COFFERDAMS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER, LICENSED IN THE STATE OF NEW HAMPSHIRE. PLAN AND DESIGN CALCULATIONS SHALL BE SUBMITTED TO THE BUREAU OF BRIDGE DESIGN FOR DOCUMENTATION, IN ACCORDANCE WITH 105.02.
- BATHYMETRIC SURVEY BY GM2 ON OCT. 25, 2019. CONTOUR ELEVATIONS ARE AT 1' INTERVALS.
- VERTICAL DATUM IS NAVD 88.
- THE WHITE MOUNTAIN NATIONAL FOREST LIDAR PROJECT INFORMATION WAS USED TO OBTAIN THE LAND TOPOGRAPHY DATA OUTSIDE THE RIVER. CONTOUR ELEVATIONS ARE AT 2' INTERVALS.

GENERAL CONSTRUCTION NOTES:

- EXISTING PLANS ARE AVAILABLE ONLINE IN THE BID PACKAGE ON THE INVITATION TO BID WEB PAGE, DURING THE BIDDING PERIOD. THE EXISTING PLANS MAY BE VIEWED AT NHDOT, BUREAU OF BRIDGE DESIGN OFFICE DURING THE BIDDING PERIOD. AFTER THE CONTRACT HAS BEEN AWARDED A COMPLETE SET OF EXISTING PLANS WILL BE FORWARDED TO THE CONTRACTOR UPON REQUEST.
- THE CONTRACTOR SHOULD BE AWARE THAT EXISTING STRUCTURE DIMENSIONS AND ELEVATIONS SHOWN IN THESE PLANS WERE TAKEN FROM ORIGINAL BRIDGE PLANS, AERIAL IMAGERY AND LIMITED FIELD SURVEY DATA AND DO NOT NECESSARILY REPRESENT THE "AS BUILT" DIMENSIONS AND ELEVATIONS. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS OF THE EXISTING STRUCTURE AND BE PREPARED TO MAKE ANY ADJUSTMENTS REQUIRED TO PROPERLY REHABILITATE THE BRIDGE PIER. ANY DISCREPANCIES IN DIMENSIONS, CHARACTER OR EXTENT OF THE EXISTING FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO ADVANCING THE WORK.
- THE CONTRACTOR SHALL CONTACT DIG SAFE TO SURVEY AND TAG ALL UNDERGROUND LOCATIONS NEAR THE BRIDGE FOR POSSIBLE UTILITIES.
- ALL WORK TO BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL CODES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THESE DRAWINGS IN ACCORDANCE WITH ALL PROJECT REQUIREMENTS.
- ALL SHOP & FIELD WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE AMERICAN SOCIETY FOR WELDING IN BUILDINGS AND CONSTRUCTION AWS D1.1 WELDING ELECTRODES SHALL BE E70XX.
- ALL STRUCTURE WORK INCLUDING, BUT NOT LIMITED TO, COFFERDAMS, SHEET PILING, STRUCTURAL FILL, STONE FILL AND GEOTEXTILES SHALL BE PERFORMED IN ACCORDANCE WITH DIVISION 500 OF THE 2016 NHDOT CONSTRUCTION MANUAL.

ACCESS FOR BRIDGE CONSTRUCTION:

- PRIOR TO THE COMMENCEMENT OF OPERATIONS, THE CONTRACTOR WILL REQUEST IN WRITING AUTHORIZATION TO MOVE, POSITION, AND OPERATE EQUIPMENT INCLUDING CRANES ON THE EXISTING BRIDGE. SUCH AUTHORIZATION SHALL INDICATE EQUIPMENT MAKE AND MODEL, GROSS LOAD, OPERATIONAL LOADS, MOVEMENT DIAGRAMS AND CALCULATIONS INDICATE THE BRIDGE WILL NOT BE OVERSTRESSED FOR OPERATING CAPACITY FOR ALL STAGES OF WORK. CALCULATIONS SHALL BY A PROFESSIONAL ENGINEER, LICENSED IN THE STATE OF NH. THE CONTRACTOR SHALL SUBMIT STAMPED WORKING DRAWINGS AND CALCULATIONS FOR REVIEW AND DOCUMENTATION IN ACCORDANCE WITH SECTION 105.02. COST FOR THIS WORK SHOULD BE PROPORTIONED ACCORDINGLY AS SUBSIDIARY TO ITEM 503.201 TEMPORARY COFFERDAM AND ITEM 503.301 COFFERDAM WITH SHEETING LEFT IN PLACE.
- ITEM 500.02, ACCESS FOR BRIDGE CONSTRUCTION, SHALL INCLUDE THE COSTS OF THE DESIGN, CONSTRUCTION, MAINTENANCE AND REMOVAL (INCLUDING ANY WATER DIVERSION) OF ALL TEMPORARY ACCESS NEEDED BY THE CONTRACTOR TO COMPLETE THE WORK. SEE SPECIAL PROVISIONS FOR ADDITIONAL DETAILS.
- TEMPORARY FILLS SHALL REMAIN WITHIN WETLAND IMPACT AREAS SHOWN IN THE WETLAND PERMIT. A GEOTEXTILE FABRIC SHALL BE PLACED UNDER ALL TEMPORARY FILLS TO MINIMIZE DISRUPTION OF NATIVE SOILS AND VEGETATION. ALL COSTS SUBSIDIARY TO ITEM 500.02.
- CONSTRUCTION OF THE TEMPORARY CAUSEWAY FOR PIER ACCESS CANNOT START UNTIL AFTER JULY 4th AND REMOVED BY OCTOBER 1st.
- IT SHOULD BE NOTED THAT IN SOME LOCATIONS PRE-EXCAVATION OF COBBLES AND BOULDERS MAY BE REQUIRED PRIOR TO PLACING COFFERDAMS AND TURBIDITY BARRIER. DURING EXCAVATION, THE CONTRACTOR SHALL DISTURB THE AREA AS LITTLE AS POSSIBLE AND USE NECESSARY PRECAUTIONS TO MINIMIZE THE IMPACTS TO THE RIVER. ALL COSTS INCLUDED IN UNCLASSIFIED CHANNEL EXCAVATION ITEM 207.3.

SUGGESTED CONSTRUCTION SEQUENCE NOTES:

- INSTALL TEMPORARY SIGNALS.
- INSTALL TEMPORARY BARRIERS WITH TRUCK ACCESS AND ATTENUATORS.
- CONSTRUCT SOUTHEAST ACCESS ROAD.
- IMPLEMENT DETOUR FOR INSTALLATION OF TEMPORARY AND PERMANENT COFFERDAM SHEET PILES WEST OF BRIDGE.
- FROM BRIDGE DECK, INSTALL TEMPORARY AND PERMANENT COFFERDAM SHEET PILES WEST OF BRIDGE INCLUDING CUSTOM THREE-WAY CORNER SHEETS AT SOUTHWEST AND NORTHWEST CORNERS OF COFFERDAM.
- INSTALL GEOTEXTILE SEPARATION FABRIC.
- INSTALL DOUBLE TURBIDITY CURTAIN.
- INSTALL SOUTHEAST TEMPORARY ACCESS CAUSEWAY TO ELEVATION 627.60. CAUSEWAY CONSTRUCTION CONTINUES WESTERLY UNDER MIDDLE SPAN, TO MEET TEMPORARY SHEET PILE FLOW DEFLECTOR UPSTREAM SIDE OF BRIDGE. COFFERDAM SHEET PILES TO BE ADVANCED AHEAD TO MAINTAIN COFFERDAM FILL SLOPE STABILITY. SHEET PILES UNDER SPAN TO BE SPLICED. CONSTRUCTION OF CAUSEWAY AND SHEET PILE INSTALLATION PROGRESSES IN SECTIONS, BASED ON REACH OF EXCAVATOR, WHILE ADVANCING AND MAINTAINING TURBIDITY CONTROL WITH LOCALIZED CURTAINS AHEAD OF WORK. CONSTRUCTION MATS TO BE PLACED ON TOP SURFACE AS CAUSEWAY ADVANCES.
- TEMPORARILY REMOVE DETOUR WHEN USE OF CRANE ON BRIDGE DECK IS COMPLETE.
- FROM CAUSEWAY, INSTALL SOUTH PERMANENT COFFERDAM SHEET PILES UNDER BRIDGE SPAN 1 TO WEST PERMANENT SHEET PILE CORNER ADVANCING CAUSEWAY AS REQUIRED FOR EQUIPMENT REACH. SHEET PILES UNDER SPAN TO BE SPLICED.
- DEWATER TEMPORARY COFFERDAM AS NECESSARY.
- FILL COFFERDAM IN AREA OF SCOUR HOLE WITH CRUSHED STONE FILL OR #57 OR #67 GRADATION STONE TO BOTTOM OF THE PILE CAP AS TIGHT AS POSSIBLE.
- CONTINUE TO FILL COFFERDAM IN AREA OF SCOUR HOLE WITH CRUSHED STONE OR BANK RUN GRAVEL TO EL. 621.
- WHERE NECESSARY PERFORM LOCAL EXCAVATION/STONE REMOVAL FOR TIE-ROD, WALE INSTALLATION AND ANCHORAGE.
- INSTALL WALES.
- INSTALL TIE-RODS.
- FILL COFFERDAM WITH CRUSHED STONE OR #57 OR #67 GRADATION STONE GRAVEL TO EL. 624.5.
- CUT OFF SHEET PILES TO EL 625.0
- INSTALL 6-INCH CONCRETE SLAB TO TOP OF COFFERDAM. (COORDINATE WITH ADVANCED WEATHER FORECAST FOR ANTICIPATED STORM EVENTS)
- REINSTATE DETOUR AND REMOBILIZE CRANE AS NECESSARY TO ASSIST WITH ZONE #1 AND #2 RESTORATION BELOW.
- RESTORE ZONE #1 (AREAS WITHIN THE LIMITS OF WORK BELOW TOB/OHW (BANK AND STREAM CHANNEL)) INCLUDING: REMOVAL OF CAUSEWAY STONE FILL, GEOTEXTILE FABRIC, TURBIDITY CURTAINS, TEMPORARY SHEET PILES, ETC. TO REVEAL THE PRE-CONSTRUCTION SUBSTRATE. RESTORE BANK CONTOURS AS NECESSARY.
- REMOVE WESTERN TEMPORARY SHEET PILE COFFERDAM WITH CRANE ON BRIDGE DECK.
- RESTORE ZONE #2 (AREAS WITHIN THE LIMITS OF WORK ABOVE TOB/OHW (SLOPE AREA)) INCLUDING ALL EMBANKMENT AND MATERIALS USED TO CONSTRUCT TEMPORARY ACCESS. RESTORE SLOPES TO PRE-CONSTRUCTION CONTOURS. THIS DISTURBED AREA TO BE TREATED WITH HUMUS MEETING SPECIFICATIONS OF ITEM 647.1. AND TURF ESTABLISHMENT MEETING THE SPECIFICATIONS OF ITEM 646.3.
- REMOVE DETOUR WHEN CRANE NO LONGER NEEDED FOR ZONE #2 RESTORATION.
- ONCE FINAL GRADING IS COMPLETE IN ZONE #2, THE AREA AS SHOWN ON THE RESTORATION PLAN (SHEET #14) WILL BE SEEDED WITH A NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES SEED MIX OR EQUIVALENT.
- FOLLOWING SEEDING, ZONE #2 WILL BE STABILIZED IN THE AREAS SHOWN ON SHEET #14 (WITH THE EXCEPTION OF THE RIP-RAP AREA NEAR THE SOUTH BRIDGE ABUTMENT) WITH A FULLY BIODEGRADABLE EROSION CONTROL BLANKET.
- ONCE EROSION CONTROL BLANKETS ARE IN PLACE, ZONE #2 SHALL BE PLANTED AS SHOWN ON SHEET #14.
- REMOVE SIGNALIZATION AND TEMPORARY BARRIERS.

PERMANENT COFFERDAM NOTES

- WALES ARE REQUIRED ON ALL SIDES OF THE SHEET PILES AS SHOWN.
- THE EXTERIOR WALES WILL CONSIST OF TWO C12x25 CHANNELS BACK TO BACK, WITH A GAP BETWEEN THE CHANNELS THAT WILL ALLOW THE TIE ROD TO PASS THROUGH.
- INTERIOR WALES SHALL BE FRAMED AROUND PIER HELD APPROXIMATELY 6 INCHES FROM PIER FACE PROJECTED FROM TOP OF PILE CAP. WALES SHALL BE AS SHOWN IN SECTIONS. THERE SHALL BE NO CONNECTIONS TO THE PIER CAP OR PIER FACE.
- IN ADDITION TO CLEAN STONE FILL GRADING OF TABLE 2.1.3.1 OF SECTION 508, GRADATION #57 OR #67 STONE PER TABLE 703-1 OF MATERIAL SECTION 703-AGGREGATES IS AN ACCEPTABLE SUBSTITUTE.
- PLACE 6" MINIMUM CONCRETE ON STONE FILL WITH EPOXY COATED 6 x 6-W2.9 x W2.9 WELDED WIRE FABRIC (WWF) CENTERED MID DEPTH. WWF SHALL BE IN ACCORDANCE WITH SECTION 544.2.
- SHOP DRAWINGS ARE REQUIRED FOR APPROVAL IN CONFORMANCE WITH SECTION 105.02 OF THE NHDOT SPECIFICATIONS.
- ALL STEEL SHEETING, WALES, ANCHOR RODS, ANCHOR ROD SUPPORT FRAMES, CONNECTIONS, MISC STEEL AND INCLUDING SHOP DRAWINGS, FABRICATION AND INSTALLATION SHALL BE SUBSIDIARY TO ITEM 503.301-COFFERDAM WITH SHEETING LEFT-IN-PLACE.
- TEMPORARY COFFERDAM SHEETING CUSTOM Y SECTION SHALL ACCOUNT FOR PERMANENT COFFERDAM WALES AT NW AND SW CORNERS.
- THE CONTRACTOR SHALL USE CAUTION WHEN DRIVING SHEETING IN THE VICINITY OF THE EXISTING BATTERED H-PILES.
- SHEET PILES MAY BE SPLICED AS REQUIRED UTILIZING FULL PENETRATION GROOVE WELDS IN ACCORDANCE WITH AWS STANDARDS. WELDS SHALL BE TERMINATED 1 INCH ± 1/4" FROM THE SHEET PILE KNUCKLES.
- SPLICE DETAILS AND LOCATIONS SHALL BE PROVIDED ON THE FABRICATION SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER.
- ALTERNATE SPLICE METHODS MAY BE SUBMITTED BY THE CONTRACTOR IN ADVANCE FOR APPROVAL BY THE ENGINEER.
- SHEET PILE INSTALLATION SHALL BE PERFORMED WITHIN A GUIDE FRAME.
- CONTRACTOR IS TO VERIFY THE ELEVATION OF THE PILE CAP PRIOR TO CONSTRUCTING SHEET PILE WALLS AND WALES. MAKE ADJUSTMENTS AS NEEDED TO SUIT FIELD CONDITIONS. THE CONTRACTOR SHALL INCLUDE ALL DETAILS FOR BLOCKING AND SHIMMING OF THE INSIDE WALES WITHIN THE SHOP DRAWINGS SUBMITTED TO THE ENGINEER FOR APPROVAL.

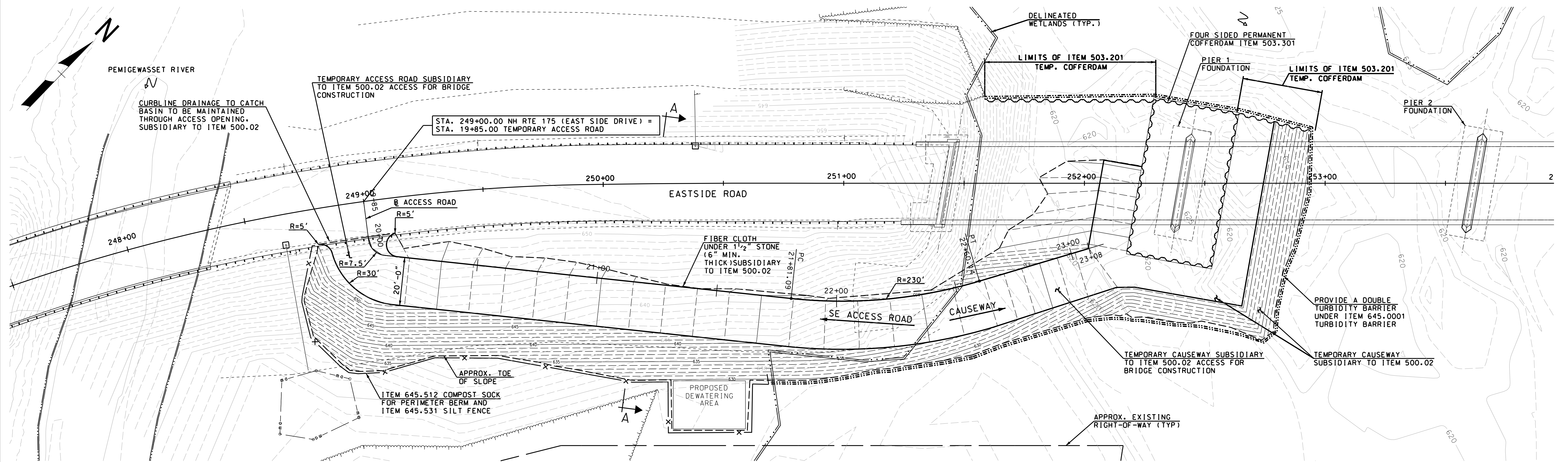
SUMMARY OF BRIDGE QUANTITIES			
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY
201.1	CLEARING AND GRUBBING	A	0.50
201.21	REMOVING SMALL TREES	EA	36.00
203.5525	PORTABLE CHANGEABLE MESSAGE SIGN PLATFORM	U	2.00
207.3	UNCLASSIFIED CHANNEL EXCAVATION	CY	95.00
403.12	HOT BITUMINOUS PAVEMENT (CURBING)-HAND METHODD	TON	5.00
500.02	ACCESS FOR BRIDGE CONSTRUCTION	U	1.00
503.201	COFFERDAM TEMPORARY	U	1.00
503.301	COFFERDAM WITH SHEETING LEFT IN PLACE	U	1.00
508.	STRUCTURAL FILL	CY	470.00
520.1	CONCRETE CLASS A	CY	50.00
544.2	REINFORCING STEEL, EPOXY COATED (F)	LB	1050.00
606.000	STEEL BEAM FOR BEAM GUARDRAIL	LF	35.00
606.012	W6X9 STEEL POST REPLACEMENTS FOR BEAM GUARDRAIL POSTS	EA	7.00
606.417	PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL	LF	370.00
606.9523	TEMP. IMPACT ATTENUATION DEVICE (NON-REDIRECTIVE) TEST LEVEL 3	U	2.00
615.02201	TRAFFIC SIGN TYPE B, BREAKAWAY MOUNTS	SF	24.50
615.023	REMOVING TRAFFIC SIGN TYPE B	U	4.00
616.171	PORTABLE TRAFFIC SIGNAL (PTS) SYSTEM	U	2.00
618.61	UNIFORMED OFFICERS WITH VEHICLE	\$	
618.7	FLAGGERS	HR	480.00
619.1	MAINTENANCE OF TRAFFIC	U	1.00
619.25	PORTABLE CHANGEABLE MESSAGE SIGN	U	2.00
632.1106	PREFORMED RETROFLECTIVE TAPE, TYPE I (REMOVABLE) 6" LINE	LF	960.00
632.1118	(STOP BAR) PREFORMED RETROFLECTIVE TAPE, TYPE I (REMOVABLE) 18" LINE	LF	28.00
632.911	OBLITERATE PAVEMENT MARKING LINE, 12" WIDE & UNDER	LF	1463.00
644.72	SLOPE SEED, TYPE 72 (STEEP SLOPE)	LB	14.00
645.0001	TURBIDITY BARRIER	LF	880.00
645.44	TEMPORARY SLOPE MATTING TYPE D (WILDLIFE FRIENDLY)	SY	1850.00
645.512	COMPOST SOCK FOR PERIMETER BERM	LF	1460.00
645.531	SILT FENCE	LF	280.00
645.7	STORM WATER POLLUTION PREVENTION PLAN	U	1.00
645.71	MONITORING SWPPP AND EROSION AND SEDIMENT CONTROLS	HR	150.00
646.3	TURF ESTABLISHMENT WITH MULCH AND TACKIFIERS	A	0.50
647.1	HUMUS	CY	325.00
650.2	LANDSCAPING	U	1.00
670.104	TEMPORARY PORTABLE LIGHTING	U	2.00
692.	MOBILIZATION	U	1.00
698.12	FIELD OFFICE TYPE B	MON	6.00
699	MISCELLANEOUS TEMPORARY EROSION AND SEDIMENT CONTROL *	\$	
1010.15	FUEL ADJUSTMENT *	\$	20000.00

* NOT A BID ITEM

ACCESS FOR BRIDGE CONSTRUCTION	
DESCRIPTION**	ITEM 500.02
	CONSTRUCT AND REMOVE ACCESS FOR BRIDGE CONSTRUCTION
PLACE ACCESS ROAD	
GEOTEXTILE; SEPARATION (SY) (593.201)	1087
EMBANKMENT IN PLACE (CY) (203.6)	1950
CRUSHED STONE (CY) (304.5)	190
STONE FILL CLASS B (CY) (585.2)	350
PLACE CAUSEWAY	
GEOTEXTILE; SEPARATION (SY) (593.201)	978
STONE FILL CLASS C (CY) (585.3)	1600
CONSTRUCTION MATS (SF)	3890
REMOVE CAUSEWAY	
GEOTEXTILE; SEPARATION (SY) (593.201)	978
STONE FILL CLASS C (CY) (585.3)	1600
CONSTRUCTION MATS (SF)	3890
REMOVE ACCESS ROAD	
COMMON EXCAVATION (CY) (203.1)	2130
GEOTEXTILE; SEPARATION (SY) (593.201)	1087
UNITS	1

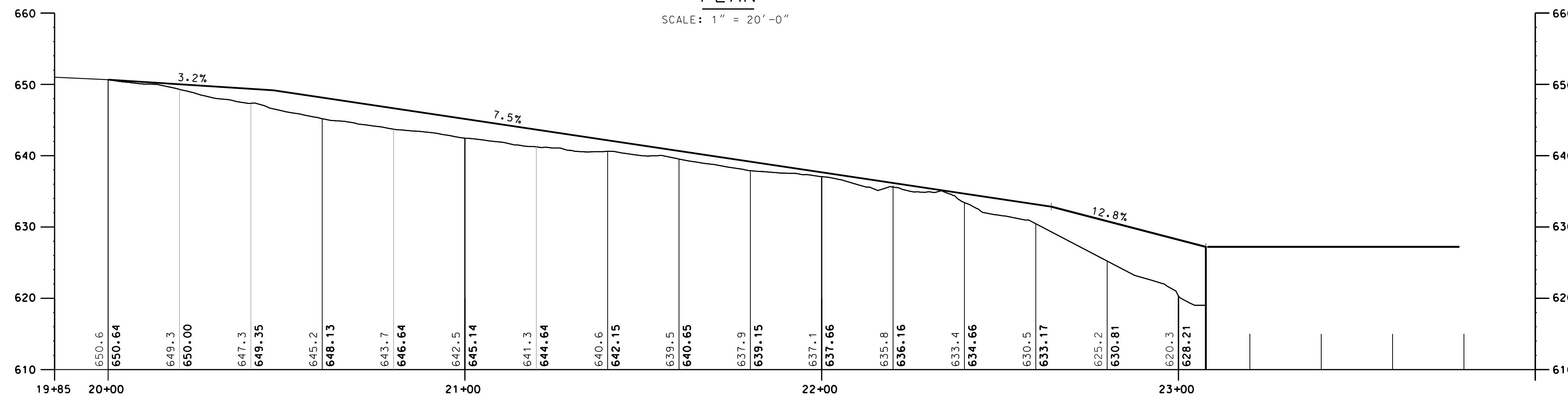
** ITEM SHALL CONFORM TO THE REQUIREMENTS OF ITEM NUMBER SHOWN IN ().

STATE OF NEW HAMPSHIRE						
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN						
TOWN WOODSTOCK, NH		BRIDGE NO. 195/093		STATE PROJECT 42534		
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER						
PROJECT NOTES AND SUMMARY OF QUANTITIES					BRIDGE SHEET	
					2 OF 17	
REVISIONS AFTER PROPOSAL		BY		DATE		FIGURE
		DESIGNED		06/2023		
		DRAWN		06/2023		
		QUANTITIES		CHECKED		TOTAL SHEETS
SHEET SCALE		ISSUE DATE		FEDERAL PROJECT NO.		
		REV. DATE		X-A004(896)		6
						21



PLAN

SCALE: 1" = 20'-0"

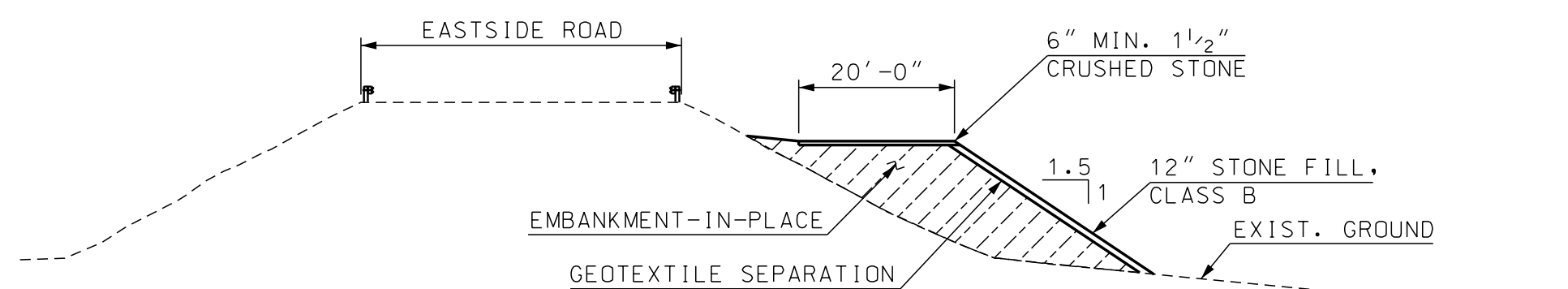


ACCESS ROAD PROFILE

SCALE: HORZ. 1" = 20'-0"
VERT. 1" = 10'-0"

NOTES:

1. THE PROPOSED CONTOURS ARE CONCEPTUAL IN NATURE AND ARE NOT MEANT TO REPRESENT THE CONTRACTOR'S MEANS AND METHODS.
2. SEE BRIDGE SHEET 4 OF 17 AND 5 OF 17 FOR CAUSEWAY/COFFERDAM PLAN AND SECTIONS.
3. SEE BRIDGE SHEETS 13 THROUGH 17 FOR TEMPORARY TRAFFIC AND DETOUR PLANS.

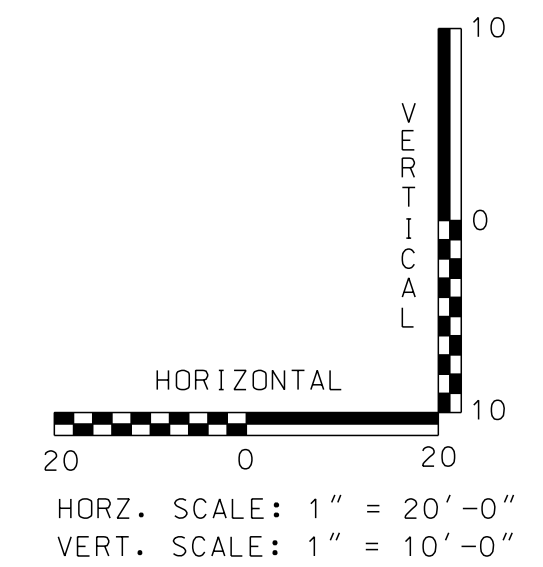


SECTION A-A

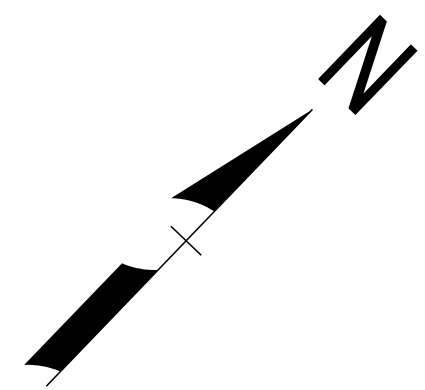
SCALE: 1" = 20'-0"

NOTES:

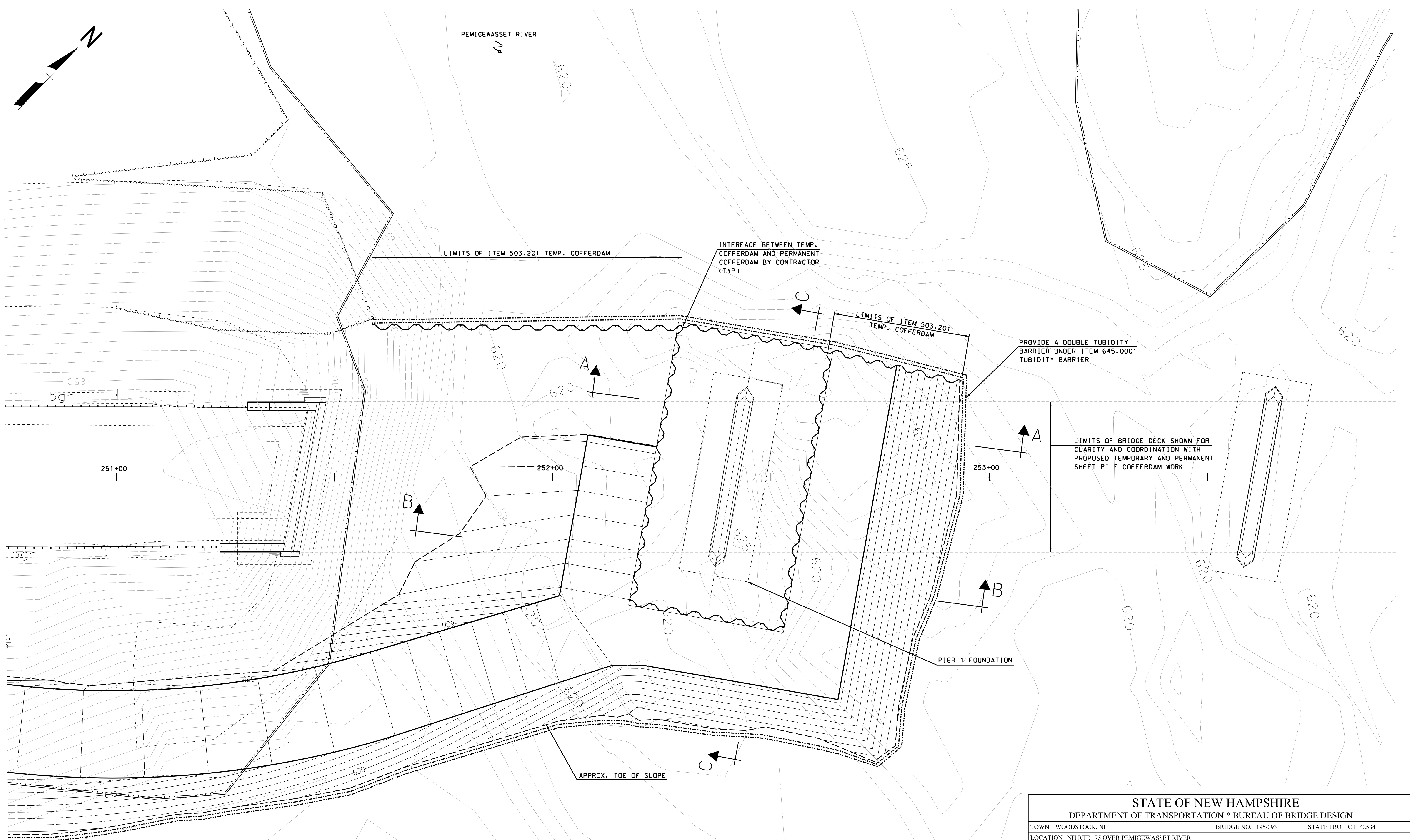
1. THE PROPOSED SECTION IS CONCEPTUAL ONLY AND PROVIDED FOR PERMITTING IMPACT PURPOSES AND NOT MEANT TO REPRESENT THE CONTRACTOR'S MEANS AND METHODS.
2. ALL WORK TO BE PAID UNDER ITEM 500.02 ACCESS FOR BRIDGE CONSTRUCTION. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION. SEE SPECIFICATION FOR ADDITIONAL DETAIL.



STATE OF NEW HAMPSHIRE					
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN					
TOWN	WOODSTOCK, NH	BRIDGE NO.	195/093	STATE PROJECT	42534
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER					
TEMPORARY ACCESS ROAD PLAN					BRIDGE SHEET
					3 OF 17
DESIGNED	TD, CD, BH	DATE	06/2023	CHECKED	RJD
DRAWN	JBM	DATE	06/2023	CHECKED	RJD
QUANTITIES			CHECKED		
ISSUE DATE		FEDERAL PROJECT NO.	X-A004(896)	SHEET NO.	7
REV. DATE					
SHEET SCALE				TOTAL SHEETS	21
AS NOTED					



PEMIGEWASSET RIVER



INTERFACE BETWEEN TEMP. COFFERDAM AND PERMANENT COFFERDAM BY CONTRACTOR (TYP)

PROVIDE A DOUBLE TUBIDITY BARRIER UNDER ITEM 645.0001 TUBIDITY BARRIER

LIMITS OF BRIDGE DECK SHOWN FOR CLARITY AND COORDINATION WITH PROPOSED TEMPORARY AND PERMANENT SHEET PILE COFFERDAM WORK

PIER 1 FOUNDATION

APPROX. TOE OF SLOPE

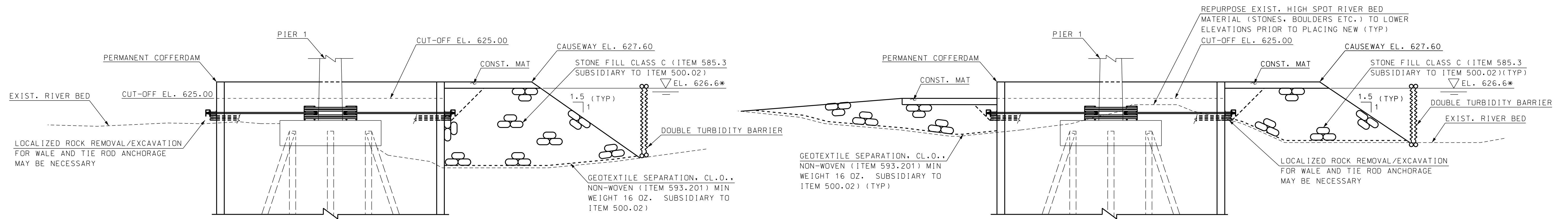
PLAN

NOTE:

1. SEE BRIDGE SHEET 5 OF 17 FOR SECTIONS A, B, AND C.
2. THE PROPOSED CONTOURS ARE CONCEPTUAL IN NATURE AND ARE NOT MEANT TO REPRESENT THE CONTRACTOR'S MEANS AND METHODS.

