

# STATE OF NEW HAMPSHIRE INTER-DEPARTMENT COMMUNICATION

**DATE:** April 3, 2024

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

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

**SUBJECT** Permit Amendment  
Auburn, 44167

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 amendment package prepared by NH DOT Bureau of Highway Design for the subject major impact project. The project will replace a 41' long 5' diameter corrugated metal pipe culvert carrying an unnamed stream under NH Route 121 (Chester Road) approximately 600' north of Bunker Hill Road in the Town of Auburn, NH. The proposed project will install a 9'X6.5' 4-sided Box Culvert with 12" embedment (open area approx. 9'X4.5') with concrete wingwalls upstream and downstream. In addition, a 3' diameter RCP culvert set 28' off the proposed box culvert has been incorporated to provide relief from future raising of Massabesic Lake.

As a result of the meeting with NHDES on 12/29/23, NHDOT has evaluated a modified design of the project to best accommodate an estimated 1' water level rise as requested by NHDES. The project is not classified as a significant amendment in accordance with RSA 482-A:3:XIV (e): This meaning of "significant amendment" shall not apply to an application amendment that is in response to a request from the department. A copy of this application and plans can be accessed on the NHDOT's website via the following link: <https://www.dot.nh.gov/projects-plans-and-programs/programs/environmental-management-system/project-management-section-0>

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

Mitigation was determined to not be required as the proposed work was determined to be self-mitigating.

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

The lead people to contact for this project are Kirk Mudgett, Bureau of Highway Design (271-1598 or Kirk.O.Mudgett@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 was previously processed for this application (Voucher #732767) in the amount of \$1,306.40 and has been paid in full. The total impacts are the same, however some impacts have changed from temporary to permanent.

If and when this permit amendment 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 Auburn (4 copies via certified mail)

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

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

Jeanie Brochi, US Environmental Protection Agency (via electronic notification)

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

Kevin Nyhan, BOE (via electronic notification)



**AMENDMENT REQUEST FORM  
FOR A WETLANDS APPLICATION OR PERMIT  
Water Division/Land Resources Management  
Wetlands Bureau**



**RSA/Rule:** RSA 482-A:3, XIV(e)/ Env-Wt 311.13; Env-Wt 314.07

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

Any request for an amendment to a wetlands application or permit must be submitted to the Department on this form. An applicant may request an amendment to a pending permit application or an existing permit, provided the proposed change does not constitute a **“significant amendment.”** A **“significant amendment”** means an amendment which changes the proposed or previously approved acreage of the permitted fill or dredge area by 20 percent or more, includes a prime wetland, or elevates the project’s impact classification. This meaning of "significant amendment" shall not apply to an application amendment that is in response to a request from the Department (RSA 482-A:3, XIV(e)).

<b>SECTION 1 - REQUESTED AMENDMENT TYPE AND AMENDMENT CRITERIA</b>
<p>Does the proposed change constitute a “significant amendment” as provided in RSA 482-A:3, XIV(e) and described above? <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span></p> <p>If you answered “yes” to the previous question, then you cannot request an amendment using this form and must file a new permit application.</p>
<p><input type="checkbox"/> AMENDMENT TO PENDING PERMIT APPLICATION, NHDES FILE NUMBER: [ ] (proceed to Section 2)</p> <p><input checked="" type="checkbox"/> AMENDMENT TO EXISTING PERMIT NUMBER: 2023-02842 (proceed to Section 3)</p>
<b>SECTION 2 - AMENDMENT TO A PENDING PERMIT APPLICATION</b>
<p><input type="checkbox"/> Not applicable</p> <p>To request an amendment to a pending permit application, the applicant must:</p> <ul style="list-style-type: none"> <li>Submit the information required by Env-Wt 311.03, showing the changes prior to the Department’s issuance of a final decision on the application, including but not limited to, a revised set of plans and revised application fees for any additional square footage of impacts calculated pursuant to RSA 482-A:3, I(b) or (c) as applicable, and</li> <li>Provide notice to each person to whom notice of the original application was sent prior to filing the amended application with the Department (Env-Wt 311.13).</li> </ul> <p><input type="checkbox"/> By checking this box, you confirm that you have provided all information required pursuant to Env-Wt 311.03 to the Department and provided the required notice(s) as described above.</p>

**SECTION 3 - AMENDMENT TO AN EXISTING PERMIT**

Not applicable

To request an amendment to an existing permit, the permittee must:

- Submit the information required and filed with the original permit application, including but not limited to a revised set of plans, and revised application fees for any additional square footage of impacts calculated pursuant to RSA 482-A:3, I(b) or (c) as applicable, and
- Provide notice to all who received notice of the original application prior to filing the amended application with the Department (Env-Wt 314.07).

By checking this box, you confirm that you have provided all necessary information to the Department and provided the required notice(s) as described above.

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

NHDES Wetlands Bureau, PO Box 95, Concord, NH 03303-0095

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



# STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

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



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

**APPLICANT'S NAME:** NH Dept. of Transportation      **TOWN NAME:** Auburn

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](#).

<b>SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))</b>	
Please use the <a href="#">Wetland Permit Planning Tool (WPPT)</a> , the Natural Heritage Bureau (NHB) <a href="#">DataCheck Tool</a> , the <a href="#">Aquatic Restoration Mapper</a> , or other sources to assist in identifying key features such as: <a href="#">priority resource areas (PRAs)</a> , <a href="#">protected species or habitats</a> , 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"> <li>• Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&amp;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.</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>• Protected species or habitat?                             <ul style="list-style-type: none"> <li>○ If yes, species or habitat name(s): Sandy pond shore system, coastal plain grass-leaved goldenrod (<i>Euthamia caroliniana</i>), red threeawn (<i>Aristida longespica</i> var. <i>geniculata</i>), river birch (<i>Betula nigra</i>), unpretentious yellow-seeded false pimpernel (<i>Lindernia dubia</i> var. <i>anagallidea</i>), American Eel, Swamp Darter</li> <li>○ NHB Project ID #: NHB23-1098</li> </ul> </li> </ul>	<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 checked="" type="checkbox"/> Yes <input 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: <ul style="list-style-type: none"> <li>• Name of Local River Management Advisory Committee (LAC): [REDACTED]</li> <li>• A copy of the application was sent to the LAC on Month: [REDACTED] Day: [REDACTED] Year: [REDACTED]</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
For dredging projects, is the subject property contaminated? <ul style="list-style-type: none"> <li>• If yes, list contaminant: [REDACTED]</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
For stream crossing projects, provide watershed size (see <a href="#">WPPT</a> or Stream Stats): 312 acres (Lidar delineation with site assessment)	
<b>SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i))</b>	
Provide a <b>brief</b> 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 project will replace a 41' long 5' diameter corrugated metal pipe culvert carrying a unnamed stream under NH Route 121 (Chester Road) approximately 600' north of Bunker Hill Road in the Town of Auburn. The existing pipe is in poor condition, the inlet invert has corroded away and sinkholes were observed and subsequently repaired in December 2022 and May 2023. There is only approx. 1' of cover over the pipe. The proposed project will install a 9'X6.5' 4-sided Box Culvert with 2' embedment (open area approx. 9'X4.5') with concrete wingwalls upstream and downstream. The proposed culvert will add 4' of length on the inlet. The total length will be 45' to accommodate a pedestrian crossing during construction phasing and to provide wider shoulder for pedestrian and/or bike traffic. In addition, a 3' dia. reinforced concrete pipe is proposed 28' off the centerline of the box culvert. This pipe has been designed to alleviate the affect of higher tailwater if the Massabesic Lake water surface elevations is raised in the future. Incidental work includes removing and installing new guardrail, pavement restoration, and grading to match the stream channel through the culvert.</p> <p>Permanent impacts to riverine, scrub-shrub palustrine and lacustrine wetlands are required in the immediate vicinity of the culvert inlet and outlet to install headwalls, grade the stream channel, add 4' of culvert length on the inlet side, and install the 3' RCP culvert. Temporary impacts include bordering scrub-shrub palustrine wetlands required for installation of cofferdams, water bypass, and dewatering. Temporary impacts to riverine and lacustrine wetlands is also required for access and to facilititate installation of the proposed culverts.</p>	
<b>SECTION 3 - PROJECT LOCATION</b>	
Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.	
ADDRESS: NH RT 121/Chester Road (600ft north of Bunker Hill Road)	
TOWN/CITY: Auburn	
TAX MAP/BLOCK/LOT/UNIT: Map: 23 (Within State ROW)	
US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: Massabesic Lake and unnamed tributary	

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

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

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

<input type="checkbox"/> N/A		
(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places):		43.9070° North
		71.9753° West
<b>SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))</b>		
If the applicant is a trust or a company, then complete with the trust or company information.		
NAME: NH Dept. of Transportation		
MAILING ADDRESS: PO Box 483		
TOWN/CITY: Concord	STATE: NH	ZIP CODE: 03303
EMAIL ADDRESS: kirk.o.mudgett.dot.nh.gov		
FAX: [REDACTED]	PHONE: 603-271-1598	
ELECTRONIC COMMUNICATION: By initialing here: [REDACTED], I hereby authorize NHDES to communicate all matters relative to this application electronically.		
<b>SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))</b>		
<input checked="" type="checkbox"/> N/A		
LAST NAME, FIRST NAME, M.I.: [REDACTED]		
COMPANY 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.		
<b>SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))</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.		

**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):

In accordance with Env-Wt 400, the jurisdictional areas within the project limits have been delineated by the NHDOT Bureau of the Environment on 4/7/23. The jurisdictional areas are referenced on the included wetland impact plans. The project has been designed in accordance with Env-Wt 527 and Env-Wt 900 to the maximum extent practicable as described per NRAM meeting on 6-21-23. The meeting minutes are included in this application package as well as a supplemental narrative to address Env-Wt 904.10-Alternative Designs. Unavoidable impacts to wetlands have been minimized to the maximum extent practicable. Project specific information is contained within this permit application.

**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: **6** Day: **21** Year: **2023**

N/A - Mitigation is not required

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

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

N/A – Compensatory mitigation is not required

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

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

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

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

Permanent 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			<input type="checkbox"/>			<input type="checkbox"/>
	Scrub-shrub Wetland	5		<input type="checkbox"/>	612		<input type="checkbox"/>
	Emergent Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Wet Meadow			<input type="checkbox"/>			<input type="checkbox"/>
	Vernal Pool			<input type="checkbox"/>			<input type="checkbox"/>
	Designated Prime Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Duly-established 100-foot Prime Wetland Buffer			<input type="checkbox"/>			<input type="checkbox"/>
Surface Water	Intermittent / Ephemeral Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Perennial Stream or River	984	58	<input type="checkbox"/>	688	82	<input type="checkbox"/>
	Lake / Pond	483	79	<input type="checkbox"/>	494	59	<input type="checkbox"/>
	Docking - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - River			<input type="checkbox"/>			<input type="checkbox"/>
Banks	Bank - Intermittent Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Bank - Perennial Stream / River			<input type="checkbox"/>			<input type="checkbox"/>
	Bank / Shoreline - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
Tidal	Tidal Waters			<input type="checkbox"/>			<input type="checkbox"/>
	Tidal Marsh			<input type="checkbox"/>			<input type="checkbox"/>
	Sand Dune			<input type="checkbox"/>			<input type="checkbox"/>
	Undeveloped Tidal Buffer Zone (TBZ)			<input type="checkbox"/>			<input type="checkbox"/>
	Previously-developed TBZ			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Tidal Water			<input type="checkbox"/>			<input type="checkbox"/>
<b>TOTAL</b>		<b>1472</b>	<b>137</b>		<b>1794</b>	<b>141</b>	

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

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

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

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

Permanent and temporary (non-docking):	3266 SF	× \$0.40 =	\$ 1,306.4
Seasonal docking structure:		× \$2.00 =	\$
Permanent docking structure:		× \$4.00 =	\$
Projects proposing shoreline structures (including docks) add \$400 =			\$
Total =			\$ 1,306.4

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

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

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



The application fee for minor or major impact is the above calculated total or \$400, whichever is greater = \$ 1,306.4

**SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)**

Indicate the project classification.

Minimum Impact Project       Minor Project       Major Project

**SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)**

Initial each box below to certify:

Initials: kom _____ _____	To the best of the signer's knowledge and belief, all required notifications have been provided.
Initials: kom _____ _____	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
Initials: kom _____ _____	The signer understands that: <ul style="list-style-type: none"> <li>• The submission of false, incomplete, or misleading information constitutes grounds for NHDES to:                         <ol style="list-style-type: none"> <li>1. Deny the application.</li> <li>2. Revoke any approval that is granted based on the information.</li> <li>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.</li> </ol> </li> <li>• The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.</li> <li>• The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact 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.</li> </ul>
Initials: kom _____ _____	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.