SHEET SCALE
1" = 10'-0"

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN WOODSTOCK, NH			BRIDGE NO. 195/093			STATE PROJECT 42534			
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER									
SITE PLAN - PERMANENT PIER COFFERDAM									BRIDGE SHEET 4 OF 17
REVISIONS AFTER PROPOSAL		BY	DATE	CHECKED	BY	DATE	FIGURE		
		TD, BH	06/2023	RJD	RJD	06/2023			
		JBM	06/2023	RJD	RJD	06/2023			
		QUANTITIES				CHECKED			
		ISSUE DATE	FEDERAL PROJECT NO.		SHEET NO.	TOTAL SHEETS			
		REV. DATE	X-A004(896)		8	21			



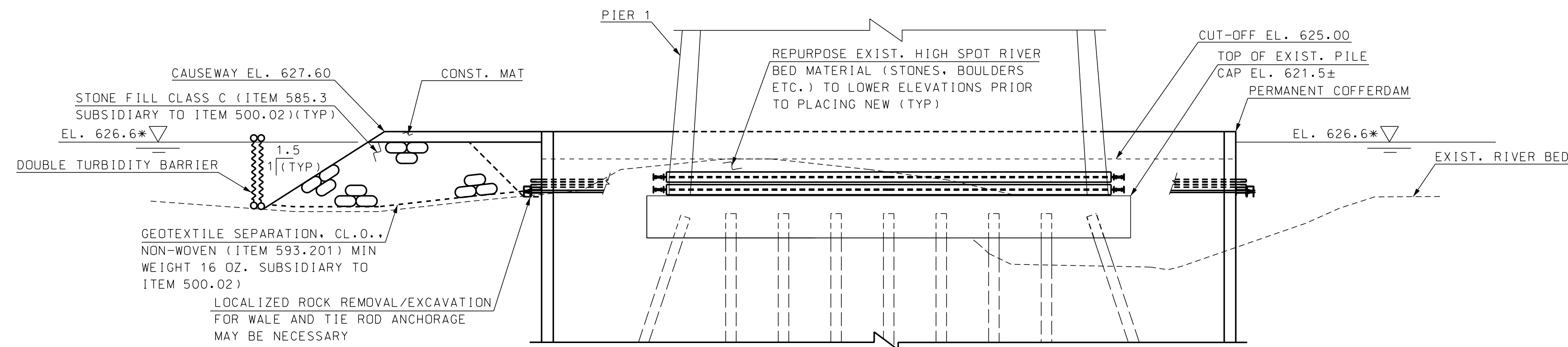
SECTION A-A

SCALE: 1/8" = 1'-0"

SECTION B-B

SCALE: 1/8" = 1'-0"

* RIVER GUIDANCE CRITERIA SEASONAL FLOW (1910 cfm). ELEVATION SHOWN FOR REFERENCE.



SECTION C-C

SCALE: 1/8" = 1'-0"

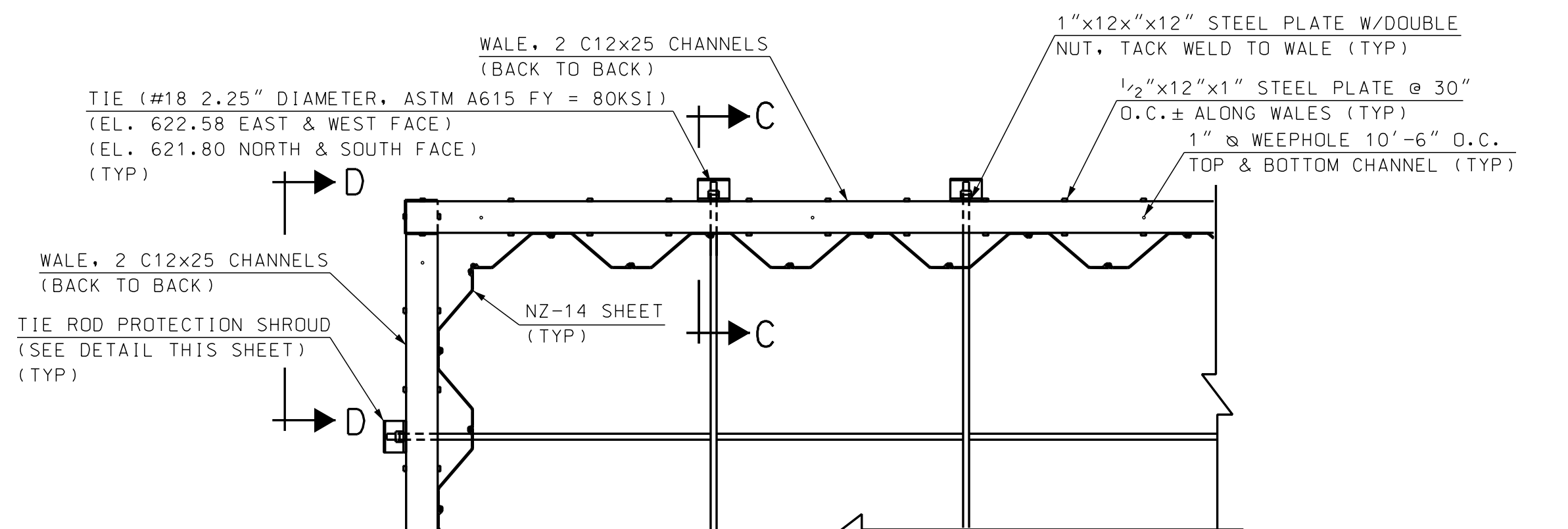
ALTERNATIVE CONSTRUCTION CONCEPTS WITHIN SAME PERMITTED IMPACT ZONE AND TOE OF SLOPE LIMITS

1. 1:1 STONE FILL CAUSEWAY SLOPE.
 1. PROVIDE STABLE 1:1 CAUSEWAY FILL SLOPE EACH SIDE AS COFFERDAM AND SHEET PILE ADVANCEMENT PROGRESSES PER SUGGESTED SEQUENCE.
 2. INSTALL TIE-RODS, WALES AND ANCHORAGE.
 3. CONTINUE PER SUGGESTED SEQUENCE.
11. PORTADAM / STONE FILL CAUSEWAY
 1. INSTALL CAUSEWAY STONE FILL TO APPROXIMATE UNIFORM EL 620.00 ADVANCING TO TEMPORARY COFFERDAM DEFLECTOR.
 2. INSTALL PORTADAM FROM TEMPORARY COFFERDAM DEFLECTOR ON NORTH AND EAST SIDES OF TOP OF CAUSEWAY STONE FILL SURFACE EL. 622.0. TOP OF PORTADAM SHALL BE TO MINIMUM EL. 627.6.
 3. DEWATER PORTADAM AND INSTALL PERMANENT COFFERDAM IN DRY.
 4. CONTINUE SIMILAR PER SUGGESTED SEQUENCE.

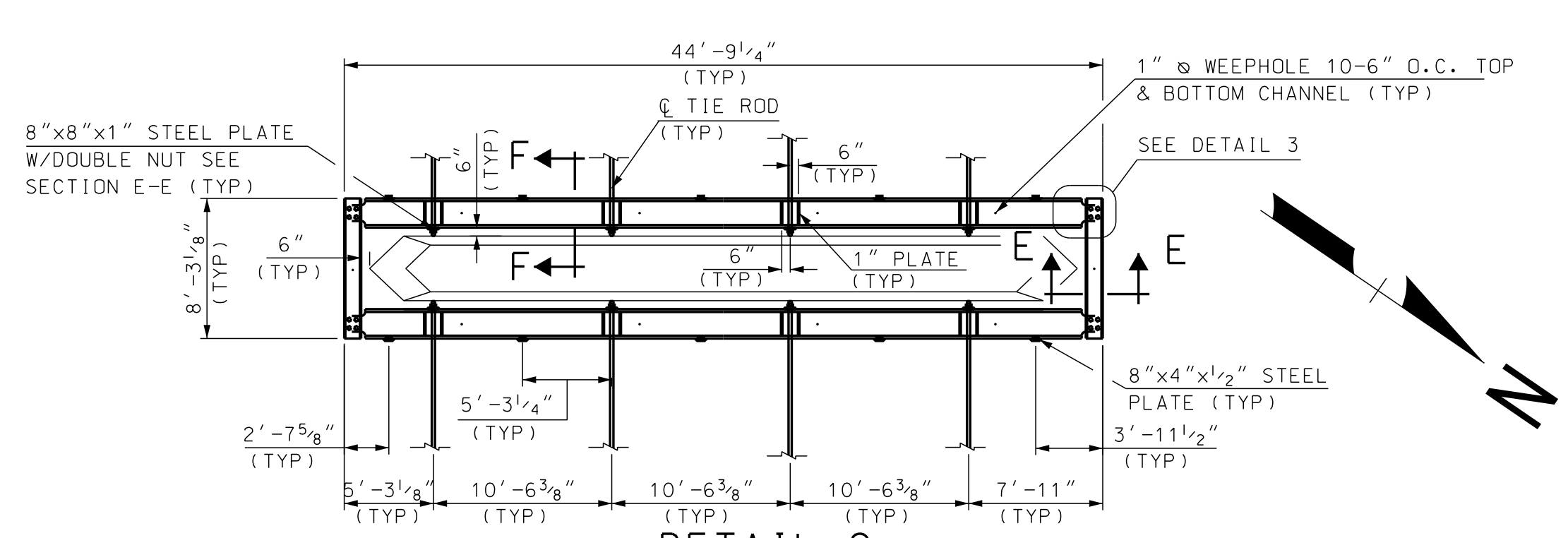
NOTE: ABOVE ALTERNATIVES REQUIRE SAME OTHER SEQUENCES I.E. TEMPORARY COFFERDAM SHEET PILES, TURBIDITY BARRIERS, GEOTEXTILE SEPARATION, REMOVALS, EROSION CONTROLS, REMOVALS AND RESTORATIONS.

THE ABOVE ALTERNATIVES ARE CONCEPTUAL ONLY AND FINAL DESIGN OF TEMPORARY WORKS REMAINS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL NOT EXCEED THE ENVIRONMENTAL IMPACT LIMITS AS PRESENTED ON THESE PLANS AND IN PERMIT.

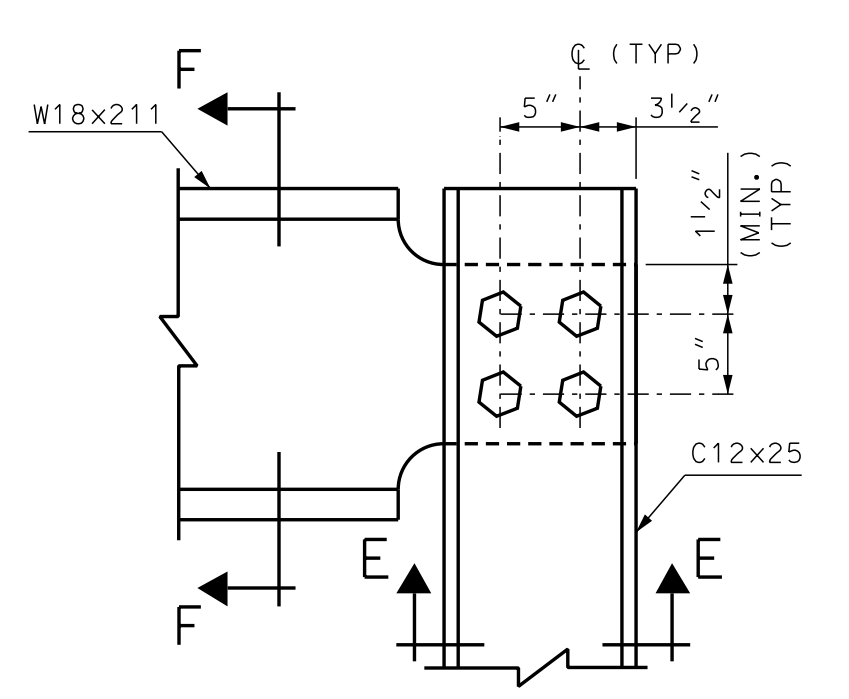
STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN WOODSTOCK, NH		BRIDGE NO. 195/093			STATE PROJECT 42534				
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER									
TEMPORARY CAUSEWAY SECTIONS									BRIDGE SHEET
REVISIONS AFTER PROPOSAL		BY DATE			BY DATE			5 OF 17	
		DESIGNED	TD, SR, BH	06/2023	CHECKED	RJD	06/2023	FIGURE	
		DRAWN	JBM	06/2023	CHECKED	RJD	06/2023		
		QUANTITIES			CHECKED				
SHEET SCALE		ISSUE DATE			FEDERAL PROJECT NO.			SHEET NO.	
AS NOTED		REV. DATE			X-A004(896)			9	
								TOTAL SHEETS	
								21	



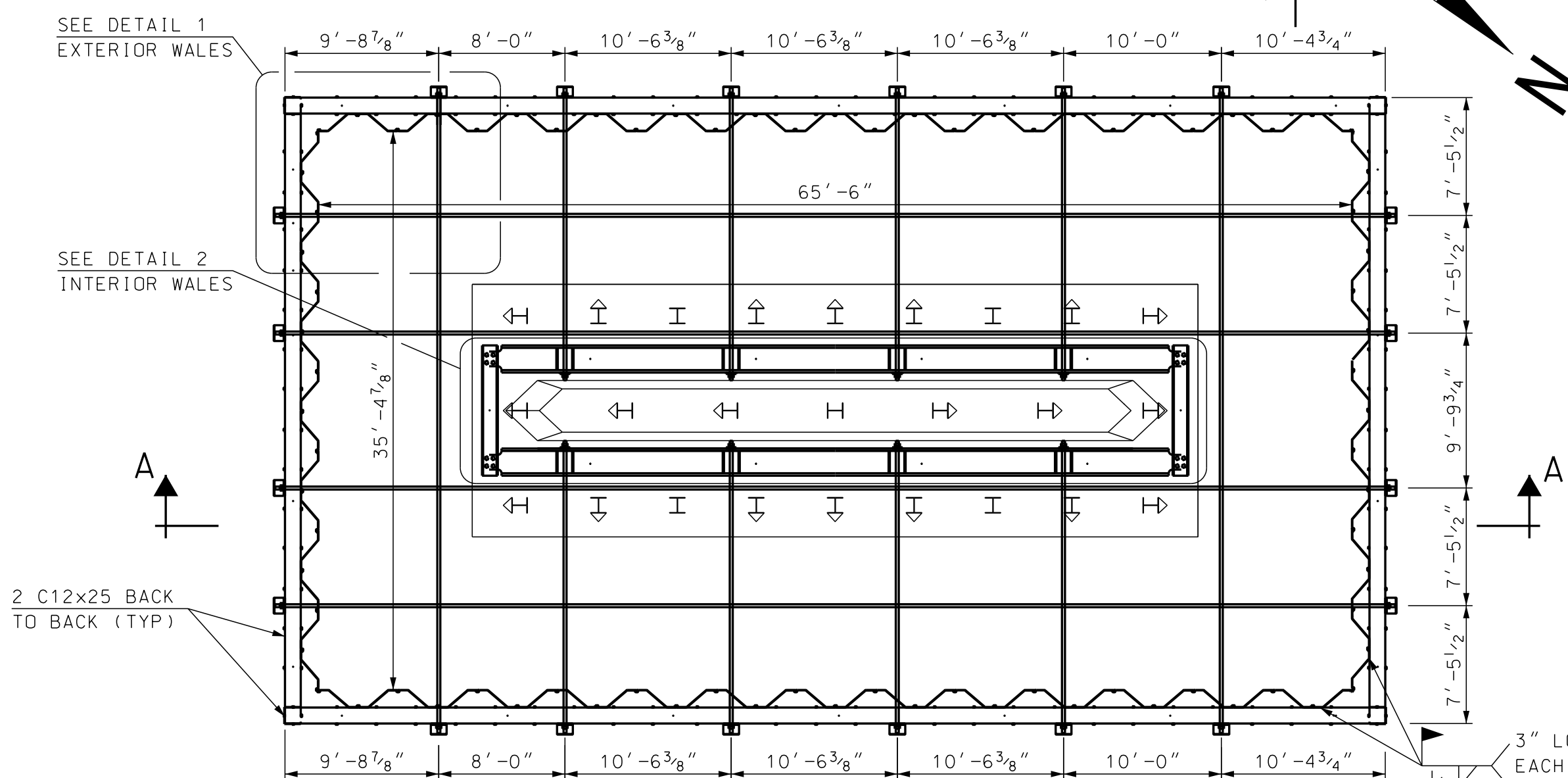
DETAIL 1
SCALE: 1/4" = 1'-0"



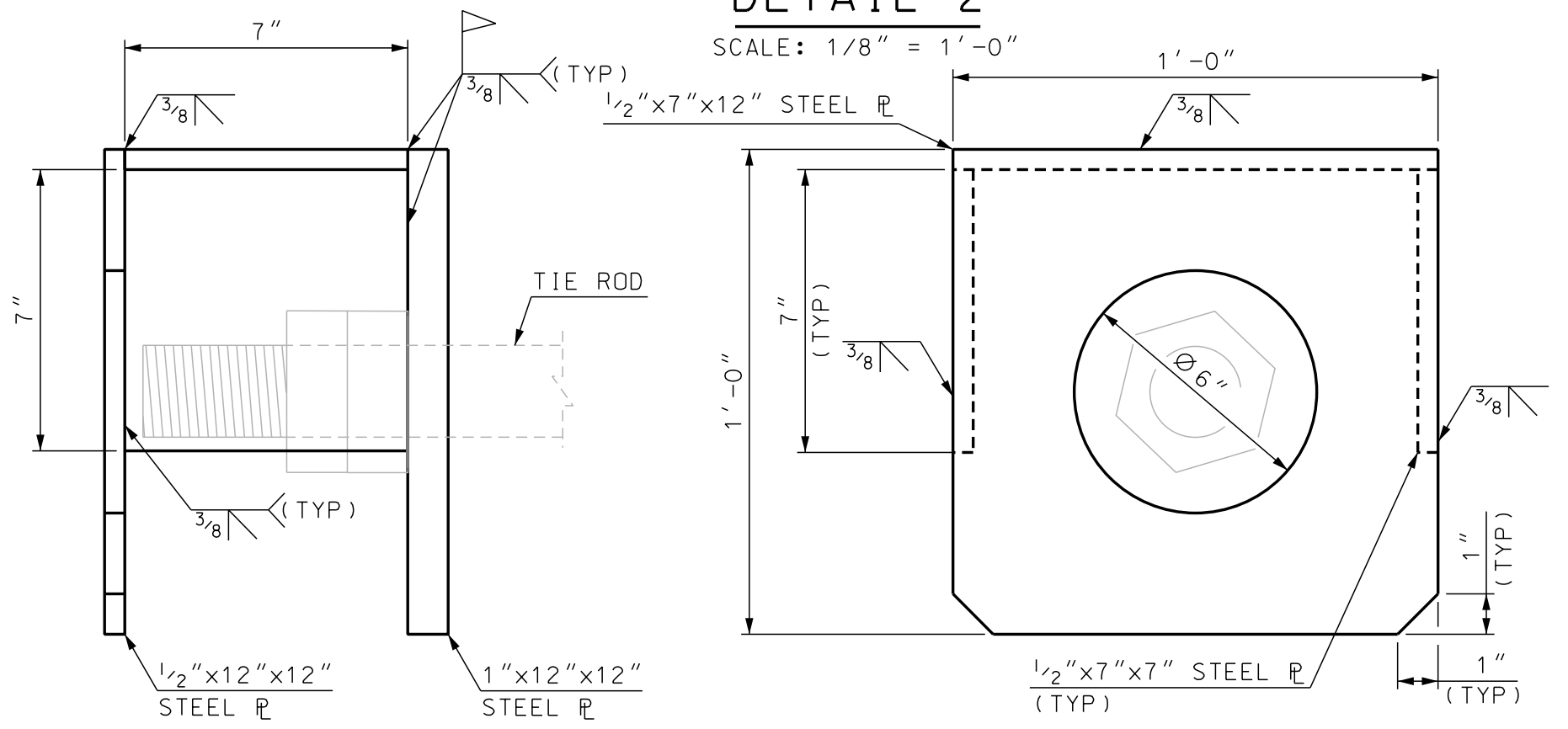
DETAIL 2
SCALE: 1/8" = 1'-0"



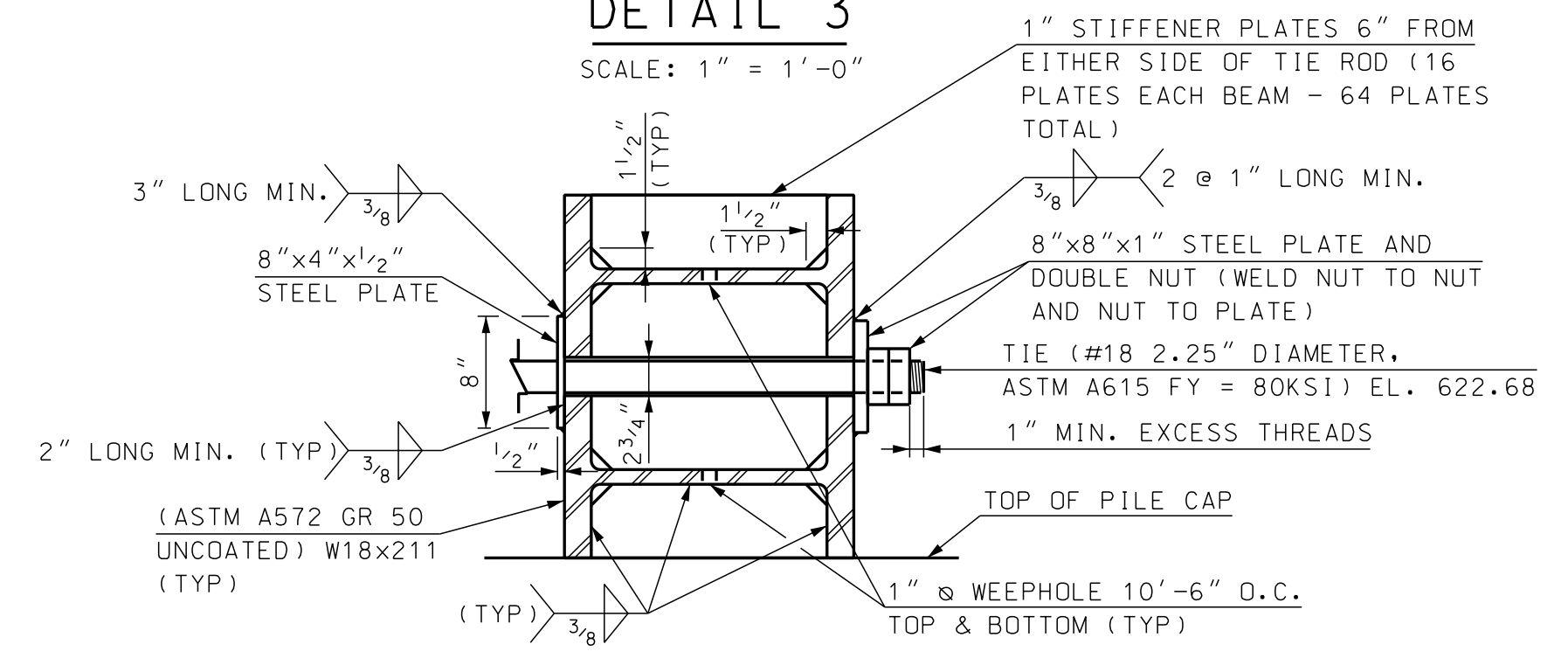
DETAIL 3
SCALE: 1" = 1'-0"



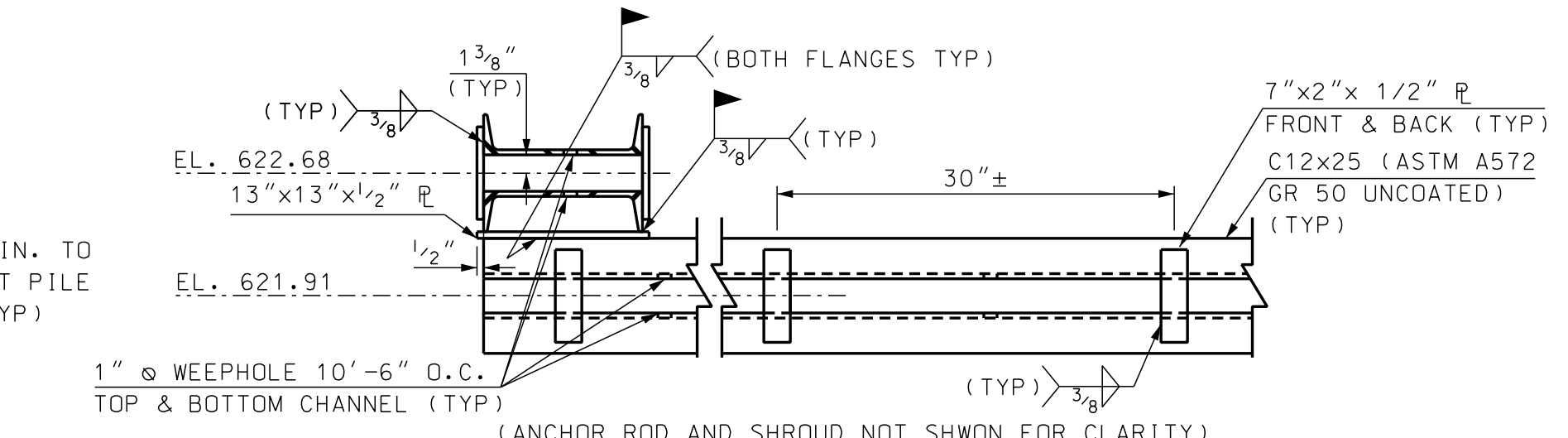
PLAN
SCALE: 1/8" = 1'-0"



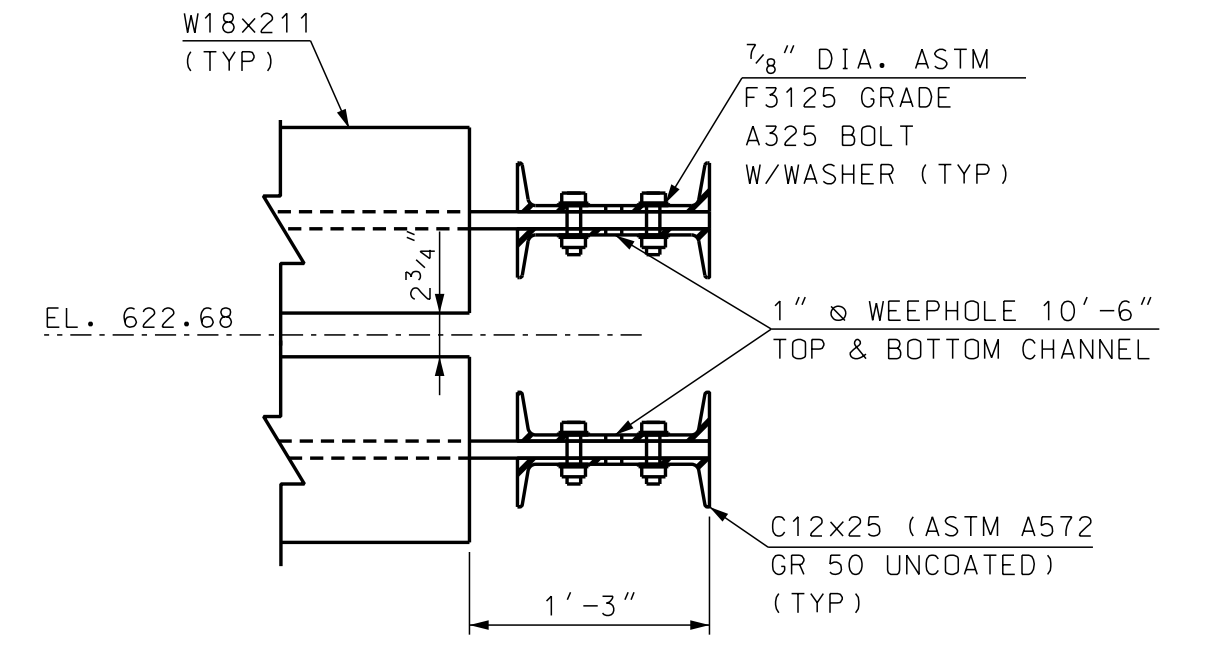
TIE ROD SHROUD DETAIL
SCALE: 3" = 1'-0"



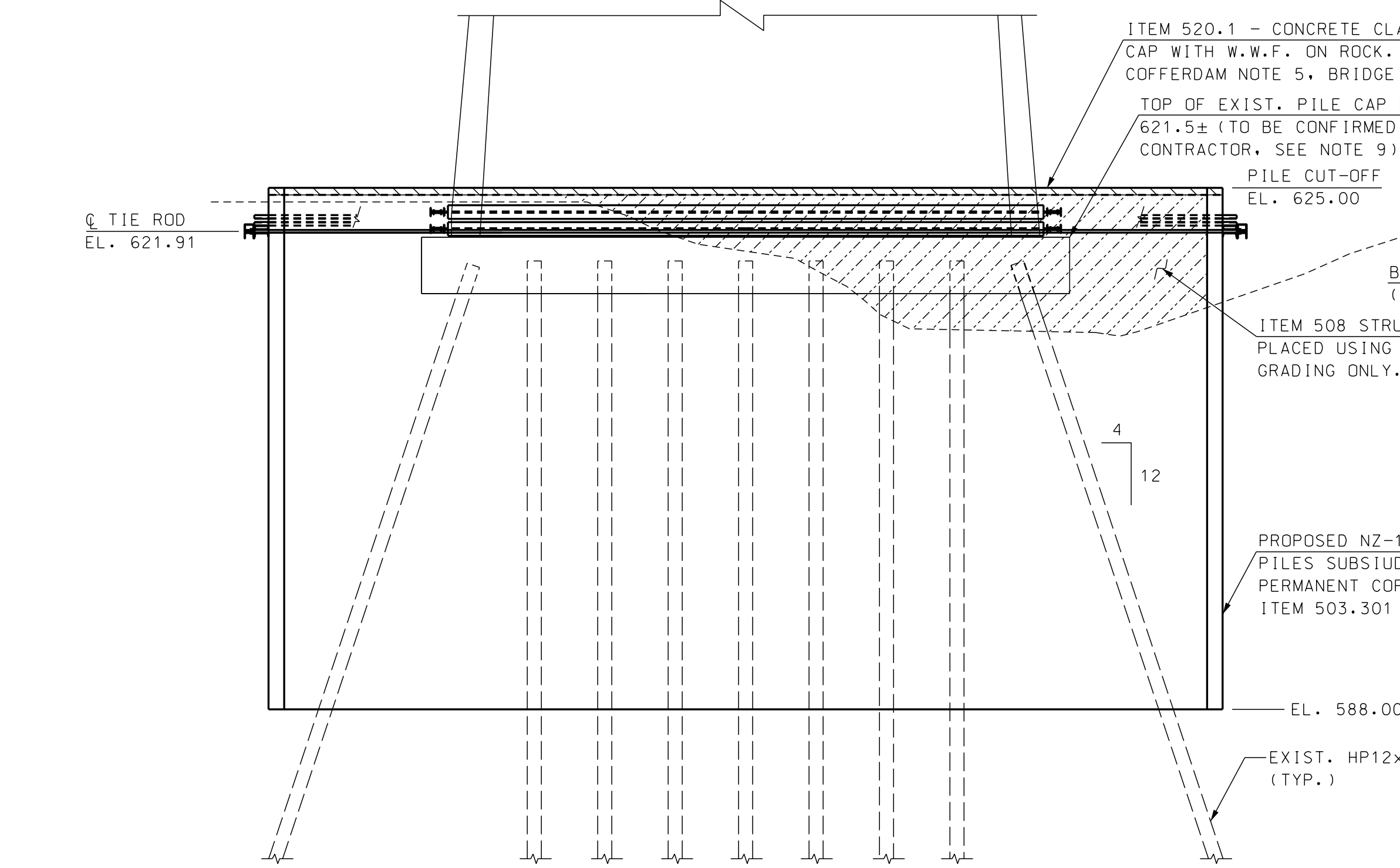
SECTION F-F
SCALE: 1" = 1'-0"



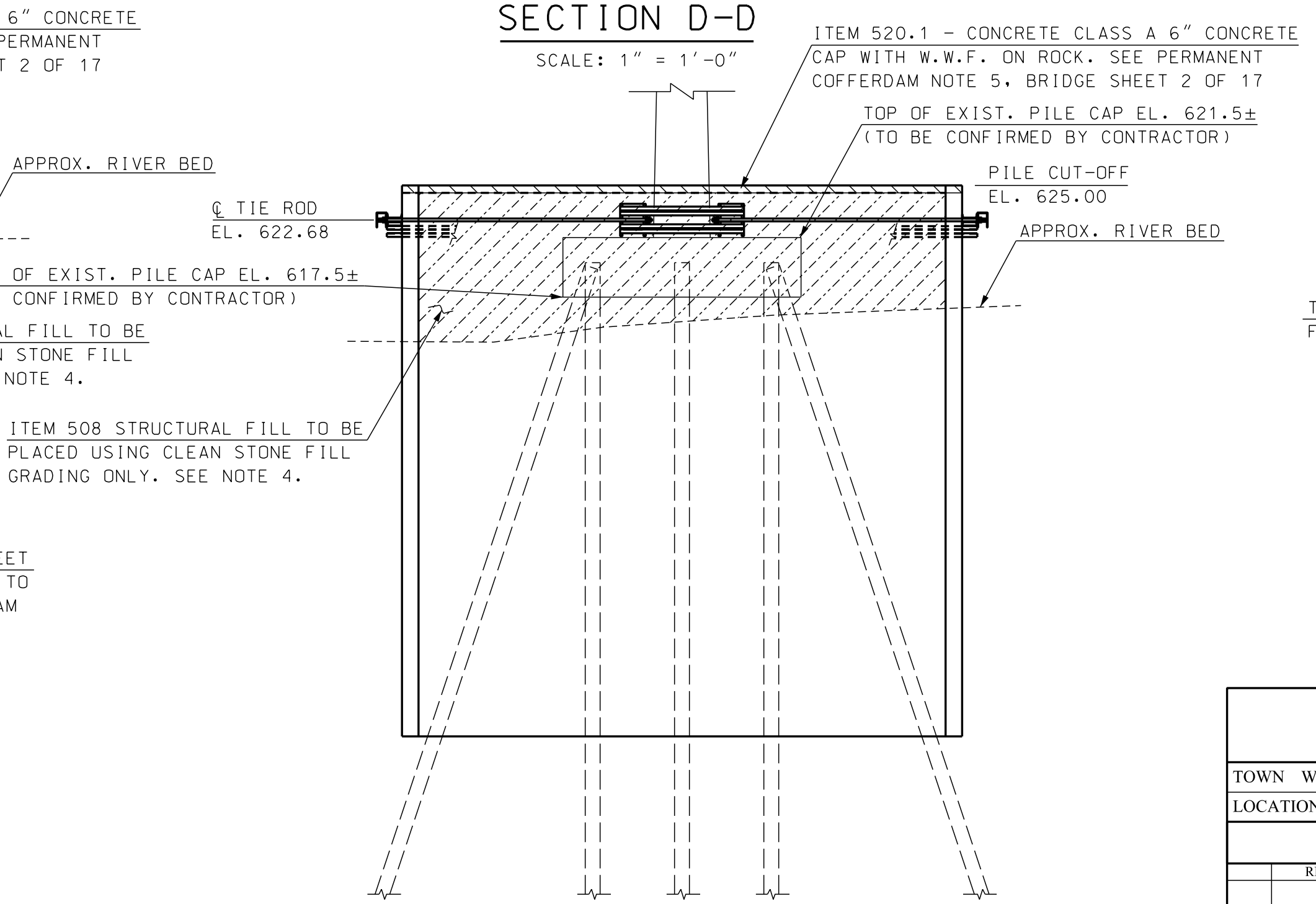
SECTION D-D
SCALE: 1" = 1'-0"



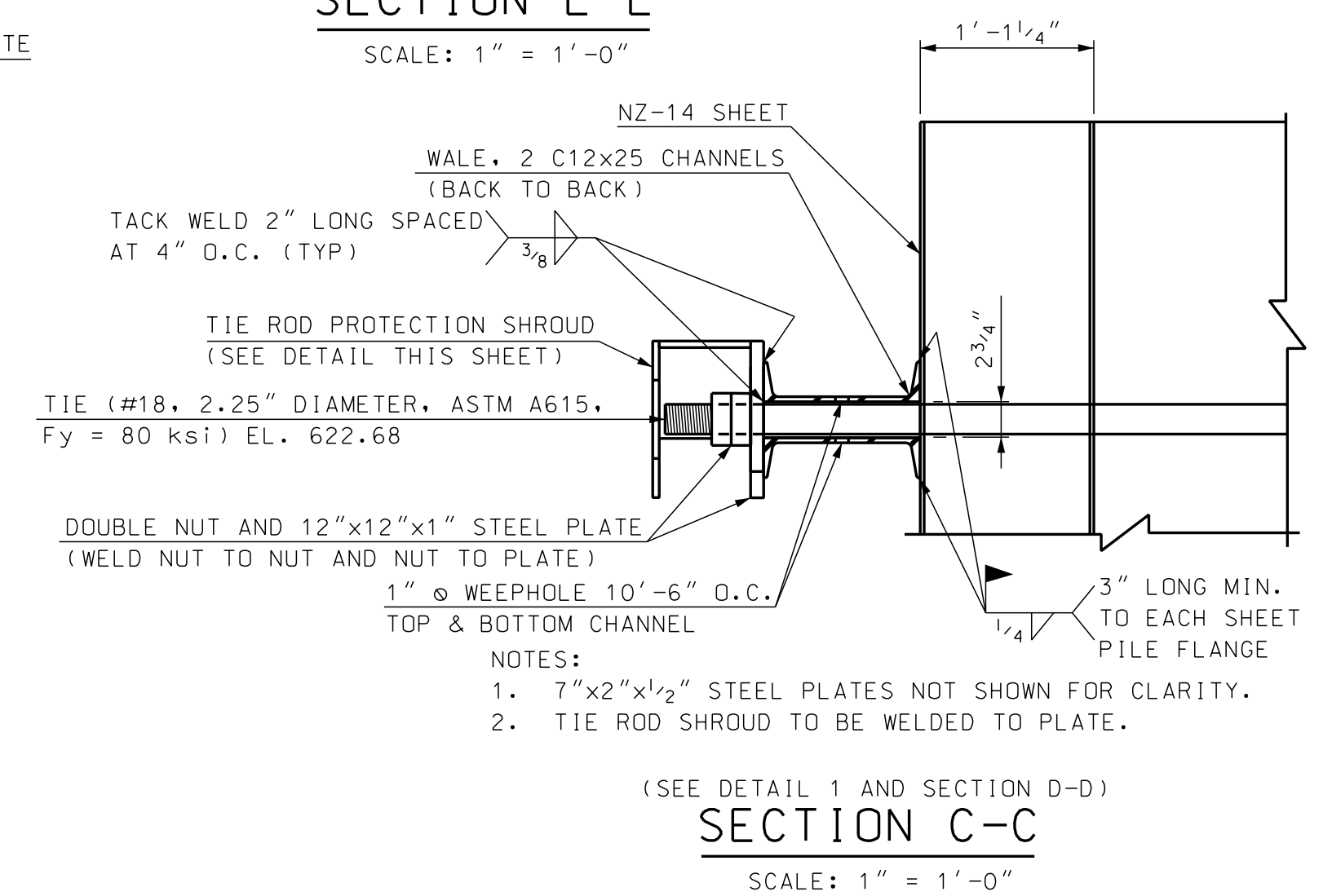
SECTION E-E
SCALE: 1" = 1'-0"