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

SIGNATURE (OWNER): _____	PRINT NAME LEGIBLY: _____	DATE: _____
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): <i>Kirk Mudgett</i>	PRINT NAME LEGIBLY: Kirk Mudgett	DATE: 4/1/24
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: State agency exempt per RSA 482-A:3, I(a)
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TOWN/CITY: 4 copies via cert. mail	DATE: exempt per Env-WT 311.05(a)(14)
------------------------------------	---------------------------------------

**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".

## Thomson, Rhona

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**From:** Diers, Ted  
**Sent:** Wednesday, January 31, 2024 1:29 PM  
**To:** Mudgett, Kirk  
**Cc:** Forst, Darlene; OSullivan, Andrew; Commerford, James; Mallette, Timothy; Nyhan, Kevin; Thomson, Rhona; Pelletier, Rene  
**Subject:** RE: Auburn 44167 - Potential Massabesic Lake Level Rise - Follow Up

Thanks, Kirk.

We greatly appreciate your forethought and accommodation on this.

Ted

Ted Diers, Assistant Director, Water Division  
NH Department of Environmental Services  
PO Box 95  
Concord, NH 03302-0095  
Work Phone – 603-271-2951  
Cell Phone – 603-568-5991  
[Theodore.e.diers@des.nh.gov](mailto:Theodore.e.diers@des.nh.gov)  
[www.des.nh.gov](http://www.des.nh.gov)

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**From:** Mudgett, Kirk <Kirk.O.Mudgett@dot.nh.gov>  
**Sent:** Tuesday, January 30, 2024 12:53 PM  
**To:** Diers, Ted <THEODORE.E.DIERS@des.nh.gov>  
**Cc:** Forst, Darlene <DARLENE.C.FORST@des.nh.gov>; OSullivan, Andrew <Andrew.M.OSullivan@dot.nh.gov>; Commerford, James <James.S.Commerford@dot.nh.gov>; Mallette, Timothy <Timothy.S.Mallette@dot.nh.gov>; Nyhan, Kevin <Kevin.T.Nyhan@dot.nh.gov>; Thomson, Rhona <Rhona.C.Thomson@dot.nh.gov>  
**Subject:** Auburn 44167 - Potential Massabesic Lake Level Rise - Follow Up

Hi Ted,

As a result of the meeting with NHDES on 12/29/23, NHDOT has evaluated a modified design of the project to best accommodate an estimated 1' water level rise as requested by NHDES. NHDOT realizes the raising of the lake to supply water to those towns affected by PFAS contamination is a high priority project for the department. The poor culvert condition also places the replacement as a high priority and meeting the current advertising date allows just enough time to construct next season. Our plan being advertised incorporates a larger clear opening to the proposed culvert than originally designed.

An additional modification, adding of a surge pipe, will have to be made post advertising, as it will require an amended wetlands permit, and permanent easements from the Manchester water works parcel. If all moves smoothly and quickly, we believe we can provide the contractor with an updated plan in time to order materials for construction. Are there any updates needed going forward?

*Kirk Mudgett, P.E.*  
Bureau of Highway Design | NHDOT  
Chief of Specialty Section



## Auburn 44167

### Amended Wetland Permit

#### Comparison of Previously Permitted and Amended Permit Impact Areas

##### Previously Permitted Wetland Impact Areas

Jurisdictional Area	Permanent		Temporary	
	SF	LF	SF	LF
Scrub-shrub Wetland	5		612	
Perennial Stream	516	33	1156	107
Lake/Pond	86	24	891	114
<b>Total</b>	<b>607</b>	<b>57</b>	<b>2659</b>	<b>221</b>

Total Permitted Impact Areas		
	SF	LF
<b>Total</b>	<b>3266</b>	<b>278</b>

##### Amended Wetland Impact Areas

Jurisdictional Area	Permanent		Temporary	
	SF	LF	SF	LF
Scrub-shrub Wetland	5		612	
Perennial Stream	984	58	688	82
Lake/Pond	483	79	494	59
<b>Total</b>	<b>1472</b>	<b>137</b>	<b>1794</b>	<b>141</b>

Total Amended Impact Areas		
	SF	LF
<b>Total</b>	<b>3266</b>	<b>278</b>

\*No Change in Total Impact Area from existing permit.



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



Water Division/Land Resources Management  
Wetlands Bureau

[Check the Status of your Application](#)

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

**APPLICANT'S NAME:** NH Dept. of Transportation      **TOWN NAME:** Auburn

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.

A FULLY COMPLIANT STREAM CROSSING DESIGN AT THIS LOCATION WOULD REPLACE THE EXISTING 5' DIA, CMP CULVERT WITH A 32' SPAN BRIDGE STRUCTURE WITH A WILDLIFE SHELF INSIDE. THIS WOULD LIKELY REQUIRE A PERMANENT EASEMENT OF THE NORTHERN ABUTTING PROPERTY. THE CURRENT CONSTRUCTION COST ESTIMATE FOR THIS OPTION IS \$2,169,000. SECURING FUNDING AND ADDITIONAL DESIGN TIME WOULD REQUIRE A DELAY IN THE START OF CONSTRUCTION OF 3-5 YEARS. A DELAY OF THIS MAGNITUDE WOULD INCREASE THE RISK OF FAILURE OF THE EXISTING CULVERT AND THE ROADWAY. INFLATION, ENGINEERING, AND PERMANENT EASEMENTS OR ACQUISITIONS (WHICH MAY BE REQUIRED) ARE NOT INCLUDED IN THE COST ESTIMATE. THIS ALTERNATIVE IS NOT CONSIDERED PRACTICAL UNDER THIS PROGRAM.

A HYDRAULIC DESIGN IS PROPOSED TO PASS THE 50-YEAR EVENT WITHOUT OVERTOPPING THE ROADWAY. SEVERAL SPANS WERE CONSIDERED TO BALANCE HYDRAULIC CAPACITY, A TIMELY REPLACEMENT TO REDUCE THE RISK OF FAILURE, AND ENVIRONMENTAL IMPACTS. AN EMBEDDED 9' SPAN STRUCTURE WAS ORIGINALLY SELECTED TO MEET THIS PURPOSE. HOWEVER, TO ACCOMMODATE THE POTENTIAL 1' FUTURE RAISE IN MASSABESIC LAKE, THE SELECTED ALTERNATIVE HAS BEEN REVISED TO INCLUDE A 3' DIAMETER REINFORCED CONCRETE PIPE (RCP) AND TO REVISE THE RISE OF THE CONCRETE BOX CULVERT TO 6.5'. THE RCP CULVERT SET 28' OFF THE CENTERLINE OF THE CONCRETE BOX CULVERT.

ADDITIONAL PERMANENT IMPACTS ARE REQUIRED TO CONSTRUCT A 3' WIDE CHANNEL CONNECTING THE RCP TO THE STREAM AND LAKE AT THE INLET AND OUTLET RESPECTIVELY. THESE AREAS WERE PREVIOUSLY PERMITTED AS TEMPORARY IMPACTS REQUIRED FOR STREAM DIVERSION, WHICH BE COMPLETED WITH THE CONCRETE PIPE. THE TOTAL PROPOSED IMPACT AREAS AND LINEAR FEET (TEMPORARY + PERMANENT) ARE UNCHANGED.

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

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

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

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

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

There are no marshes delineated within the project area.

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

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

The existing 5' dia. pipe culvert provides a hydrologic connection between the un-named stream and Massabesic Lake. There is no existing perch at the inlet or outlet. The proposed structure is a 9'X6.5' Box culvert embedded with stream simulation material. The proposed invert elevations will be set such that the simulated streambed material inside the culvert matches the existing streambed upstream and downstream. Temporary disturbance to inlet and outlet areas will be restored such that there is no change to the existing streambed grade. The hydrologic connection between the upstream and downstream channels will remain the same post-construction.

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

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

The project has been designed in accordance with ENV-Wt 400, 500, and 900. Unavoidable impacts to wetlands have been minimized to the maximum extent practicable; the Department has addressed Env-Wt 311.07 Avoidance and Minimization through the checklist document included with this application. The proposed design is the minimum impact alternative that meets the project purpose and need and avoids impacts or minimizes impacts to nearby jurisdictional areas.

The resources present within the project area that will be impacted consist of the un-named stream (R2UB23), palustrine scrub-shrub wetland (PSS1F) and Massabesic Lake (L1UBH). There will be no change in the function of these wetlands due to the project. The project only proposes permanent impacts at the inlet and outlet of the proposed culvert as required to construct headwalls, add 4' of culvert at the inlet, regrade embankment adjacent to the inlet, and to grade the stream channel. The proposed temporary impacts are required to install cofferdams, water bypasses, and dewatering.

Records of rare/protected species and habitats near the project area include sandy pond shore system, coastal plain grass-leaved goldenrod, red threeawn, river birch, unpretentious yellow-seeded false pimpernel, American eel, and swamp darter. After coordination with NHB, no concerns were identified regarding impacts to the protected plant species and natural community. Regarding the wildlife records, NHFG recommendations will be followed. Recommendations include excluding baffles from culvert design, embedding the culvert with native stream material, contacting NHFG if turtles or other endangered/threatened species are encountered during construction, avoiding the use of erosion control methods containing plastic or multifilament/monofilament polypropylene netting or mesh with an opening size of greater than 1/8 inches, and ensuring NHFG access to the project area throughout the term of the

**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 un-named stream is not navigable nor is it used for water recreation or is it an identified fishing location. Massabesic Lake is popular for boating and sailing (swimming is prohibited due to water supply), however depths at the culvert outlet are shallow and recreation is not expected within the project area. The Project will have no permanent effect on public commerce, navigation, or recreation. However without a timely replacement, failure of the existing culvert could result in significant transportation delays, as detours are not readily available for the traffic volume on NH 121.



**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.

Downstream of the culvert a PSS1F wetland borders the lake. A 5 square foot permanent impact is proposed for the concrete wingwall and streambed material at the culvert outlet. This impact is limited to the length of wingwall required for embankment slope tie-in and is within the extent of the existing masonry wingwalls.

There are approximately 18 acres of wetlands beginning approx. 600' upstream of the project (per the National Wetlands Inventory) which likely do provide flood storage. The project will not impact these or change their flood storage function.

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

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

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

A scrub-shrub wetland is located on the edge of Massabesic Lake just to the north of the culvert. The mapped extents of the wetland overlap the existing wingwall extents. Such that, while the proposed wingwall replacement is shorter than the existing extents, there is a 5 square foot permanent impact proposed for the new wingwall.

**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.

Massabesic Lake is a major drinking water supply reservoir for the City of Manchester. The project will employ best management practices during construction to prevent untreated runoff from entering the water supply. Post-project the site will have no effect on Massabesic Lake or wetlands that would be detrimental to drinking water supply and groundwater aquifer levels.

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

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

Avoidance of all impacts is not practical due to the size and poor structural condition of the existing culvert. The proposed 9'X6.5' box culvert will cause an increase in hydraulic capacity, enhance Aquatic Organism Passage, and improve geomorphic compatability. Simulated streambed material will be added inside the culvert without causing impacts to the upstream and downstream channels. Permanent impacts to the stream channel are the minimum necessary to match the new culvert to the existing stream channel. Therefore, the proposed structure should be considered self-mitigating.

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

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

N/A

**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

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

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

N/A

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

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

N/A

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

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

N/A

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

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

N/A

<b>PART II: FUNCTIONAL ASSESSMENT</b>	
<b>REQUIREMENTS</b>	Ensure that project meets the requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).
<b>FUNCTIONAL ASSESSMENT METHOD USED:</b>	See attached stream crossing assessment.
<b>NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT:</b> JOSH BROWN, DEIDRA BENJAMIN	
<b>DATE OF ASSESSMENT:</b> 4/7/2023	
Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT: <input checked="" type="checkbox"/>	
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 type="checkbox"/>	
Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.	

**CULVERT REPLACEMENT  
NH ROUTE 121 OVER UN-NAMED BROOK  
AUBURN, NH  
NHDOT PROJECT NO. 44167  
SUPPLEMENTAL NARRATIVE**

**Project Description**

The project will replace an existing 60" diameter corrugated metal pipe which conveys a small stream into Massabesic lake. The proposed alternative is a precast 9' wide by 6.5' high 4-sided box culvert embedded with stream simulation material, with concrete headwall and wingwalls upstream and downstream, a 12" layer of simulated streambed material to initiate natural sedimentation processes, and reconstruction of the roadway over the culvert. In addition, a 3' diameter RCP culvert set 28' off the proposed box culvert has been incorporated to provide relief from future raising of Massabesic Lake. This is a federally funded culvert rehabilitation project. The proposed advertising date is February 20, 2024, with construction anticipated in the summer-fall of 2024.

This project was initiated and is funded under NHDOT's Federal CRDR Program (Culvert Replacement/Rehabilitation & Drainage Repair). The Program purpose is to address major culvert and drainage needs statewide that are not being addressed through current or future Capital Improvement or other programmatic projects. The Program receives \$2,000,000 in total funding annually, which includes construction, engineering, and ROW costs. The Program funding is fully committed for at least the next three years. The replacement of this crossing was prioritized due to severe sinkholes and soil piping that required rapid repairs in December 2022. The pipe is at the end of its design life and failure to address these deficiencies without a timely replacement could lead to failure or collapse of the culvert and would cause serious impacts to public/private infrastructure and the travelling public.

**Existing Conditions**

The existing crossing is a 41' long 60" diameter corrugated metal pipe culvert with a granite headwall and granite masonry wingwalls. No record of original construction is known, however initial construction was likely a stone box installed circa 1920, or before. Anecdotal evidence from District 5 suggests the current 60" CMP was installed around 20 years ago. The culvert slope is nearly flat with a downstream outlet elevation of 247.55 and about 1' of embedment. At the inlet the bottom of the pipe was fully eroded and an approx. 1' deep hole was observed, likely from recent installation of a (since removed) grate to prevent beaver activity. Mortar has eroded from the headwalls and the wingwalls are beginning to fall into the stream. The fill height over the pipe is about 1'.

In late December of 2022, severe sinkholes and soil piping were discovered and required emergency repair by NHDOT District 5. Water was flowing around the pipe and eroding the embankment up to the shoulder and pavement. This raised significant concern for the stability of the culvert and roadway and prioritized repair and replacement. Sinkholes were subsequently discovered in May and again in September. Pictures of the sinkholes are available in the Photo Log.

The crossing is a Tier 3 due to FEMA Zone A Floodplain surrounding Massabesic Lake and the priority species identified by NHB. The watershed is approximately 312 acres (0.487 square miles) based on LIDAR. The Streamstats watershed was larger, 474 acres (0.74 square miles), however it did not account for roadway elevations and drainage structures along Bunker Hill Road. Which based on field review would prevent runoff from crossing the roadway and instead flow to Massabesic Lake through a 12" and 30" culvert under NH 121 south of Bunker Hill Road.

Review of the NHDES Aquatic Restoration Mapper on 3/28/23 notes the 60" cmp culvert is backwatered. The Mapper indicates it can pass the 2-year flood with a drainage area of 470 acres. AOP scored reduced passage and Geomorphic score was Mostly Incompatible.

NH121 is a Tier 3 road (Major Collector) with average daily traffic (ADT) volume in 2022 of 5,102 vehicles per day with 6% being business/commercial vehicles. The peak recorded ADT was 6,298 vehicles per day in 2019 with 8% being business/commercial vehicles. The paved width is about 24' wide with markings for 11' travel lanes with 1' shoulders. The ROW width is 66'. The posted speed limit is 35 mph.

A stream assessment was performed by the NHDOT Bureau of the Environment on 4/7/23. The average slope is 1% for approximately 200 feet upstream before the stream dissipates into a scrub-shrub wetland system. Bankfull measurements ranged from 8 to 19 feet at the three reference reach cross sections. The stream is a Rosgen Type E stream with a very large entrenchment ratio (typical of Type E streams), ranging from 10.5 to 25 at the reference reaches. The flood prone width at each cross section was 200+ feet indicative of the flat topography in the lower reaches of the watershed.

A challenge of construction at this location is the lack of an available detours along State maintained roads. The proposed design will limit NH 121 to one way traffic for the duration of construction. Access to remove the existing pipe and install the replacement structure will primarily be done from within the existing roadway.

### **Natural and Cultural resources**

#### **Threatened and Endangered Species:**

An Official Species List was requested and obtained from the US Fish and Wildlife Service using the Information for Planning and Conservation (IPaC) tool. The Official Species List indicated one mammal species, the Northern Long-Eared Bat (NLEB), and one insect species, Monarch Butterfly, within the project area.

Using the FHWA, FRA, FTA Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bat on IPaC, it was found that the project may rely on the amended 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 proposed action intersects an area where northern long-eared bats are not likely to occur; therefore, it is anticipated that the project would have no effect on northern long-eared bat. The project is not expected to impact any federally protected species and no further consultation with the USFWS is required.



The monarch butterfly has become a candidate for listing under the Endangered Species Act (ESA). The USFWS will review the monarch's status each year until resources are available to begin developing a proposal to list the monarch as threatened or endangered under the ESA. The candidate status of the monarch does not provide protection under the Endangered Species Act, and no further coordination with the USFWS is required. Monarch habitat includes non-forested, non-shrubby areas where there is potential for nectar species (flowering plants) and/or milkweed plants, including, but not limited to, regularly or semi-regularly mowed areas within the ROW and where a clear zone is maintained.

#### The Natural Heritage Bureau data check:

The Natural Heritage Bureau data check identified one exemplary natural community (sandy pond shore system), three state threatened plant species (coastal plain grass-leaved goldenrod, red threeawn, and river birch), and one state endangered plant species (unpretentious yellow-seeded false pimpernel). After coordination with NHB involving photos taken of the project area, no further concerns were identified in regard to the rare plant species and natural community, and no impacts are anticipated.

#### NH Fish & Game Coordination:

The NHB DataCheck letter identified two vertebrate species of special concern in the vicinity of the project area, American Eel and Swamp Darter. NHFG provided the following recommendations:

- American Eel (State species of special concern) and Swamp Darter (State species of special concern) occur within the vicinity of the project area. All operators and personnel working on or entering the site should be made aware of the potential presence of these species.
- Baffles should not be included within the culvert design.
- If the proposed culvert is to be embedded, it should be embedded with native stream material to mimic upstream and downstream conditions.
- Turtles may be attracted to disturbed ground during nesting season (May 15th – June 30th). All turtle species nests are protected by NH laws. If a nest is observed or suspected, operators shall contact Melissa Winters (603-479-1129) or Josh Megyesy (978-578-0802) at NHFG immediately for further consultation.
- All manufactured erosion and sediment control products, with the exception of turf reinforcement mats, utilized for, but not limited to, slope protection, runoff diversion, slope interruption, perimeter control, inlet protection, check dams, and sediment traps shall not contain plastic, or multifilament or monofilament polypropylene netting or mesh with an opening size of greater than 1/8 inches (shown to trap snakes and other reptiles/wildlife). All observations of threatened or endangered species on the project site shall be reported immediately to the NHFG nongame and endangered wildlife environmental review program by phone at 603-271-2461 and by email at [NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov), with the email subject line containing the NHB DataCheck tool results letter assigned number, the project name, and the term Wildlife Species Observation.
- Photographs of the observed species and nearby elements of habitat or areas of land disturbance shall be provided to NHFG in digital format at the above email address for verification, as feasible.

In the event a threatened or endangered species is observed on the project site during the term

of the permit, the species shall not be disturbed, handled, or harmed in any way prior to consultation with NHFG and implementation of corrective actions recommended by NHFG. NHFG, including its employees and authorized agents, shall have access to the property during the term of the permit.

These recommendations will all be incorporated into design and construction.

Cultural Resources:

The proposed project was reviewed by the Department's Cultural Resource Program Manager and Cultural Resource Program Specialist, and it was determined that the project would be consistent with the conditions of Appendix B of the Programmatic Agreement between the Department, the NH Division of the Federal Highway Administration, and the NH Division of Historical Resources and a Section 106 finding of "No Historic Properties Affected" was made. The culvert is estimated to be about 20 years old, when lintels of a stone box culvert were removed and the CMP was dropped into the existing culvert area, so it is not considered historic. A pre-contact archaeological site is within the vicinity of the boat launch area. Project activities, including staging, will be limited to previously disturbed areas, and no excavation will occur near the boat launch area.

Wetlands:

Impacts to wetlands are predominantly temporary. Proposed permanent impacts are limited to the inlet and outlet of the proposed culvert as required to construct headwalls, add 4' of culvert at the inlet, regrade embankment adjacent to the inlet, and to grade the stream channel.

Water Quality:

The project was reviewed by the Department's Water Quality Program Manager and no concerns were identified. The project would not require earth disturbances equal to or greater than one acre and thus, coverage under the EPA's National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) is not required. Although the project area is located within a regulated Municipal Separate Storm System (MS4) community, the project would not be subject to MS4 Permit requirements as it would not result in one acre or more of land disturbance. Best Management Practices will be utilized throughout construction to prevent erosion and sedimentation.

Impaired Waters:

The unnamed brook is not in the list of impaired waters in Auburn (2018-303d list).

Contamination:

No point-source or PFAS concerns were identified. Limited Reuse Soils (LRS) within the operational State right-of-way shall be addressed in accordance with applicable NHDES rules, waivers, and/or Soils Management Plans.

### Invasive Species:

The Contractor will be required to perform all work activities in accordance with the Department publication “Best Management Practices for the Control of Invasive and Noxious Plant Species” to prevent the spread of invasive species during construction.

### Prime Wetlands, Designated Rivers, and Shoreland Water Quality Protection Act:

There are no prime wetlands or designated rivers within the project area. The project area is within the protected shoreland buffer of Lake Massabesic, and the appropriate shoreland permit will be obtained.

### Floodplains:

FEMA Zone A floodplain is mapped around the lake perimeter and loosely follows NH121 in the vicinity of the culvert. There are no base flood elevations or a study available for Zone A. There is also a Zone A boundary which begins approximately 300 feet upstream of the culvert and follows the perimeter of a wetland complex.

### Conservation Lands:

The project area is bordered by Manchester Water Works land. Coordination with Manchester Water Works has been initiated and is ongoing. There are no Conservation Land Stewardship or Land and Community Heritage Investment Program-supported resources in or near the project area.

### Conservation Commission:

A letter was sent to the Auburn Conservation Commission on 2/6/23 and no response was received within the 30 day period required for timely response.

### **Massabesic Lake**

Massabesic Lake is a water supply reservoir for the City of Manchester. The lake level is maintained via a dam spillway with 18” flashboards located on the southwestern side of the lake. The flashboard crest is at elevation 250.0 (ft, NAVD88), which maintains the normal pond elevation. As the existing culvert invert elevation is 247.55, the normal lake level will backwater through the culvert with a depth of approximately 2.5 feet. Water withdrawals throughout the summer tend to draw down the reservoir in the late summer and fall.

Two full years of daily lake level data was provided by Manchester Water Works and is shown below in Figure 1. Additional tables of monthly lake level data were provided by the Massabesic Yacht Club. From these sources the estimated existing/historical 50-year WSEL is 251.5’. Direct WSEL data is not available on the 100-year flood conditions, but based on NHDOT District 5 experience, NH 121 along Massabesic Lake overtopped during the 2006 Mother’s Day floods. This is the only known overtopping event. The FEMA Zone A delineation and language in the Auburn 2018 Hazard Mitigation Plan generally agree with

this assumption. Thus, it is assumed that the 100-year event will overtop NH 121 for approximately 600 feet of roadway as it runs along Massabesic lake. The roadway centerline in the vicinity of the culvert ranges from El. 253.2 to El. 254.2. Generally, any increase in WSEL due to the culvert overtopping during this event will be negligible.



Figure 1: Available Massabesic Water Surface Level Data

In December 2023, after receiving the Wetland Permit, NHDOT was made aware of an ongoing effort to raise the Massabesic Lake water surface by up to 1 foot. While currently in the feasibility study phase, NHDES indicated raising the lake is a priority to help mitigate PFAS impacted water sources in communities around Manchester. NHDES staff stated that the Lake could be raised as early as 2 years out if there were no issues. As of December 2023, the consultant (MSK Engineers) doing the feasibility study anticipates beginning work in late January or possibly into February. The scope of work is focused on improvements at the dam required to pass the 1,000-year event. The result of raising the Lake at the design event (50-year) can only be estimated at this point and would ultimately need further study. The estimated worst case at the design event would be a 1' increase corresponding to the 1' increase at the normal lake level. Design tailwater would increase to EL. 252.5'.

### Hydrology/Hydraulics

The watershed is primarily forested, with lots along Bunker Hill, Nolls Farm, Coleman roads, and with frontage along NH 121. Approximately 19 acres of wetlands are present in the lower reaches of the watershed. A private airstrip (Cleary Airport) with a grass runway bisects the watershed and directs runoff towards a fire pond at its southern end. The watershed boundary was determined to be 312 acres using LIDAR and field review.

Hydrology was analyzed using two methods, Streamstats (ie. the USGS NH Rural Equation) combined with the USGS National Urban Equation and an SCS/HydroCAD Model using the Curve Number

Methodology. The rural Streamstats flows were reviewed and increased with the USGS National Urban Equation using a Basin Development factor (BDF) of 2. This helps to better account for development in the upland reaches of the watershed, notable two subdivisions. The 50-year event runoff is 152 cfs using the USGS method. The larger Streamstats drainage area of 474 acres was used for a resilience factor .