SECTION A-A
SCALE: 1/8" = 1'-0"

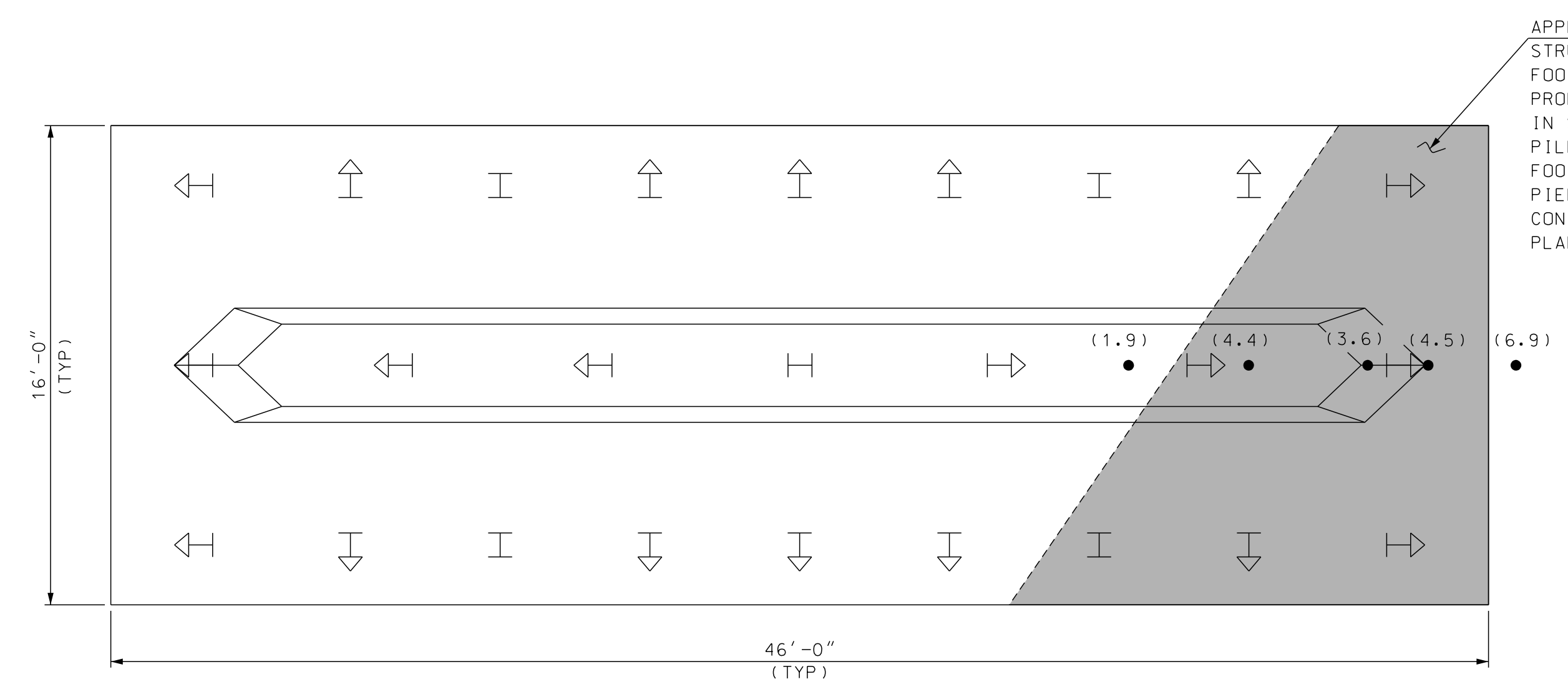
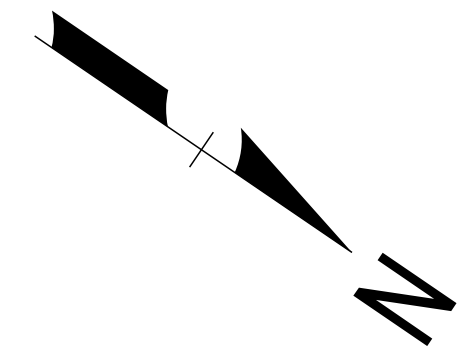


SECTION B-B
SCALE: 1/8" = 1'-0"



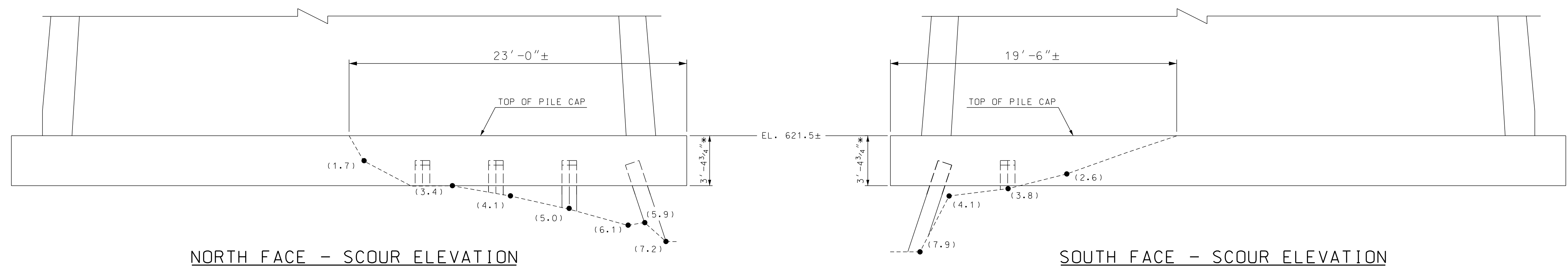
SECTION C-C
SCALE: 1" = 1'-0"

STATE OF NEW HAMPSHIRE					
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN					
TOWN	WOODSTOCK, NH	BRIDGE NO.	195/093	STATE PROJECT	42534
LOCATION	NH RTE 175 OVER PEMIGEWASSET RIVER				
PERMANENT PIER COFFERDAM DETAILS					BRIDGE SHEET
					6 OF 17
DESIGNED	TD, SR, BH	DATE	06/2023	CHECKED	RJD
DRAWN	JBM	DATE	06/2023	CHECKED	RJD
ISSUE DATE		FEDERAL PROJECT NO.	X-A004(896)	SHEET NO.	10
REV. DATE				TOTAL SHEETS	21



APPROXIMATE LIMITS OF ITEM 508
STRUCTURAL FILL BELOW PILE CAP
FOOTPRINT. FOR ADDITIONAL AREA OF
PROPOSED STRUCTURAL FILL PLACED
IN SCOUR HOLE AND ABOVE BOTTOM OF
PILE CAP ALL WITHIN COFFERDAM
FOOTPRINT SEE SHEET 9 PERMANENT
PIER COFFERDAM DETAILS AND SITE
CONTOURS ON SHEET 8 SITE
PLAN-TEMPORARY PIER COFFERDAM.

CENTER LINE - SCOUR PLAN



NORTH FACE - SCOUR ELEVATION

SOUTH FACE - SCOUR ELEVATION

*AS DETERMINED BY TERRACON ON 08/23/2019, AND DOCUMENTED
IN THE UNDERWATER SUBSTRUCTURE INSPECTION REPORT.

NOTES:

1. THE APPROXIMATE SCOUR DEPTHS SHOWN (INDICATED AS (#.#)) ARE AS REPORTED IN THE UNDERWATER SUBSTRUCTURE INSPECTION REPORT DATED 08/23/2019, REV. 02/11/2020. THE SCOUR DEPTHS SHOWN ARE MEASURED FROM THE TOP OF THE PILE CAP AND HAVE UNITS OF FEET. CURRENT SCOUR CONDITIONS COULD BE SIGNIFICANTLY DIFFERENT AT THE TIME OF PROJECT INITIATION. CONTRACTOR MAY VERIFY SCOUR CONDITIONS AT THE PROJECT STARTUP.
2. ELEVATION VIEW SCOUR DEPTHS ARE TAKEN AT THE FACE OF THE PILE CAP/FOOTING.
3. FOR DEEPER SCOUR DEPTHS OUTSIDE LIMITS OF PILE CAP, SEE EXISTING SITE/CHANNEL CONTOURS ON APPLICABLE PLAN SHEETS.
4. NOTED PILE CAP ELEVATION WAS PROVIDED BY TWO INDEPENDENT SOURCES AND DIFFERS FROM THE DESIGN PLANS. SINCE THE TOP OF PILE CAP SETS THE ELEVATION OF ALL TIE RODS AND PASSAGES THROUGH SHEET PILE COFFERDAM, IT IS IMPORTANT THAT ADDITIONAL VERIFICATION BY CONTRACTOR BE MADE PRIOR TO DETAILING AND FABRICATION OF COFFERDAM ELEMENTS.

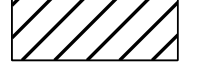


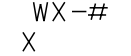
SHEET SCALE
1/4" = 1'-0"

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN WOODSTOCK, NH		BRIDGE NO. 195/093			STATE PROJECT 42534				
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER									
SCOUR REPAIR DETAILS									BRIDGE SHEET
REVISIONS AFTER PROPOSAL		BY		DATE		BY		DATE	
		DESIGNED		06/2023		CHECKED		06/2023	
		DRAWN		06/2023		CHECKED		06/2023	
		QUANTITIES				CHECKED			
		ISSUE DATE				FEDERAL PROJECT NO.		SHEET NO.	
		REV. DATE				X-A004(896)		11	
								TOTAL SHEETS	
								21	

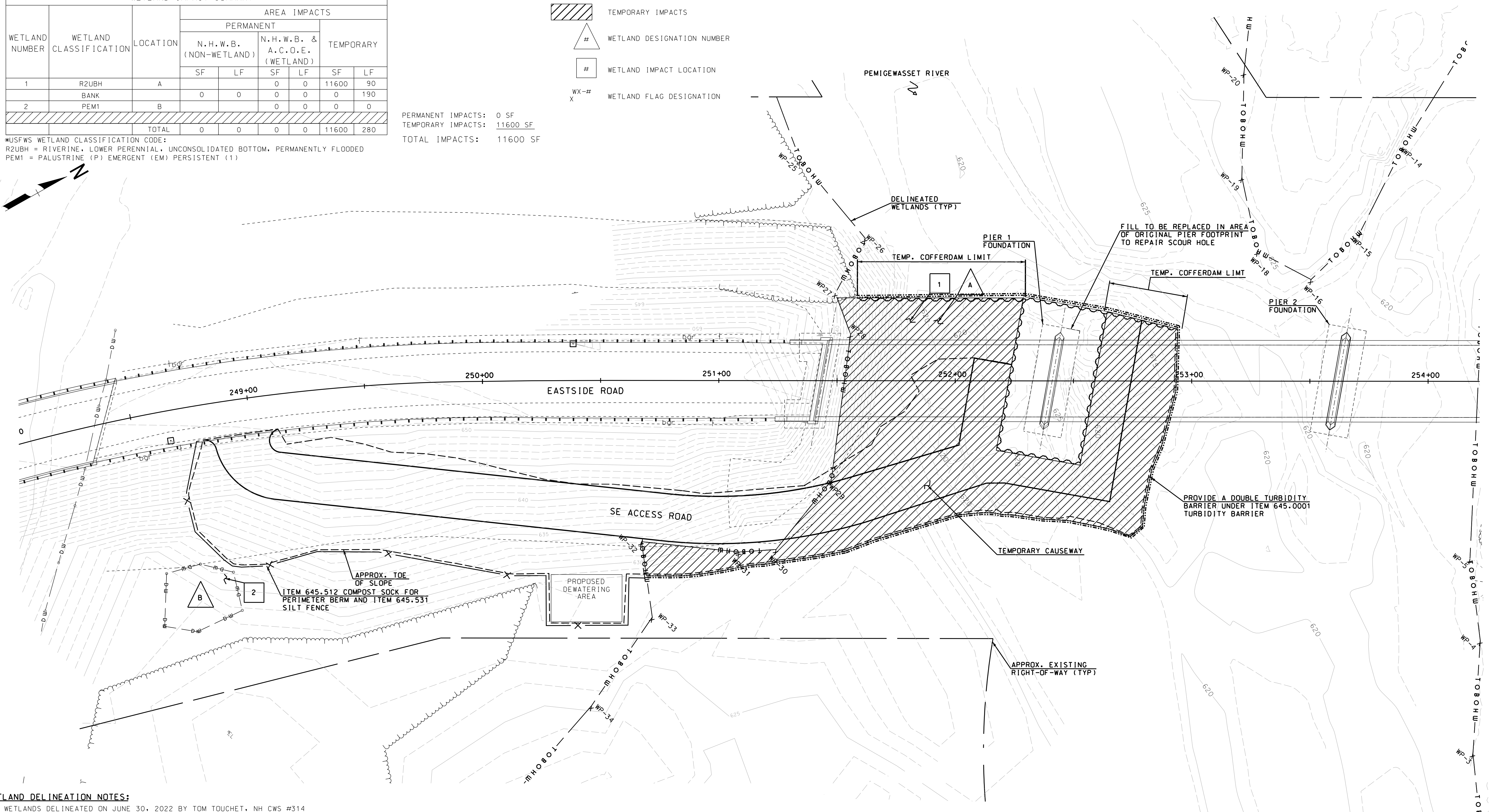
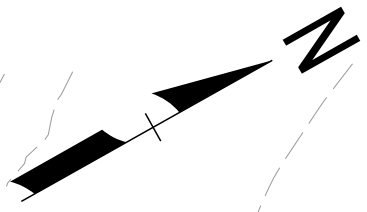
WETLAND IMPACT SUMMARY										
WETLAND NUMBER	WETLAND CLASSIFICATION	LOCATION	AREA IMPACTS						TEMPORARY	
			PERMANENT				TEMPORARY			
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E. (WETLAND)		SF	LF		
		SF	LF	SF	LF	SF	LF			
1	R2UBH	A	0	0	0	0	11600	90		
	BANK		0	0	0	0	0	190		
2	PEM1	B	0	0	0	0	0	0		
TOTAL			0	0	0	0	11600	280		

*USFWS WETLAND CLASSIFICATION CODE:
R2UBH = RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, PERMANENTLY FLOODED
PEM1 = PALUSTRINE (P) EMERGENT (EM) PERSISTENT (1)

WETLAND DELINEATION NOTES:

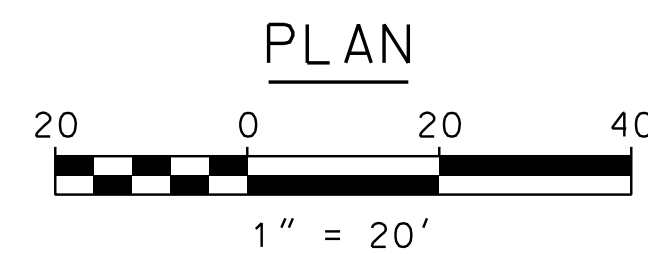
-  TEMPORARY IMPACTS
-  WETLAND DESIGNATION NUMBER
-  WETLAND IMPACT LOCATION
-  WETLAND FLAG DESIGNATION

PERMANENT IMPACTS: 0 SF
TEMPORARY IMPACTS: 11600 SF
TOTAL IMPACTS: 11600 SF



WETLAND DELINEATION NOTES:

- (1) WETLANDS DELINEATED ON JUNE 30, 2022 BY TOM TOUCHET, NH CWS #314 USING USACE THREE-PARAMETER METHODOLOGY IN ACCORDANCE WITH USACE 1987 DELINEATION MANUAL.
- (2) THE ENTIRE AREA SHOWN OUTSIDE OF THE WATERCOURSE IS 250-FOOT PROTECTED SHORELAND.
- (3) THE ENTIRE AREA SHOWN IS WITHIN THE 100-YEAR FLOODPLAIN.
- (4) LIMITED REUSE SOILS (LRS) WITHIN THE ROW THAT ARE EXCAVATED SHALL REMAIN ON NHDOT-OWNED-PROPERTY AND OUT OF JURISDICTIONAL AREA.
- (5) AREA WITHIN TEMPORARY WETLAND DISTURBANCE WILL BE USED FOR ACCESS CAUSEWAY. GEOTEXTILE FABRIC WILL BE INSTALLED BELOW TEMPORARY FILL FOR CAUSEWAY.



NOTE:

THE PROPOSED CONTOURS ARE CONCEPTUAL IN NATURE AND ARE NOT MEANT TO REPRESENT THE CONTRACTOR'S MEANS AND METHODS.

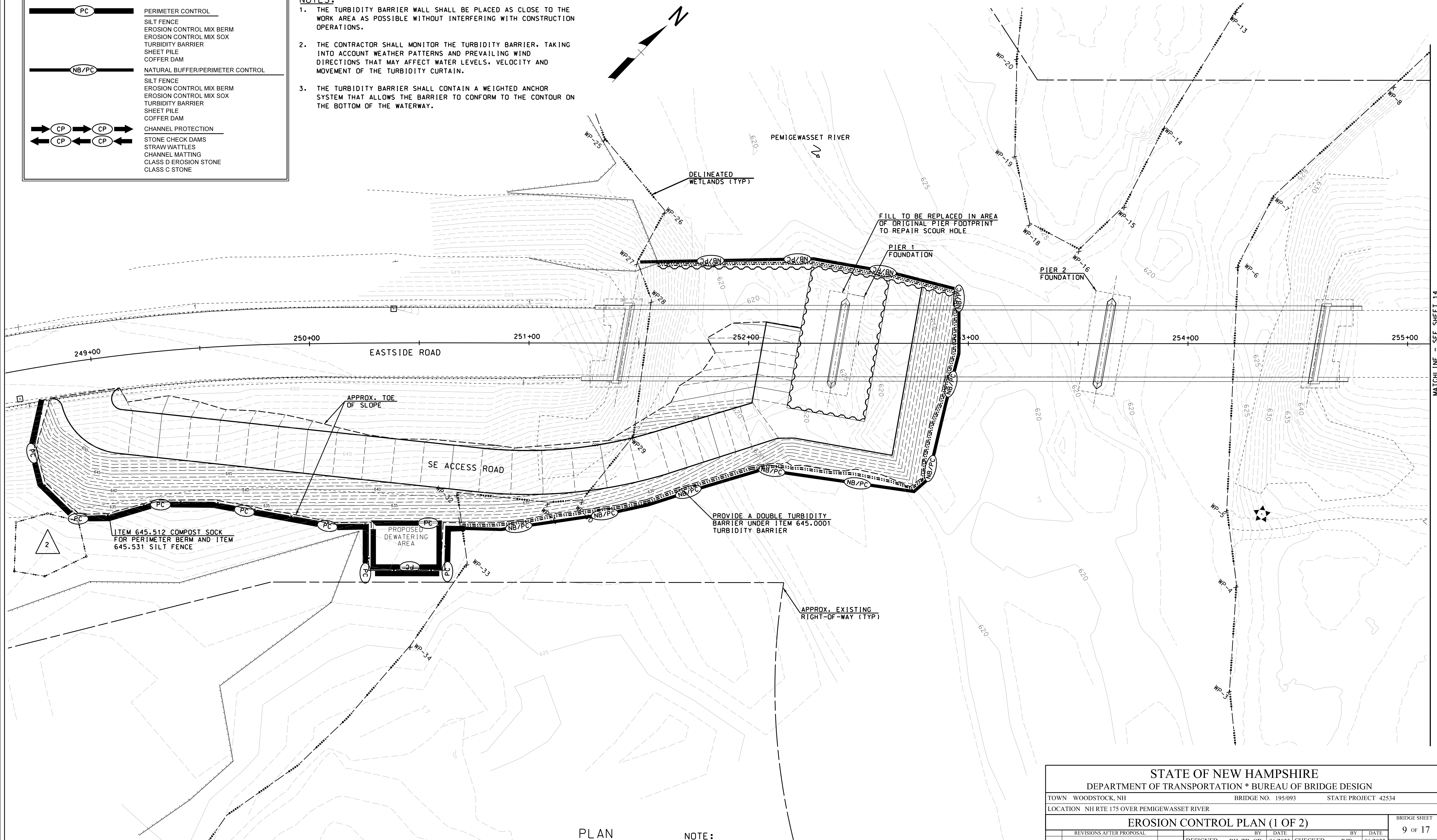
SHEET SCALE
1" = 20'-0"

STATE OF NEW HAMPSHIRE										
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN										
TOWN		WOODSTOCK, NH		BRIDGE NO.		195/093		STATE PROJECT		42534
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER										
WETLAND IMPACT PLAN									BRIDGE SHEET	
									8 OF 17	
DESIGNED		BH, TD, CD		DATE		06/2023		CHECKED		RJD
DRAWN		JBM		DATE		06/2023		CHECKED		RJD
QUANTITIES				DATE				CHECKED		
ISSUE DATE				FEDERAL PROJECT NO.		X-A004(896)		SHEET NO.		12
REV. DATE				TOTAL SHEETS		21				

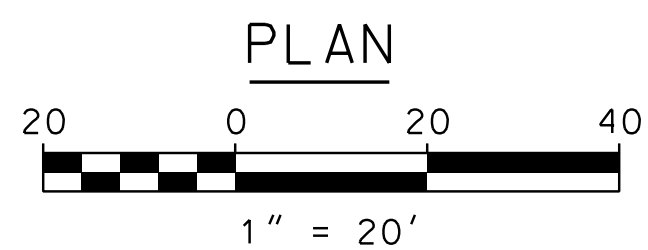
EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL
	SILT FENCE
	EROSION CONTROL MIX BERM
	EROSION CONTROL MIX SOX
	TURBIDITY BARRIER
	SHEET PILE
	COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL
	SILT FENCE
	EROSION CONTROL MIX BERM
	EROSION CONTROL MIX SOX
	TURBIDITY BARRIER
	SHEET PILE
	COFFER DAM
	CHANNEL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

NOTES:

1. THE TURBIDITY BARRIER WALL SHALL BE PLACED AS CLOSE TO THE WORK AREA AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.
2. THE CONTRACTOR SHALL MONITOR THE TURBIDITY BARRIER. TAKING INTO ACCOUNT WEATHER PATTERNS AND PREVAILING WIND DIRECTIONS THAT MAY AFFECT WATER LEVELS, VELOCITY AND MOVEMENT OF THE TURBIDITY CURTAIN.
3. THE TURBIDITY BARRIER SHALL CONTAIN A WEIGHTED ANCHOR SYSTEM THAT ALLOWS THE BARRIER TO CONFORM TO THE CONTOUR ON THE BOTTOM OF THE WATERWAY.



100% PS&E PLANS
NOT FOR CONSTRUCTION

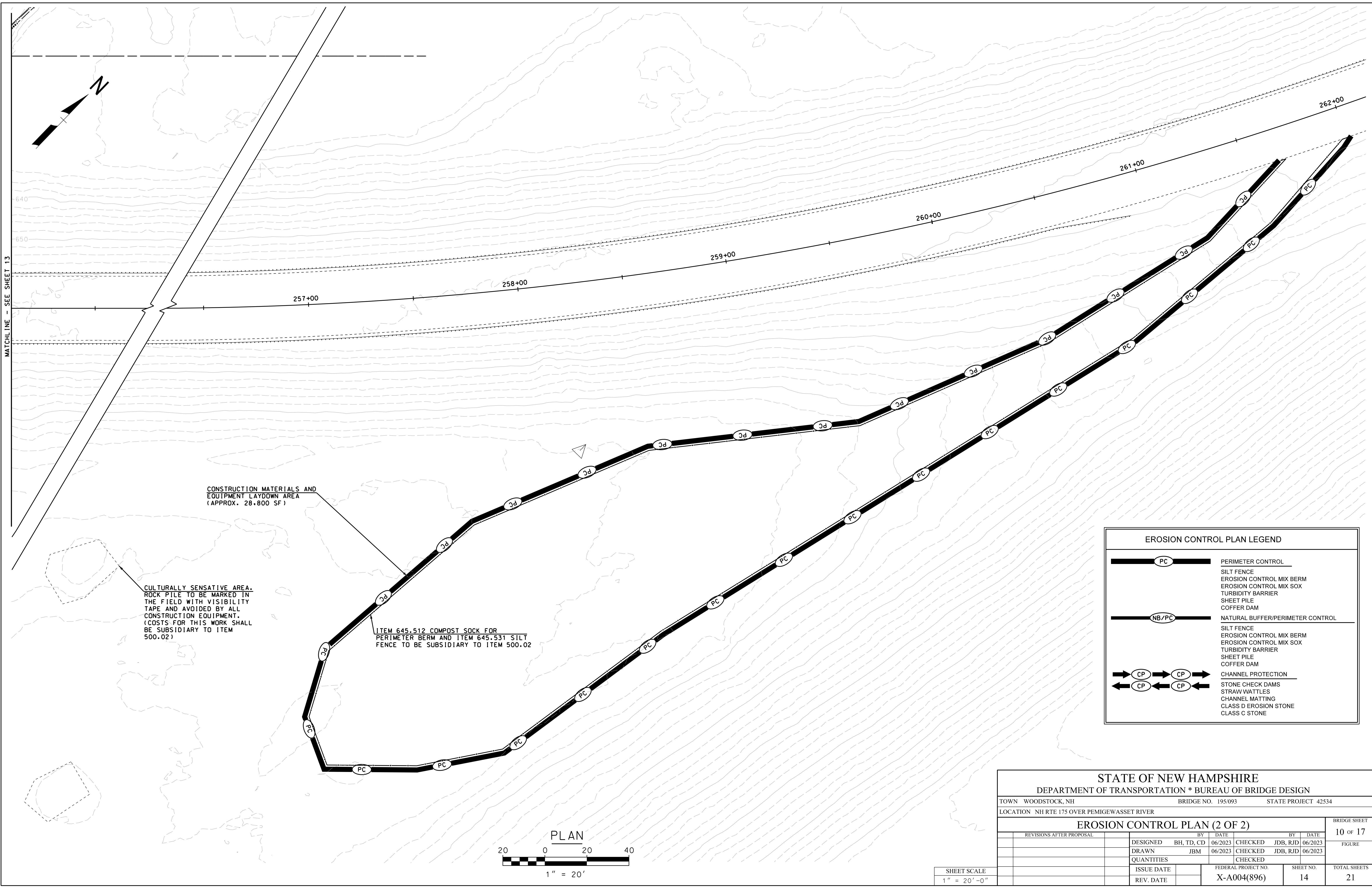


NOTE:
THE PROPOSED CONTOURS ARE CONCEPTUAL IN NATURE AND ARE NOT MEANT TO REPRESENT THE CONTRACTOR'S MEANS AND METHODS.

SHEET SCALE
1" = 20'-0"

STATE OF NEW HAMPSHIRE					
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN					
TOWN	WOODSTOCK, NH	BRIDGE NO.	195/093	STATE PROJECT	42534
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER					
EROSION CONTROL PLAN (1 OF 2)					BRIDGE SHEET
					9 OF 17
DESIGNED	BH, TD, CD	DATE	06/2023	CHECKED	RJD
DRAWN	JBM	DATE	06/2023	CHECKED	RJD
QUANTITIES			CHECKED		
ISSUE DATE		FEDERAL PROJECT NO.	X-A004(896)	SHEET NO.	13
REV. DATE				TOTAL SHEETS	21

MATCHLINE - SEE SHEET 14



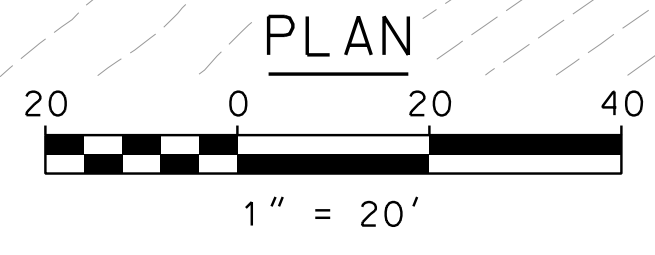
MATCHLINE - SEE SHEET 13

CONSTRUCTION MATERIALS AND EQUIPMENT LAYDOWN AREA (APPROX. 28,800 SF)

CULTURALLY SENSITIVE AREA. ROCK PILE TO BE MARKED IN THE FIELD WITH VISIBILITY TAPE AND AVOIDED BY ALL CONSTRUCTION EQUIPMENT. (COSTS FOR THIS WORK SHALL BE SUBSIDIARY TO ITEM 500.02)

ITEM 645.512 COMPOST SOCK FOR PERIMETER BERM AND ITEM 645.531 SILT FENCE TO BE SUBSIDIARY TO ITEM 500.02

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



STATE OF NEW HAMPSHIRE					
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN					
TOWN WOODSTOCK, NH		BRIDGE NO. 195/093		STATE PROJECT 42534	
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER					
EROSION CONTROL PLAN (2 OF 2)					BRIDGE SHEET
					10 of 17
DESIGNED BH, TD, CD		BY DATE		CHECKED JDB, RJD	
DRAWN JBM		06/2023		06/2023	
QUANTITIES		CHECKED		JDB, RJD	
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	
REV. DATE		X-A004(896)		14	
		TOTAL SHEETS		21	

SHEET SCALE
1" = 20'-0"

NOTES:

1. SITE RESTORATION WILL BE PERFORMED WITHIN TWO RESTORATION ZONES: ZONE #1 FOR AREAS WITHIN THE LIMITS OF WORK BELOW TOB/OHW (BANK AND STREAM CHANNEL) AND ZONE #2 FOR AREAS WITHIN THE LIMITS OF WORK ABOVE TOB/OHW (SLOPE AREA).
2. ZONE #1 RESTORATION WILL CONSIST OF THE REMOVAL OF TEMPORARY ACCESS CAUSEWAY, GEOTEXTILE FABRIC, TEMPORARY SHEETING, SILT CURTAINS, ETC. TO REVEAL THE PRE-CONSTRUCTION SUBSTRATE. MATERIALS REMOVED WILL BE DISPOSED OF OFFSITE IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS AND REQUIREMENTS.
3. ZONE #2 RESTORATION CONSISTS OF REMOVAL OF THE TEMPORARY ACCESS ROAD FILL UNTIL THE NATURAL SUBSTRATE IS REACHED FOLLOWED BY APPROXIMATELY 6" OF HUMUS TO BE REPLACED IN AREAS THAT ARE DISTURBED WITHIN THE ZONE AND FINAL GRADING PERFORMED TO RESTORE THE SLOPE TO PRE-CONSTRUCTION CONTOURS. THE DISTURBED AREA TO BE TREATED WITH HUMUS MEETING SPECIFICATIONS OF ITEM 647.1 AND TURF ESTABLISHMENT WITH MULCH AND TACKIFIERS MEETING THE SPECIFICATIONS OF ITEM 646.3. ONCE FINAL GRADING IS COMPLETE, THE AREA AS SHOWN ON THE RESTORATION PLAN SHALL BE SEEDED WITH SLOPE SEED TYPE 72 FOR STEEP SLOPES ITEM NO. 644.72. SEED MIX SHOULD BE LIGHTLY RAKED INTO THE SOIL TO ENSURE GOOD SEED-TO-SOIL CONTACT. FOLLOWING SEEDING, ZONE #2 WILL BE STABILIZED IN THE AREAS SHOWN ON THE PLANS (WITH THE EXCEPTION OF THE RIP-RAP AREA NEAR THE SOUTH BRIDGE ABUTMENT) WITH TEMPORARY SLOPE MATTING TYPE D (WILDLIFE FRIENDLY) ITEM NO. 645.44. ONCE EROSION CONTROL BLANKETS ARE IN PLACE, ZONE #2 SHALL BE PLANTED WITH SHRUB AND TREE SPECIES IN THE SPECIES, SIZES, QUANTITIES, AND SPACINGS SHOWN IN TABLE 1 AND ON THE RESTORATION PLAN. ANY SUBSTITUTIONS WILL REQUIRE PRIOR APPROVAL WITH THE ENGINEER. TREE AND SHRUB PLANTING OF THE RESTORATION AREA SHALL BE PAID UNDER ITEM 650.2 LANDSCAPING. SEED MIX PLANTING SHALL BE PAID UNDER ITS OWN ITEM 644.72.

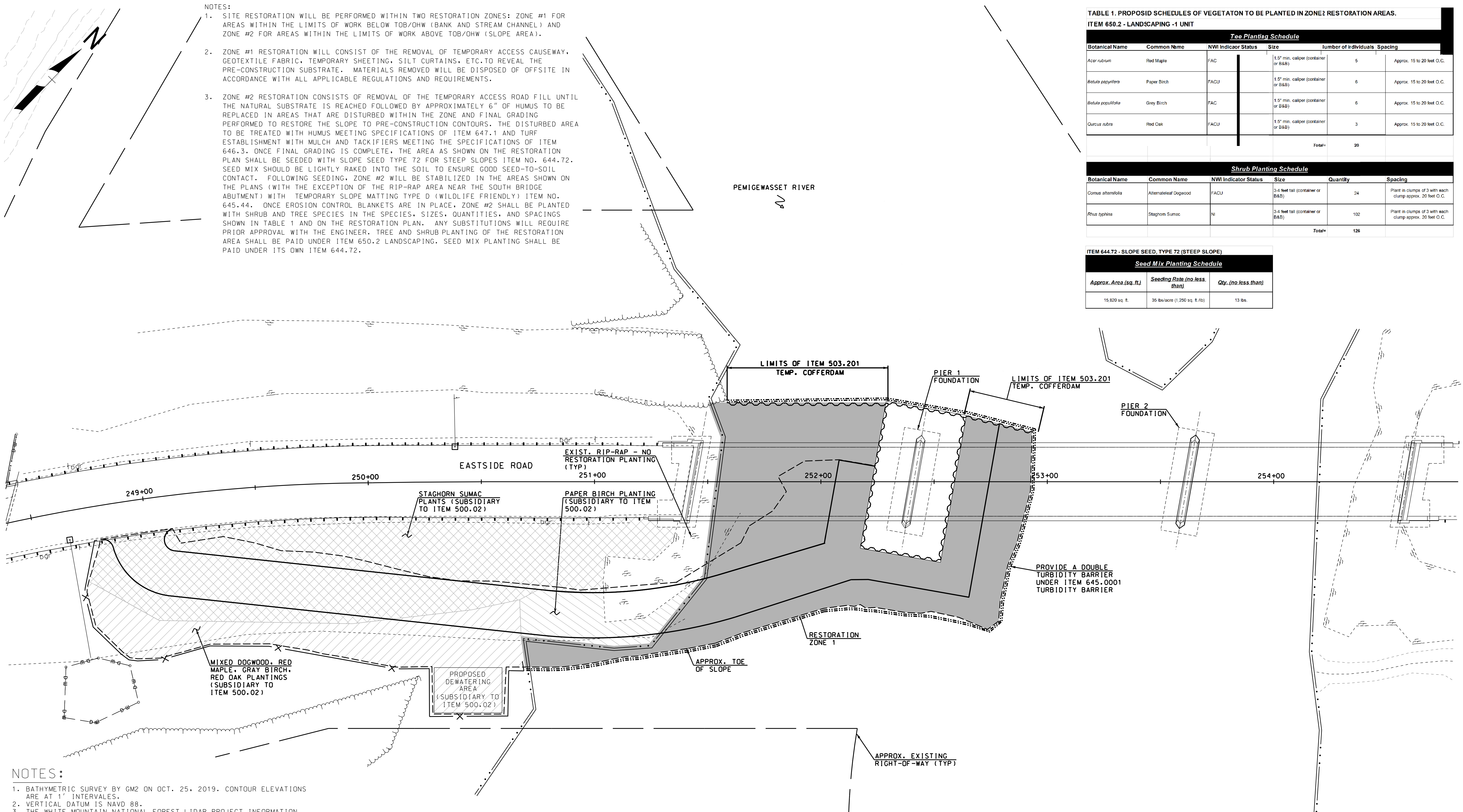
TABLE 1. PROPOSID SCHEDULES OF VEGETATON TO BE PLANTED IN ZONE#2 RESTORATION AREAS.