NOAA Atlas 14 rainfall predictions were used to develop a HydroCAD model using the SCS Curve Number methodology. Analysis divided the watershed into subbasins. The composite curve number for the entire watershed was determined to be 65. A summary of results is shown below in Table 1. The SCS/HydroCAD flows were used for design of the culvert.

Table 1: Summary of 24-hour Rainfall and Peak Runoff Flows

Recurrence	24-hr Rainfall (inches)	Peak Flow Summary (cfs)	
	NOAA Atlas 14	USGS National Urban Equation	SCS/HydroCAD
2	2.91	47	32
5	3.83	76	70
10	4.6	98	108
25	5.65	126	165
50	6.43	152	<b>209</b>
100	7.28	180	269

**Bold Value was used for design.**

A HEC-RAS model was developed to evaluate the existing conditions using observed and recorded Massabesic Lake levels, conduct alternative analyses, and to determine the final design of the proposed culvert. Table 2 below, shows the performance of the existing culvert by headwater elevation. Survey indicates the NH121 centerline over the culvert is at El. 253.2. This analysis shows the culvert is likely undersized as it overtops at the current 25-year estimate. It also likely indicates the flow is conservative for design purposes, as NHDOT district 5 has not reported overtopping events of this frequency. Note

Table 2: Existing 5' Diameter Pipe Calculated Headwater Elevations

Recurrence Year	Headwater Elevation (ft, NAVD88)
2	251.14
5	252.1
10	252.93
25	<b>253.21</b>
50	<b>253.34</b>
100	<b>Lake Overtops NH121</b>

**Indicates Overtopping**

### Applicable Design Standard

The Department design standard guidance is to pass the 50-year event while keeping the peak water surface elevation less than the top of the culvert rise (ie. low chord). Due to the high Massabesic lake

levels, this headwater criteria is not achievable at this location as the backwater condition (Water Surface El. 251.5), would leave only 6" of freeboard. In this case, the design standard will be to prevent the 50-year event from overtopping the roadway. As previously noted, the roadway will overtop due to Massabesic Lake at the 100 year event, regardless the culverts hydraulic capacity.

### **Alternative Analysis**

USACE's HEC-RAS program was used for alternative analyses. Three alternatives were originally considered and a fourth (a revised version of alternative 3) was added following our understanding and analysis of the potential for a 1 foot rise in Massabesic Lake. Each alternative is described below. Table 3 below shows the headwater elevations resulting from analyses with the existing/historical Massabesic Lake Elevations and Table 4 shows the analyses with the estimated 1 foot raise in Lake Level. Minor differences in Table 3 from the original permit application are due to a refinement of the modeled roadway elevations. Cost estimates were developed in May of 2023 and may not reflect the latest bidding conditions.

#### **Alternative 1: Stream Crossing Rules Compliant 32' Bridge**

The existing structure would be completely removed, a significant portion of roadway closed and excavated, a new bridge structure installed, and the roadway subsequently reconstructed. The average bankfull width based on the three reference reaches surveyed was 14.3', with a flood-prone width of over 200 feet, and an entrenchment ratio range of 10.5 to 25. Using the minimum reference reach for a Rosgen Type E stream (per Figure 3 of the Stream Crossing Worksheet) of 2.2, the stream crossing rule compliant span is 31.5'. Rounded to 32' for alternative analysis.

This alternative proposes a 32' span by 35' wide, 3-sided cast-in-place concrete bridge structure with bridge rail, headers, and wingwalls. Construction would be phased to maintain single lane traffic, however the project would cause significant traffic interruptions.

**Cost for this alternative was estimated at \$2,175,000.** See the attached detailed cost estimate located at the end of this supplemental narrative. Note that the estimates provided are only for preliminary construction cost. Design engineering, permit fees, mitigation cost (if any), ROW impacts, and reimbursable utility impacts are not included. It also does not account for raising the roadway, which may be required to meet NHDOT standards. We anticipate this alternative would require acquisition of the northern abutting property or rights. Securing funding and additional design time would require a delay in the start of construction of 3 – 5 years, or more. The existing pipe will not last another 3 – 5 years, therefore this alternative does not meet the goal of timely repair and is not considered practical under this Program.

#### **Alternative 2: 54" Slip-line with a new 4'X2' Critter Crossing Concrete Box**

The pipe would be slip-lined with a 54" smooth bore liner, the voids filled with pumpable cellular concrete, the headwalls repaired and/or reconstructed, and a new 4'X2' concrete box constructed in addition to the culvert. The concrete box provides a dry critter crossing under NH 121 during low lake

levels and additional hydraulic capacity during high flow events. It would be situated to use the existing PEM1E wetland bordering NH121 upstream and small inlet downstream about 25' south of the culvert.

The 4'X2' concrete box pipe would be installed first and used to control and convey flows while the pipe culvert is dewatering and the 54" slip-line installed. Compared to other alternatives this would minimize traffic disturbances, provide a dry wildlife crossing, and reduce construction time and costs. Hydraulic analyses shown in Table 2 below indicate this alternative provides similar hydraulic performance to the existing condition.

**Cost for this alternative was estimated at \$320,000.** See the attached detailed cost estimate located at the end of this supplemental narrative. Note that the estimates provided are only for construction cost. Design engineering, permit fees, mitigation cost (if any), ROW impacts, and reimbursable utility impacts are not included.

### **Alternative 3: 9'X6' 4-Sided Concrete Box Culvert**

The existing pipe, headwalls, and wingwalls would be completely removed and a new 9' wide by 6' high 4-sided box culvert would be installed with concrete headwalls and wingwalls. The culvert would include embedded streambed simulation material. Once established, natural sedimentation processes will resume due to the lower velocities created by the lake backwatering through the culvert and into the wetland. Compared with other alternatives, this would increase AOP, hydraulic connectivity, and substantially increase the hydraulic capacity. Under the existing/historical lake levels, this alternative can pass the 50-year flood with approximately half a foot of freeboard. However, a 1 foot rise in the 50-year lake level will lead to State roadway overtopping.

**Cost for this alternative was estimated at \$682,000.** See the attached detailed cost estimate located at the end of this supplemental narrative. Note that the estimates provided are only for construction cost. Design engineering, permit fees, mitigation cost (if any), ROW impacts, and reimbursable utility impacts are not included.

### **Revised Alternative 3: 9'X6.5' 4-Sided Concrete Box Culvert with 3' Diameter Reinforced Concrete Pipe**

In December 2023, after being notified of the potential future increase to Massabesic Lake, Alternative 3 (the selected alternative) was revised to increase the height from 6' to 6.5' (4.5' open rise) and the previously temporary bypass pipe is now proposed as a permanent 3' diameter reinforced concrete pipe. Construction considerations are the same. The proposed culverts are calculated to accommodate a 1 foot increase in tailwater (up to EL. 252.5) before overtopping at the 50-year event.

Table 3: Existing and Alternative Headwater Elevations (Existing/Recorded Massabesic Lake)

Recurrence Year	Flow (cfs)	Headwater Elevation (ft, NAVD88)				
		Existing: 5' Dia. Pipe	Alt 1: 32' Span Bridge	Alt 2: Slip-line with Surge/Critter Pipe	Alt 3: 9'X6' Box (9'X4' open area)	REV Alt 3: 9'X6.5' (9'X4' open area) with 3' RCP
2	32	251.14	251	251.18	251.02	251.02
5	70	252.1	251.5	252.24	251.61	251.58
10	108	252.93	251.51	253.19	251.76	251.7
25	165	<b>253.36</b>	251.52	<b>253.44</b>	252.12	251.97
50	209	<b>253.49</b>	251.53	<b>253.54</b>	252.5	252.25
100	269	Massabesic Lake Floods Roadway				

Table 4: Existing and Alternative Headwater Elevations (Massabesic Lake with estimated 1 foot raise)

Recurrence Year	Flow (cfs)	Headwater Elevation (ft, NAVD88)				
		Existing: 5' Dia. Pipe	Alt 1: 32' Span Bridge	Alt 2: Slip-line with Surge/Critter Pipe	Alt 3: 9'X6' Box (9'X4' open area)	REV Alt 3: 9'X6.5' (9'X4' open area) with 3' RCP
2	32	252.12	252	252.15	252.02	252.02
5	70	253.09	252.5	253.20	252.61	252.59
10	108	<b>253.32</b>	252.51	<b>253.36</b>	252.77	252.71
25	165	<b>253.47</b>	252.52	<b>253.50</b>	253.13	252.98
50	209	<b>253.57</b>	252.53	<b>253.59</b>	<b>253.32</b>	253.11
100	269	Massabesic Lake Floods Roadway				

**Bold** indicates overtopping of the roadway (above El. 253.2)

**Proposed Design**

The proposed design is the 9'X6.5' four sided box culvert embedded with streambed simulation material with a 3' diameter reinforced concrete pipe (RCP) set 28' off the centerline in the existing low flow channel. The box culvert alignment will match that of the existing culvert, which is perpendicular to the roadway. The RCP culvert will be set 28 feet off the concrete box centerline. The streambed invert elevations will match the existing stream channel upstream and downstream and maintain the reach slope of 0.5% through the concrete box culvert. The RCP culvert will be set 0.5' above the streambed through the box and will maintain a flat slope. Refer to the concrete box culvert profile on sheet 5 and the RCP culvert profile on sheet 6 of the Wetland Plans for invert elevations and anticipated tie-ins. The concrete box culvert is proposed to increase from 41' to 45' long to accommodate a widened shoulder on the inlet side for a bike/pedestrians both during construction sequencing and post-construction. The guardrail will also be re-aligned to maintain the same offset from the headwall, and the edge of the roadway embankment will be re-established. The embankment will be graded with a 3H:1V slope (instead of the typical 4H:1V) to minimize the impact to the adjacent riverine wetland. Refer to plan and cross section on sheet 7 of the Wetland Plans for extents of this impact.

Water diversion will be through the proposed 3' dia. RCP culvert which will be installed before excavation dewatering of the proposed box culvert. The pipe will be located at the border of the riverine wetland



upstream and the small lacustrine inlet at the downstream. Project impact areas allow for this type of diversion. Final water diversion plan will be per the Contractor's approved SWPPP.

Pavement reconstruction is anticipated for approximately 50 feet in either direction of the culvert (approx. 100 linear feet in total). Guardrail will be removed and re-installed to match the existing extents. A single utility pole, located on the outlet/lake side of NH121 will be relocated to accommodate the guardrail re-installation in coordination with the utility companies.

Benefits of this alternative include; increasing hydraulic capacity and connectivity, increasing AOP, maintaining and improving sediment transport, and reduce the potential for flooding. Since Massabesic Lake backwaters the culvert most of the time, there is limited concern for low flow AOP as well as scour.

Permanent stream impacts will be required for grading around the new wingwalls, extending the inlet 4' upstream, and to construct a 3' wide channel to the RCP culvert. Permanent impacts extend 29' upstream and 32' downstream of the existing inlet and outlet to construct the 3' wide channel to and from the RCP culvert. Temporary stream impacts will be required for access, water diversion, and erosion controls. These extend 45' upstream and 38' downstream from the existing inlet and outlet. A detailed breakdown of the impacts is shown in Table 4 below and in the Wetland Plans. Total disturbed area (temporary and permanent) is estimated at 3,266 SF (0.075 acres). This is unchanged from the original application.

No tree clearing is required at the inlet or outlet. Temporary impact areas will be restored with approved seed, mulch, and wildlife friendly erosion control matting (where steeper than 4:1).

### **Construction and Access Considerations**

Construction will be phased to maintain single lane travel along NH121 for the duration of the anticipated two-month construction period. Access to the culvert will primarily be from the closed travel lanes and shoulders of NH 121 due to the low fill height. Additional access on the upstream side, requiring a temporary easement, is anticipated on the north bank to install the cofferdam. The 3' diameter RCP culvert will be installed first to divert the stream during construction of the concrete box culvert. Water diversions structures (ie. cofferdams) will be installed upstream and downstream to facilitate stream diversion and dewatering of the site. Traffic control for this installation will be handled by flaggers.

It is anticipated the first phase of traffic control will close the northbound lane and install the proposed box culvert on the inlet side. During this phase temporary lane widening will shift the southbound lane towards the existing headwall to allow for approximately half the culvert length to be installed. The anticipated second phase of traffic will switch the lanes, closing the southbound lane while installing the second half of the culvert on the outlet side. Single lane traffic will be maintained with temporary signals.

### **Summary**

The proposed culvert replacement is presented as an Alternative Design under Env-Wt 904.10 because the proposed culvert would not meet the compliant span requirement and would not provide a vegetated bank or wildlife shelf within the structure.

The proposed culvert will meet all the general design criteria under 904.01 and comply with the remaining provisions of 904.07 to the maximum extent practicable.