ITEM 650.2 - LANDSCAPING -1 UNIT						
Tree Planting Schedule						
Botanical Name	Common Name	NWI Indicator Status	Size	Number of individuals	Spacing	
<i>Acer rubrum</i>	Red Maple	FAC	1.5" min. caliper (container or B&B)	5	Approx. 15 to 20 feet O.C.	
<i>Betula papyrifera</i>	Paper Birch	FACU	1.5" min. caliper (container or B&B)	6	Approx. 15 to 20 feet O.C.	
<i>Betula populifolia</i>	Grey Birch	FAC	1.5" min. caliper (container or B&B)	6	Approx. 15 to 20 feet O.C.	
<i>Quercus rubra</i>	Red Oak	FACU	1.5" min. caliper (container or B&B)	3	Approx. 15 to 20 feet O.C.	
				Total=	20	

Shrub Planting Schedule						
Botanical Name	Common Name	NWI Indicator Status	Size	Quantity	Spacing	
<i>Cornus alternifolia</i>	Alternatleaf Dogwood	FACU	3-4 feet tall (container or B&B)	24	Plant in clumps of 3 with each clump approx. 20 feet O.C.	
<i>Rhus typhina</i>	Staghorn Sumac	NI	3-4 feet tall (container or B&B)	102	Plant in clumps of 3 with each clump approx. 20 feet O.C.	
				Total=	126	

ITEM 644.72 - SLOPE SEED, TYPE 72 (STEEP SLOPE)

Seed Mix Planting Schedule		
Approx. Area (sq. ft.)	Seeding Rate (no less than)	Qty. (no less than)
15,620 sq. ft.	35 lbs/acre (1,290 sq. ft./lb)	13 lbs.

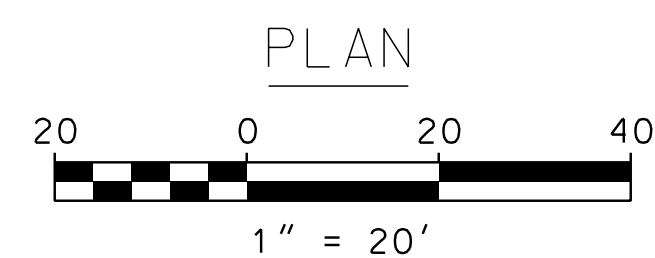


NOTES:

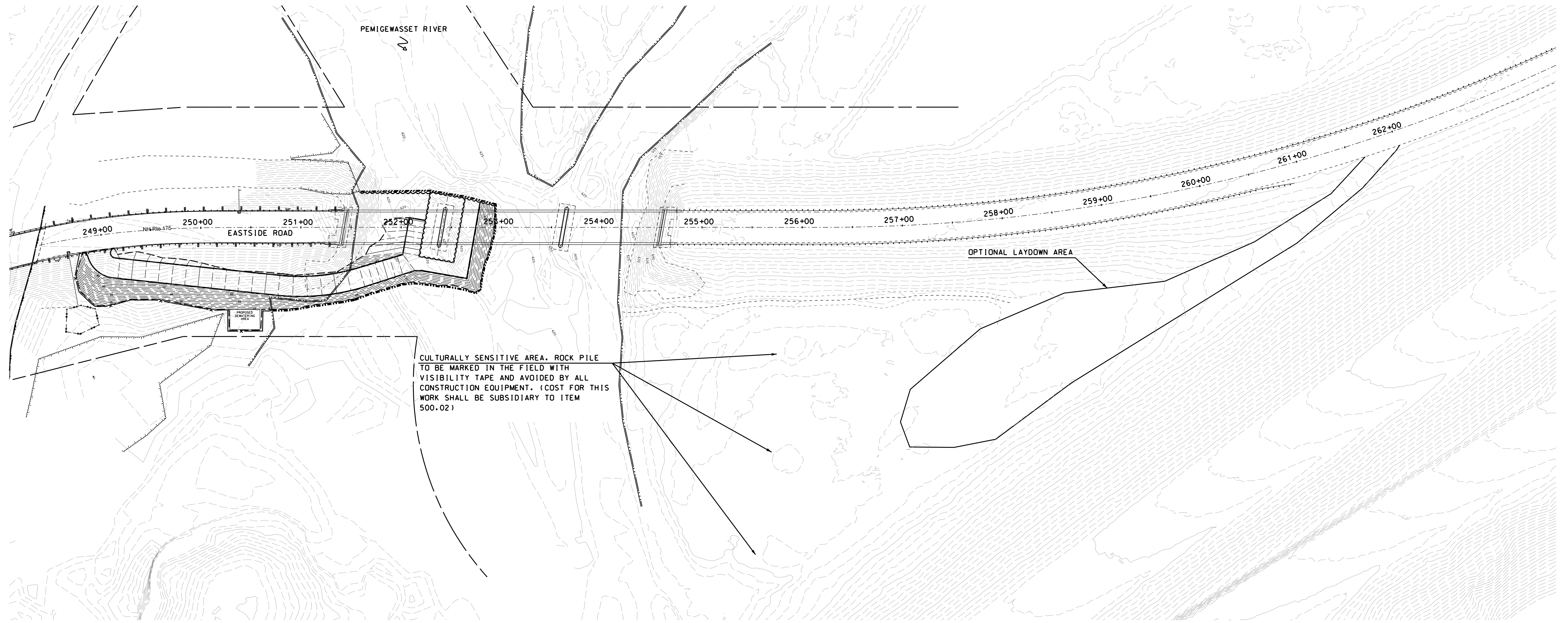
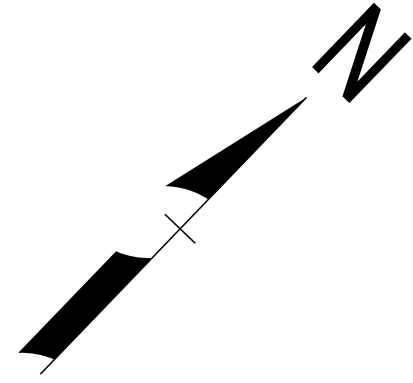
1. BATHYMETRIC SURVEY BY GM2 ON OCT. 25, 2019. CONTOUR ELEVATIONS ARE AT 1' INTERVALS.
2. VERTICAL DATUM IS NAVD 88.
3. THE WHITE MOUNTAIN NATIONAL FOREST LIDAR PROJECT INFORMATION WAS USED TO OBTAIN THE LAND TOPOGRAPHY DATA OUTSIDE THE RIVER. CONTOUR ELEVATIONS ARE AT 2' INTERVALS.
4. THE ENTIRE AREA SHOWN OUTSIDE OF THE WATERCOURSE IS 250-FOOT PROTECTED SHORELAND.
5. THE ENTIRE AREA SHOWN IS WITHIN THE 100-YEAR FLOODPLAIN.

LEGEND:

- ZONE 1 RESTORATION
- ZONE 2 RESTORATION - PAPER BIRCH PLANTING
- ZONE 2 RESTORATION - STAGHORN SUMAC PLANTS
- ZONE 2 RESTORATION - MIXED DOGWOOD, RED MAPLE, GRAY BIRCH, RED OAK PLANTINGS



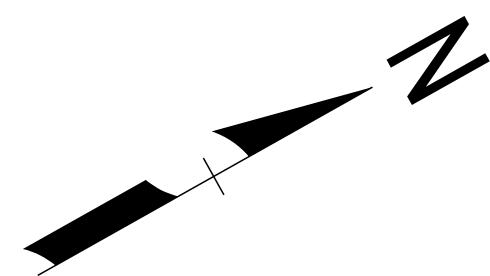
STATE OF NEW HAMPSHIRE					
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN					
TOWN WOODSTOCK, NH		BRIDGE NO. 195/093		STATE PROJECT 42534	
LOCATION NH RTE 175 OVER PEGEWASSET RIVER					
ACCESS ROAD RESTORATION PLAN					BRIDGE SHEET
					11 OF 17
REVISIONS AFTER PROPOSAL		BY	DATE	BY	DATE
		DESIGNED	BH, TT, CD	CHECKED	RJD
		DRAWN	JBM	CHECKED	RJD
		QUANTITIES		CHECKED	
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.	
REV. DATE		X-A004(896)		15	
SHEET SCALE				TOTAL SHEETS	
1" = 20'-0"				21	



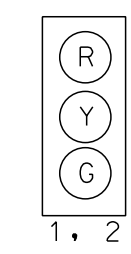
PLAN

STATE OF NEW HAMPSHIRE										
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN										
TOWN WOODSTOCK, NH			BRIDGE NO. 195/093			STATE PROJECT 42534				
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER										
CONTRACTOR LAYDOWN AREA									BRIDGE SHEET	
									12 OF 17	
REVISIONS AFTER PROPOSAL		BY		DATE		CHECKED		BY		DATE
		TD, BH		06/2023		RJD		RJD		06/2023
		JBM		06/2023		RJD		RJD		06/2023
QUANTITIES		CHECKED								
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.		TOTAL SHEETS				
REV. DATE		X-A004(896)		16		21				

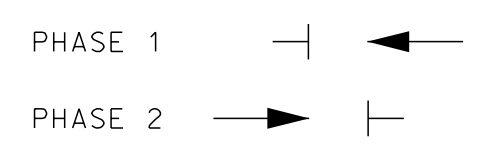
SHEET SCALE
1" = 50'-0"



SIGNAL LEGEND

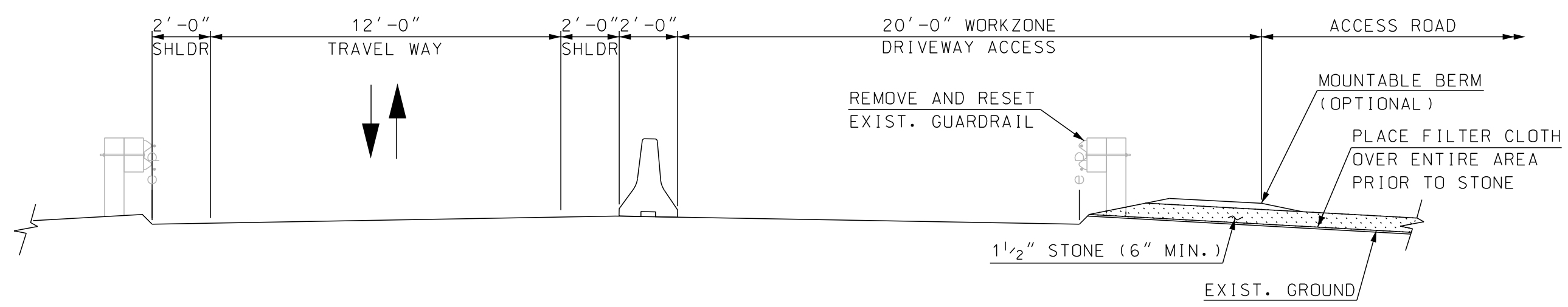


PREFERRED SIGNAL PHASING



TIMING IN SECONDS	Ø1	Ø2
INITIAL INTERVAL	7	7
VEHICLE EXTENSION	2	2
MAXIMUM I	25	25
MAXIMUM II	25	25
YELLOW	4	4
ALL RED	35	35
WALK/FLASH DON'T WALK	N/A	N/A
RECALL	SOFT	OFF
DETECTOR	NL	NL
FLASH	FR	FR

NL = NON-LOCKING



EASTSIDE ROAD CONSTRUCTION ENTRANCE

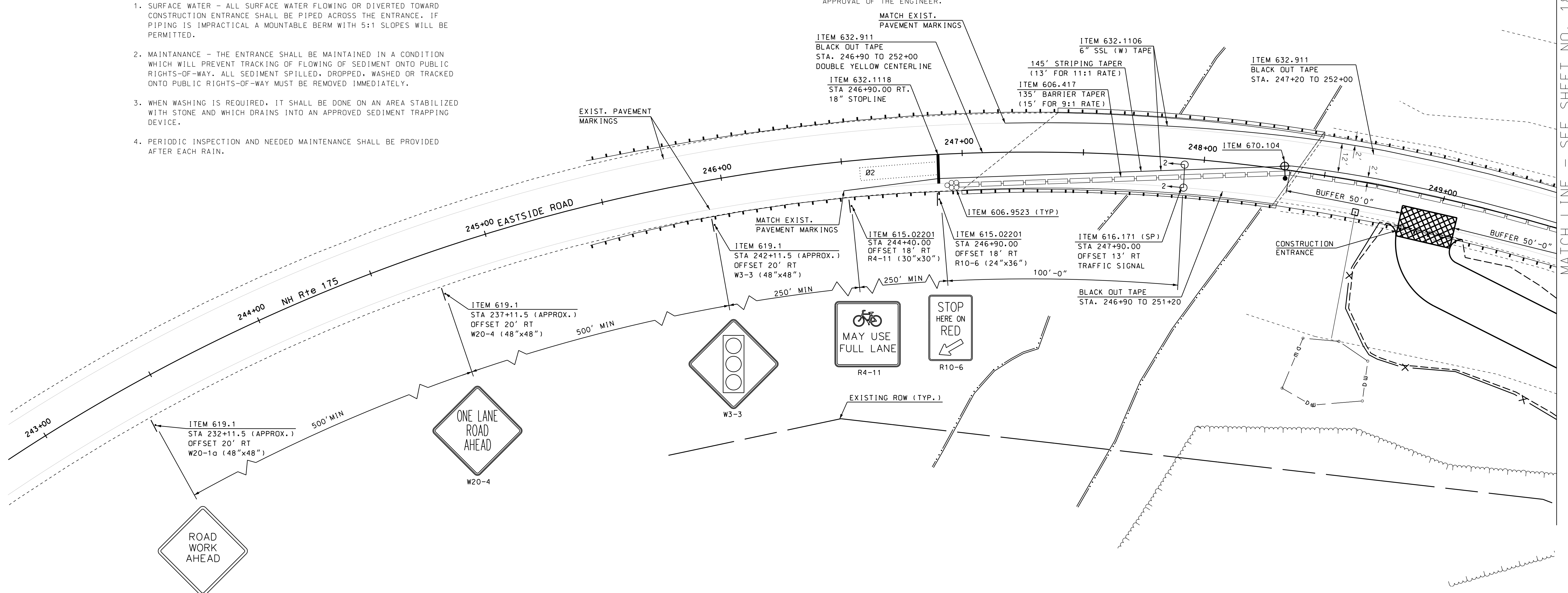
NOT TO SCALE

NOTES

1. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCE SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
2. MAINTANANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

TEMPORARY TRAFFIC SIGNAL NOTES

1. THE PORTABLE TRAFFIC SIGNAL SYSTEM SHALL BE FULLY ACTUATED. VIDEO DETECTION SHALL BE USED TO DETECT VEHICLES AND BICYCLES.
2. EMERGENCY PREEMPTION SHALL BE PROVIDED WITH THE PORTABLE TRAFFIC SIGNAL SYSTEM.
3. THE TRAFFIC SIGNAL TRAILERS MAY BE ADJUSTED BY A MAXIMUM OF TWENTY FEET WITH THE APPROVAL OF THE ENGINEER.
4. TRAFFIC SIGNAL TIMINGS MAY BE ADJUSTED IN THE FIELD WITH THE APPROVAL OF THE ENGINEER.

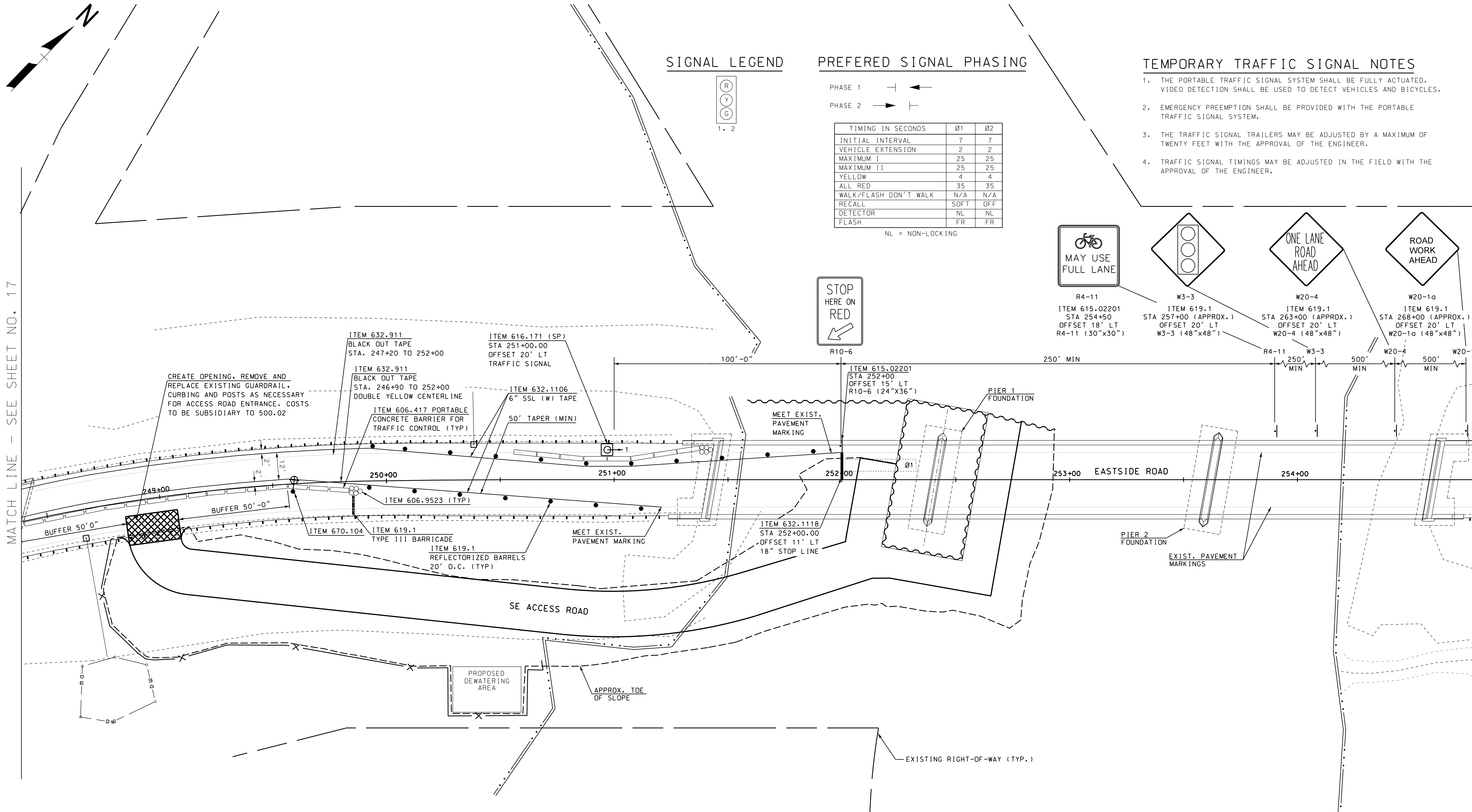


MATCH LINE - SEE SHEET NO. 18

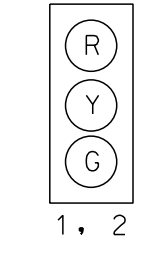
PLAN

STATE OF NEW HAMPSHIRE					
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN					
TOWN	WOODSTOCK, NH	BRIDGE NO.	195/093	STATE PROJECT	42534
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER					
TEMPORARY TRAFFIC CONTROL (1 OF 2)					BRIDGE SHEET
					13 OF 17
DESIGNED	GS	DATE	06/2023	CHECKED	AMS
DRAWN	JBM	DATE	06/2023	CHECKED	RJD
QUANTITIES			CHECKED		
ISSUE DATE		FEDERAL PROJECT NO.	X-A004(896)	SHEET NO.	17
REV. DATE				TOTAL SHEETS	21

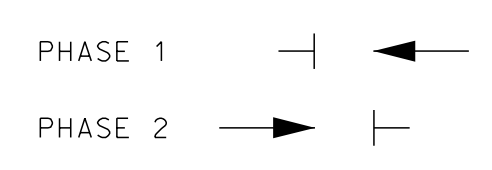
SHEET SCALE
1" = 20'-0"



SIGNAL LEGEND



PREFERRED SIGNAL PHASING

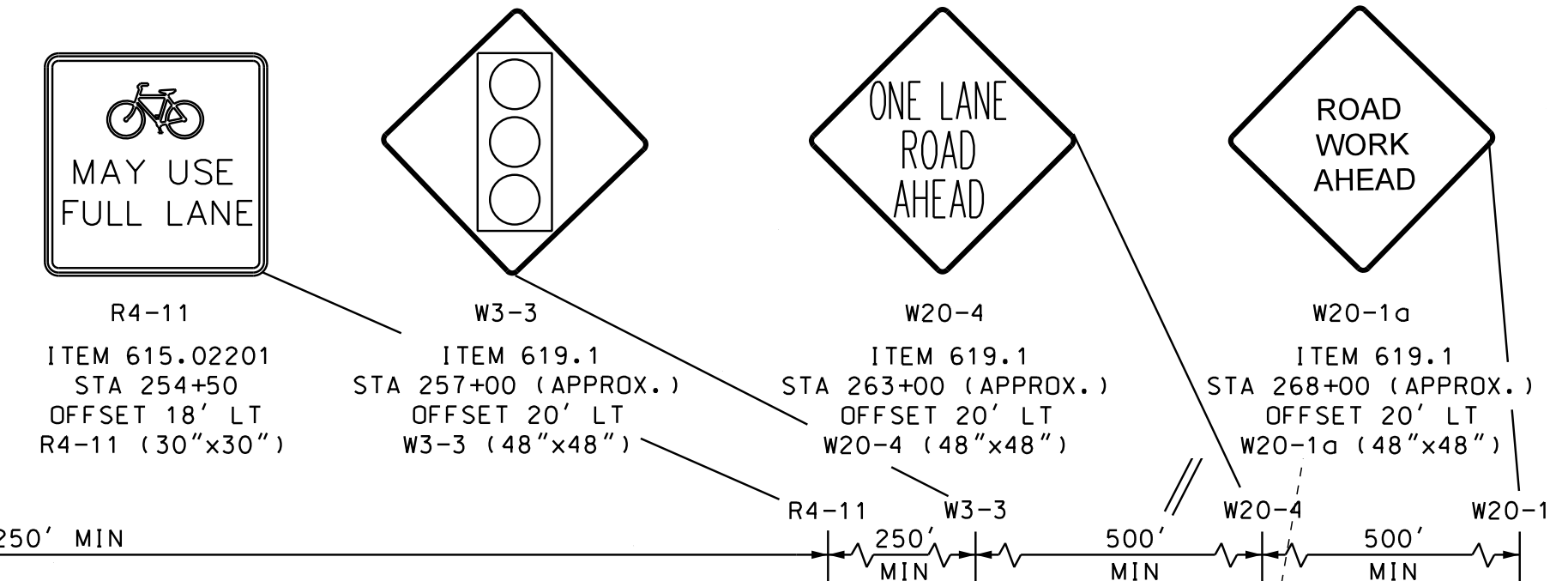


TIMING IN SECONDS	Ø1	Ø2
INITIAL INTERVAL	7	7
VEHICLE EXTENSION	2	2
MAXIMUM I	25	25
MAXIMUM II	25	25
YELLOW	4	4
ALL RED	35	35
WALK/FLASH DON'T WALK	N/A	N/A
RECALL	SOFT	OFF
DETECTOR	NL	NL
FLASH	FR	FR

NL = NON-LOCKING

TEMPORARY TRAFFIC SIGNAL NOTES

1. THE PORTABLE TRAFFIC SIGNAL SYSTEM SHALL BE FULLY ACTUATED. VIDEO DETECTION SHALL BE USED TO DETECT VEHICLES AND BICYCLES.
2. EMERGENCY PREEMPTION SHALL BE PROVIDED WITH THE PORTABLE TRAFFIC SIGNAL SYSTEM.
3. THE TRAFFIC SIGNAL TRAILERS MAY BE ADJUSTED BY A MAXIMUM OF TWENTY FEET WITH THE APPROVAL OF THE ENGINEER.
4. TRAFFIC SIGNAL TIMINGS MAY BE ADJUSTED IN THE FIELD WITH THE APPROVAL OF THE ENGINEER.


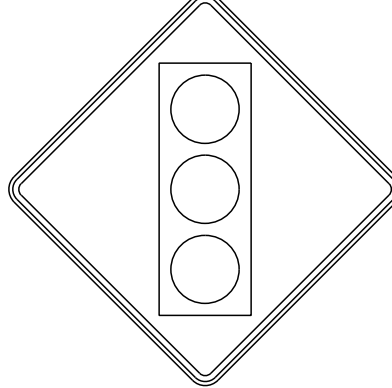

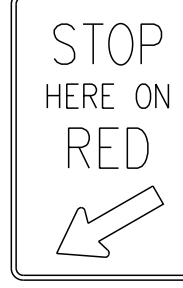



MATCH LINE - SEE SHEET NO. 17

PLAN

STATE OF NEW HAMPSHIRE					
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN					
TOWN	WOODSTOCK, NH	BRIDGE NO.	195/093	STATE PROJECT	42534
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER					
TEMPORARY TRAFFIC CONTROL (2 OF 2)					BRIDGE SHEET
					14 OF 17
DESIGNED	GS	DATE	06/2023	CHECKED	AMS
DRAWN	JBM	DATE	06/2023	CHECKED	RJD
QUANTITIES			CHECKED		
ISSUE DATE		FEDERAL PROJECT NO.	X-A004(896)	SHEET NO.	18
REV. DATE				TOTAL SHEETS	21

SHEET SCALE
1" = 20'-0"

ITEM #	IDENT #	SIGN SIZE		TEXT DIMENSIONS	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.)		POSTS PER SIGN					REMARKS			
		WIDTH (inch)	HEIGHT (inch) TEXT						UC	LC	CAPS	NOM AREA	TOTAL AREA	BREAKAWAY	STEEL I-BEAM		CONCRETE BASE	4" ALUMINUM	U-CHANNEL-GALV.
--	W20-1a (AHEAD)	48	48					2	16.00	32.00					2	BLACK/FL. ORANGE ON TEMP. SIGN STANDS			
--	W3-3	48	48					2	16.00	32.00					2	TOP CIRCLE - RED BOTTOM CIRCLE - GREEN BACKGROUND - YELLOW			
--	W20-4	48	48					2	16.00	32.00					2	BLACK/FL. ORANGE ON TEMP. SIGN STANDS			
--	R10-6	24	36					2	6.00	12.00					1	LEGEND - BLACK BACKGROUND - WHITE			
--	R4-11	30	30					2	6.25	12.50					1	LEGEND - BLACK BACKGROUND WHITE			

GENERAL TRAFFIC CONTROL NOTES

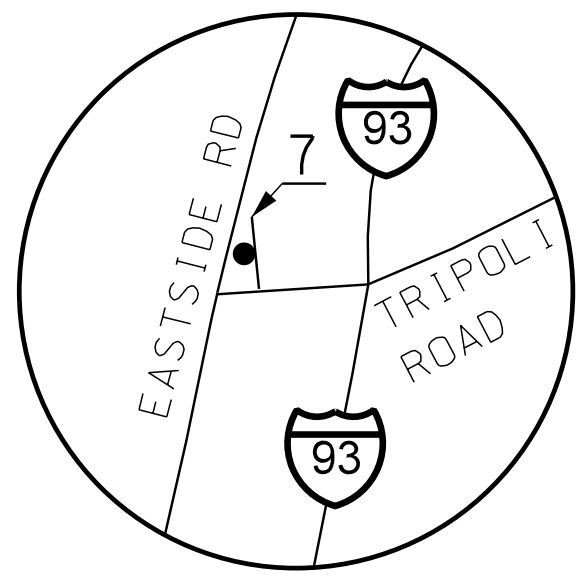
1. ALL DIAMOND SHAPED ORANGE CONSTRUCTION SIGNS SHALL BE 48"x48".
2. ALL TRAFFIC CONTROL SIGNS SHALL BE MAINTAINED IN LIKE-NEW CONDITION. PLACEMENT OF SIGNS SHALL BE ADJUSTED TO AVOID OBSTRUCTING EXISTING SIGNS AND TO ENSURE PROPER SIGHT LINES TO THE TRAFFIC CONTROL SIGNS.
3. THE CONTRACTOR SHALL INSTALL TWO PORTABLE CHANGEABLE MESSAGE SIGNS, ITEM 619.25, AT LOCATIONS APPROVED BY NHDOT BUREAU OF CONSTRUCTION. IF REQUIRED, PORTABLE CHANGEABLE MESSAGE SIGN PLATFORMS SHALL BE CONSTRUCTED AND PAID FOR UNDER ITEM 203.5525. REMOVAL OF THE PORTABLE CHANGEABLE MESSAGE SIGN PLATFORMS SHALL BE SUBSIDIARY TO ITEM 203.5525. REMOVAL OF CHANGEABLE MESSAGE SIGNS SHALL BE SUBSIDIARY TO ITEM 619.25.

SIGN LAYOUT NOTES

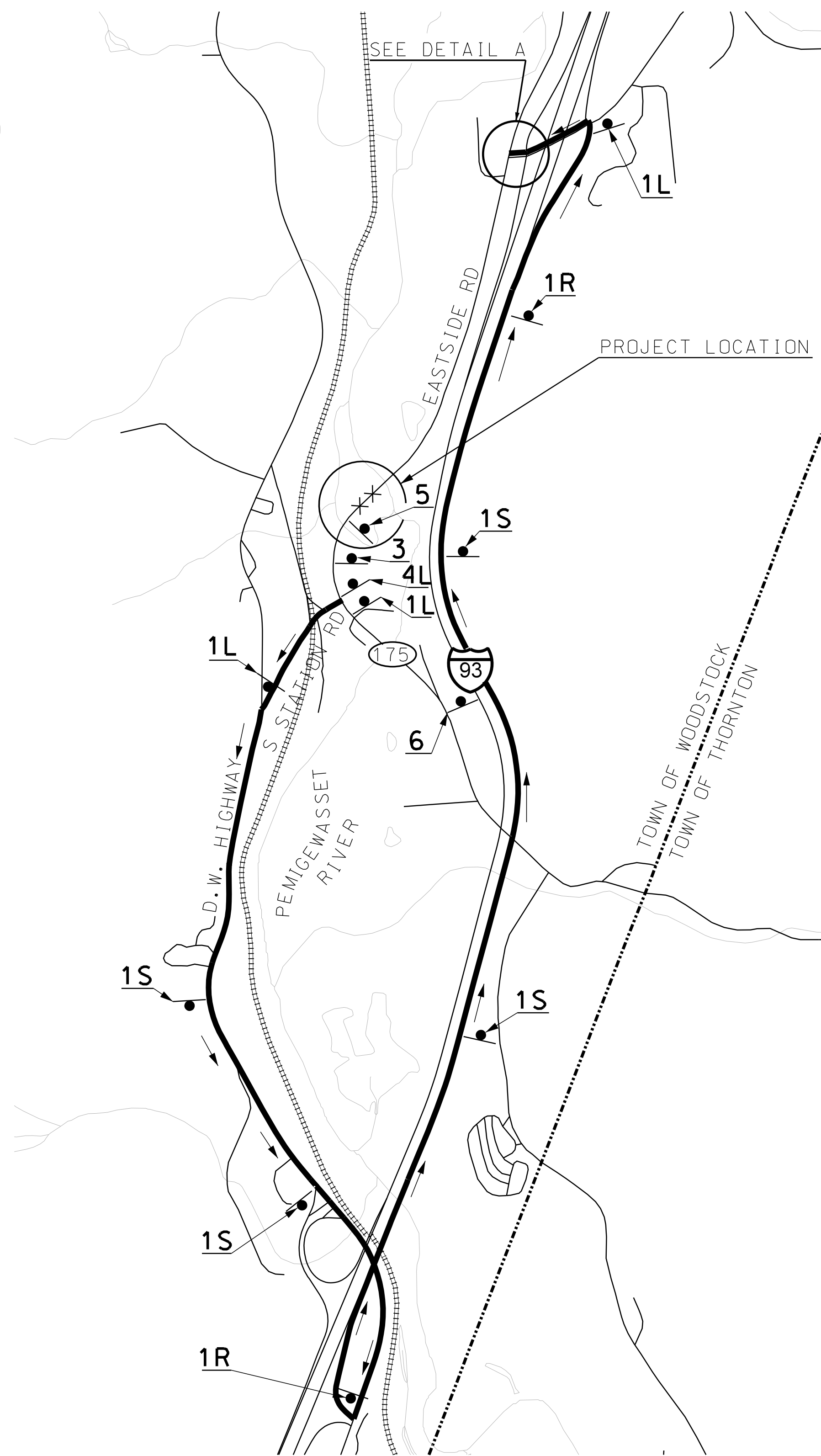
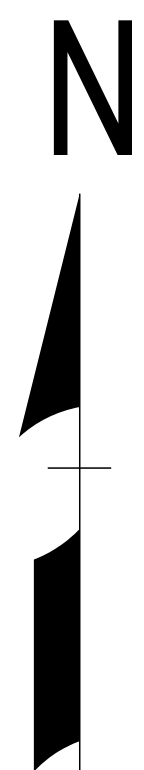
1. REFER TO THE "STANDARD HIGHWAY SIGNS MANUAL" AS PUBLISHED BY THE USDOT-FHWA FOR EXACT DETAILS OF BORDERS, ETC.
2. REFER TO THE "STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION" AS PUBLISHED BY THE NHDOT FOR EXACT DETAILS OF PERMANENT SIGNING STANDARDS.
3. THE MINIMUM SIGN HEIGHT FOR A ROADSIDE SIGN IN A RURAL DISTRICT SHALL BE INCREASED FROM 5 FEET TO 6 FEET. ALL OTHER SIGN HEIGHTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD. THE CONTRACTOR SHALL INSTALL TWO PORTABLE CHANGEABLE MESSAGE SIGNS, ITEM 619.25, AT LOCATIONS APPROVED BY NHDOT BUREAU OF CONSTRUCTION. IF REQUIRED, PORTABLE CHANGEABLE MESSAGE SIGN PLATFORMS SHALL BE CONSTRUCTED AND PAID FOR UNDER ITEM 203.5525. REMOVAL OF THE PORTABLE CHANGEABLE MESSAGE SIGN PLATFORMS SHALL BE SUBSIDIARY TO ITEM 203.5525. REMOVAL OF CHANGEABLE MESSAGE SIGNS SHALL BE SUBSIDIARY TO ITEM 619.25.