## Auburn 44167

### CONSTRUCTION SEQUENCE

1. Perform necessary clearing operations for access and staging.
2. Install perimeter sediment controls and install necessary temporary erosion controls as specified on the strategies sheet. Include all staging areas. Set up dewatering basins.
3. Install Stream Diversion. The proposed 3' diameter reinforced concrete pipe (RCP) will be used for stream diversion set 28' off the centerline of the proposed box culvert, as shown on the Wetland Plans. The Contract will require the Contractor's stream diversion plan (ie cofferdams) to be designed to accommodate a 2-year storm event.
4. Construct temporary widening on outlet side of the culvert for Phase 1 traffic control. Widening is expected to extend nearly to the existing headwall. The actual width of widening will be as approved by the NHDOT Engineer, based on the Contractor's installation plan for the culvert.
5. Set up Phase 1 traffic control barrier (maintain 1 lane of traffic through work area using, shifted toward the outlet side of culvert).
6. Install Cofferdam to support the portion of NH 121 open to traffic.
7. Remove approximately half of the existing CMP culvert (starting at the inlet side), install new box culvert sections, embedment material, outlet side headwall and grading to match existing channel and banks.
8. Stabilize outlet channel banks and over bank areas.
9. Modify cofferdam supporting NH 121 as needed for Phase 2 of culvert installation.
10. Set up Phase 2 traffic control (shift traffic toward inlet side of culvert). Construct temporary widening at the inlet side of the culvert.
11. Remove temporary widening constructed during Phase 1. Restore disturbed areas to original or proposed grade. Stabilize disturbed areas.
12. Remove remaining portion of the box culvert, install new box culvert sections, embedment material, inlet side headwall, and grading to match inlet channel and banks.
13. Stabilize inlet channel banks and over bank areas.
14. Remove cofferdam and traffic control barrier (maintain 1 lane of traffic using concrete barriers, shift traffic as needed to accomplish remaining operations).
15. Repair and stabilize areas disturbed by removal. Remove water diversion structures (not included permanent Reinforced Concrete Pipe) and re-establish flow through the new culvert.
16. Install final paving and pavement markings. Final pavement width and elevation will match the original NH 121 conditions.
17. Stabilize remaining disturbed areas.
18. Remove all perimeter controls.

## Thomson, Rhona

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**From:** Newton, Kevin  
**Sent:** Thursday, February 15, 2024 12:00 PM  
**To:** Thomson, Rhona  
**Cc:** Benedict, Karl; FGC: NHFG review  
**Subject:** RE: NHB23-1098, Culvert Replacement Under NH Route 121, Auburn, NHDES Wetland Standard Dredge & Fill - Major, NHDED Shoreland Standard Permit

Thanks Rhona, I appreciate the background for why that design was selected. I do not have any further recommendations for this project based on the newly received information. Please incorporate NHFG recommendations as you indicated below from the initial review.

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

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

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

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

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**From:** Thomson, Rhona <Rhona.C.Thomson@dot.nh.gov>  
**Sent:** Thursday, February 15, 2024 11:40 AM  
**To:** Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>  
**Cc:** Benedict, Karl <Karl.D.Benedict@des.nh.gov>; FGC: NHFG review <NHFGreview@wildlife.nh.gov>  
**Subject:** RE: NHB23-1098, Culvert Replacement Under NH Route 121, Auburn, NHDES Wetland Standard Dredge & Fill - Major, NHDED Shoreland Standard Permit

Hi Kevin,

Thanks for your response! The original temporary bypass pipe was anticipated to be 3' diameter and plastic. The permanent pipe would be the same size, keeping total impact area the same, but made of reinforced concrete. The culvert height was increased from 6' to 6.5' feet to increase capacity as much as possible without raising the elevation of the roadway. If the culvert width were to be increased, it would technically qualify as a bridge, which would require additional funding and design time that could delay construction 3 to 5 years. It could also require raising the roadway elevation and/or additional impacts outside State right-of-way. Since the pipe is failing, the hope is to maintain the anticipated construction start date of fall 2024. A wetland permit amendment request will be submitted soon. Please let me know if any more information is needed.

Thank you!

Rhona

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**From:** Newton, Kevin <[Kevin.M.Newton@wildlife.nh.gov](mailto:Kevin.M.Newton@wildlife.nh.gov)>  
**Sent:** Thursday, February 15, 2024 10:58 AM  
**To:** Thomson, Rhona <[Rhona.C.Thomson@dot.nh.gov](mailto:Rhona.C.Thomson@dot.nh.gov)>  
**Cc:** Benedict, Karl <[Karl.D.Benedict@des.nh.gov](mailto:Karl.D.Benedict@des.nh.gov)>; FGC: NHFG review <[NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov)>  
**Subject:** RE: NHB23-1098, Culvert Replacement Under NH Route 121, Auburn, NHDES Wetland Standard Dredge & Fill - Major, NHDED Shoreland Standard Permit

Hi Rhona,

Can you please remind me what the original details for the temporary bypass pipe were (i.e sizing)? Is there a reason for creating an additional permanent structure and channel to provide the capacity rather than enlarging the proposed upgraded box culvert?

Thanks,

Kevin

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**From:** Thomson, Rhona <[Rhona.C.Thomson@dot.nh.gov](mailto:Rhona.C.Thomson@dot.nh.gov)>  
**Sent:** Monday, February 12, 2024 11:25 AM  
**To:** Newton, Kevin <[Kevin.M.Newton@wildlife.nh.gov](mailto:Kevin.M.Newton@wildlife.nh.gov)>  
**Subject:** RE: NHB23-1098, Culvert Replacement Under NH Route 121, Auburn, NHDES Wetland Standard Dredge & Fill - Major, NHDED Shoreland Standard Permit

Hi Kevin,

I have a minor update about the subject project, Auburn 44167, which will replace a 60" corrugated metal pipe with a 9' x 6.5' concrete box culvert carrying an unnamed stream under NH 121 into Lake Massabesic. A small change has been made to the plans, so I wanted to check in with you in case you have any additional comments or questions. DES reached out to let us know that Manchester Water Works is conducting a study to raise the lake level of Lake Massabesic sometime in the next few years. To accommodate lake level rise, the proposed temporary bypass pipe will now be a permanent 3' reinforced concrete pipe. The pipe will be in water during most conditions, but may be dry during low flow conditions. The plan is that the addition of this permanent pipe will increase the culvert capacity sufficiently to accommodate rising lake levels.

The NHFG recommendations listed below have all been incorporated into the project and will be followed throughout construction.

Please let me know if you have any questions or comments about the addition of the bypass pipe.

Thanks so much for your review!

Rhona

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**From:** Newton, Kevin <[Kevin.M.Newton@wildlife.nh.gov](mailto:Kevin.M.Newton@wildlife.nh.gov)>  
**Sent:** Tuesday, May 2, 2023 2:31 PM  
**To:** Thomson, Rhona <[Rhona.C.Thomson@dot.nh.gov](mailto:Rhona.C.Thomson@dot.nh.gov)>  
**Cc:** FGC: NHFG review <[NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov)>; Winters, Melissa <[Melissa.J.Winters@wildlife.nh.gov](mailto:Melissa.J.Winters@wildlife.nh.gov)>; Detzel, Seta <[Seta.A.Detzel@des.nh.gov](mailto:Seta.A.Detzel@des.nh.gov)>  
**Subject:** NHB23-1098, Culvert Replacement Under NH Route 121, Auburn, NHDES Wetland Standard Dredge & Fill - Major, NHDED Shoreland Standard Permit

Good afternoon Rhona,

New Hampshire Fish and Game has completed review of the consultation request for NHB23-1098 prepared by the New Hampshire Department of Transportation. The proposed project is for the replacement of an existing 60" CMP with a 8'x6' embedded box culvert located under NH Route 121, Auburn, NH.

**If plan details change, please consult the New Hampshire Fish and Game Nongame and Endangered Wildlife Program to determine if updated recommendations are required.**

Applications associated with this review:

- NHDES – Wetland Standard Dredge & Fill - Major (pending)
- NHDES – Shoreland Standard Permit (pending)

**Incorporation of NHFG recommendations is not required for Species of Special Concern; however, incorporation of recommendations is highly recommended or may be required for certain permits. Applicants would still be responsible for any actions that may result in the take of these species. The recommendations below should be incorporated into site plans in order to help minimize potential take.**

NHFG Recommendations:

1. American Eel (State species of special concern) and Swamp Darter (State species of special concern) occur within the vicinity of the project area. All operators and personnel working on or entering the site should be made aware of the potential presence of these species.
2. Baffles should not be included within the culvert design.
3. If the proposed culvert is to be embedded, it should be embedded with native stream material to mimic upstream and downstream conditions.
4. Turtles may be attracted to disturbed ground during nesting season (May 15th – June 30th). All turtle species nests are protected by NH laws. If a nest is observed or suspected, operators shall contact Melissa Winters (603-479-1129) or Josh Megyesy (978-578-0802) at NHFG immediately for further consultation.
5. All manufactured erosion and sediment control products, with the exception of turf reinforcement mats, utilized for, but not limited to, slope protection, runoff diversion, slope interruption, perimeter control, inlet protection, check dams, and sediment traps shall not contain plastic, or multifilament or monofilament polypropylene netting or mesh with an opening size of greater than 1/8 inches.
6. All observations of threatened or endangered species on the project site shall be reported immediately to the NHFG nongame and endangered wildlife environmental review program by phone at 603-271-2461 and by email at [NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov), with the email subject line containing the NHB DataCheck tool results letter assigned number, the project name, and the term Wildlife Species Observation.
7. Photographs of the observed species and nearby elements of habitat or areas of land disturbance shall be provided to NHFG in digital format at the above email address for verification, as feasible.
8. In the event a threatened or endangered species is observed on the project site during the term of the permit, the species shall not be disturbed, handled, or harmed in any way prior to consultation with NHFG and implementation of corrective actions recommended by NHFG.
9. NHFG, including its employees and authorized agents, shall have access to the property during the term of the permit.

NHFG has completed our review of materials submitted for consultation under FIS 1004 in compliance with the Memorandum of Agreement between the Fish and Game Department and the Department of Transportation regarding Environmental Review of NHDOT Projects(RSA 21-A:, III), signed by NHFG dated 2/4/2022. Questions or concerns on NHFG recommendations must follow FIS 1004.12. Note that NHFG recommendations may be withdrawn pursuant to FIS 1004.

Sincerely,

Kevin Newton

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

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

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

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

## **Auburn 44167**

### **CONSTRUCTION SEQUENCE**

1. Perform necessary clearing operations for access and staging.
2. Install perimeter sediment controls and install necessary temporary erosion controls as specified on the strategies sheet. Include all staging areas. Set up dewatering basins.
3. Install Stream Diversion. The proposed 3' diameter reinforced concrete pipe (RCP) will be used for stream diversion set 28' off the centerline of the proposed box culvert, as shown on the Wetland Plans. The Contract will require the Contractor's stream diversion plan (ie cofferdams) to be designed to accommodate a 2-year storm event.
4. Construct temporary widening on outlet side of the culvert for Phase 1 traffic control. Widening is expected to extend nearly to the existing headwall. The actual width of widening will be as approved by the NHDOT Engineer, based on the Contractor's installation plan for the culvert.
5. Set up Phase 1 traffic control barrier (maintain 1 lane of traffic through work area using, shifted toward the outlet side of culvert).
6. Install Cofferdam to support the portion of NH 121 open to traffic.
7. Remove approximately half of the existing CMP culvert (starting at the inlet side), install new box culvert sections, embedment material, outlet side headwall and grading to match existing channel and banks.
8. Stabilize outlet channel banks and over bank areas.
9. Modify cofferdam supporting NH 121 as needed for Phase 2 of culvert installation.
10. Set up Phase 2 traffic control (shift traffic toward inlet side of culvert). Construct temporary widening at the inlet side of the culvert.
11. Remove temporary widening constructed during Phase 1. Restore disturbed areas to original or proposed grade. Stabilize disturbed areas.
12. Remove remaining portion of the box culvert, install new box culvert sections, embedment material, inlet side headwall, and grading to match inlet channel and banks.
13. Stabilize inlet channel banks and over bank areas.
14. Remove cofferdam and traffic control barrier (maintain 1 lane of traffic using concrete barriers, shift traffic as needed to accomplish remaining operations).
15. Repair and stabilize areas disturbed by removal. Remove water diversion structures (not included permanent Reinforced Concrete Pipe) and re-establish flow through the new culvert.
16. Install final paving and pavement markings. Final pavement width and elevation will match the original NH 121 conditions.
17. Stabilize remaining disturbed areas.
18. Remove all perimeter controls.