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN	WOODSTOCK, NH	BRIDGE NO.	195/093	STATE PROJECT	42534				
LOCATION	NH RTE 175 OVER PEMIGEWASSET RIVER								
CONSTRUCTION SIGN SUMMARY									BRIDGE SHEET
DESIGNED	GS	DATE	06/2023	CHECKED	AMS	DATE	06/2023	15 of 17	
DRAWN	JBM	DATE	06/2023	CHECKED	RJD	DATE	06/2023	FIGURE	
ISSUE DATE		FEDERAL PROJECT NO.	X-A004(896)	SHEET NO.	19	TOTAL SHEETS	21		
REV. DATE									

SHEET SCALE



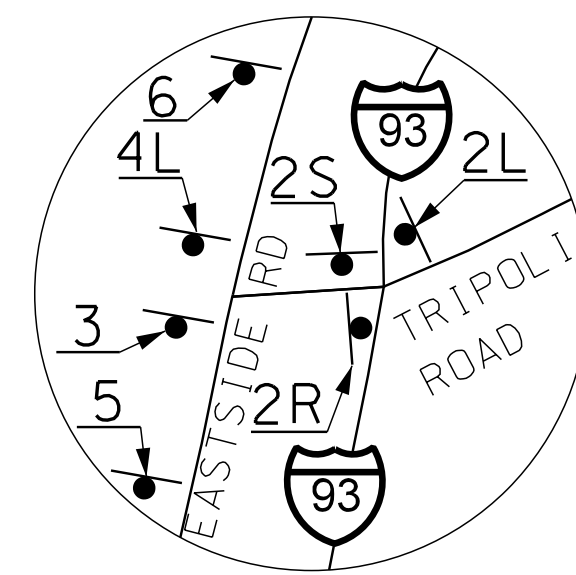
DETAIL A



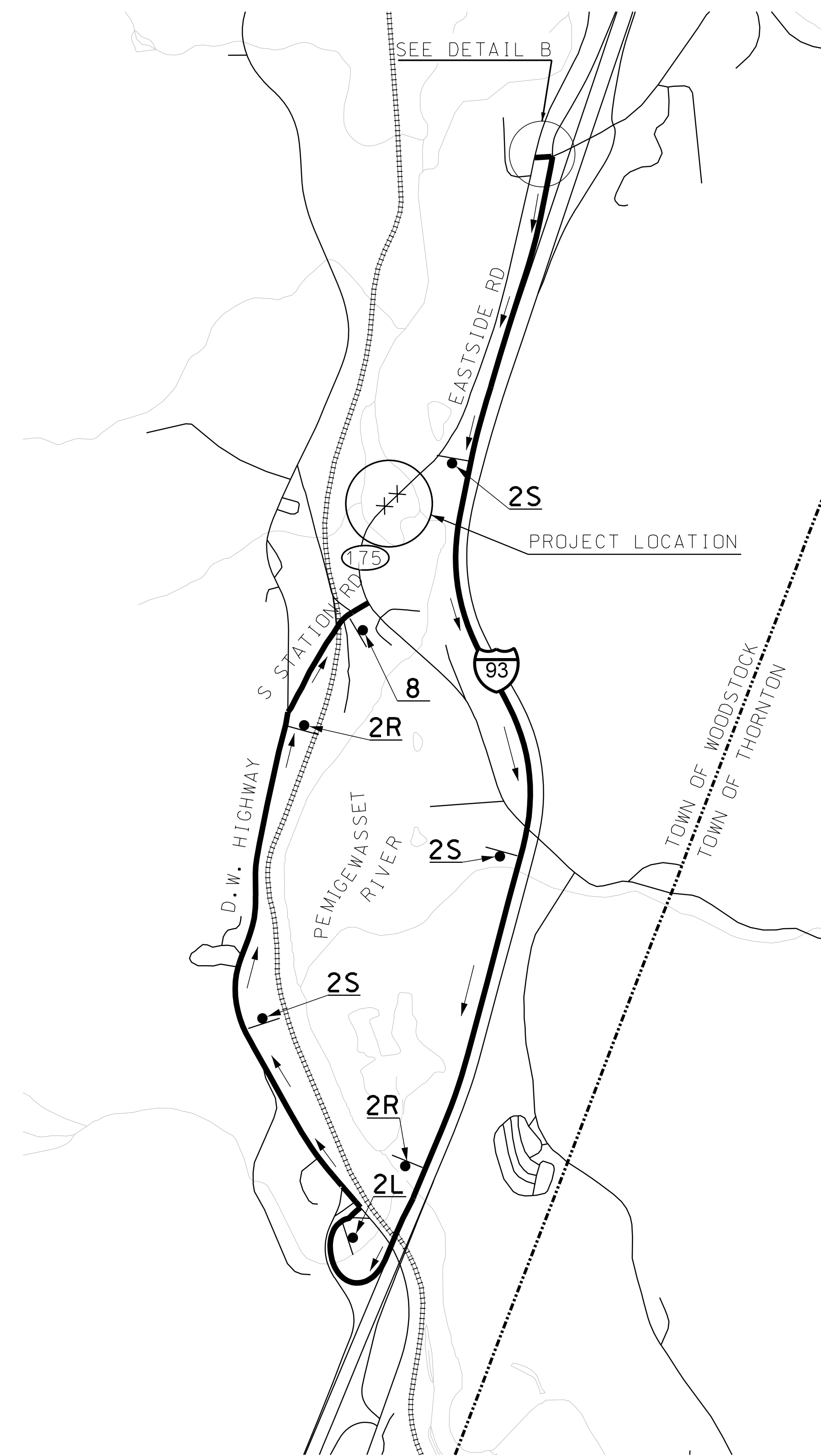
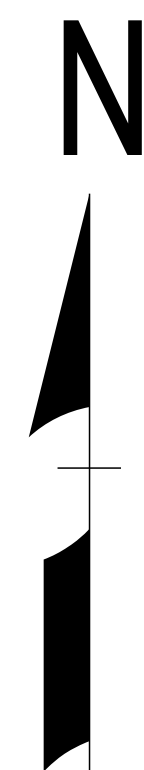
NORTH BOUND DETOUR PLAN

SCALE: 1/2" = 1 MILE

NOTE: SOUTH BOUND DETOUR SIGNS NOT SHOWN FOR CLARITY.



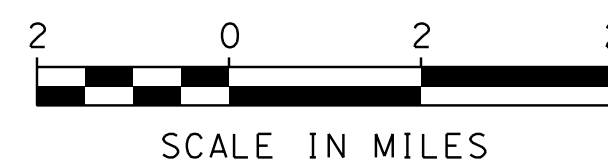
DETAIL B



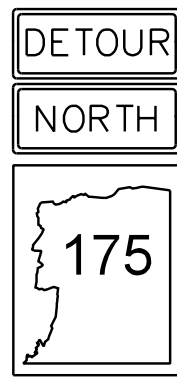
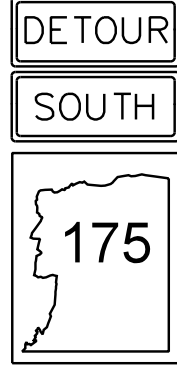




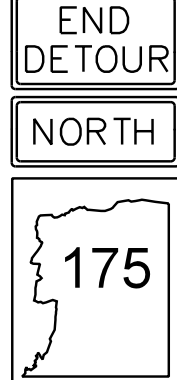
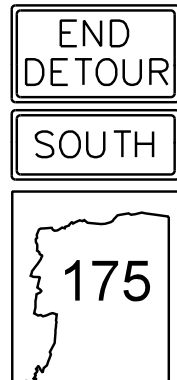

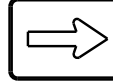

SOUTH BOUND DETOUR PLAN

SCALE: 1/2" = 1 MILE

NOTE: NORTH BOUND DETOUR SIGNS NOT SHOWN FOR CLARITY.



STATE OF NEW HAMPSHIRE					
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN					
TOWN	WOODSTOCK, NH	BRIDGE NO.	195/093	STATE PROJECT	42534
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER					
DETOUR PLAN					BRIDGE SHEET
					16 OF 17
DESIGNED	GS	DATE	06/2023	CHECKED	AMS
DRAWN	JBM	DATE	06/2023	CHECKED	RJD
QUANTITIES			CHECKED		
ISSUE DATE		FEDERAL PROJECT NO.	X-A004(896)	SHEET NO.	20
REV. DATE					TOTAL SHEETS
					21

ITEM #	IDENT #	SIGN SIZE		TEXT DIMENSIONS	LETTER HEIGHT (inch)	SHIELD SIZE (inch)	ARROW (inch)	NUMERAL (inch)	# SIGNS REQ'D	SIGN AREA (SQ. FT.)		POSTS PER SIGN				REMARKS
		WIDTH (inch)	HEIGHT (inch) TEXT							NOM AREA	TOTAL AREA	BREAKAWAY	STEEL I-BEAM	4" ALUMINUM	U-CHANNEL-GALV.	
1	M4-8	24	12						9	2.00	18.00					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
	M3-1	24	12							2.00	18.00					LEGEND - BLACK BACKGROUND - WHITE
	M1-5	24	24							4.00	36.00					LEGEND - BLACK BACKGROUND - WHITE
2	M4-8	24	12						9	2.00	18.00					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
	M3-3	24	12							2.00	18.00					LEGEND - BLACK BACKGROUND - WHITE
	M1-5	24	24							4.00	36.00					LEGEND - BLACK BACKGROUND - WHITE
3	W20-1	48	48						2	16.00	32.00					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
4	R11-3b	60	30						2	12.50	25.00					LEGEND - BLACK BACKGROUND - WHITE
	M4-10 (L OR R)	48	18							6.00	12.00					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
5	R11-2	48	30						2	10.00	20.00					LEGEND - BLACK BACKGROUND - WHITE MOUNTED ON TYPE 3 BARRICADE
6	W20-2	48	48						2	16.00	32.00					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
7	M4-8a	24	18						1	3.00	3.00					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
	M3-1	24	12							2.00	2.00					LEGEND - BLACK BACKGROUND - WHITE
	M1-5	24	24							4.00	4.00					LEGEND - BLACK BACKGROUND - WHITE
8	M4-8a	24	18						1	3.00	3.00					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
	M3-3	24	12							2.00	2.00					LEGEND - BLACK BACKGROUND - WHITE
	M1-5	24	24							4.00	4.00					LEGEND - BLACK BACKGROUND - WHITE
L	M6-1L	21	15						5	2.19	10.95					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
R	M6-1R	21	15						5	2.19	10.95					BLACK/FL. ORANGE ON TEMP. SIGN STANDS
S	M6-1S	21	15						8	2.19	17.52					BLACK/FL. ORANGE ON TEMP. SIGN STANDS

STATE OF NEW HAMPSHIRE									
DEPARTMENT OF TRANSPORTATION * BUREAU OF BRIDGE DESIGN									
TOWN WOODSTOCK, NH			BRIDGE NO. 195/093			STATE PROJECT 42534			
LOCATION NH RTE 175 OVER PEMIGEWASSET RIVER									
CONSTRUCTION DETOUR SIGN SUMMARY								BRIDGE SHEET	
								17 of 17	
REVISIONS AFTER PROPOSAL		BY		DATE		CHECKED		BY	
		GS		06/2023		AMS		06/2023	
		JBM		06/2023		RJD		06/2023	
		QUANTITIES		CHECKED					
ISSUE DATE		FEDERAL PROJECT NO.		SHEET NO.		TOTAL SHEETS			
REV. DATE		X-A004(896)		21		21			

SHEET SCALE

Appendix B
Natural Resource Agency Coordination
Meeting Minutes

Woodstock-Lincoln 195/093, 42534

NHDOT Natural Resource Agency Coordination Meeting February 18, 2020

Jennifer Doyle-Breen, AECOM, provided an overview of the project site and scope. The project scope is to repair the southern pier of the bridge that carries NH Route 175 over the Pemigewasset River (195/093) in the Town of Woodstock. Sediments have continuously deposited upstream, resulting in the river veering towards the southwest and scouring the southern pier (Pier 1). Up to 15 feet of scour has occurred since the bridge was built in 1975. The upstream pile cap is undermined, and the steel H-piles are vertically exposed up to 4.5 feet. Calculations indicate that future scour could increase up to 17.5 feet below the existing streambed if no measures are implemented to stabilize the bridge pier.

Todd Dwyer, AECOM, discussed the potential scour repair alternatives. One of the alternatives entails installing sheet piles around the pier where scour has occurred to a depth below the current scour hole, and then backfilling the void inside of the sheet piles with either gravel or concrete. This option can be implemented under either dry or wet conditions. Dry sheet pile installation would involve installing temporary cofferdams upstream and downstream of the work area to direct water from the main channel of the Pemigewasset River into the side channel to the southwest, and thereby create a dewatered, dry area around the southern pier. The other sheetpile alternative involves working under wet conditions while the river is flowing and accessing the work area via a temporarily installed trestle from the east bank of the river. For either sheetpile alternative, splicing of sheetpiles may be needed due to the depth of the scouring.

The other options involve placing grout bags around the existing pier under wet, low flow river conditions and backfilling the scour hole below the pier with tremie concrete pumped from the bridge deck and grouting the voids. These last two alternatives would entail placing either rip-rap stone or A-Jacks concrete around the pier to restore the previously placed stone fill. Both countermeasure alternatives would be installed under wet conditions and would involve the same access trestle from the eastern bank as the wet sheetpile alternative. There is an existing access road on the eastern bank of the river that would be utilized up to the river edge.

J. Doyle-Breen discussed natural resources that are present in the project site. The watercourse boundaries were delineated in the field by a NH Certified Wetland Scientist (CWS), and this boundary is represented by flags placed in the field and picked up by a surveyor, however, it was not clearly demarcated as to whether this line was intended to be the Ordinary High Water (OHW) or the Top of Bank (TOB) or both (OHW/TOB). In addition, the surveyor identified the water level on the day that fieldwork was completed. These two areas were depicted on a figure in solid blue and blue hatching, and do not match exactly, as the CWS boundary depicts a greater area than the surveyor-identified water level. J. Doyle-Breen said that NH Fish and Game (NHFG) indicated that there are wood turtles in the vicinity of the project site. The project area is also within the habitat range of the northern long-eared bat (NLEB) and the river supports other non-protected aquatic life. The site is located within the 100-year floodplain and floodway of the Pemigewasset River. J. Doyle-Breen stated that the Pemigewasset River is protected as a Designated River but the location of the project site within the river is excluded from the protected corridor. J. Doyle-Breen detailed the estimated areas of permanent and temporary d. No impacts to vegetated wetlands are anticipated but impacts to watercourse and bank are anticipated.

Matt Urban, NHDOT Bureau of Environment, asked if the impact area estimates presented were based off the surveyor water level or CWS-delineated watercourse boundary. J. Doyle-Breen clarified that the preliminary impact estimates assumed that the surveyor water level represents the OHW and the CWS-delineated boundary represents the TOB. M. Urban stated that it should be assumed that the CWS-delineated boundary represents the OHW, or possible the OHW/TOB and should be labeled as such on the plans. The surveyor observed water level lines should be removed from the plans. J. Doyle-Breen will seek clarification from the CWS regarding the previous delineation and appropriately update the plans and impact areas.

Carol Henderson, NH Fish and Game, asked about sheet pile walls in dry conditions and asked if estimates for diverting the river to the smaller channel were accounted for in the impacts. J. Doyle-Breen said yes and then showed the table that shows the estimate but noted that the area of watercourse impact needed to be modified to correctly reflect the CWS flagged edge of watercourse and not bank.

J. Doyle-Breen noted that the dry alternative would facilitate equipment access and sheetpile installation and would allow a quicker construction period than the wet alternatives. All the wet alternatives would include the construction of the same trestle access from the eastern bank as the wet sheetpile alternative. There is an existing access road on the eastern bank of the river that would be utilized up to the river edge. Melilotus Dube, NHDOT Bureau of Environment, and Bill Saffian, NHDOT Bureau of Bridge Design, noted that based on previous discussions that day, the permitted impact for the trestle would be required to encompass the entire outline of the trestle, including the battered piles and not just the support piles, since means and methods cannot be dictated to the contractor. The permit application would acknowledge that impact area may be less. The contract documents would require the contractor to remove all component of the trestle at the end of construction.

Regarding the “dry” installation alternative involving installation of cofferdams to divert flow from the Pemigewasset mainstem to the western channel, Karl Benedict, NHDES Wetlands Bureau, expressed concern about the duration of work, maintenance of low flow condition, and impacts to aquatic life in the Pemigewasset River. K. Benedict also asked about the scour impacts to the smaller channel used for the diverted water and requested that impacts to the side channel be evaluated. He also asked about how the water quality in the river would be protected for work during wet conditions and noted that NHDES has not seen a lot of success with use of silt curtains, and it is likely that the work area would need to be isolated with cofferdam sheetpiles for any of the alternatives.

Rick Kristoff, US Army Corps of Engineers, mentioned that the project location is listed as an Essential Fish Habitat for the Atlantic Salmon and to consult with the National Oceanic and Atmospheric Administration.

Regarding the grout bag alternative involving placement of rip-rap stone around the pier, C. Henderson asked what would be done to ensure that the Class A stone would stay in place. T. Dwyer stated that this alternative would involve ongoing maintenance, as compared to the sheetpile alternative that would provide a more permanent solution. B. Saffian also indicated that the size of stone versus rip-rap would be specified to the contractor based on the scour calculations, so that the appropriate size of material would be placed to minimize movement.

Andrew O’Sullivan, NHDOT Bureau of Environment, stated that if grout was going to be added in the A-Jacks that measures would need to be included to make sure that the pH level does not increase.

B. Saffian asked whether the dry sheetpile alternative would be allowable or not. K. Benedict and C. Henderson stated that the cofferdam/dry alternative would have to be reviewed by NHFG and the DES Watershed Assistance Section to see if it is viable. K. Benedict indicated that the dry sheetpile alternative is not prohibited *per se* but needs to be vetted with NHFG and the NHDES Watershed Program regarding low flow requirements and the duration of how long the river would be dewatered would be a factor. C. Henderson said that the cofferdam idea is harder to sell than doing work in the dry and that in general NHFG would not recommend the cofferdam alternative involving river dewatering, but the decision would be up to NHDES. She indicated that duration of dewatering would be a factor and asked about the difference in project length for the wet versus dry options. T. Dwyer indicated that a construction schedule had not yet been fully developed but based on experience conducting work under wet conditions it might take three to four months, whereas work under the dry, de-watered conditions might take half that time. C. Henderson pointed out that the river dewatering option would require evaluating impacts to side channel, including scour and flooding. She also indicated that the time of year of dewatering would be a factor as NHFG would not want river dewatering to occur during peak spawning season for species such as bass or trout. All of these issues would require evaluation before NHFG could provide a final recommendation. C. Henderson also indicated that if the dry/cofferdam alternative were recommended, then NHFG would request that a survey be completed to identify whether mussels were present in this area of the river, and if so, that they be moved prior to work occurring. B. Saffian suggested that a less impactful dewatering alternative could be to place cofferdams such

that water flow is directed to the southwest side of the river, leaving the area on the northeast side dry to create a work area around the pier.

J. Doyle-Breen listed the anticipated permits required. Due to affecting greater than 200-linear feet of a watercourse, a NHDES Major Impact Standard Dredge and Fill Permit will be needed. Discussion was held regarding whether impacts to the protected shoreland could be permitted via Permit-by-Notification (PBN). AECOM will review the impact limitations for PBN; the only portion of the project that would require shoreland permitting would be a relatively small area upslope of the CWS watercourse boundary on the northeast side of the river and the existing access road that parallels Route 175 perpendicular to the river, which would provide access from the road. The project will require a USACOE Pre-Construction Notification in order to qualify under the NH General Permit 2 regarding repair and maintenance of existing structures and fill. J. Doyle-Breen indicated that during consultation with NH Fish and Game as part of the Natural Heritage Bureau DataCheck follow-up, Kim Tuttle, NH Fish and Game requested that to mitigate impacts to wood turtle, lining of the entire channel width with angular rip-rap be avoided and use of polypropylene erosion control measures be avoided. J. Doyle-Breen indicated that the cofferdam/dry construction option had not been vetted with NHFG and that further consultation would occur if this option were to be advanced. Consultation with the US Fish and Wildlife Service resulted in a "No Effect" determination for NLEB under the 2018 Federal Highway Administration, Federal Rail Administration, and Federal Transit Administration Programmatic Biological Opinion. Consultation with NH Division of Historic Resources is underway.

All temporarily disturbed areas for construction access would be restored and therefore would not require mitigation. Because the project involves replacement of previous fill, the compensatory mitigation exemption for repairing/maintenance of previous fills was assumed to apply and that mitigation for fill around the pier itself would not be required. Lori Sommer, NHDES Wetlands Bureau, was not present and K. Benedict suggested following up with her to confirm whether the compensatory mitigation exemption applies. T. Dwyer mentioned that there may be a potential future need for bank stabilization on the southwestern bank where scouring has also occurred. K. Benedict indicated that if needed, the decision process outlined in the wetland regulations would need to be followed to determine if natural bank stabilization were possible prior to proposing placement of rip-rap on the bank. In the event that mitigation is required, the Town of Woodstock has been contacted to identify whether there were any identified priority mitigation projects, and none had yet been identified based on consultation with the Town to date. It was also mentioned that the Coast Guard should be consulted regarding proposed work on the bridge.*

*Subsequent to the meeting, the Coast Guard confirmed that the Pemigewasset River is considered a navigable waterway and appropriate consultation would be required.

Woodstock-Lincoln 195/093, 42534
NHDOT Natural Resource Agency Coordination Meeting May 20, 2020

Jennifer Doyle-Breen, AECOM, presented the slides describing the project, impacts, and goals for the meeting. She provided an overview of the project site and scope and reminded the group that this project was initially presented at the February 18, 2020 meeting. The project scope is to repair the southern pier of the bridge that carries NH Route 175 over the Pemigewasset River (195/093) in the Town of Woodstock. Up to 15 feet of scour has occurred since the bridge was built in 1975. Calculations indicate that future scour could increase up to 17.5 feet below the existing streambed if no measures are implemented to stabilize the bridge pier. Natural resources present include the Pemigewasset River watercourse and adjacent Bank, 100-year floodplain, 250-foot Protected Shoreland, Atlantic salmon, and wood turtle. No vegetated wetlands are present. The confusion regarding the Certified Wetland Scientist (CWS) Ordinary High Water (OHW) line and the surveyor identified limit of water has been resolved. The surveyed line has been removed, and the CWS confirmed that the flag line shown represents both TOB and OHW.

J. Doyle-Breen indicated that there are alternative permanent scour repair measures as well as alternative construction access approaches, and any scour repair alternative can be matched with any of the construction access alternatives. She described the potential permanent scour repair alternatives, which include the following:

- Alternative I: installing permanent sheet pile around the pier where scour has occurred to a depth below future calculated scour depth, and then backfilling the void inside of the sheet pile with gravel.
- Alternative II: installing a temporary sheet pile cofferdam, installing concrete in the scour hole under the pier as a structural repair, as well as riprap fill in the river as a hydraulic countermeasure.
- Alternative III: installing a temporary sheet pile cofferdam, installing concrete in the scour hole under the pier as a structural repair, as well as A-Jacks fill in the river as a hydraulic countermeasure.

These options are similar to those described in February, although Alternatives II and III have been modified to include a temporary cofferdam around the repair work area to allow concrete placement work in a dry rather than wet condition in order to protect water quality by facilitating an isolated work area and then pumping/monitoring/treatment of water before it is discharged back into the river. Alternative I, involving permanent sheetpile, is the least costly alternative and includes the smallest footprint, and is therefore preferred.

J. Doyle-Breen then described the access alternatives and illustrated these by showing plans for each. The access alternatives include the following:

- Alternative A: Southwest Temporary Road/Upstream Causeway
- Alternative B: Southeast Temporary Road/Downstream Causeway
- Alternative C: Existing Path Widening/Northeast Downstream Causeway
- Alternative D: Existing Path Widening/ Northwest Upstream Causeway
- Alternative E: Existing Path Widening/Northeast Downstream Trestle

Of the access alternatives, all involve temporary fill in the river and banks to varying degrees. Compared to Alternatives A through D, Alternative E is significantly more expensive, and therefore not preferred. Alternatives A through D offer various pros and cons. Alternatives A and B include some safety concerns as they require construction of a new access road with an 8% slope. Also, these alternatives do not include readily available staging areas, so additional impacts would be required for clearing at the base of the slopes for staging. Alternatives C and D would allow staging to occur at the end of the existing access path in an area adjacent to the river. Alternative C is the longest causeway, while Alternative D includes the greatest area of fill in the river. Alternative D offers many advantages, including a shorter construction period and the potential use of mats by the contractor rather than construction of a causeway for the entire construction length, if low flows during construction made use of mats feasible.

J. Doyle-Breen reviewed the list of permits required, including NH DES Wetland and Shoreland Permits; US Army Corps of Engineers General Permit regarding repair/maintenance of existing structures and fills, and potentially a

Coast Guard Bridge Permit. Due to the presence of Atlantic salmon, an Essential Fish Habitat (EFH) analysis to be reviewed by the National Marine Fisheries Service (NMFS) will be required. NH Fish and Game (NHFG) indicated that there are wood turtles in the vicinity of the project site and requested that polypropylene erosion control be avoided and that the entire river width not be filled with riprap; both requests can be accommodated. The project area is also within the habitat range of the northern long-eared bat (NLEB); a bat survey was conducted, and no signs of bat were found. Consultation with the US Fish and Wildlife Service resulted in a “No Effect” determination for NLEB under the 2018 Federal Highway Administration, Federal Rail Administration, and Federal Transit Administration Programmatic Biological Opinion.

In regard to wetland mitigation, J. Doyle-Breen indicated that all temporarily disturbed areas for construction access would be restored and therefore would not require mitigation. Because the project involves replacement of previous fill, the compensatory mitigation exemption for repairing/maintenance of previous fills was assumed to apply and that mitigation for fill around the pier itself would not be required. If mitigation is required, the Town of Woodstock was contacted to identify whether there were any identified priority mitigation projects, and none have been identified.

J. Doyle-Breen closed the presentation by reiterating that Alternative I, Permanent Sheetpile, was the preferred alternative for the scour repair and that Alternative E was not preferred for access due to high cost. Of the remaining Alternatives, A through D were all viable and offered various pros and cons, but that Alternative D was identified as the most advantageous option. All expressing opinions were in favor of Alternative I for the permanent repair, but extensive discussion amongst the attendees was held regarding the benefits and disadvantages of the various construction access alternatives, as detailed below.

Peter Steckler, Nature Conservancy, suggested that the access alternatives on the downstream side of the bridge would benefit from a shadow effect and limit erosion.

Bill Saffian, NHDOT Bureau of Bridge Design, emphasized the traffic impact associated with Alternatives A and B, as alternating one-way traffic would be required to accommodate construction vehicle access. He also noted that there would be a concrete cap on top of the permanent sheetpile for scour repair Alternative I, but that this would be cast out of the water rather than in-place.

Karl Benedict, NHDES Wetlands Bureau, stated that there were some concerns with water quality issues for any of the causeway alternatives and that any stone placed needed to be clean, washed stone. He noted that matting is a great option during the time of year with shallow flows. Rick Devanna, AECOM, explained that the causeways would likely be constructed by placing a geotechnical liner on the riverbed, with relatively large rock from the bottom of the access causeway to near the top, and finer/smaller rock material at top, filling voids to provide a construction vehicle drivable surface. The agencies expressed concern with use of finer material due to water quality concerns. Karl also stated that clarification was needed relative to the relief piping as shown and if there are additional impacts for these areas.

Lori Sommer, NH DES Wetlands Bureau, indicated that limitation on the extent of the causeway construction was her biggest concern. She suggested that construction could occur in the fall, when less traffic would minimize safety and traffic concerns associated with Alternatives A and B, since these had the shortest causeways. Regarding the pros identified for Alternatives C and D, L. Sommer indicated that she would want to see more detail regarding the difference in construction period and in the water quality measures to protect the river and bed referenced on the slides.

Carol Henderson, NH Fish and Game, stated that the state no longer has an Atlantic salmon management program in the Pemigewasset River, so any concerns about time of year restrictions would arise from the NMFS EFH review. J. Doyle-Breen indicated that feedback from NMFS had not yet been obtained. C. Henderson also indicated that she would prefer Alternative B because it involved a shorter causeway in the river.

Rick Kristoff, US Army Corps of Engineers, and Beth Alafat, EPA, both indicated that they had no questions or comments.

Sarah Large, NHDOT Bureau of Environment, indicated that she had received a note from Amy Lamb, NH Natural Heritage Bureau noting that coordination regarding the NLEB was needed*. In addition, S. Large asked L. Sommer to confirm that if the proposed permanent fill was within the footprint of the original fill placed to protect the bridge pier, then mitigation would not be required. L. Sommer agreed. S. Large also asked NH DES to confirm the assumption that even though the Pemigewasset is a Tier 3 Stream under the wetland regulation definitions, because the project was not a new crossing and involved replacement of fill with no change to hydraulics, then the Stream Crossing Rules would not apply. K. Benedict confirmed this assumption and clarified that the wetland application should discuss hydraulics in a narrative format and explain why the river hydraulics will not change based on the proposed repairs.

Additional discussion was held amongst the group regarding the advantages and disadvantages of the various alternatives, including the need to consider the impacts of the project to Protected Shoreland. Shoreland impacts were not identified on the slides, but J. Doyle-Breen indicated that impacts to Protected Shoreland for Alternatives A and B were orders of magnitude greater than those for C and D, due to the presence of the existing access path on the north side of the river. J. Doyle-Breen indicated that in approximate numbers, Shoreland impacts for Alternatives A and B were between 11,000 and 14,000 square feet, whereas those for Alternatives C and D ranged between 2,500 and 3,500 square feet. Mark Hemmerlein, NHDOT Bureau of Environment, noted that the aerial photos suggest that access could be accomplished via Alternative B by driving equipment over a sandbar into the river, with minimal need for constructing a causeway. The discussion ended with an agreement that a site visit was needed to observe conditions associated with each alternative, and this was subsequently scheduled for Friday, May 29 at noon.

*Subsequent to the meeting, AECOM was asked to re-evaluate the IPaC questionnaire to confirm the “No Effect” finding and applicability of the 2018 Federal Highway Administration, Federal Rail Administration, and Federal Transit Administration Programmatic Biological Opinion for NLEB, and this review is currently underway.

Woodstock-Lincoln 195/093, 42534

NHDOT Natural Resource Agency Coordination Meeting Site Visit Friday May 29, 2020

Attendees:

NHDOT

Andrew O'Sullivan, Bureau of Environment
Mark Hemmerlein, Bureau of Environment
Bill Saffian, Bureau of Bridge Design
Steve Glines, Bureau of Construction

NHDES

Karl Benedict, Wetlands Bureau

AECOM

Jennifer Doyle-Breen
Richard Devanna
Todd Dwyer

The group of attendees assembled to review the four access alternatives under consideration for construction access, which include:

:

- Alternative A: Southwest Temporary Road/Upstream Causeway
- Alternative B: Southeast Temporary Road/Downstream Causeway
- Alternative C: Existing Path Widening/Northeast Downstream Causeway
- Alternative D: Existing Path Widening/ Northwest Upstream Causeway

All in attendance agreed that Alternative C was the least desirable as it crosses the deepest part of the river and requires the longest causeway. Therefore, this has been dismissed from further consideration.

Alternative A offers the advantage of a shorter length of causeway in the river as compared to Alternatives B and D, however construction of a causeway for this alternative requires crossing one of the deeper and faster flowing areas of the river, and may also necessitate installation of a cofferdam in the river upstream of the work area to divert flow. Use of Alternative A would also require clearing mature trees to facilitate staging and access. Therefore, this alternative was also dismissed from further consideration.

Alternatives B and D offer different advantages and disadvantages, which were discussed at length during the visit.

Alternative B would involve a shorter total causeway than Alternative D and the area that would be cleared consists mainly of shrubs such as Staghorn Sumac, which could easily be replanted. Bill Saffian, NHDOT Bureau of Bridge Design, reiterated the safety concern regarding Alternative B as it would require construction of a new access road with an 8% slope that joins Rt 175 on a curve. Steve Glines, DOT Bureau of Construction, indicated that Alternative B would require instituting traffic controls to facilitate a 1-lane, alternating 2-way traffic pattern and would require cutting down through the road bed material to provide access that wasn't a complete fill section. Also, this alternative does not include readily available staging areas, so equipment and material stockpiles would need to be staged at the northern side of the river and transported across the bridge to the south side access. Use of Alternative B for would facilitate access to the downstream side of the pier needing scour repair, but may require use of a portadam to divert flow since the access still traverses a deeper, faster flowing portion of the river as compared to Alternative D. Jennifer Doyle-Breen, AECOM, stated that the currently calculated impacts do not include a portadam. Karl Benedict, NH DES Wetlands Bureau, indicated that because the currently projected river

watercourse impacts for Alternative B are less than 10,000 square feet, this alternative would be considered a Minor project by DES Wetlands, and therefore compensatory mitigation would not be required. However, water quality issues remain a concern due to the placement of imported rock and stone into the river, even if clean washed stone were stipulated. Thus, the natural resource agencies view a shorter causeway as being a substantial positive for Alternative B. If the Alternative B access road were proposed to remain in place permanently, information regarding impacts on the 100-year floodplain would be needed.

Alternative D involves a longer causeway because, even though flows on many days such as the day of the visit would be low enough to allow use of timber mats for much of the access distance, it cannot be guaranteed that during construction flows would be low enough to facilitate use of mats versus construction of a causeway for the entire access length. Karl Benedict of NH DES indicated that the wetland permit will stipulate that work must occur during low flow conditions and that if flows are predicted to rise due to a storm, equipment would need to be removed from the river, although the causeway would stay in place. The length of the causeway is a concern to the agencies due to amount of stone/rock fill needed and the potential impact on water quality.

NH DOT and AECOM pointed out that there are several advantages to Alternative D including:

- There is no clearing required in the Protected Shoreland
- The existing access road can be used, which would eliminate the traffic safety concerns associated with Alternative B, and also eliminate the need for traffic controls and the need to bench cut through the roadway to minimize access road fills.
- Due to the more shallow water associated with Alternative D, there is more flexibility for the contractor; it may be possible for the contractor to use mats during low flows so that actual causeway length could be reduced and may only be the distance between the sandbar to the west of the bridge and the southern pier.
- Because Alternative D accesses the pier from upstream, there is a more favorable work angle and flow diversion would not be needed.
- There is an existing cleared area that can be used for staging at the upslope end of the existing access road

Karl Benedict indicated that because Alternative D would fill more than 10,000 square feet of area in the river, it would be considered a Major project, requiring compensatory mitigation. Therefore, the permit application would need to include a plan for removal of stone/rock fill placed for the causeway, as well as monitoring to confirm success of the restoration measure. He also indicated that a requirement for Alternative D would be a plan to revegetate the existing cleared access road after construction, to prevent stormwater runoff from transporting sediments into the river. Restoration would be required for a distance of 250-feet from the edge of the river (it should be noted that this was not an anticipated project expense). The same concern identified for Alternative B regarding water quality impacts of placing stone/rock fill in the river would apply to Alternative D. Although Alternative D includes more stone/rock fill, both options would require use of mixing zone and water quality monitoring. Proposal for this approach needs to be described in wetland application. Karl also indicated that the option of using timber mats for part of the access would be viewed favorably. Discussion regarding Alternatives B and D included the fact that a causeway upstream of the work area would divert the higher velocity water from the underwater work area and that the Alternative D causeway would serve this purpose. In contrast, Alternative B would require the addition of a portadam to achieve diversion of high velocity water.

A question was raised regarding public access concerns during construction. Bill Saffian clarified that the entire area between the bridge and Route I93 is within NH DOT Right-of-Way, including the existing access road. Public access can be prohibited during construction.

At the conclusion of the meeting, it was agreed by all in attendance that there were both pros and cons to both Alternatives B and D and either could potentially be acceptable depending on the permit application discussion of positive and negative features of each option and the associated mitigation measures, and that it would be up to DOT to select an alternative that they could support as the preferred which reduces impacts to the maximum extent

possible. Karl Benedict, NH DES Wetlands Bureau, and Andy O'Sullivan, NHDOT Bureau of Environment, agreed that there would be no need for this project to be heard at another Natural Resource Agency Coordination meeting. Karl indicated that he would be the one reviewing the permit application when it is submitted, and that if needed AECOM could email him, Lori Sommer (NH DES Wetlands Bureau) and Andy O'Sullivan with any additional questions. Karl further suggested that once the preferred alternative is decided upon and the project impact numbers are finalized, it would be beneficial for AECOM to email this information to him, Lori Sommer and Andy O'Sullivan to confirm mitigation requirements.

Woodstock 42534, Bridge No. 093

NHDOT Natural Resource Agency Coordination Meeting November 17, 2021

Jennifer Doyle-Breen, AECOM, introduced the project, impacts, and construction access alternatives goals for the meeting. Andy O'Sullivan, NHDOT BOE, asked about the date of the cover photo, as the water levels appeared higher than he had seen them when at the site. Subsequent to the meeting AECOM checked the photo files; the cover photo was taken on November 4, 2018. J. Doyle-Breen provided an overview of the project site and scope and reminded the group that this project had been previously presented at the February 18, 2020 and May 20, 2020 meetings, and that a site visit attended by Karl Benedict, NHDES, as well as staff from both NHDOT (A. O'Sullivan and Mark Hemmerlein, Bureau of Environment; Bill Saffian, Bureau of Bridge Design, and Steve Glines, Bureau of Construction) and AECOM (J. Doyle-Breen, Todd Dwyer, and Rick Devanna) occurred in May 2020. The project scope is to repair a scour hole that has developed under the southern pier, Pier I, of the bridge that carries NH Route 175 over the Pemigewasset River (195/093) in the Town of Woodstock. Up to 15 feet of scour has occurred since the bridge was built in 1975. Calculations indicate that future scour could increase up to 17.5 feet below the existing streambed if no measures are implemented to stabilize the bridge pier. Natural resources present include the Pemigewasset River watercourse and adjacent Bank, 250-foot Protected Shoreland, Atlantic salmon habitat, and wood turtle. No vegetated wetlands are present. Northern Long-Eared Bat (NLEB) is ubiquitous in the region, however no known hibernacula or roosting trees are known to occur at the project site.