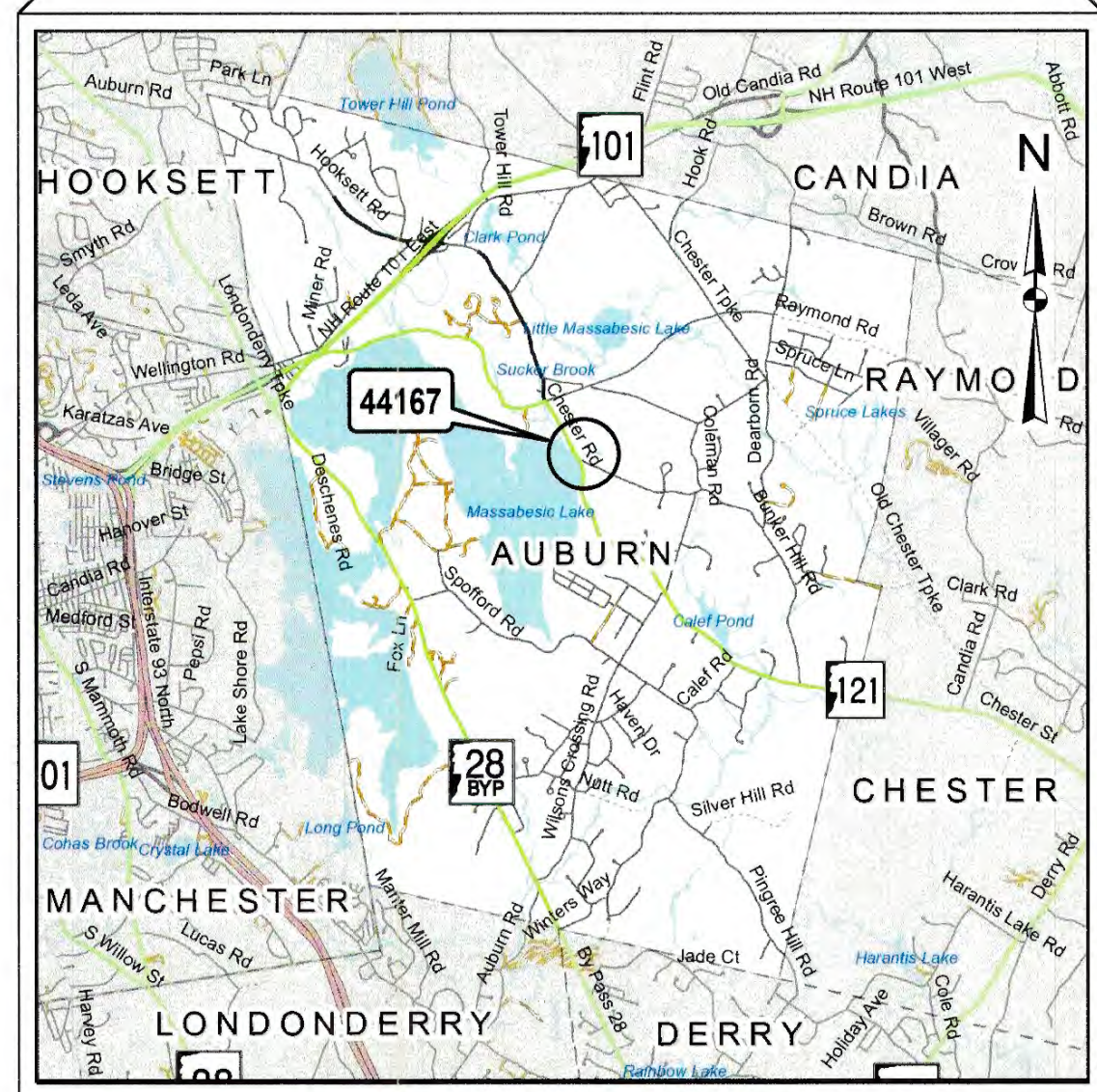
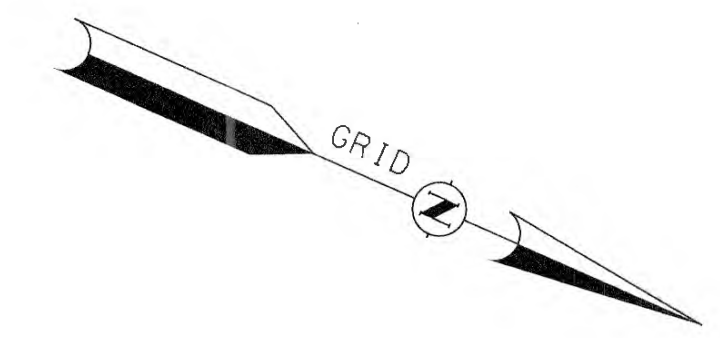


STATE OF NEW HAMPSHIRE  
DEPARTMENT OF TRANSPORTATION

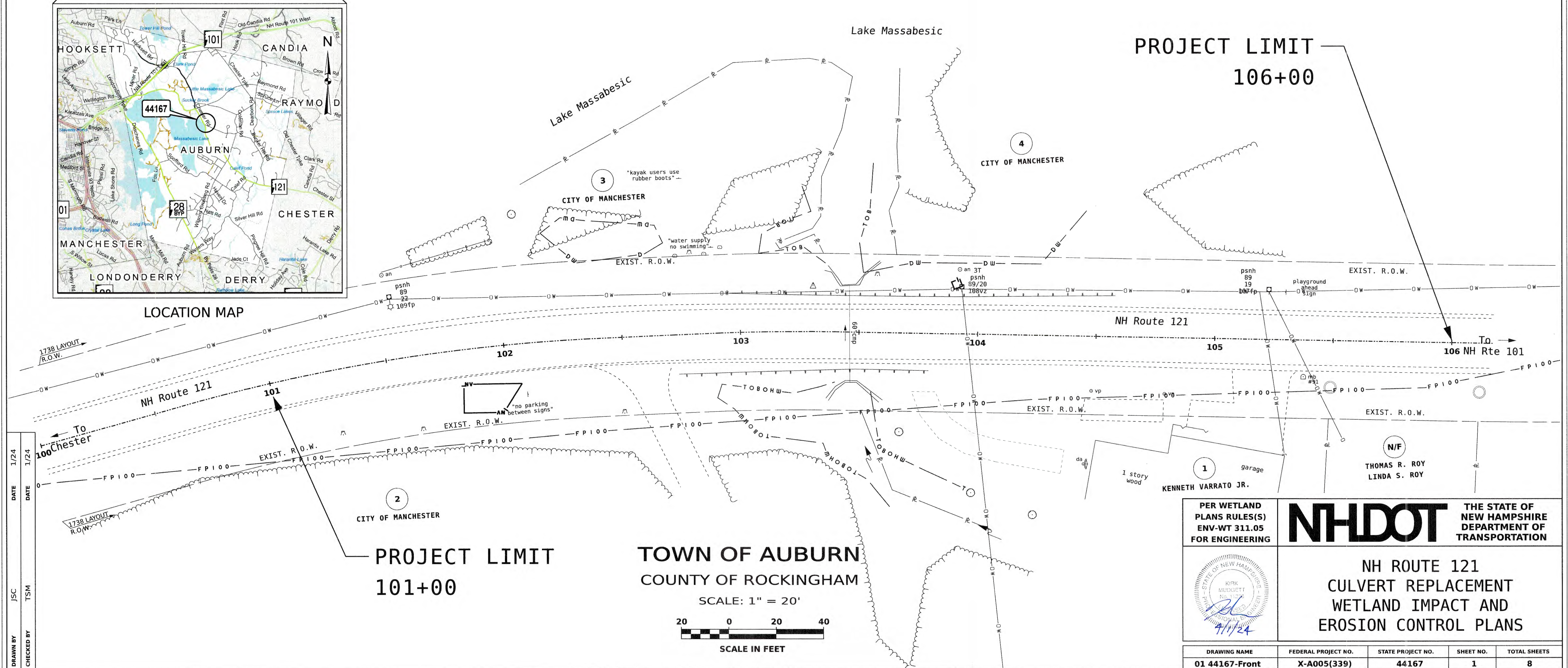
# AMENDED WETLAND PERMIT PLANS FEDERAL AID PROJECT

FEDERAL PROJECT NO. X-A00(339)  
N.H. PROJECT NO. 44167

DESIGN DATA		
AVERAGE DAILY TRAFFIC 20	24	6,550
AVERAGE DAILY TRAFFIC 44	44	8,000
PERCENT OF TRUCKS		4.2%
DESIGN SPEED		40 MPH
LENGTH OF PROJECT		45 LF (CULVERT)



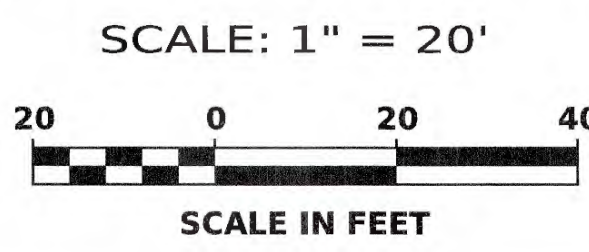
LOCATION MAP



PROJECT LIMIT  
101+00

PROJECT LIMIT  
106+00

TOWN OF AUBURN  
COUNTY OF ROCKINGHAM

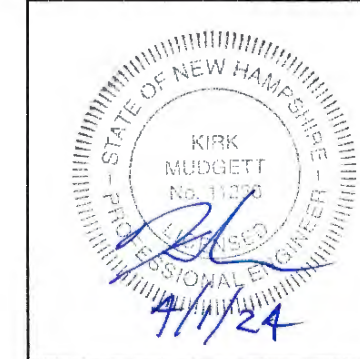


DRAWN BY JSC  
CHECKED BY TSM  
DATE 1/24  
DATE 1/24

PER WETLAND  
PLANS RULES(S)  
ENV-WT 311.05  
FOR ENGINEERING



THE STATE OF  
NEW HAMPSHIRE  
DEPARTMENT OF  
TRANSPORTATION



NH ROUTE 121  
CULVERT REPLACEMENT  
WETLAND IMPACT AND  
EROSION CONTROL PLANS

DRAWING NAME	FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
01 44167-Front	X-A005(339)	44167	1	8

# GENERAL

EDGE OF PAVEMENT TRAVELED WAY			
DRIVEWAYS	 (label surface type)		
BUILDINGS			(building to be removed)
	(label house or type of building)		
FOUNDATION	 (label type)		
LEACH FIELD	 leach field		
BRIDGE CROSSINGS			STREAM OVERPASS
STEPS AND WALK	 (label type)		
INTERMITTENT WATER COURSE			
SHORE LINE			river/stream pond (label name of water body)
POTENTIAL WET AREA SYMBOL			
BRUSH OR WOODS LINE			
TREES (PLANS)			
	(show station, circumference in feet & type)		
TREE OR STUMP (CROSS-SECTIONS)			
HEDGE	 (label type)		
MONITORING WELL			
WELL			
FLAG POLE			

ORIGINAL GROUND (TYPICALS)		
ROCK OUTCROP		
ROCK LINE (TYPICALS & SECTIONS ONLY)		
	existing	PROPOSED
GUARDRAIL (label type)		
JERSEY BARRIER		
CURB (LABEL TYPE)		
STONE WALL		
RETAINING WALL (LABEL TYPE)	 (points toward retained ground)	
FENCE (LABEL TYPE)		
SIGNS	 (single post)	 (double post)
GAS PUMP		
FUEL TANK (ABOVE GROUND)	 (label size & type)	
STORAGE TANK FILLER CAP		
SEPTIC TANK		
GRAVE		
MAILBOX		
VENT PIPE		
SATELLITE DISH ANTENNA		
PHONE		
GROUND LIGHT/LAMP POST		
BORING LOCATION		
TEST PIT		
INTERSTATE NUMBERED HIGHWAY		
UNITED STATES NUMBERED HIGHWAY		
STATE NUMBERED HIGHWAY		

# SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE	
DELINEATED WETLAND	
ORDINARY HIGH WATER	
TOP OF BANK	
TOP OF BANK & ORDINARY HIGH WATER	
NORMAL HIGH WATER	
WIDTH AT BANK FULL	
PRIME WETLAND	
PRIME WETLAND 100' BUFFER	
NON-JURISDICTIONAL DRAINAGE AREA	
COWARDIN DISTINCTION LINE	
TIDAL BUFFER ZONE	
DEVELOPED TIDAL BUFFER ZONE	
HIGHEST OBSERVABLE TIDE LINE	
MEAN HIGH WATER	
MEAN LOW WATER	
VERNAL POOL	
SPECIAL AQUATIC SITE	
REFERENCE LINE	
WATER FRONT BUFFER	
NATURAL WOODLAND BUFFER	
PROTECTED SHORELAND	
INVASIVE SPECIES LABEL	
INVASIVE SPECIES	

# FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY	
100 YEAR FLOODPLAIN BOUNDARY	
FLOODWAY	

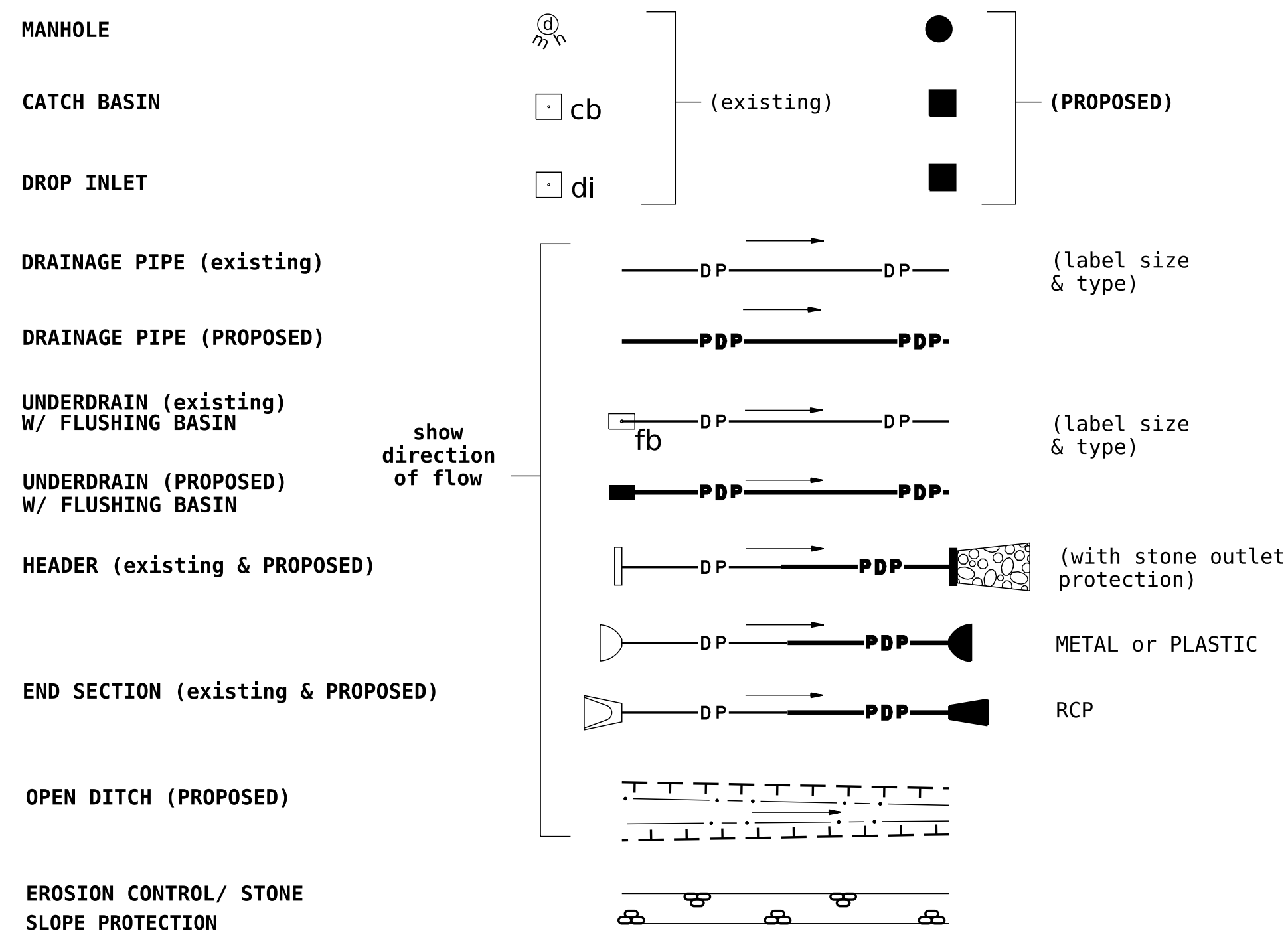
# ENGINEERING

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

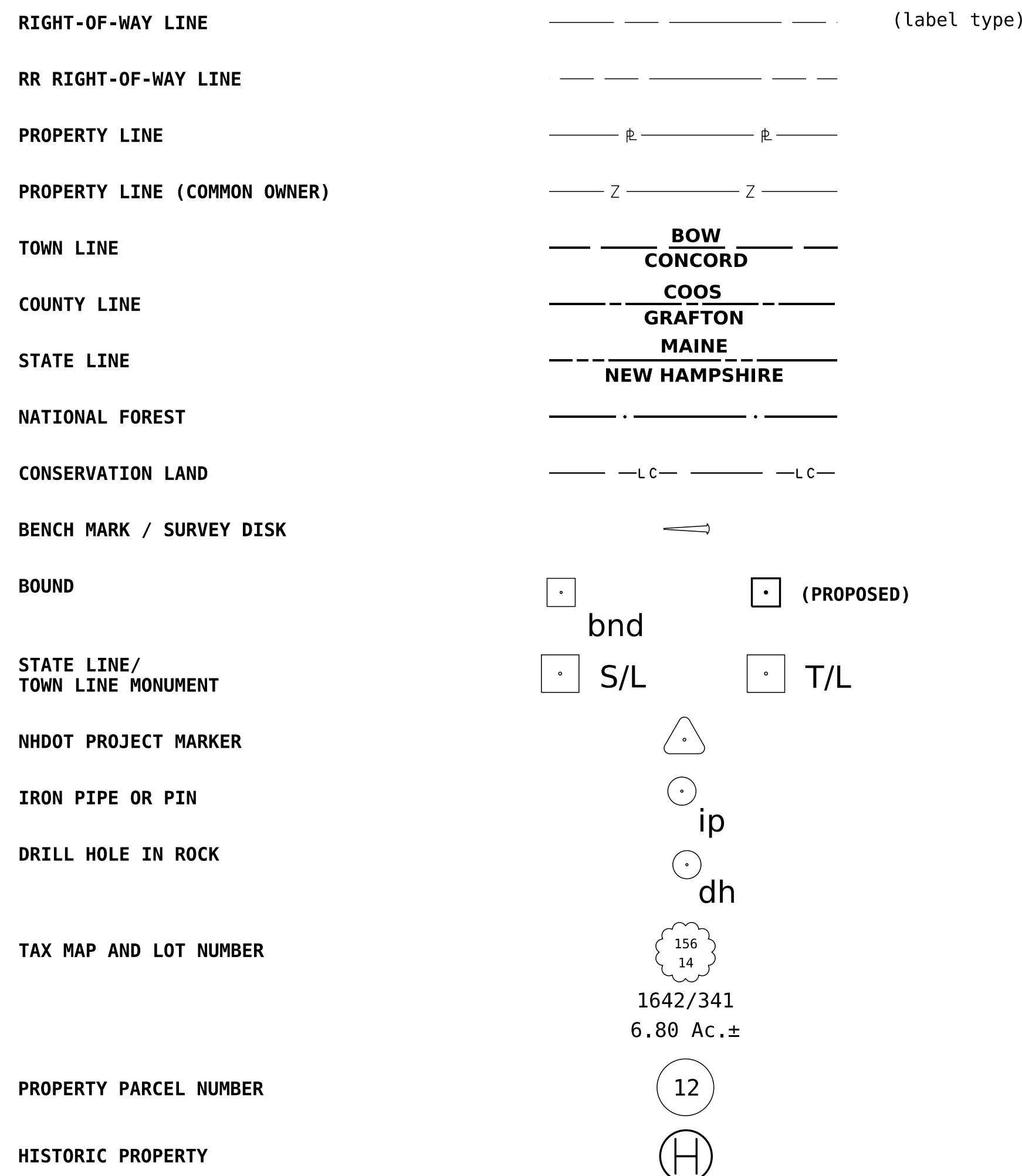
STATE OF NEW HAMPSHIRE AUBURN	
DEPARTMENT OF TRANSPORTATION	BUREAU OF HIGHWAY DESIGN
<b>STANDARD SYMBOLS</b>	

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
02-25-2022	02, 3 44167stdsyml-2-cc	44167	2	8