J. Doyle-Breen indicated that at past meetings alternative permanent scour repair measures as well as alternative construction access approaches had been discussed. For the scour repair itself, Alternative I, involving permanent sheetpile and placement of stone and tremie grout in dry conditions, was selected (as discussed at the May 20, 2020 NRACM) because its footprint is limited to the original riprap footprint that had been constructed around the pile supported pier, it has the smallest footprint, and it is the least costly alternative. The construction access is the most challenging part of the project, and much analysis of various access alternatives has occurred since May 2020.

At the May 2020 site visit, the following access alternatives were reviewed, and at that time the potentially preferred access was narrowed to Alternatives B and D.

- Alternative A: Southwest Temporary Road/Upstream Causeway
- Alternative B: Southeast Temporary Road/Downstream Causeway
- Alternative C: Existing Path Widening/Northeast Downstream Causeway
- Alternative D: Existing Path Widening/ Northwest with cross over to Upstream Causeway
- Alternative E: Existing Path Widening/Northeast Downstream Trestle

J. Doyle-Breen shared graphics illustrating the original Alternatives B and D access routes and the envisioned causeways needed for either approach. As shown in the figures, both alternatives require accessing the entire circumference around the scoured pier, which results in a similar amount of stone fill in the river. To minimize stone fill, a substantial portion of the access pathway would be accomplished with construction mats along the northeastern shore for Alternative D. Since both Alternative B and D would involve a similar amount of stone fill in the river, both of these original alternatives include concerns regarding turbidity during construction. Alternative D also posed a concern regarding the need to by-pass flow through the access causeway in the main portion of the river channel. The original Alternative B does not offer the opportunity to use mats and results in a similar amount of rock fill in the river as compared to Alternative D. Alternative B also requires greater disturbance in the 250-foot Protected Shoreland due to the need to construct a new access road in the roadway sideslope.

To address continued concerns associated with the original Alternatives B and D, and after discussion with Steve Glines from the DOT Construction Bureau, a Modified Alternative B was developed, incorporating a three-sided cofferdam to create a relatively dry work area from the Alternative B access point. The graphic included in the presentation illustrates this alternative which still involves some stone fill in the river for access but minimizes exposure of the stone fill to the flow of the river due to the use of temporary sheetpile combined with the permanent sheetpile installed as part of the final scour protection measures. In addition to the rock fill, geotextile fabric would be installed in the remainder of area inside the sheetpiles to facilitate equipment access and temporary stockpiling of

materials. A new access road would be constructed off of Route 175. Todd Dwyer, AECOM, explained the construction sequencing of the Modified Alternative B, which would occur as follows:

1. Construct access road to toe of slope at river.
2. Install sheet piles, including guide piles, on the upstream side of the bridge from the southerly abutment shoreline out toward the southerly pier to divert water beyond the southerly pier into span 2 (these would be installed from the bridge deck). A portion of these sheet piles will be temporary and a portion permanent
3. Continue constructing the access road in the riverbed to reach the downstream end of the southerly pier by incrementally placing stone and temporary sheetpiles within reach of machinery and install double turbidity curtain along northern work edge.
4. Install northern permanent sheetpiles below bridge using Giken Vibro Pile technology or similar with spliced piles utilizing the same incremental placement of stone and sheetpile to connect to the permanent sheetpile previously placed on the upstream side.
5. Install the geotextile fabric for the laydown/access area and install the remaining permanent sheetpiles below the bridge on the southerly and easterly sides of the pier.
6. Install the stone fill inside the permanent sheetpile cofferdam, grout the voids, and install topping slab

J. Doyle-Breen reviewed the impacts for Alternatives B, D and Modified B. Alternative B involves about half of the amount of stone fill as the original Alternatives B and D. Original Alternative B and Modified Alternative B involve the greatest area of 250-foot Shoreland impact due to the need to construct the new access road. J. Doyle-Breen reviewed the mitigation measures including work during low flow, construction sequencing (as discussed by T. Dwyer) to minimize work in flowing water, turbidity curtain, and revegetation of cleared Shoreland. She also noted that Lori Sommer (NHDES) had previously confirmed that mitigation would not be required for the permanent fill since it will be within the footprint of the original fill placed to protect the bridge pier. Although work would be done under low flow conditions, if a large storm such as a hurricane were forecasted during the construction period, all equipment and material would be removed from the river in advance of the storm. The sheetpiles would remain in place, however the river would be able to overflow the sheetpile and occupy the flood storage area inside the work area once water levels reached and overtopped the sheetpile vent elevation

J. Doyle-Breen presented the list of permits required, including NH DES Wetland and Shoreland Permits; US Army Corps of Engineers General Permit regarding repair/maintenance of existing structures and fills, and potentially a Coast Guard Bridge Permit. Due to the presence of Atlantic salmon, an Essential Fish Habitat (EFH) analysis to be reviewed by the National Marine Fisheries Service (NMFS) will be required. The project area is also within the habitat range of NLEB; a bat survey was conducted in 2019, and no signs of bat presence were found. This survey will be re-done due to the time that has passed since the original survey completion. Consultation with the US Fish and Wildlife Service resulted in a "Likely to Adversely Effect" determination for NLEB under the 2018 Federal Highway Administration, Federal Rail Administration, and Federal Transit Administration Programmatic Biological Opinion. There are no archaeological issues with Alternative B Modified.

J. Doyle-Breen summarized by stating that Alternative B Modified offers advantages over the other construction access alternatives due to the smaller amount of rock fill and work outside of the main portion of the channel. Although it does involve dewatering a portion of the river for the 8 – 10 weeks of construction, the work would be done in low flow conditions, and some of the area within the sheetpiles may be dry during low flow conditions. The goal is to reach consensus with those present at the meeting that Alternative B Modified appears to be the best option in a challenging construction work environment, so that the project can move forward with completing and submitting permit applications.

A. O'Sullivan opened the meeting for questions from the agencies. K. Benedict stated that he was in favor of the Modified Alternative B. He inquired if the upstream temporary sheetpile could be angled rather than perpendicular to the flow. Bill Saffian (NHDOT Bridge) responded that since the sheetpile would be placed from the bridge, the reach of the equipment would limit how far the sheetpile could be placed from the bridge. K. Benedict asked about

water quality monitoring and whether a 10 NTU differential could be maintained during construction or a mixing zone would be needed. Mark Hemmerlein (NHDOT BOE) stated that because the water levels will be very low, a mixing zone is difficult to implement and may be limited to a 100-foot width. K. Benedict suggested that coordination with Gregg Comstock of the Watershed Bureau should be consulted in regard to appropriate measures to protect water quality.

J. Doyle Breen noted that K. Benedict had previously confirmed that even though the Pemigewasset is a Tier 3 Stream under the wetland regulation definitions, because the project was not a new crossing and involved replacement of fill with no change to hydraulics, then the Stream Crossing Rules would not apply. K. Benedict confirmed this assumption and clarified that the wetland application should discuss hydraulics in a narrative format and explain why the river hydraulics will not change based on the proposed repairs. A. O'Sullivan clarified that the NHDES wetland application would therefore omit standard stream-crossing data typically submitted, such as reference reach comparisons.

L. Sommer asked if the 8 – 10 week construction period included the entire project, including the new access road. T. Dwyer replied that yes this schedule estimate is based on recent experience on similarly sized projects and would include all construction elements.

L. Sommer asked about how the slope would be restored in the area of the access road. T. Dwyer and J. Doyle-Breen responded that the slope would be regraded to pre-existing conditions and revegetated. L. Sommer also asked for confirmation whether the temporary sheetpile would be removed at the conclusion of construction, and T. Dwyer confirmed that it would be removed.

Carol Henderson (NH Fish and Game) stated that she had previously advocated for Alternative B because it involved a shorter causeway in the river and was in favor of Modified Alternative B.

The following agency representatives had no comments: Mike Hicks (US Army Corps of Engineers Regulatory Division), Jeanie Brochi (US EPA), and Pete Stickler (The Nature Conservancy). Jamie Sikora of the Federal Highway Administration asked about the life span of the permanent scour protection proposed; T. Dwyer replied that the design was anticipated to have a useful life of 75 years or greater.

B. Saffian stated that the construction of the new access road may require excavating into the road along with one-lane, alternating two-way traffic control with temporary signals for the duration of the work.

Appendix C
Wetland Function-Value
Evaluation Form



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.: Scott, David L. (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 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 Written Narrative (NHDES-W-06-089) or 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 with 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: <u>Wooded</u>	
CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): <u>0, overhead Rt. 175</u>	
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: <u>Terry Ramborger, CWS #013</u>	
DATE(S) OF SITE VISIT(S): <u>10-25-19 & 4-23-20</u>	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 field if "other"): <input checked="" type="checkbox"/> USACE Highway Methodology. <input type="checkbox"/> Other scientifically supported method (enter name/ title): 	

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

SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
WETLAND ID: Pemigewasset River, Woodstock, NH	LOCATION: (LAT/ LONG) 43.979582/-71.680468
WETLAND AREA: N/A	DOMINANT WETLAND SYSTEMS PRESENT: Riverine
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? River only	COWARDIN CLASS: R2UBH, from USFWS Wetlands Mapper on 5/8/20
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input type="checkbox"/> Yes <input type="checkbox"/> No if not, where does the wetland lie in the drainage basin? N/A	IS THE WETLAND PART OF: <input checked="" 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 type="checkbox"/> Yes <input checked="" 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 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	<input type="checkbox"/> Yes <input type="checkbox"/> No	N/A
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 NHF&G; 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	N/A	N/A	N/A	N/A	N/A
2					
3					
4					
5					
6					
7					
8					

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SECTION 6 - STREAM RESOURCES SUMMARY				
DESCRIPTION OF STREAM: Pemigewasset River		STREAM TYPE (ROSGEN):		
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 river supports a variety of state & local resources.				
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	1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Lack of habitat stressors, presence of aquatic species, good wildlife habitat & water quality.
2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4,5,11,13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Site remote to populations.
3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,3,4,5,6,7,8,9,12,13,14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Permanent watercourse with known history of fisheries, 10 known species noted.
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6,7,9,13,14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Stream in area of consideration surrounded by flat topography.
5	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,3,4,7,8, 15	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Floodplains adjacent with frequent charging, evidence of flooding debris.
6	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	River known to contain protected species, e.g. avian & bats
7	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,5	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Waterflow channelized & flows swiftly most of the year.
8	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,3,4,5,6,11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Known history of fisheries.
9	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5,6,7,8,9,10,11,12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Scenic vistas of river easily seen from overlying road.
10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8,10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Water moves swiftly through the stream most of the year.
11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,6,8,9,11,12,14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Shoreline vegetation along the stream is providing a stabilization function.
12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3,7,10,11,16,18,19,22,26,30	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Important fisheries habitat

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13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,4,5,6,8,9,12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	River provides recreational opportunities such as hiking, boating & fishing.
14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,4,5,8,12,17,18,21	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	River provides habitat for resident/migratory species.

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

- Wildlife and vegetation diversity/abundance list.
- Photograph of wetland attached.
- 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 for more information)

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Species Observed within or Near the Limits of Work for the NHDOT Woodstock-Lincoln 42534 Bridge Scour Protection Project

Vegetation

Scientific Name	Common Name
<i>Acer rubrum</i>	Red maple
<i>Agrostis alba</i>	Redtop
<i>Athyrium filix-femina</i>	Lady fern
<i>Betula allegheniensis</i>	Yellow birch
<i>Betula papyrifera</i>	White birch
<i>Betula populifolia</i>	Grey birch
<i>Carex</i> sp.	Sedge
<i>Celastrus orbiculatus</i>	Asiatic bittersweet
<i>Clematis virginiana</i>	Virgin's bower
<i>Cornus alternifolia</i>	Alternatleaf dogwood
<i>Dichanthelium clandestinum</i>	Deer-tongue grass
<i>Fagus grandifolia</i>	American beech
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Lysimachia terrestris</i>	Swamp candle
<i>Onoclea sensibilis</i>	Sensitive fern
<i>Parthenocissus quinquefolia</i>	Virginia creeper
<i>Phalaris arundinacea</i>	Reed canarygrass
<i>Pinus strobus</i>	White pine
<i>Polygonum cuspidatum</i>	Japanese knotweed
<i>Populus grandidentata</i>	Big-tooth aspen
<i>Prunus serotina</i>	Black cherry
<i>Quercus rubra</i>	Northern red oak
<i>Rhus typhina</i>	Staghorn sumac
<i>Rubus allegheniensis</i>	Allegheny blackberry
<i>Salix</i> spp.	Willows
<i>Schizachyrium scoparium</i>	Little bluestem
<i>Solidago gigantea</i>	Late goldenrod
<i>Solidago rugosa</i>	Rough-stem goldenrod
<i>Spiraea alba</i>	Meadowsweet
<i>Tsuga canadensis</i>	Canada hemlock

Wildlife

Scientific Name	Common Name
<i>Anaxyrus americanus</i>	Eastern American toad
<i>Buteo jamaicensis</i>	red-tail hawk
<i>Poecile atricapillus</i>	black-capped chickadee

Appendix D

NHB Datacheck Report and Correspondence

New Hampshire Natural Heritage Bureau NHB DataCheck Results Letter

To: Taelise Ricketts
250 Apollo Drive
Chelmsford, MA 01824

From: NH Natural Heritage Bureau

Date: 5/2/2023 (This letter is valid through 5/2/2024)

Re: Review by NH Natural Heritage Bureau of request dated 5/2/2023

Permit Type: Wetland Standard Dredge & Fill - Major

NHB ID: NHB23-1339

Applicant: Taelise Ricketts

Location: Woodstock
Tax Map: N/A, Tax Lot: N/A
Address: Woodstock 195/093 Bridge on NH-175 over the Pemigewasset River

Proj. Description: Previous Project Number: NHB22-1876. The water flow within the Pemigewasset River has resulted in erosion around the bridge support piers, which is known as scouring. To address the scour condition and prevent future damage, repairs will be implemented by the NH Department of Transportation.

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

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

Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

MAP OF PROJECT BOUNDARIES FOR: NHB23-1339



Appendix E

USFWS IPaC Report and Correspondence



United States Department of the Interior



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

In Reply Refer To:

October 12, 2022

Project code: 2022-0057968

Project Name: NH DOT 42534 Woodstock 195/093 Bridge Scour Repairs (2022)

Subject: Consistency letter for the 'NH DOT 42534 Woodstock 195/093 Bridge Scour Repairs (2022)' project under the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated October 12, 2022 to verify that the **NH DOT 42534 Woodstock 195/093 Bridge Scour Repairs (2022)** (Proposed Action) may rely on the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action is within the scope and adheres to the criteria of the PBO, including the adoption of applicable avoidance and minimization measures, and may affect, and is likely to adversely affect the endangered Indiana bat (*Myotis sodalis*) and/or the threatened Northern long-eared bat (*Myotis septentrionalis*). Consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required.

This "may affect - likely to adversely affect" determination becomes effective when the lead Federal action agency or designated non-federal representative requests the Service rely on the PBO to satisfy the agency's consultation requirements for this project. Please provide this consistency letter to the lead Federal action agency or its designated non-federal representative for review, and as the agency deems appropriate, transmit to this Service Office for verification that the project is consistent with the PBO.

This Service Office will respond by letter to the requesting Federal action agency or designated non-federal representative within 30 calendar days after receiving request for verification to:

- verify that the Proposed Action is consistent with the scope of actions covered under the PBO;
- verify that all applicable avoidance, minimization, and compensation measures are included in the action proposal;
- identify any action-specific monitoring and reporting requirements, consistent with the monitoring and reporting requirements of the PBO, and
- identify anticipated incidental take.

ESA Section 7 compliance for this Proposed Action is not complete until the Federal action agency or its designated non-federal representative receives a verification letter from the Service.

If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or Northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA Section 7(a)(2) may be required.

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

If the Proposed Action may affect any other federally-listed or proposed species and/or designated critical habitat, additional consultation between the lead Federal action agency and this Service Office is required. If the proposed action has the potential to take bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act may also be required. In either of these circumstances, please advise the lead Federal action agency accordingly.

The following species may occur in your project area and **are not** covered by this determination:

- Canada Lynx *Lynx canadensis* Threatened
 - Monarch Butterfly *Danaus plexippus* Candidate
-

Project Description

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

Name

NH DOT 42534 Woodstock 195/093 Bridge Scour Repairs (2022)

Description

Water flow within the Pemigewasset River has resulted in erosion around the bridge's support piers. To remediate the scouring, permanent sheet piles will be installed around the southern bridge pier within the footprint of the original rip-rap where a scour hole now exists. Stone will be placed inside of the permanent sheet piles to repair the scour hole. During construction, additional, temporary steel sheet piles will be installed along the east and west side of the abutment to create a dry work area by diverting upstream flow around the construction area. A temporary access road will be installed from Eastside Road to access the construction area around the southern bridge pier.

Determination Key Result

Based on your answers provided, this project is likely to adversely affect the endangered Indiana bat and/or the threatened Northern long-eared bat. Therefore, consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required. However, also based on your answers provided, this project may rely on the conclusion and Incidental Take Statement provided in the revised February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat.

Qualification Interview

1. Is the project within the range of the Indiana bat^[1]?

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

Automatically answered

No

2. Is the project within the range of the Northern long-eared bat^[1]?

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

Automatically answered

Yes

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

A) *Federal Highway Administration (FHWA)*

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

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

No

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

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

No

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

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

No

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

No

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

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

[2] The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR Section 402.02). Further clarification is provided by the [User's Guide for the Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat](#).

Yes

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

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

Yes

10. Will the project clear more than 20 acres of suitable habitat per 5-mile section of road/rail?

No

11. Have presence/probable absence (P/A) summer surveys^{[1][2]} been conducted^{[3][4]} **within** the suitable habitat located within your project action area?

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

[2] Presence/probable absence summer surveys conducted within the fall swarming/spring emergence home range of a documented Indiana bat hibernaculum (contact local Service Field Office for appropriate distance from hibernacula) that result in a negative finding requires additional consultation with the local Service Field Office to determine if clearing of forested habitat is appropriate and/or if seasonal clearing restrictions are needed to avoid and minimize potential adverse effects on fall swarming and spring emerging Indiana bats.

[3] For projects within the range of either the Indiana bat or NLEB in which suitable habitat is present, and no bat surveys have been conducted, the transportation agency will assume presence of the appropriate species. This assumption of presence should be based upon the presence of suitable habitat and the capability of bats to occupy it because of their mobility.

[4] Negative presence/probable absence survey results obtained using the [summer survey guidance](#) are valid for a minimum of two years from the completion of the survey unless new information (e.g., other nearby surveys) suggest otherwise.

No

12. Does the project include activities **within documented NLEB habitat**^{[1][2]}?

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

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

No

13. Will the removal or trimming of habitat or trees occur **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors?

Yes

14. What time of year will the removal or trimming of habitat or trees **within** suitable but **undocumented NLEB** roosting/foraging habitat or travel corridors occur?

C) During both the active and inactive seasons

15. Will *any* tree trimming or removal occur **within** 100 feet of existing road/rail surfaces?

Yes

16. Will **more than** 10 trees be removed **between** 0-100 feet of the road/rail surface *during* the active season^[1]?

[1] Areas containing more than 10 trees will be assessed by the local Service Field Office on a case-by-case basis with the project proponent.

Yes

17. Will *any* tree trimming or removal occur **between** 100-300 feet of existing road/rail surfaces?

No

18. Are *all* trees that are being removed clearly demarcated?

Yes

19. Will the removal of habitat or the removal/trimming of trees involve the use of **temporary** lighting?

No

20. Will the removal of habitat or the removal/trimming of trees include installing new or replacing existing **permanent** lighting?

No

21. Does the project include wetland or stream protection activities associated with compensatory wetland mitigation?

No

22. Does the project include slash pile burning?

No

23. Does the project include *any* bridge removal, replacement, and/or maintenance activities (e.g., any bridge repair, retrofit, maintenance, and/or rehabilitation work)?

Yes

24. Is there *any* suitable habitat^[1] for Indiana bat or NLEB **within** 1,000 feet of the bridge? (includes any trees suitable for maternity, roosting, foraging, or travelling habitat)

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

Yes

25. Has a bridge assessment^[1] been conducted **within** the last 24 months^[2] to determine if the bridge is being used by bats?

[1] See [User Guide Appendix D](#) for bridge/structure assessment guidance

[2] Assessments must be completed no more than 2 years prior to conducting any work below the deck surface on all bridges that meet the physical characteristics described in the Programmatic Consultation, regardless of whether assessments have been conducted in the past. Due to the transitory nature of bat use, a negative result in one year does not guarantee that bats will not use that bridge/structure in subsequent years.

Yes

SUBMITTED DOCUMENTS

- Woodstock NH175 Bridge Bat Memo_06.27.2022.pdf <https://ipac.ecosphere.fws.gov/project/FONVDW75PJCJFG7KOB4EJPAMA/projectDocuments/118013989>

26. Did the bridge assessment detect *any* signs of Indiana bats and/or NLEBs roosting in/under the bridge (bats, guano, etc.)^[1]?

[1] If bridge assessment detects signs of *any* species of bats, coordination with the local FWS office is needed to identify potential threatened or endangered bat species. Additional studies may be undertaken to try to identify which bat species may be utilizing the bridge prior to allowing *any* work to proceed.

Note: There is a small chance bridge assessments for bat occupancy do not detect bats. Should a small number of bats be observed roosting on a bridge just prior to or during construction, such that take is likely to occur or does occur in the form of harassment, injury or death, the PBO requires the action agency to report the take. Report all unanticipated take within 2 working days of the incident to the USFWS. Construction activities may continue without delay provided the take is reported to the USFWS and is limited to 5 bats per project.

No

27. Will the bridge removal, replacement, and/or maintenance activities include installing new or replacing existing **permanent** lighting?

No

28. Does the project include the removal, replacement, and/or maintenance of *any* structure other than a bridge? (e.g., rest areas, offices, sheds, outbuildings, barns, parking garages, etc.)

No

29. Will the project involve the use of **temporary** lighting *during* the active season?

Yes

30. Is there *any* suitable habitat **within** 1,000 feet of the location(s) where **temporary** lighting will be used?

Yes

31. Will the project install new or replace existing **permanent** lighting?

No

32. Does the project include percussives or other activities (**not including tree removal/trimming or bridge/structure work**) that will increase noise levels above existing traffic/background levels?

No

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

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

Yes

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

No

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

Automatically answered

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

36. Is the habitat removal portion of this project consistent with a Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because tree removal that occurs within the NLEB's active season occurs greater than 0.5 miles from the nearest hibernaculum, is less than 100 feet from the existing road/rail surface, and is not in documented NLEB roosting/foraging habitat or travel corridors, and a visual emergence survey has not been conducted

37. Is the habitat removal portion of this project consistent with a Not Likely to Adversely Affect determination in this key?

Automatically answered

Yes, because the tree removal/trimming that occurs outside of the NLEB's active season occurs greater than 0.5 miles from the nearest hibernaculum, is less than 100 feet from the existing road/rail surface, includes clear demarcation of the trees that are to be removed, and does not alter documented roosts and/or surrounding summer habitat within 0.25 miles of a documented roost.

38. Is the bridge removal, replacement, or maintenance activities portion of this project consistent with a No Effect determination in this key?

Automatically answered

Yes, because the bridge has been assessed using the criteria documented in the BA and no signs of bats were detected

39. **General AMM 1**

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

Yes

40. **Tree Removal AMM 1**

Can *all* phases/aspects of the project (e.g., temporary work areas, alignments) be modified, to the extent practicable, to avoid tree removal^[1] in excess of what is required to implement the project safely?

Note: Tree Removal AMM 1 is a minimization measure, the full implementation of which may not always be practicable. Projects may still be NLAA as long as Tree Removal AMMs 2, 3, and 4 are implemented and LAA as long as Tree Removal AMMs 3, 5, 6, and 7 are implemented.

[1] The word "trees" as used in the AMMs refers to trees that are suitable habitat for each species within their range. See the USFWS' current summer survey guidance for our latest definitions of suitable habitat.

Yes

41. **Tree Removal AMM 3**

Can tree removal be limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits)?

Yes

42. **Lighting AMM 1**

Will *all* **temporary** lighting be directed away from suitable habitat during the active season?

Yes

43. For Indiana bat, if applicable, compensatory mitigation measures are required to offset adverse effects on the species (see Section 2.10 of the BA). Please select the mechanism in which compensatory mitigation will be implemented:

6. Not Applicable

Project Questionnaire

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

N/A

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

N/A

3. How many acres^[1] of trees are proposed for removal between 0-100 feet of the existing road/rail surface?

[1] If described as number of trees, multiply by 0.09 to convert to acreage and enter that number.

1.62

4. **Please verify:**

All tree removal will occur greater than 0.5 mile from any hibernaculum.

Yes, I verify that all tree removal will occur greater than 0.5 miles from any hibernaculum.

5. Is the project location 0-100 feet from the edge of existing road/rail surface?

Yes

6. Is the project location 100-300 feet from the edge of existing road/rail surface?

No

7. **Please verify:**

No documented NLEB roosts or surrounding summer habitat within 150 feet of documented roosts will be impacted between June 1 and July 31.

Yes, I verify that no documented NLEB roosts or surrounding summer habitat within 150 feet of documented roosts will be impacted during this period.

8. Please describe the proposed bridge work:

To address the scour condition and prevent future damage to the bridge, repairs will be implemented by the NH Department of Transportation.

Permanent sheet piles will be installed around the southern bridge pier within the footprint of the original rip-rap where a scour hole now exists. Stone will be placed inside of the permanent sheet piles to repair the scour hole. During construction, additional, temporary steel sheet piles will be installed along the east and west side of the abutment to create a dry work area by diverting upstream flow around the construction area. A temporary access road will be installed from Eastside Road to access the construction area around the southern bridge pier.

9. Please state the timing of all proposed bridge work:
June 2023 to December 2023, between 7 am and 6 pm
10. Please enter the date of the bridge assessment:
May 25, 2022
11. You have indicated that the following Avoidance and Minimization Measures (AMMs) will be implemented as part of the proposed project:
 - *Tree Removal AMM 1*
 - *Lighting AMM 1*
 - *Tree Removal AMM 3*
 - *General AMM 1*

Avoidance And Minimization Measures (AMMs)

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

TREE REMOVAL AMM 1

Modify all phases/aspects of the project (e.g., temporary work areas, alignments) to avoid tree removal.

LIGHTING AMM 1

Direct temporary lighting away from suitable habitat during the active season.

TREE REMOVAL AMM 3

Ensure tree removal is limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits).

GENERAL AMM 1

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

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

This key was last updated in IPaC on October 11, 2022. Keys are subject to periodic revision.

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

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

IPaC User Contact Information

Agency: New Hampshire Department of Transportation
Name: Melilotus Dube
Address: NH Department of Transportation
Address Line 2: 7 Hazen Drive
City: Concord
State: NH
Zip: 03302
Email: melilotus.m.dube@dot.nh.gov
Phone: 6032713226

Lead Agency Contact Information

Lead Agency: Federal Highway Administration



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:

June 28, 2023

Project Code: 2022-0057968

Project Name: NH DOT 42534 Woodstock 195/093 Bridge Scour Repairs (2022)

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:

Updated 4/12/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

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. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

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 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. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the “**New England Field Office Endangered Species Project Review and Consultation**” website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 4/12/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule went into effect on March 31, 2023. You may utilize the **Northern Long-eared Bat Rangewide Determination Key** available in IPaC. More information about this Determination Key and the Interim Consultation Framework are available on the northern long-eared bat species page:

<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

For projects that previously utilized the 4(d) Determination Key, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project was not completed by March 31, 2023, and may result in incidental take of NLEB, please reach out to our office at newengland@fws.gov to see if reinitiation is necessary.

Additional Info About Section 7 of the Act

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines 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 Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. 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/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) 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. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

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:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

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: 2022-0057968
Project Name: NH DOT 42534 Woodstock 195/093 Bridge Scour Repairs (2022)
Project Type: Bridge - Maintenance
Project Description: Water flow within the Pemigewasset River has resulted in erosion around the bridge's support piers. To remediate the scouring, permanent sheet piles will be installed around the southern bridge pier within the footprint of the original rip-rap where a scour hole now exists. Stone will be placed inside of the permanent sheet piles to repair the scour hole. During construction, additional, temporary steel sheet piles will be installed along the east and west side of the abutment to create a dry work area by diverting upstream flow around the construction area. A temporary access road will be installed from Eastside Road to access the construction area around the southern bridge pier.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.9801739,-71.67928853464954,14z>



Counties: Grafton County, New Hampshire

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 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
Canada Lynx <i>Lynx canadensis</i> Population: Wherever Found in Contiguous U.S. There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
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: AECOM
Name: Taelise Ricketts
Address: 250 Apollo Drive
City: Chelmsford
State: MA
Zip: 01824
Email: taelise.ricketts@aecom.com
Phone: 9789052985

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

Appendix F
NHDOT Cultural Resource Review

BUREAU OF ENVIRONMENT, NHDOT
REVIEW REQUEST TO THE NH DIVISION OF HISTORICAL RESOURCES

Date: June 22, 2021 **Return Prior to:** _____

Project: Woodstock 42534 – Phase IA Archaeological Reconnaissance Woodstock 195/093 Bridge Scour Project (NHDOT 42534), Woodstock, Grafton County, NH, June 15, 2021

Other Parties _____

COMMENTS:

This is the updated report with revisions as per NHDOT & NHDHR recommendations.

NHDOT & NHDHR concur with the AECOM recommendation that a Phase IB Intensive Archaeological Investigation be completed in the APE of the NE quadrant in the area of the access road. The study should also include post-contact background research into the logging industry in Woodstock including the logging rail line and logging piers.

Sheila Charles
Cultural Resources Program Specialist/Archaeologist
Bureau of Environment
New Hampshire Department of Transportation
7 Hazen Drive
Concord, NH 03302-0483
Tel (603)271-4049
Sheila.Charles@dot.nh.gov

This request is forwarded to the **NH DIVISION OF HISTORICAL RESOURCES** for review and comment. NEPA and Sec. 106 of the NHPA require consultation with the SHPO to ensure the review of all actions covered by these acts relative to historical and cultural properties. The review should focus on the project's impacts pertinent to this act.

FOR MORE INFORMATION CONTACT: *Sheila Charles*
Cultural Resources Program Specialist/Archaeologist
Sheila.Charles@dot.nh.gov 603-271-4049

COMMENTS: Please check one. Additional comments should be included below or on a separate sheet.

CONCUR *WITH RESULTS OF SURVEY + RECOMMENDATION OF PHASE I-B TESTING IN NE QUADRANT IN ARE OF ACCESS ROAD.*

CONCUR WITH CONDITION *(Indicate major reservations about the project and the specific substantive changes or modifications desired.)*

RECEIVED
JUL 14 2021

TECHNICAL COMMENTS (No formal position, technical comments may be attached.)

NO COMMENTS

**** NON-RECEIPT OF THIS REVIEW IMPLIES CONSENT
PLEASE COPY AND RETURN THIS SHEET**

Date: 6-29-21

Reviewer's signature: David Stealy Title: EIC COORDINATOR
(Please Type or Print)

J:\FORMS\trDHR Archaeology.doc

RECEIVED
BUREAU OF ENVIRONMENT
JUL 02 2021
IN DEPARTMENT
OF TRANSPORTATION

BUREAU OF ENVIRONMENT, NHDOT
REVIEW REQUEST TO THE NH DIVISION OF HISTORICAL RESOURCES

Date: June 21, 2021

Return Prior to:

RECEIVED
BUREAU OF ENVIRONMENT

Project: Woodstock 42534 -
Phase IB Archaeological Survey Woodstock 195/093 Bridge Scour Project (NHDOT 42534)
Woodstock, Grafton County, NH, by Daniel Cassedy, AECOM, July 13, 2021

JUL 29 2021
NH DEPARTMENT
OF TRANSPORTATION

Other Parties

COMMENTS:

Summary Comments by Sheila Charles:

Very detailed presentation of data for the project area and newly identified Archaeological site 27-GR-0324, containing Post-Contact cultural features identified as 3 floating log boom piers associated with the Woodstock Lumber Company Mill operation. The report also includes a few great comparative photographs of log boom piers in other locations. The author also provides comparisons with other regions in the US outside of New England, highlighting the similarities and differences in cultural manifestations.

The stone pile piers of the archaeological site lie near but outside of the APE for the current NHDOT project. Nevertheless, AECOM recommended protective measures such as installation of high visibility temporary fencing be erected to ensure these features are not impacted during construction. No further archaeological survey is necessary.

NHDOT concurs with the report findings and recommendations.

The following are a very few, and very minor, recommended edits:

Page	Paragraph	Line	Section Heading	Comment
12	3	3	Archaic Period	"In 1993." Change period to comma, etc
16	1	1	Woodland Period	yield to yielded
26	5	Last few	Results	See last sentence

This request is forwarded to the NH DIVISION OF HISTORICAL RESOURCES for review and comment. NEPA and Sec. 106 of the NHPA require consultation with the SHPO to ensure the review of all actions covered by these acts relative to historical and cultural properties. The review should focus on the project's impacts pertinent to this act.

FOR MORE INFORMATION CONTACT: Sheila Charles
Cultural Resources Program Specialist/Archaeologist
Sheila.Charles@dot.nh.gov 603-271-4049

COMMENTS: Please check one. Additional comments should be included below or on a separate sheet.

CONCUR WITH RESULTS OF SURVEY + RECOMMENDATION THAT PROTECTIVE MEASURES (I.E. HIGH VISIBILITY FENCING) BE TAKEN PRIOR TO CONSTRUCTION TO ENSURE FEATURES OF SITE 27-GR-0324 ARE NOT IMPACTED - WELL-WRITTEN + CONCISE REPORT.

CONCUR WITH CONDITION (Indicate major reservations about the project and the specific substantive changes or modifications desired.)

TECHNICAL COMMENTS (No formal position, technical comments may be attached.)

NO COMMENTS

**** NON-RECEIPT OF THIS REVIEW IMPLIES CONSENT
PLEASE COPY AND RETURN THIS SHEET**

Date: 7.22.21

Reviewer's signature:

David Dwyer

Title:

RIC COORDINATOR

(Please Type or Print)

Appendix G
ACOE Appendix B



**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?	N/A	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	N/A	
2.7 What is the area of the proposed fill in wetlands?	0 s.f.	
2.8 What % of the overall project sire will be previously and proposed filled wetlands?	N/A	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://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?		N/A
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?		N/A
5. Historic/Archaeological Resources		
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. 		
6.1 Will there be complete loss of aquatic resources on site?	N/A	
6.2 Have the impacts to the aquatic resources been avoided and minimized to the greatest extent practicable?	N/A	
6.3 Will all aquatic resource function be lost?	N/A	
6.4 Does the aquatic resource (s) have regional significance (watershed or ecoregion)?	N/A	
6.5 Is there an on-site alternative with less impact?	N/A	
6.6 Is there an off-site alternative with less impact?	N/A	
6.7 Will there be a loss to a resource dependent species?	N/A	
6.8 Are indirect impacts greater than 1 acre within and adjacent to the project area?	N/A	
6.9 Does the proposed mitigation replace aquatic resource function for direct, indirect, and cumulative impacts?	N/A	

*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.

Appendix H
ACOE Wetland Determination
Field Data Sheets

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NHDOT/Pemigewasset River City/County: Woodstock/Grafton Sampling Date: 10-25-19
 Applicant/Owner: NHDOT State: NH Sampling Point: WP-3 Upland
 Investigator(s): Terry Ramborger Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Upland bank to river Local relief (concave, convex, none): None Slope (%): 0-3
 Subregion (LRR or MLRA): 143 Lat: 43.979684 Long: -71.679908 Datum: _____
 Soil Map Unit Name: 102 - Sunday loamy sand NWI classification: Upland area

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Upland bank adjacent to Pemigewasset River. Plot near flag WP-3	

HYDROLOGY

Wetland Hydrology Indicators: N/A <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)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

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

Remarks:
 Upland bank

VEGETATION – Use scientific names of plants.

Sampling Point: WP-3 Upland

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Betula papyrifera</u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>	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>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25</u> (A/B)	
2. <u>Quercus rubra</u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>		
3. <u>Populus grandidentata</u>	<u>10</u>	<u>No</u>	<u>FACU</u>		
4. _____					
5. _____					
6. _____					
7. _____					
<u>60</u> = Total Cover				Prevalence Index worksheet: <u>N/A</u> 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 = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. <u>Betula papyrifera</u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>		
2. <u>Betula alleghaniensis</u>	<u>10</u>	<u>No</u>	<u>FAC</u>		
3. <u>Fagus grandifolia</u>	<u>10</u>	<u>No</u>	<u>FACU</u>		
4. <u>Quercus rubra</u>	<u>3</u>	<u>No</u>	<u>FACU</u>		
5. _____					
6. _____					
7. _____					
<u>53</u> = Total Cover				Hydrophytic Vegetation Indicators: <u>N/A</u> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Dichanthelium clandestinum</u>	<u>5</u>	<u>Yes</u>	<u>FAC+</u>		
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
<u>5</u> = Total Cover				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.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. <u>None</u>	<u>--</u>	<u>--</u>	<u>--</u>		
2. _____					
3. _____					
4. _____					
_____ = Total Cover					Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: WP-3 Upland

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 4/2						sl	--
2-16+	10YR 5/3						sl	--

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)	<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)	
<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)		<input type="checkbox"/> Other (Explain in Remarks)	

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

Restrictive Layer (if observed): <u>N/A</u>	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Type: _____ Depth (inches): _____	

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: NHDOT/Pemigewasset River City/County: Woodstock/Grafton Sampling Date: 10-25-19
 Applicant/Owner: NHDOT State: NH Sampling Point: WP-3 Wetland
 Investigator(s): Terry Ramborger Section, Township, Range: N/A
 Landform (hillslope, terrace, etc.): Pemigewasset riverbed Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR or MLRA): 143 Lat: 43.979684 Long: -71.679908 Datum: _____
 Soil Map Unit Name: W - Water NWI classification: Riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p align="center">Riverbed of Pemigewasset River. Near flag WP-3</p>	

HYDROLOGY

Wetland Hydrology Indicators: N/A Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) _____ Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) _____ Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) _____ Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Drift Deposits (B3) _____ Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) _____ Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) _____	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>6-12</u> Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: <u>N/A</u>	
Remarks: <p align="center">Sample in riverbed of Pemigewasset River</p>	

VEGETATION – Use scientific names of plants.

WP-3 Wetland
Sampling Point: _____

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Populus grandidentata</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</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>50</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>5</u> = Total Cover				Prevalence Index worksheet: N/A 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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Betula alleghaniensis</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Betula papyrifera</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Salix babylonica</u>	<u>1</u>	<u>No</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>16</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Phalaris arundinacea</u>	<u>3</u>	<u>Yes</u>	<u>FACW+</u>	Hydrophytic Vegetation Indicators: N/A <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 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. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>3</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u>None</u>	<u>--</u>	<u>--</u>	<u>--</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.)
 Vegetation overhanging from adjacent bank

SOIL

WP-3 Wetland
Sampling Point: _____

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		
0-16+	10 YR 3/2						lcos	Riverbed xstony

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

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B) <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) <input type="checkbox"/> Dark Surface (S7) (LRR K, L) <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L) <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L) <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)

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

Restrictive Layer (if observed): N/A Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No _____
---	---

Remarks:
 Riverbed of Pemigewasset River sampled

Appendix I
Photographs and Existing
Conditions Figure

*Representative Photos in the Vicinity of Bridge No. 195/093 NH Route 175
over the Pemigewasset River – Bridge Scour Protection Project
Woodstock, NH*



Figure 1. View of Bridge No. 195/093 with the Pemigewasset River flowing underneath (looking west). Pier I is on the left-hand side of the photo. Pier II is located on the right.



Figure 2. View of Pier I (the subject of this scour repair project). View is looking south.



Figure 3. Panoramic view looking under the bridge in the project area at Pier 1 where the proposed causeway will be located (looking north).



Figure 4. View of Route 175 (left side of photo) and slope where the temporary access road will be constructed to reach Pier 1 (looking northeast toward the bridge).



Figure 5. View of the project area with Pier 1 visible on the left-hand side of the photo (looking southeast).



Figure 6. Proposed open staging area located northeast of the bridge, east of Route 175 (looking south).

Appendix J
Construction Sequence Narrative

SUGGESTED CONSTRUCTION SEQUENCE NOTES – (Note: For sequencing purposes bridge alignment is called north to south).

1. Install Temporary Signals.
2. Install Temporary Barriers with Truck Access and Attenuators.
3. Construct Southeast Access Road.
4. Implement detour for installation of Temporary and Permanent Cofferdam Sheet Piles west of bridge.
5. From Bridge Deck, install Temporary and Permanent Cofferdam Sheet Piles west of bridge including custom three-way corner sheets at southwest and northwest corners of cofferdam.
6. Install Geotextile Separation Fabric.
7. Install double turbidity curtain.
8. Install Southeast Temporary Access Causeway to Elevation 627.60. Causeway construction continues westerly under middle span, to meet temporary sheet pile flow deflector upstream side of bridge. Cofferdam sheet piles to be advanced ahead to maintain cofferdam fill slope stability. Sheet piles under span to be spliced. Construction of Causeway and sheet pile installation progresses in sections, based on reach of excavator, while advancing and maintaining turbidity control with localized curtains ahead of work. Construction Mats to be placed on top surface as causeway advances.
9. Temporarily remove detour when use of crane on bridge deck is complete.
10. From causeway, install south Permanent Cofferdam Sheet Piles under bridge span 1 to west permanent sheet pile corner advancing causeway as required for equipment reach. Sheet piles under span to be spliced.
11. Dewater Temporary Cofferdam as necessary.
12. Fill Cofferdam in area of scour hole with Crushed Stone Fill or #57 or #67 gradation stone to bottom of the Pile Cap as tight as possible.
13. Continue to fill Cofferdam in area of scour hole with Crushed Stone or Bank Run Gravel to El. 621.
14. Where necessary perform local excavation/stone removal for tie-rod, wale installation and anchorage.
15. Install Wales.
16. Install Tie-Rods.
17. Fill Cofferdam with Crushed Stone or #57 or #67 gradation stone gravel to El. 624.5.
18. Cut off Sheet Piles to El 625.0
19. Install 6-inch Concrete Slab to top of Cofferdam. (Coordinate with advanced weather forecast for anticipated storm events)
20. Reinstate detour and remobilize crane as necessary to assist with Zone #1 and #2 restoration below.
21. Restore Zone #1 (areas within the limits of work below TOB/OHW (bank and stream channel)) including: removal of causeway stone fill, geotextile fabric, turbidity curtains, temporary sheet piles, etc. to reveal the pre-construction substrate. Restore bank contours as necessary.
22. Remove western Temporary sheet pile cofferdam with crane on bridge deck.

23. Restore Zone #2 (areas within the limits of work above TOB/OHW (slope area)) including all embankment and materials used to construct temporary access. Restore slopes to pre-construction contours. This disturbed area to be treated with humus meeting specifications of Item 647.1. and turf establishment meeting the specifications of Item 646.3.
24. Remove detour when crane no longer needed for Zone #2 restoration.
25. Once final grading is complete in Zone #2, the area as shown on the restoration plan (Sheet #14) will be seeded with a New England Erosion Control/Restoration Mix for Dry Sites seed mix or equivalent.
26. Following seeding, Zone #2 will be stabilized in the areas shown on Sheet #14 (with the exception of the rip-rap area near the south bridge abutment) with a fully biodegradable erosion control blanket.
27. Once erosion control blankets are in place, Zone #2 shall be planted as shown on Sheet #14.
28. Remove signalization and Temporary Barriers.

Appendix K
River Scour Modelling Memo

**New Hampshire Department of Transportation
Bureau of Bridge Design
Woodstock-Lincoln 42534
Scour Stabilization at Woodstock 195/093
NH 175 over Pemigewasset River
Woodstock, NH**

Pier 1 Rehabilitation

Hydraulic Evaluation during Construction Flood Events

Project No. 60709708

Prepared by:

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Date:

28 June 2023

Executive Summary

An SRH2D model was used to simulate the temporary construction conditions for Pier 1 Rehabilitation. Hydraulic variables were extracted from the model results for two scenarios. Scenario 1 is the average seasonal flow at 680 cfs. Scenario 2 is the median high seasonal flow of 1,910 cfs.

The results indicated that the most significant impact is a scour depth of 0.3 feet occurring at Pier 2 during Scenario 2.

Hydraulic & Scour Evaluation of the Pemigewasset River during Temporary Construction Conditions

Construction is to occur at the Woodstock 195/093 bridge to install a structural countermeasure around Pier 1 (southwest pier) and protect the pier from scour. Construction is scheduled to take place between the months of July through September, when low flows are typically anticipated. Flow statistics were analyzed at a nearby USGS gage during these months. Daily flows were analyzed to determine the likelihood of the flow rates to occur during this time. The flows modeled were 1,910 cfs and 680 cfs. The analysis of the flow records at the USGS Gaging Station (No.01075000 – Pemigewasset River at Woodstock, NH) taken over 56 years between 1940 and 2020, indicates that for 50% of the years the daily flows have exceeded 1,910 cfs at least once during the period from July 15 to October 1. Additionally, the records indicate that for 88% of the years, daily flows within the July 15 to October 1 period, may be greater than 680 cfs at least once.

The existing SRH-2D model was modified to reflect the NHDOT preferred construction conditions. This alternative includes a three-sided temporary/permanent cofferdam to allow localized work in the dry under Span 1 and construction access from a temporary access road and causeway in the southeast quadrant of the bridge site. Two scenarios were modeled corresponding to the low flows determined. The upstream boundary was set to the designated flow rates of 680 cfs (Scenario 1) and 1,910 cfs (Scenario 2). The downstream boundary condition was set to the constant elevation of 615 ft.

The top of the north and south sheet pile/cofferdam walls and causeway have been assumed to be set at elevations at or above the predicted water surface of the two scenarios. The area where construction will be performed between the Southwest Abutment (called Abutment A) and Pier 1 will be enclosed up to the predicted water surface elevations of the higher determined flow scenarios. The top of the access road will be higher than the water surface elevation. For permitting purposes and impacts to wetlands the top of causeway is set at 1'-0" freeboard above the anticipated water surface elevation. The finite element mesh was modified such that 'No-Flow' walls surround the construction area, including the cofferdam and access road. These barriers block out Span 1 of the bridge, removing a portion of available flow area from the channel. The temporary cofferdam creates an ineffective flow area. Therefore, this area is also within the No-Flow zone.

Figure 1 shows the finite element mesh in the vicinity of the bridge.

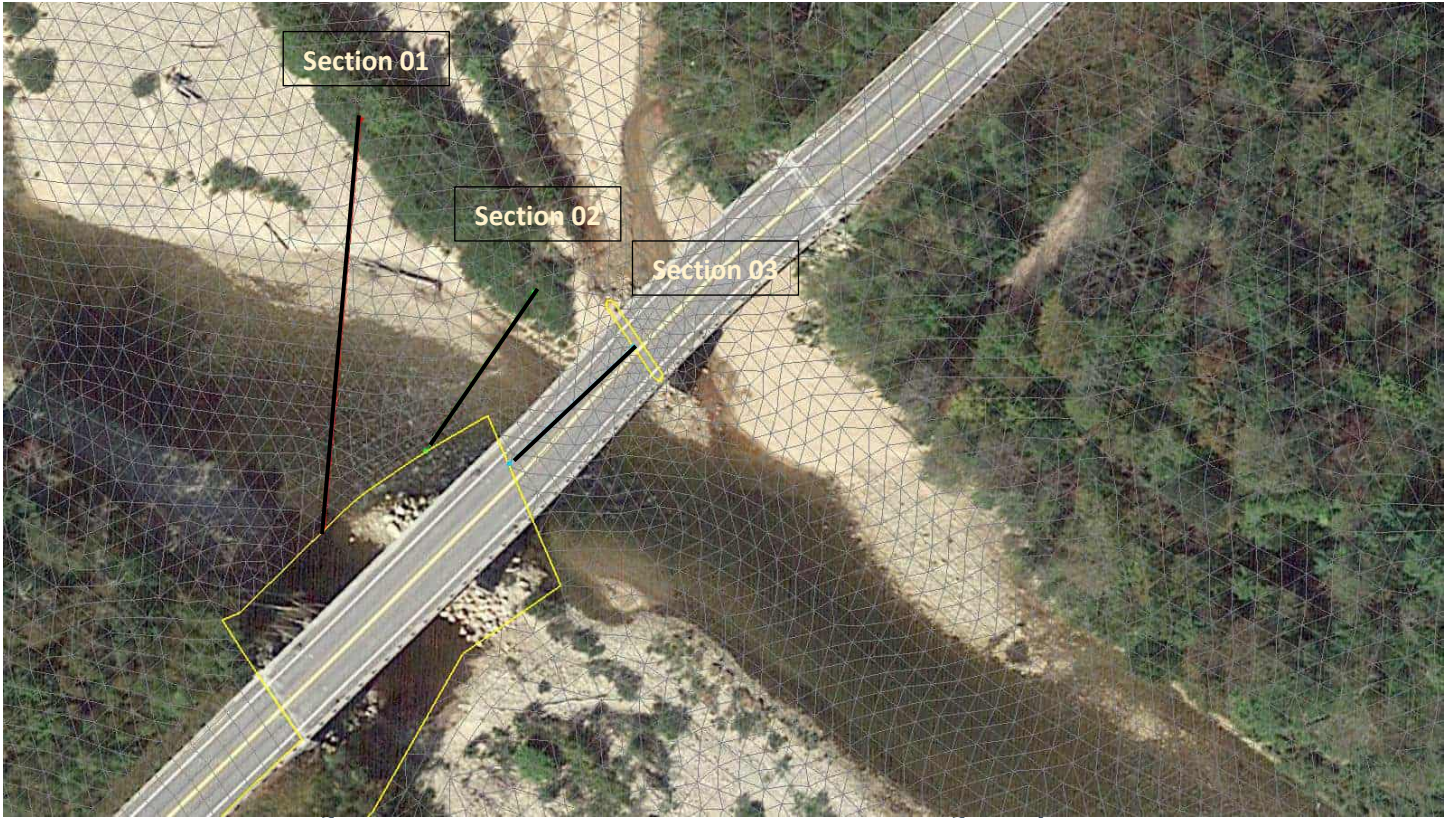


Figure 1. Finite Element Mesh and Hydraulic Cross Sections

The results indicate that the velocities would increase in the channel. This is expected due to the constriction in the channel caused by the sheet pile wall and cofferdam. **Table 1** shows the predicted water surface elevations upstream of the bridge, as well as the depths of flow and maximum velocities for the two scenarios.

Table 1 - SRH-2D Simulation Results Summary

	Scenario	WSEL (ft)	Depth (ft)	Velocity Magnitude (fps)
Upstream of Construction (Section 01)	680 cfs	624.4	2.5	3.0
	1,910 cfs	625.8	5.6	3.3
Cofferdam Constriction (Section 02)	680 cfs	624.2	5.1	5.4
	1,910 cfs	625.5	5.3	6.7
Underneath Bridge (Section 03)	680 cfs	622.1	2.2	10.2
	1,910 cfs	622.8	2.7	13.3

The results indicate that as the flow reaches the cofferdam, the water surface becomes lower, and velocities become higher. The maximum water surface elevation in the vicinity of the bridge is 625.8 ft at 1,910 cfs. The maximum velocity in the vicinity of the bridge is 13.3 fps.

Figures showing the data extraction from the hydraulic cross sections can be found in **Appendix A**. The plots show the bed elevation, water surface elevation, and velocity magnitude across the cross section. The cross sections present the simulation results along the three sections shown on **Figure 1**. The figures show the

profiles of water surface elevations and velocities across the stream under these scenarios. The cross sections are oriented left to right looking downstream.

Figures 2 and 3 present water velocity magnitude and direction in the vicinity of the bridge and cofferdam during construction.

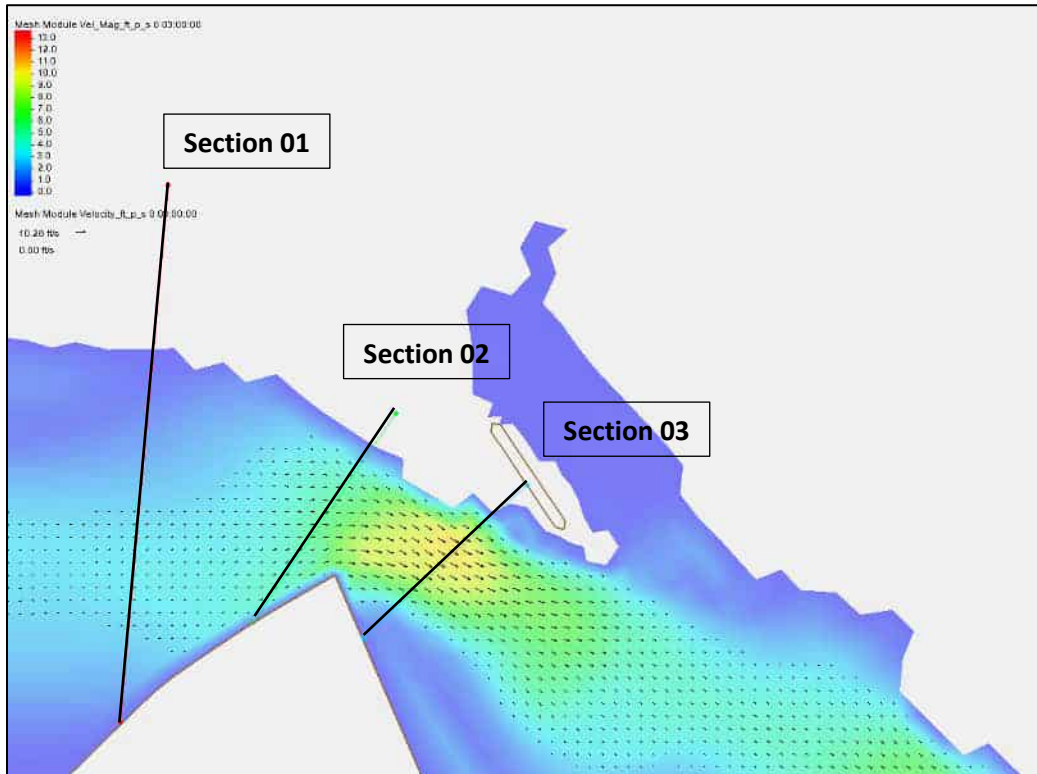


Figure 2 – Hydraulic Cross Sections and Velocity Magnitude during Scenario 1 (Q = 680 cfs)

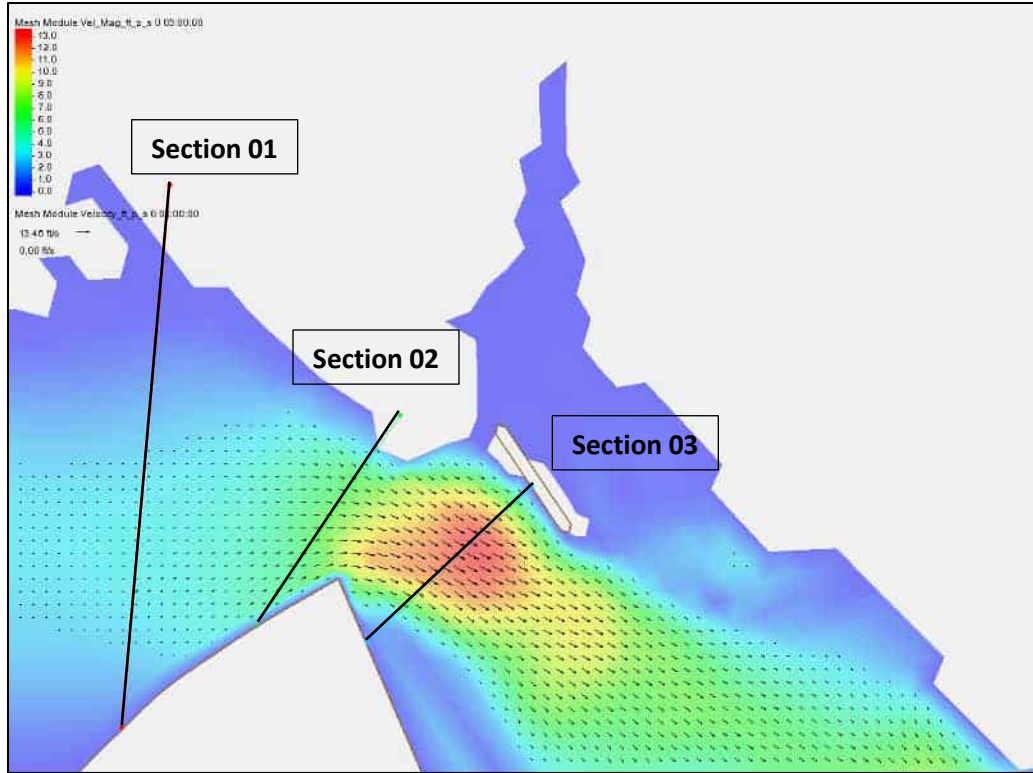


Figure 3 – Hydraulic Cross Sections and Velocity Magnitude during Scenario 2 (Q = 1,910 cfs)

Scour was calculated to assess the potential impact the construction may have on the channel upstream and at Pier 2 (northeast pier). Cross sections were drawn to extract variables for the scour computations. **Figure 4** shows the plan view of the cross sections used for the data extraction. Figures presenting the data from the cross sections during both Scenario 1(680 cfs) and Scenario 2 (1,910 cfs) can be found in **Appendix B**. The plots show the bed elevation, water surface elevation, and velocity magnitude across the cross section.

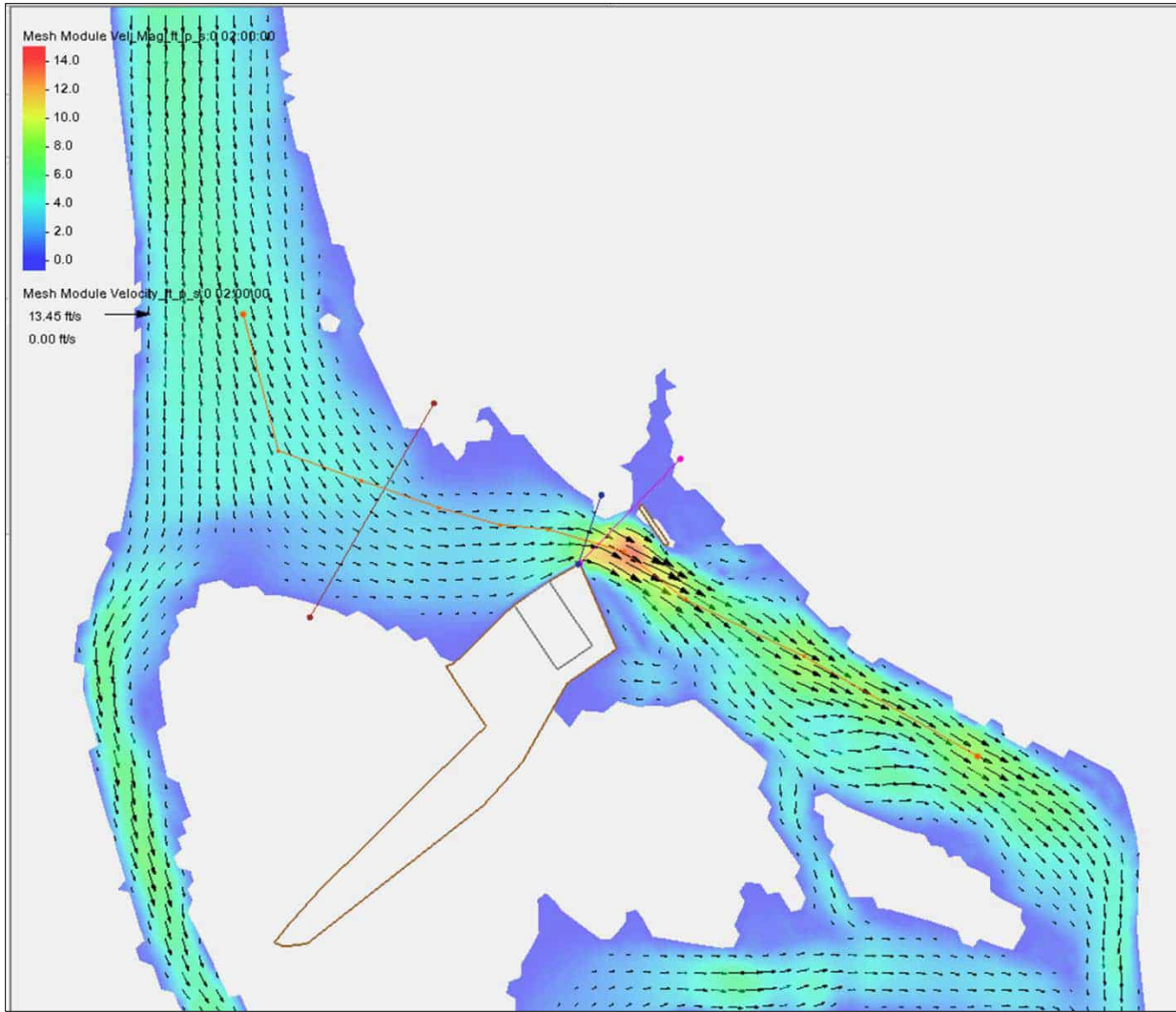


Figure 4 – Plan View of Scour Cross Sections in both scenarios (Scenario 1,910 depicted).

The results of the scour calculations yielded generally low scour depths in the channel and at Pier 2. **There is 0 feet of contraction scour calculated in both scenarios. During the 680 cfs scenario there is expected to be 0.2 feet of scour at Pier 2. During the 1,910 cfs scenario there is expected to be 0.3 feet of scour at Pier 2.** In both cases, greater than 12 feet of embedment will remain at the Pier 2 pile cap, considering the bottom of the footing. **Table 2.** summarizes the results of the scour calculations.

Table 2 – Scour Results

Summary of Scour Depths at Northeast Pier for Woodstock Bridge, Structure No. 195/093							
Scour Event	Existing Bed El. At Pier (ft)	Contraction Scour Depth (ft)	Pier Scour Depth (ft)	Total Scour Depth (ft)	Scour El. (ft)	B.o.F. (ft)	Embedment Depth (ft)
680 cfs	622.3	0.0	0.2	0.2	622.1	609.7	12.5
1,910 cfs		0.0	0.3	0.3	622.0		12.3

Notes.

B.o.F. Refers to Bottom of Footing

Appendix A. Data Extraction from Hydraulic Cross Sections (Sections 1, 2, and 3)

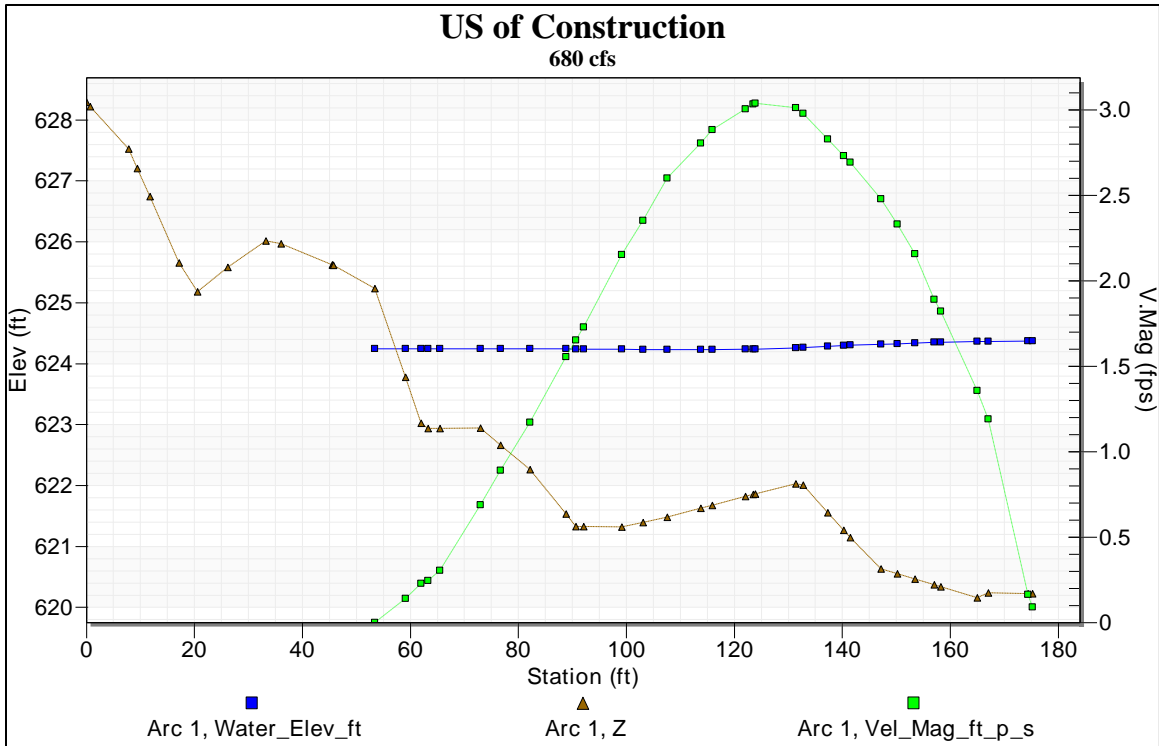


Figure 5 - Water Surface Elevation and Velocity Profiles - Section 01, Scenario 1

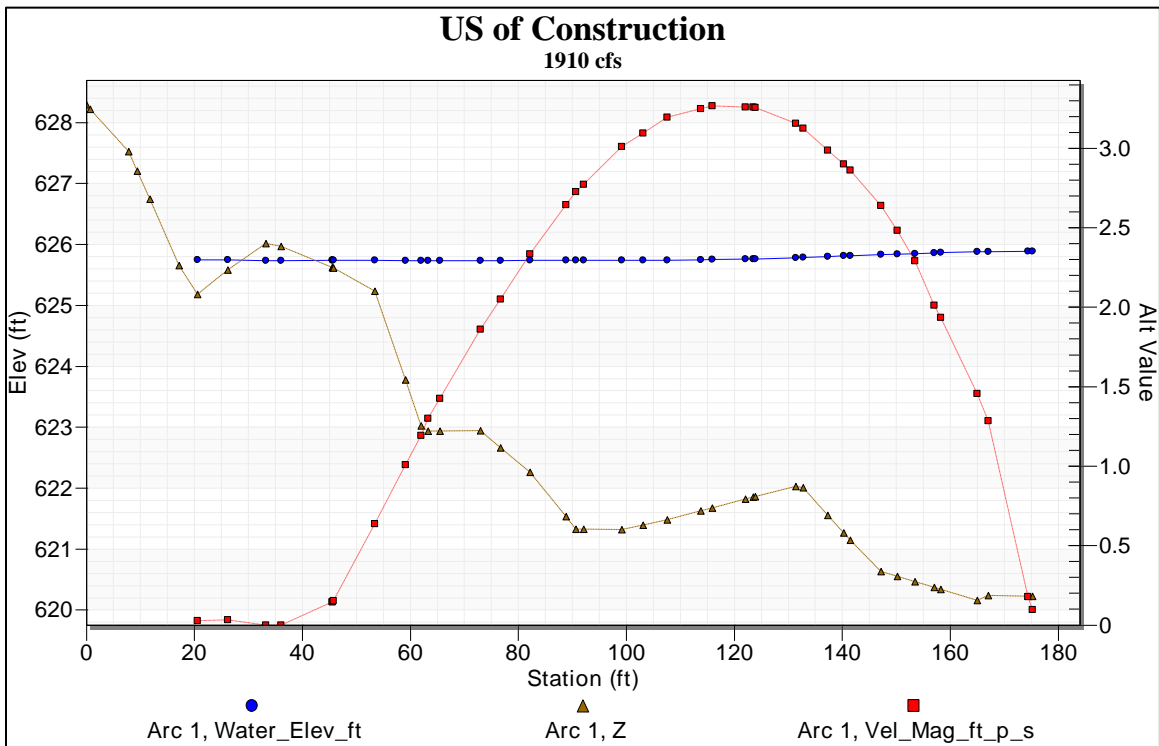


Figure 6 - Water Surface Elevation and Velocity Profiles - Section 01, Scenario 2

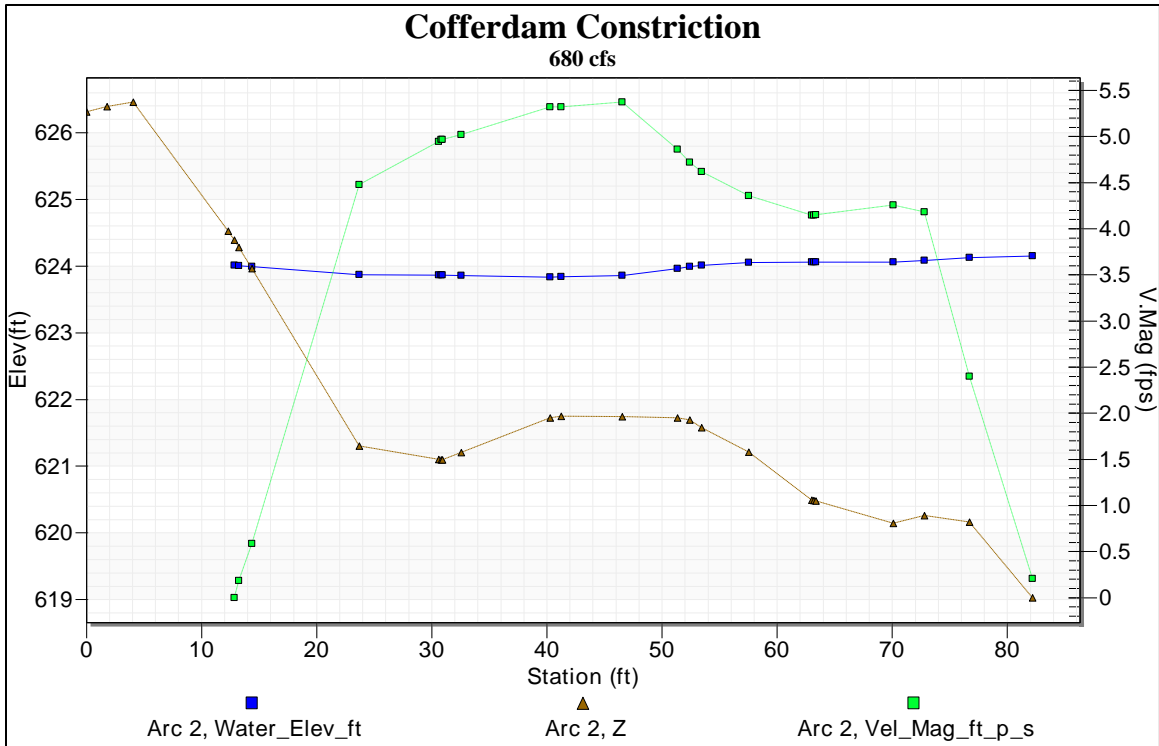


Figure 7 - Water Surface Elevation and Velocity Profiles - Section 02, Scenario 1

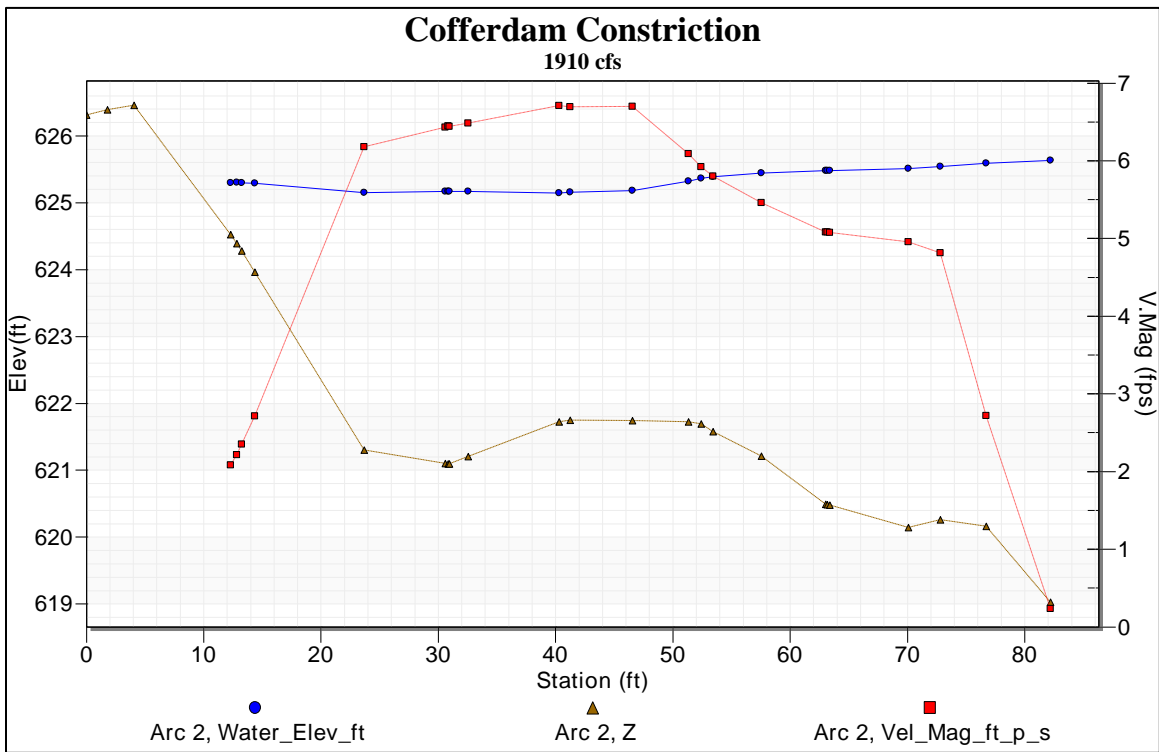


Figure 8 - Water Surface Elevation and Velocity Profiles - Section 02, Scenario 2

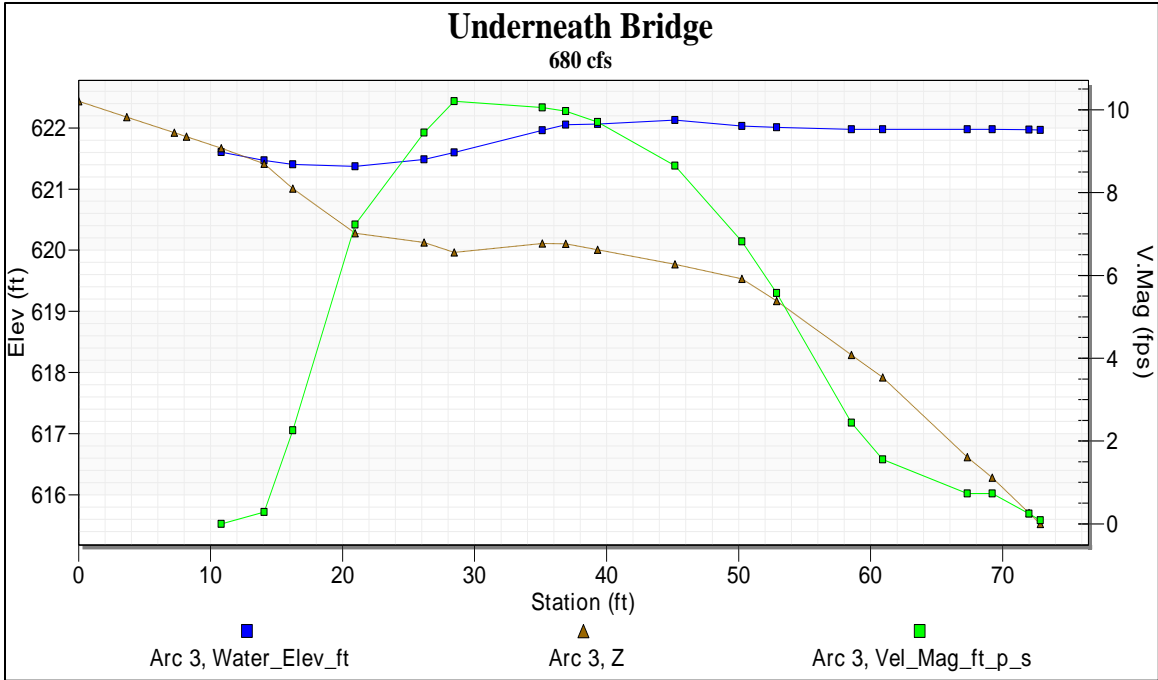


Figure 9 - Water Surface Elevation and Velocity Profiles - Section 03, Scenario 1

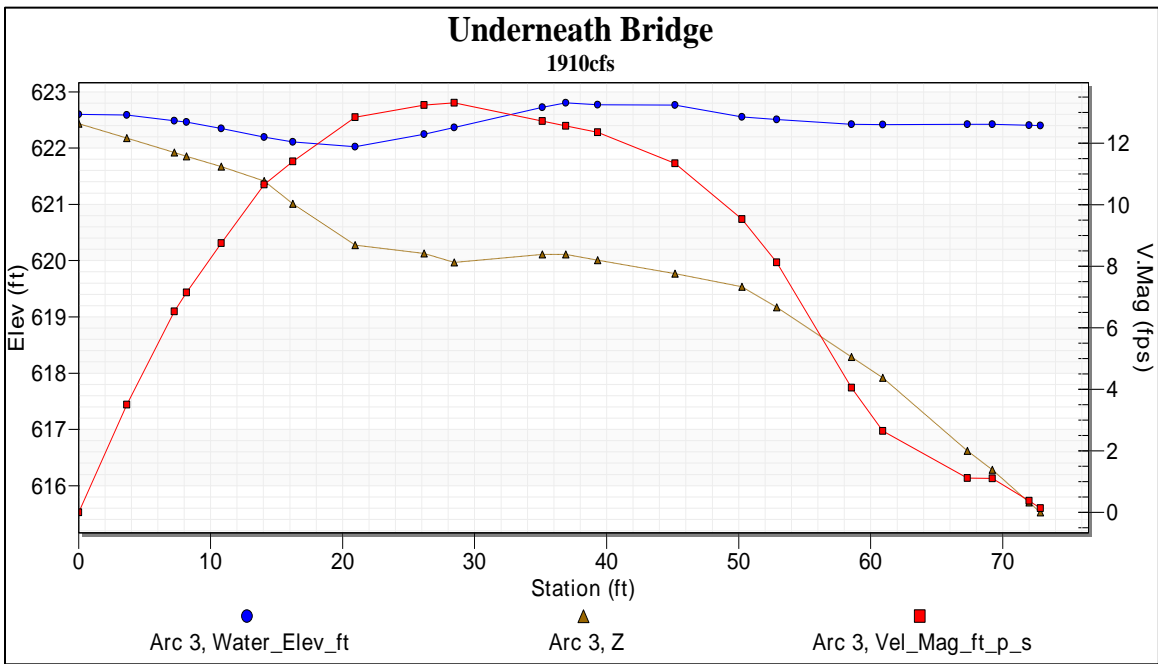


Figure 10 - Water Surface Elevation and Velocity Profiles - Section 03, Scenario 2

Appendix B. Data Extraction from Scour Cross Sections (Sections 4, 5, & 6)

Scenario 1: 680 cfs

Section 4:

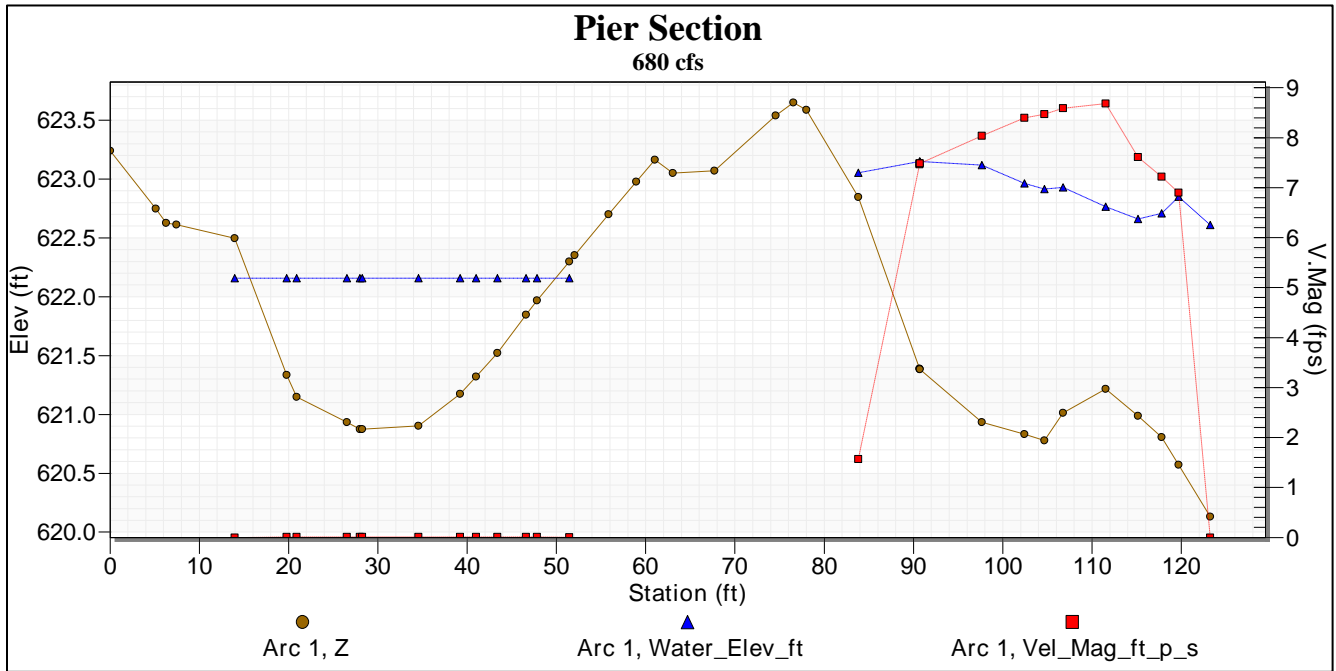


Figure 11 – Pier Section

Section 5:

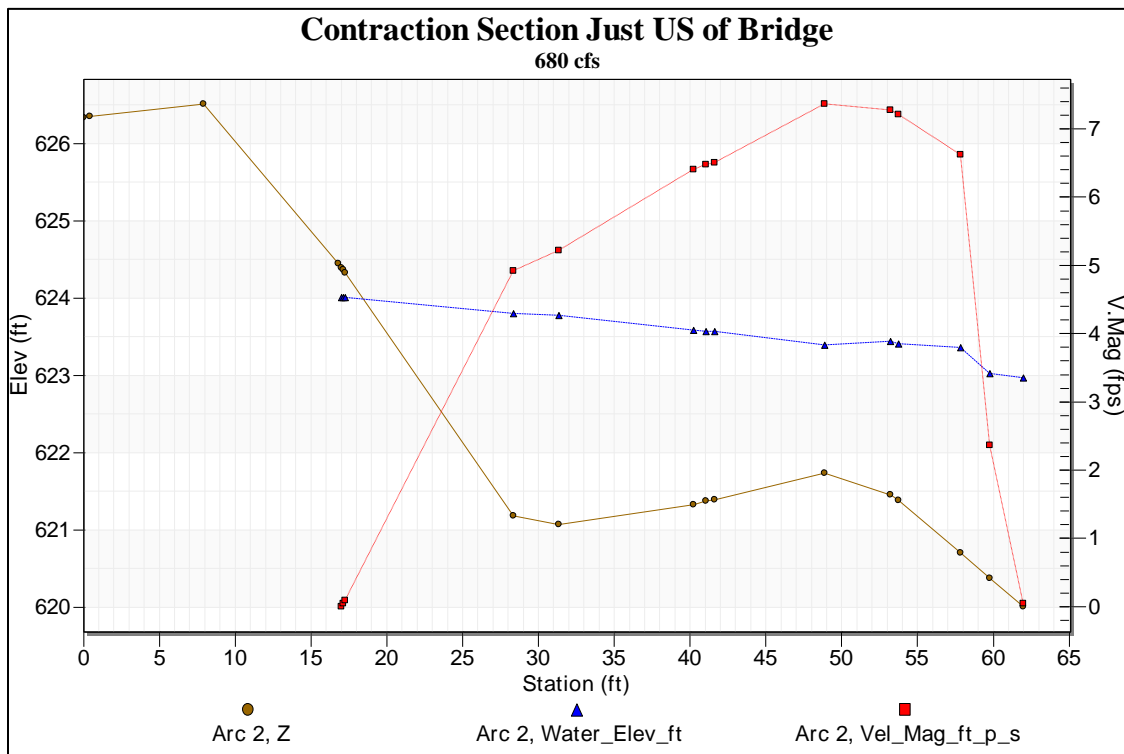


Figure 12 – Contraction Section Just Upstream of Piers

Section 6:

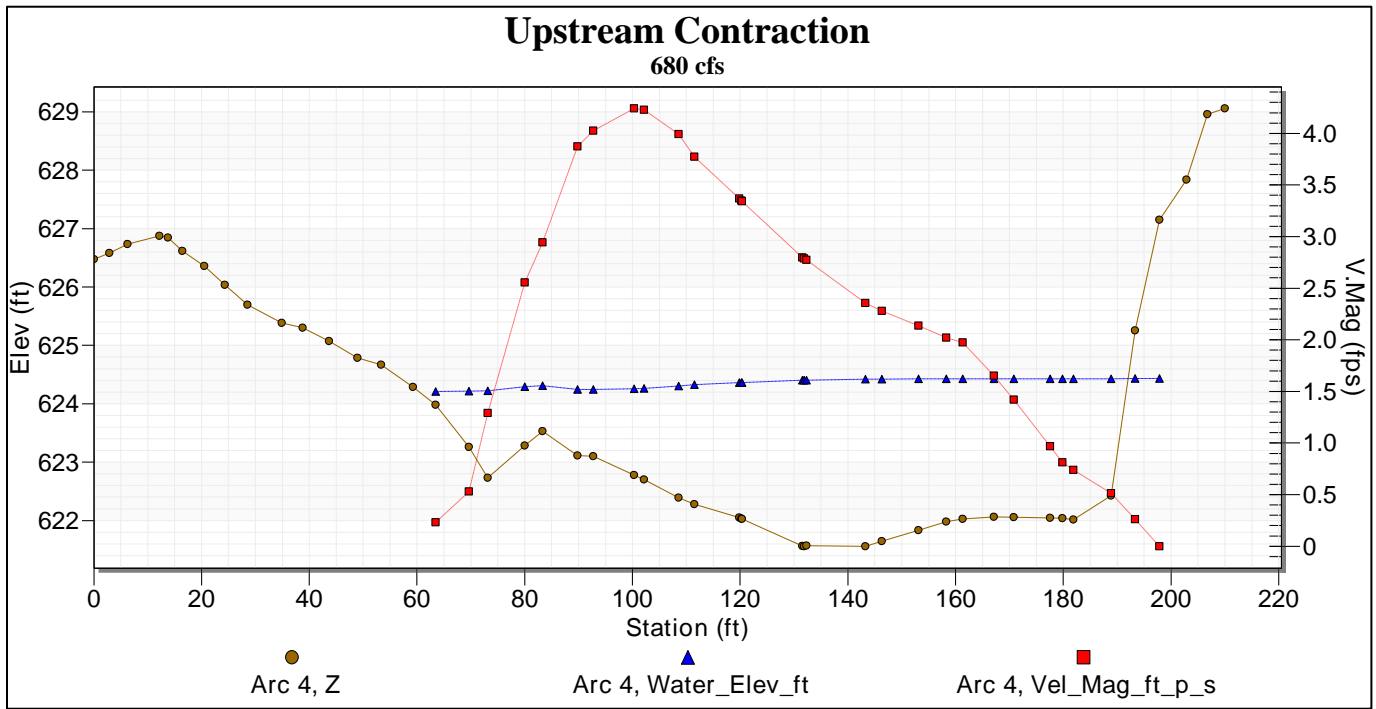


Figure 13 – Upstream Contraction Section

Scenario 2: 1,910 cfs Data

Section 4:

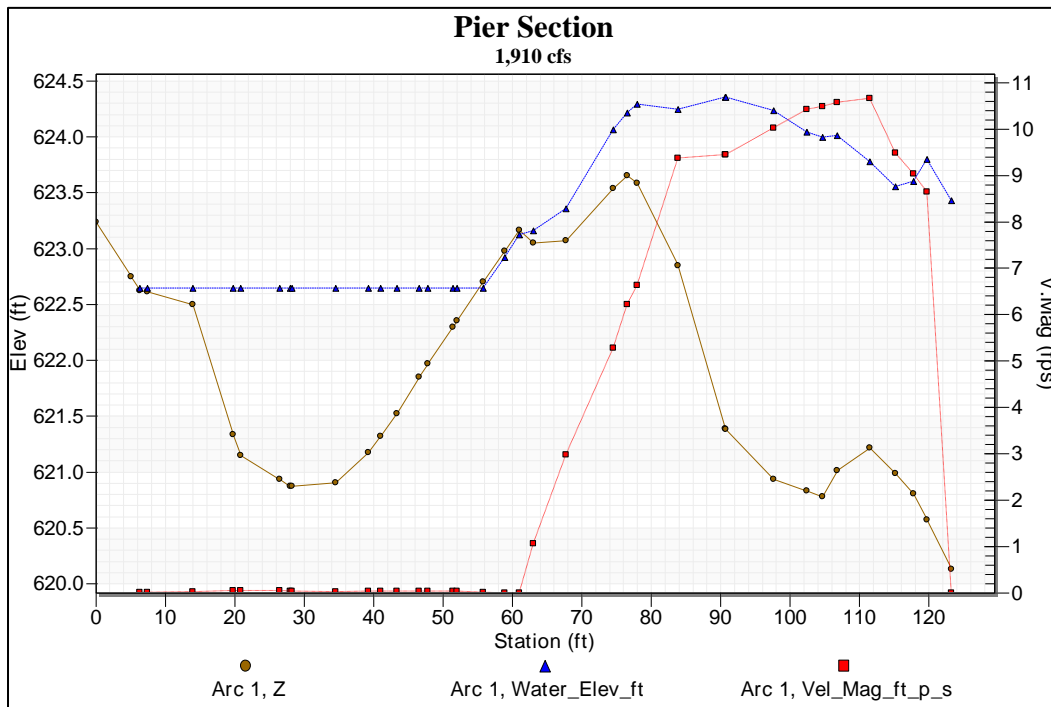


Figure 14 – Pier Section

Section 5:

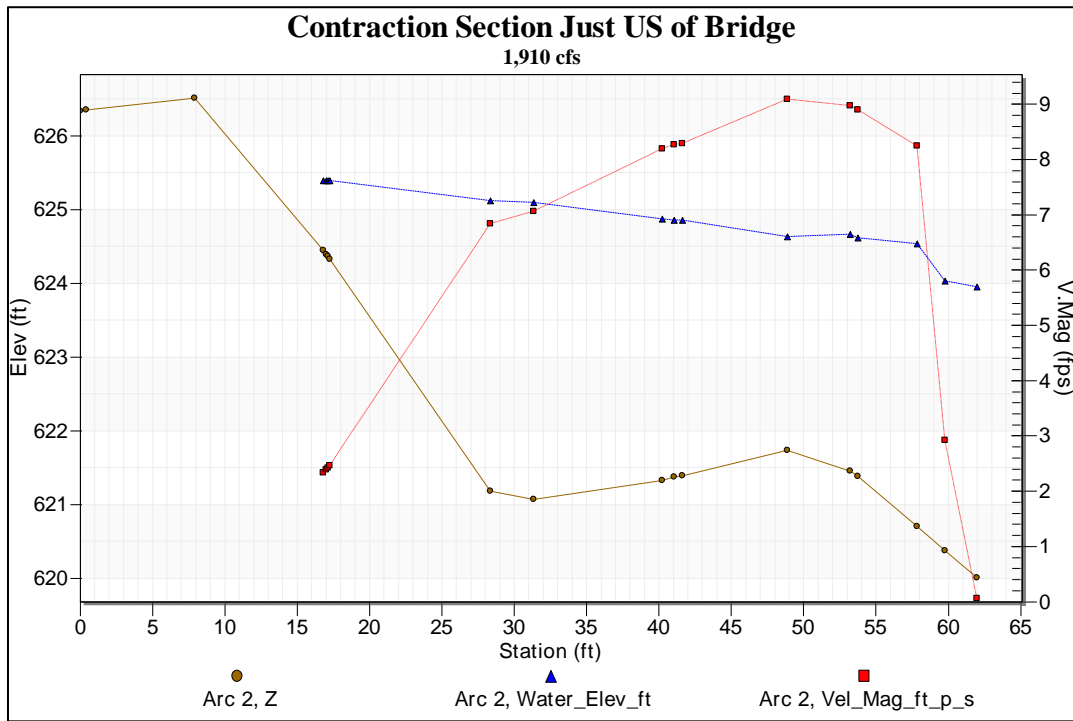


Figure 15 – Contraction Section Just Upstream of Bridge

Section 6:

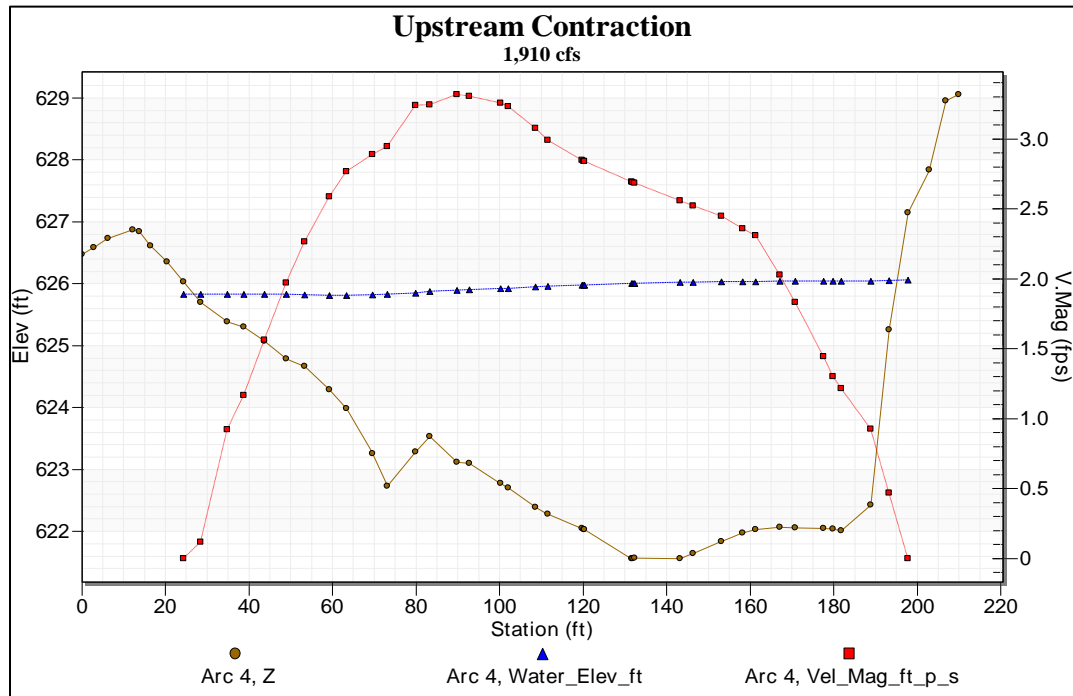


Figure 16 – Upstream Contraction Section

Appendix L
DOT Turbidity Monitoring
Protocol

TURBIDITY MIXING ZONE DESIGNATION

When implementing this mixing zone, turbidity in Pemigewasset River, as needed for in-water work and construction discharges, shall be monitored and controlled as follows to meet New Hampshire Surface Water Quality Standards Env-Wq 1703.11. Such mixing zones shall meet the criteria in New Hampshire Surface Water Quality Standards Env-Wq 1707.02.

1. Consistency with Env-Wq 1707.02 Criteria for Approval of Mixing Zones:

The NHDES may only approve a mixing zone if it:

- (a) *Meets the criteria in Env-Wq 1703.03(c)(1);*
Adherence to this procedure, environmental commitments made for this project, the contract documents, as applicable, and all necessary environmental permits ensures that the criteria of this rule are met. Any potential impacts shall be limited to a short duration, and low intensity. Additional detail may be found in the **Compliance Summary** section (9) below.
- (b) *Does not interfere with biological communities or populations of indigenous species.*
Adherence to this procedure, environmental commitments made for this project, the contract documents, as applicable, and all necessary environmental permits ensures that the criteria of this rule are met. Any potential impacts shall be limited to a short duration, and low intensity. Additional detail may be found in the **Compliance Summary** section (9) below.
- (c) *Does not result in the accumulation of pollutant s in the sediment or biota.*
Adherence to this procedure, environmental commitments made for this project, the contract documents, as applicable, and all necessary environmental permits ensures that the criteria of this rule are met. Additional detail may be found in the **Compliance Summary** section (9) below.
- (d) *Allows a zone of passage for swimming and drifting organisms.*
Adherence to this procedure, environmental commitments made for this project, the contract documents, as applicable, and all necessary environmental permits ensures that the criteria of this rule are met. Any potential impacts shall be limited to a short duration, and low intensity. Additional detail may be found in the **General Conditions** section (2), and **Compliance Summary** section (9) below.
- (e) *Does not interfere with existing and designated uses of the surface water.*
Adherence to this procedure, environmental commitments made for this project, the contract documents, as applicable, and all necessary environmental permits ensures that the criteria of this rule are met. Additional detail may be found in the **Compliance Summary** section (9) below.
- (f) *Does not impinge upon spawning grounds or nursery areas, or both, of any indigenous aquatic species;*
Adherence to this procedure, environmental commitments made for this project, the contract documents, as applicable, and all necessary environmental permits ensures that the criteria of this rule are met. Additional detail may be found in the **General Conditions** section (2), and **Compliance Summary** section (9) below.

- (g) *Does not result in the mortality of any plants, animals, humans, or aquatic life within the mixing zone.*
Adherence to this procedure, environmental commitments made for this project, the contract documents, as applicable, and all necessary environmental permits ensures that the criteria of this rule are met. Additional detail may be found in the **General Conditions** section (2), and **Compliance Summary** section (9) below.
- (h) *Does not exceed the chronic toxicity value of 1.0 TUc at the mixing zone boundary; and*
This criterion is not applicable to this mixing zone, which is only designated for short term, low intensity turbidity.
- (i) *Does not result in an overlap with another mixing zone.*
This mixing zone does not overlap with another mixing zone.

2. General Conditions:

- a. All proposed monitoring for turbidity in the waterbody during in-water work, as needed, shall be completed by a qualified Contractor approved by NHDOT and shall be conducted in accordance with the specifications below.
- b. All turbidity monitoring measurements, and visual monitoring (with photo documentation) shall be conducted as described in sections below.
- c. With NHDOT approval, turbidity measurements using turbidity meters or probes do not need to be made if the Contractor believes that it would be unsafe for personnel to collect turbidity measurements due to conditions such as high-water velocity and/or icy conditions. In these instances, NHDES shall be notified consistent with the **Notification** section (8) below.
- d. At the discretion of NHDOT, the use of this mixing zone may be suspended and/or started on an as needed basis. NHDES shall be notified consistent with the **Notification** section (8) below.
- e. The proposed mixing zone area will extend from the discharge location to Monitoring Station D-3 as shown in the figure below in Section 3. All in-water work will be conducted in discrete work zones that will not cause a visible turbid plume that would span the entire width of the channel at any given time. A zone of passage from the discharge location to Monitoring D-2 shall be maintained by implementing the monitoring program described in Section 3 below and implementing the **Required Actions to Control Turbidity** section (4) below.

3. Monitoring Stations and Monitoring Frequency:

Markers (buoys or similar devices) shall be set up in the waterbody at the locations, and monitored, as described below:

- a. **Upstream – Background (UP-1):** A marker designating the background station shall be placed in the waterbody just upstream of the work site in an area not disturbed by the construction activity. The purpose of this station is to provide baseline/background turbidity information. Visual observations with photo-documentation and in-water turbidity measurements shall be taken as follows, each day that in-water work is conducted under this mixing zone, and/or when any construction activity is undertaken that could potentially result in increased in-water turbidity:
 - i. Daily prior to the commence of in-water work.

- ii. Midday while in-water work is being performed; and
 - iii. Daily at the conclusion of in-water work.
- b. **Downstream 1 (DS-1)¹:** A marker shall be placed 50 feet downstream from the work site in the channel. Aquatic organism passage will be assessed at this location. During construction activities that could potentially result in increased in-water turbidity, visual monitoring shall take place every hour.
- c. **Downstream 2 (DS-2):** A marker shall be placed 250 feet downstream from the work site in the channel. During construction activities that could potentially result in increased in-water turbidity, monitoring for turbidity shall be conducted as follows:
 - i. Visual Monitoring shall take place every hour.
 - ii. Turbidity measurements shall be taken hourly if there is visible turbidity.
- d. **Downstream 3 (DS-3):** A marker shall be placed 550 feet downstream from the work site. The purpose of this station is to designate the end of the mixing zone and determine compliance with turbidity-related surface water quality standards. At this location, there shall be no visible turbidity, or turbidity measurements in any part of the channel shall not exceed 10 NTUs above the measured background at UP-1. During construction activities that could potentially result in increased in-water turbidity, monitoring for turbidity shall be conducted as follows:
 - i. Visual monitoring with photo-documentation shall take place every hour.
 - ii. Turbidity measurements shall be taken hourly if there is visible turbidity.
 - iii. If there is visible turbidity at DS-2, visual monitoring with photo-documentation and turbidity measurements shall be taken every hour at DS-3 for a minimum of 2 hours after visible turbidity is observed at DS-2.

4. Required Actions to Control Turbidity:

- a. **DS-1:** If turbidity is visible in more than $\frac{1}{4}$ of the channel at this station, work shall be assessed immediately to determine the cause of the increased turbidity, and corrective actions shall be taken to limit visible turbidity to no more than $\frac{1}{4}$ of the channel. It is assumed that if turbidity is visible in more than $\frac{1}{4}$ of the channel, the turbid discharge could be impacting aquatic organism passage.
- b. **DS-2:** If turbidity is visible in any part of the channel at this station, a turbidity measurement shall be taken. If turbidity is greater than 25 NTUs above background, work shall be assessed immediately to determine the cause of the increased turbidity, and corrective actions shall be taken. It is assumed that if there is visible turbidity at this station, there is a high potential that turbidity will not meet the turbidity water quality standard at DS-3.
- c. **DS-3:** If turbidity is visible in any part of the channel at this compliance station, a turbidity measurement shall be taken within the turbid plume. If the turbidity measurement is greater than 10 NTUs above the background measurement at UP-1, work shall be stopped and assessed immediately to determine the cause of the

¹ In some instances, the establishment of a monitoring location for aquatic organism passage (DS-1) may not be applicable due to the nature of the waterbody (e.g. narrow, shallow, or slow-moving watercourse). In these instances, monitoring station DS-1 may be eliminated from the mixing zone, in which case DS-2 would be renamed DS-1, etc. It is still assumed that aquatic organism passage would not be affected provided that the provisions of this mixing zone are implemented, including the general conditions, and corrective actions as outlined herein, and turbidity levels in the discharge are typical for the type of work.

increased turbidity, and corrective actions shall be taken to bring turbidity levels to no more than 10 NTUs above the background measurement at UP-1. A description of the corrective action(s) shall be included in a monitoring report. The report shall be provided to NHDES consistent with the **Notification** section (8) below.



5. Meter Monitoring Protocols:

Field measurements of turbidity using turbidity meters shall comply with the following:

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

- i. Dataloggers can be used instead of hand-held meters to automatically collect the majority of near-continuous (i.e., every 15 minutes) turbidity measurements.
 - ii. Dataloggers shall be calibrated according to manufacturer's instructions, with results recorded on the field data sheet.
 - iii. On the same day that dataloggers are deployed as well as prior to and on the same day that dataloggers are retrieved, hand-held turbidity measurements shall be made in the water next to the datalogger for comparison to datalogger results.
 - iv. Dataloggers shall be retrieved, data downloaded, recalibrated, and redeployed at least once every 2 weeks.
 - v. If dataloggers are used, hand-held turbidity meter measurements shall also be taken at least twice per day as a back-up in case the datalogger malfunctions and/or the data (which is downloaded at least once every 2 weeks) is later found to be invalid.
- e. Quality Control and Quality Assurance
- i. Turbidity meters shall have an accuracy of + 2% for readings below 100 NTUs and + 3% for readings above 100 NTUs, and a resolution of ± 0.1 NTU. Prior to monitoring, meter specifications shall be provided to NHDOT for approval.
 - ii. Hand-held meters shall be recalibrated daily with results recorded on the field data sheet.
 - iii. Duplicate samples shall be taken for every 10th sample with results and identification of the duplicate sample clearly identified and recorded on the field data sheet. If the relative difference² between the duplicate measurement and the original measurement exceeds 10%, recalibrate the turbidity meter and re-measure turbidity.
 - iv. Blank samples shall be taken every 10th sample and recorded on the field data sheet. Blank samples shall be taken by filling a sample container with deionized water and measuring the turbidity immediately following measurement of the 10th sample.

6. Visual Monitoring with Photo Documentation Protocols:

Visual monitoring for turbidity and photo documentation shall comply with the following:

- a. Visual monitoring results shall be recorded on field data sheets. Field data sheets for visual monitoring shall include the names of the individual conducting the observations, the date, time, location, and result (i.e., visual turbidity or no visual

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

2

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

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

turbidity) of each observation, and the date/time when work was ordered to be stopped and the date/time when work was allowed to resume.

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

7. Documentation, Notification and Reporting:

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

8. Notification:

- a. NHDOT shall be notified **immediately** when turbidity measurements at the downstream mixing zone compliance station D-3 indicate that an exceedance of the surface water quality standard for turbidity has occurred.
- b. NHDES shall be notified **within 24 hours** when it is determined that monitoring cannot be conducted due to unsafe conditions.
- c. If use of this mixing zone has been suspended due to no work that could reasonably cause turbid conditions, or not yet started, NHDES shall be notified **within 24 hours** of the start or resumption of use of this mixing zone.
- d. NHDES shall be notified **within 24 hours** if a failure is discovered in maintaining a zone of passage during in-water work in accordance with General Condition 2e.

- e. Notifications relating to a non-compliance event (identified in Section 8a and 8d above) shall include:
 - i. A description of the exceedance,
 - ii. The probable cause of the exceedance,
 - iii. Corrective actions that were taken, or that will be taken, to address the exceedance, and
 - iv. An estimate of the amount of time needed until the exceedance is corrected, if not already corrected.
- f. Notifications shall be submitted to the NHDES Water Quality Certification Program at wqc@des.nh.gov, and to James Tilley (Water Quality Certification Supervisor) at james.w.tilley@des.nh.gov, or (603) 271-0699.

9. Compliance Summary:

- a. At the mixing zone compliance station D-3, water quality standards for turbidity shall be met. If turbidity exceeds water quality standards (no more than 10 NTU above background), work shall be stopped, and corrective actions undertaken.
- b. Examples of corrective actions that may be taken by the Contractor, with approval of NHDOT include, but are not limited to:
 - i. Work stoppage until turbidity at the end of the mixing zone D-3 returns to a compliant measurement,
 - ii. Stabilizing any un-stabilized soil,
 - iii. Modification of construction procedures,
 - iv. Evaluation and correction of water quality control measures,
 - v. Evaluation and correction of erosion and sediment controls (Stormwater Control Measures (SCM)),
 - vi. Enhanced SCM deployment; and/or
 - vii. Use of other SCMs.
- c. Expected in-water measurements of between 50 NTU and 10 NTU above background fall within a range of toxicity that is not acutely toxic to aquatic organisms, meaning that short durations of exposure are not detrimentally harmful.
- d. According to the EPA, “*All species of fish and other aquatic life must tolerate a range of dissolved solids concentrations in order to survive under natural conditions... Major increases in stream suspended solids (25 ppm [7 NTU] turbidity upstream versus 390 ppm [114 NTU] downstream) caused smothering of bottom invertebrates, reducing organism density to only 7.3 per square foot versus 25.5 per square foot upstream (Tebo, 1955)...*” *Quality Criteria for Water 1986, EPA, Publication 440/5-86-001, May 1, 1986 p270 (<https://www.epa.gov/sites/default/files/2018-10/documents/quality-criteria-water-1986.pdf>)*.
- e. NOAA reports here: [Section 7 Effect Analysis: Turbidity in the Greater Atlantic Region | NOAA Fisheries](#) that, “*Studies of the effects of turbid water on fish suggest that concentrations of suspended sediment can reach thousands of milligrams per liter [1,000 mg/L = 292 NTU] before an acute toxic reaction is expected (Burton 1993)*”
- f. The use of short duration construction turbidity mixing zones is limited to:
 - i. Daily, only when needed;
 - ii. Suspension at the completion of each day of work; and

- iii. Used only during active construction discharges and associated in-water construction operations.