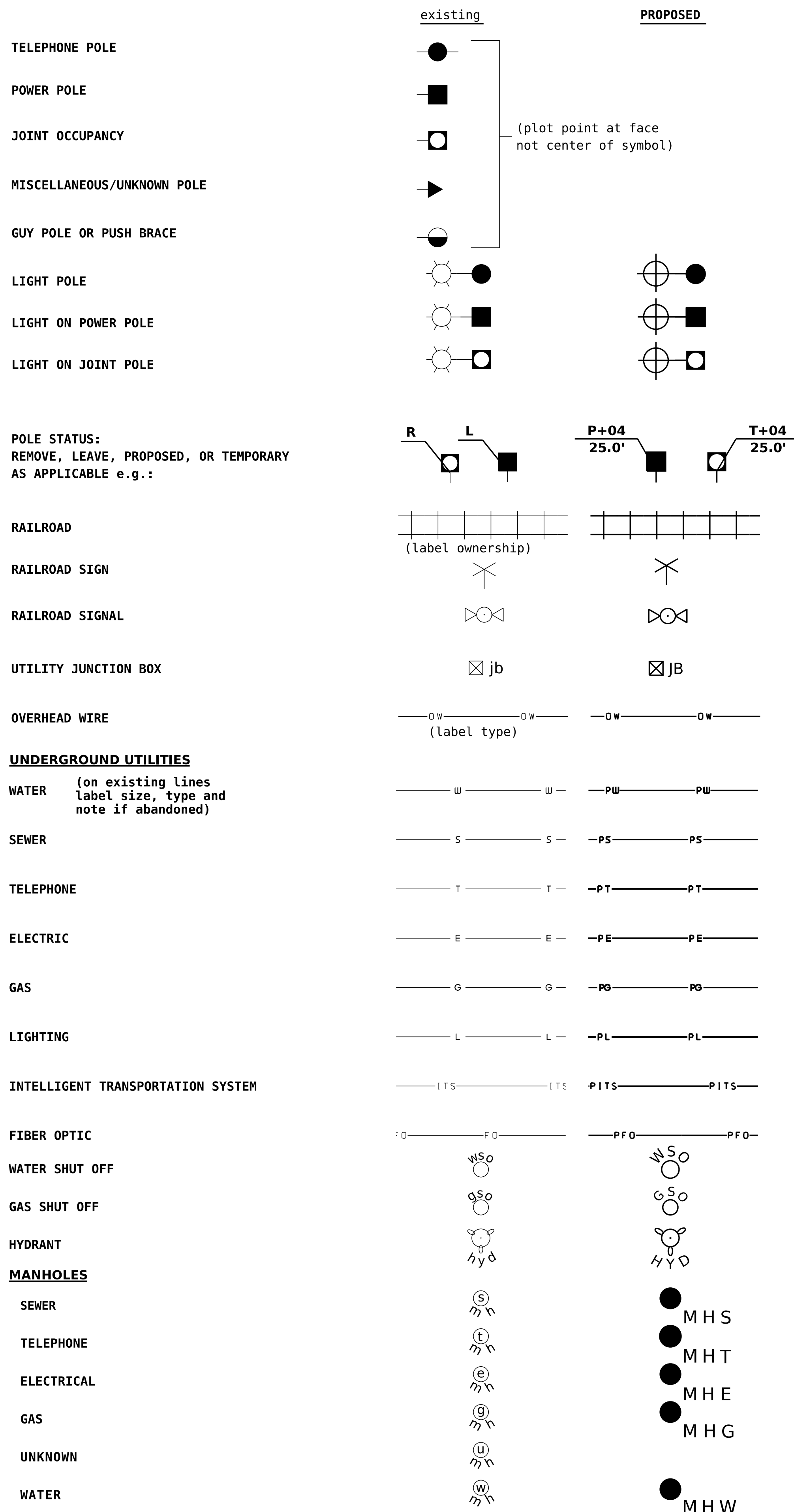
## DRAINAGE



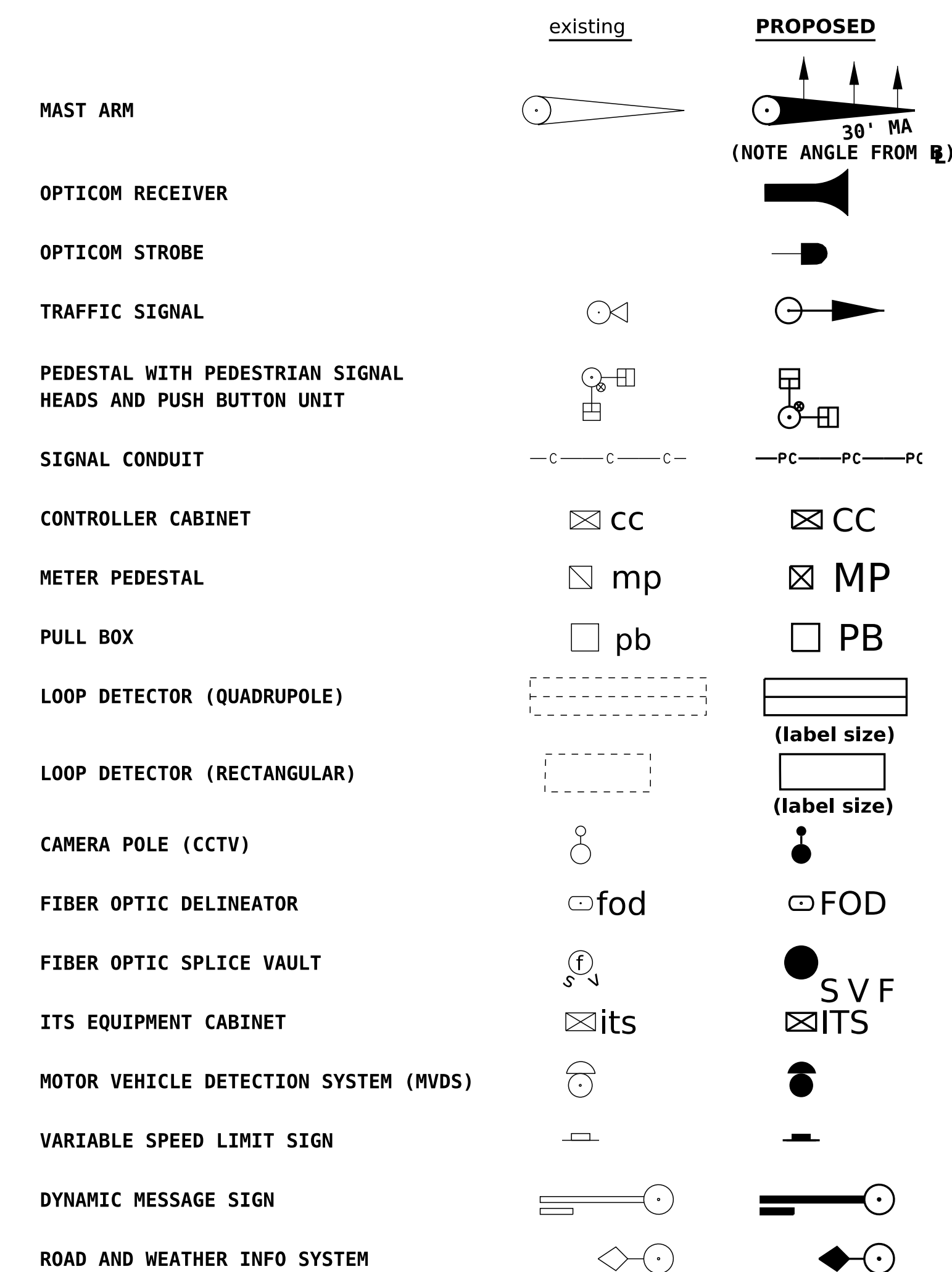
## BOUNDARIES / RIGHT-OF-WAY



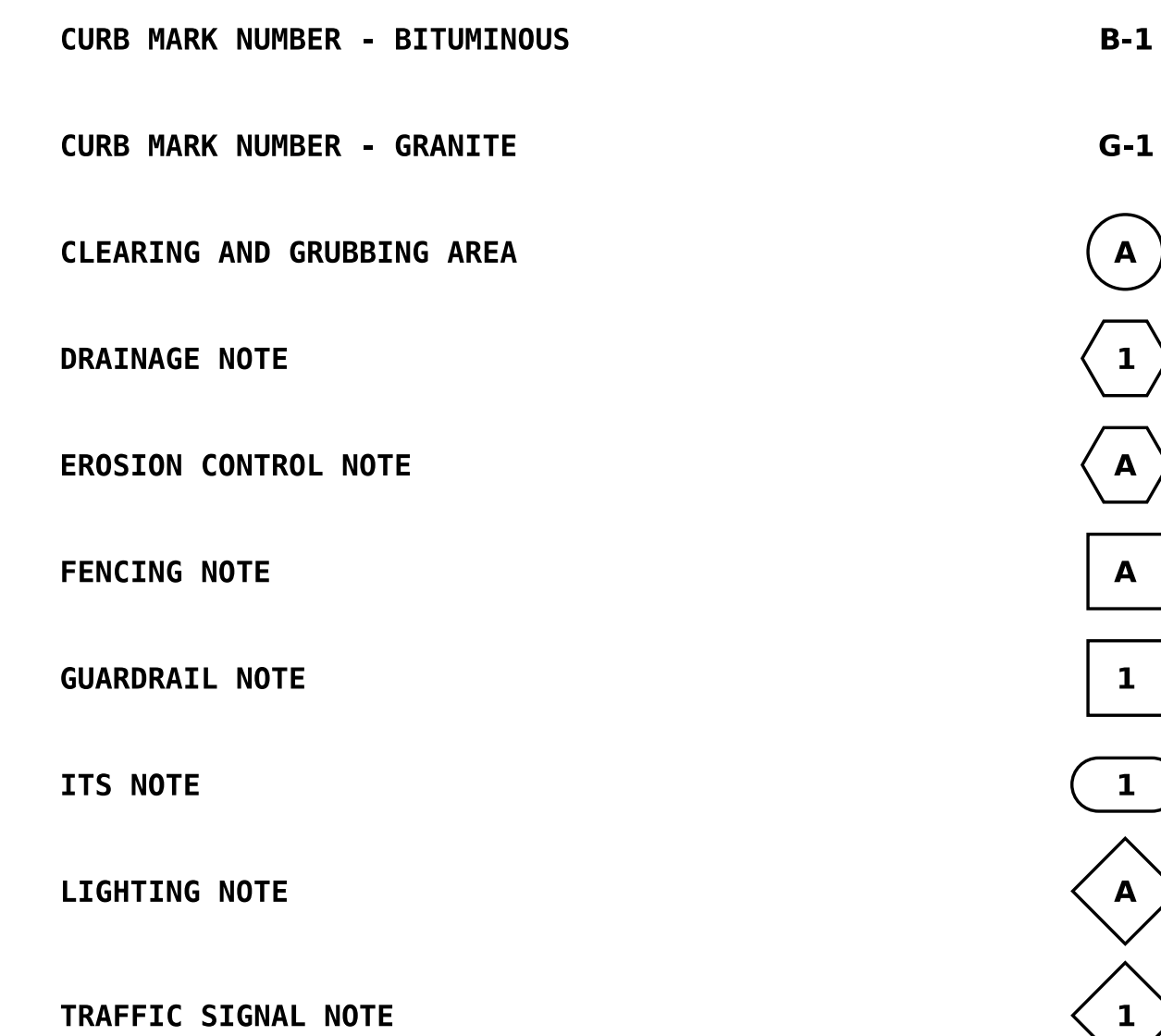
## UTILITIES



## TRAFFIC SIGNALS / ITS



## CONSTRUCTION NOTES



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

### STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
02-25-2022	02, 3 44167stdsyml1-2-ce	44167	3	8

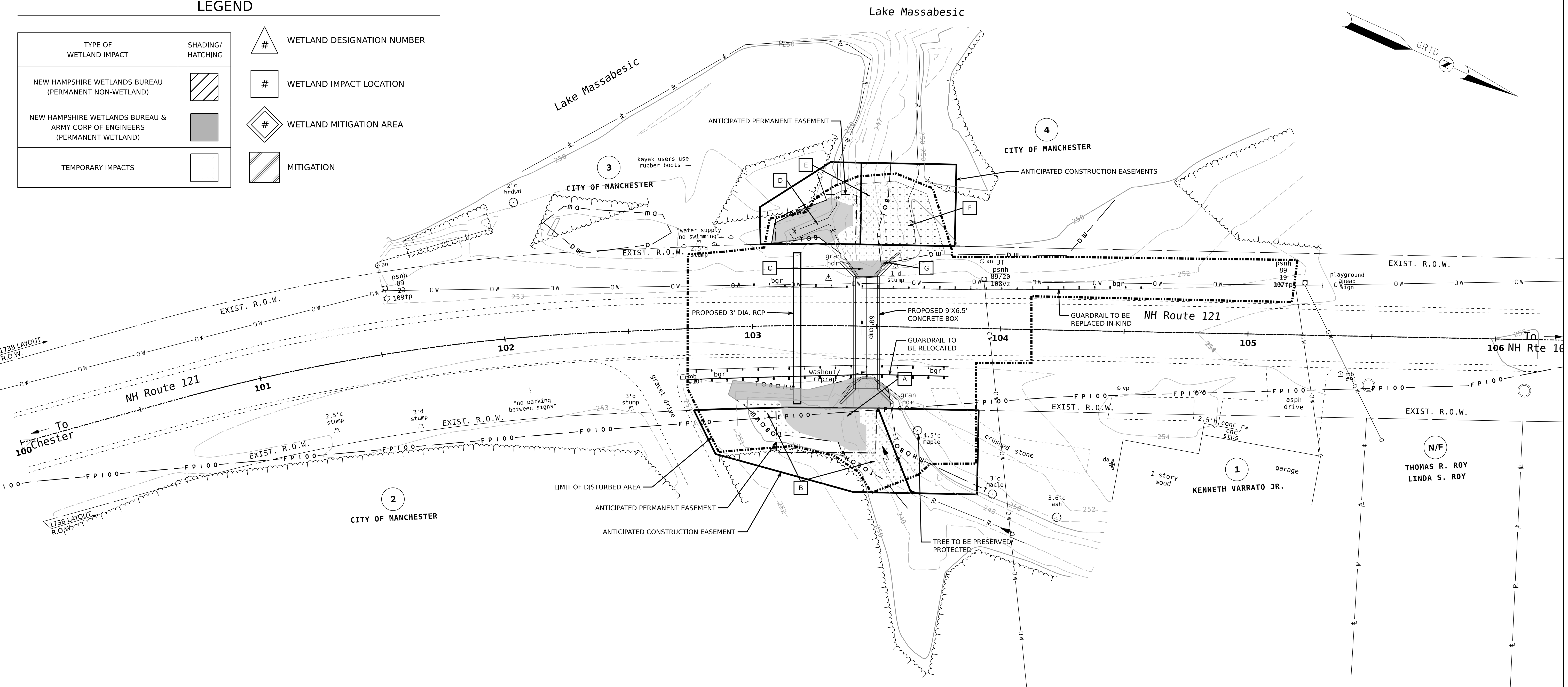
**LEGEND**

TYPE OF WETLAND IMPACT	SHADING/HATCHING	#	WETLAND DESIGNATION NUMBER
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	[Diagonal Hatching]	#	WETLAND IMPACT LOCATION
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	[Solid Grey]	#	WETLAND MITIGATION AREA
TEMPORARY IMPACTS	[Cross-hatching]	[Diagonal Hatching]	MITIGATION

REVISIONS AFTER PROPOSAL	DESCRIPTION	
	STATION	
	DATE	
NUMBER		

SEL	DATE	5/23	DATE	2/24
JSC	DATE	2/24	DATE	2/24
JSC	DATE	2/24	DATE	2/24
AS BUILT DETAILS	DATE		DATE	



WETLAND IMPACT SUMMARY											
WETLAND NUMBER	WETLAND CLASSIFICATION	LOCATION	AREA IMPACTS						LINEAR STREAM IMPACTS FOR MITIGATION		
			PERMANENT			TEMPORARY			PERMANENT		
			N.H.W.B. (NON-WETLAND)	N.H.W.B. & A.C.O.E. (WETLAND)	TEMPORARY	BANK LEFT	BANK RIGHT	CHANNEL			
SF	LF	SF	LF	SF	LF	LF	LF	LF			
1	R2UB23	A		984	58						
1	R2UB23	B				688	82				
2	L1UBH	C		86	24						
2	L1UBH	D		397	55						
2	L1UBH	E				494	59				
3	PSS1F	F					612				
3	PSS1F	G		5							
4	PEM1E	*									
TOTAL				1472	137	1794	141				

\*NO IMPACTS PROPOSED.

PERMANENT IMPACTS: 1472 SF  
 TEMPORARY IMPACTS: 1794 SF  
 TOTAL IMPACTS: 3266 SF

WETLAND CLASSIFICATION CODES	
R2UB23	RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, SAND, MUD
PEM1E	PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED / SATURATED
L1UBH	LACUSTRINE, LIMNETIC, UNCONSOLIDATED BOTTOM, PERMANENTLY FLOODED
PSS1F	PALUSTRINE, SCRUB-SHRUB, BROAD-LEAVED DECIDUOUS, SEMIPERMANENTLY FLOODED

- NOTES:
- WETLANDS WERE DELINEATED ACCORDING TO ENV-WT 406 ON 4/6/2023 BY JOSHUA BROWN AND DEIDRA BENJAMIN.
  - TOTAL WETLAND IMPACTS IN THIS AMENDMENT ARE THE SAME AS ORIGINALLY PROPOSED. PERMANENT IMPACTS HAVE INCREASED TO ACCOMMODATE ADDITIONAL 3' DIA. RCP AN GRADING OF 3' WIDE CHANNEL TO INLET AND FROM OUTLET OF THE PIPE.
  - VERTICAL DATUM IS NAVD88.

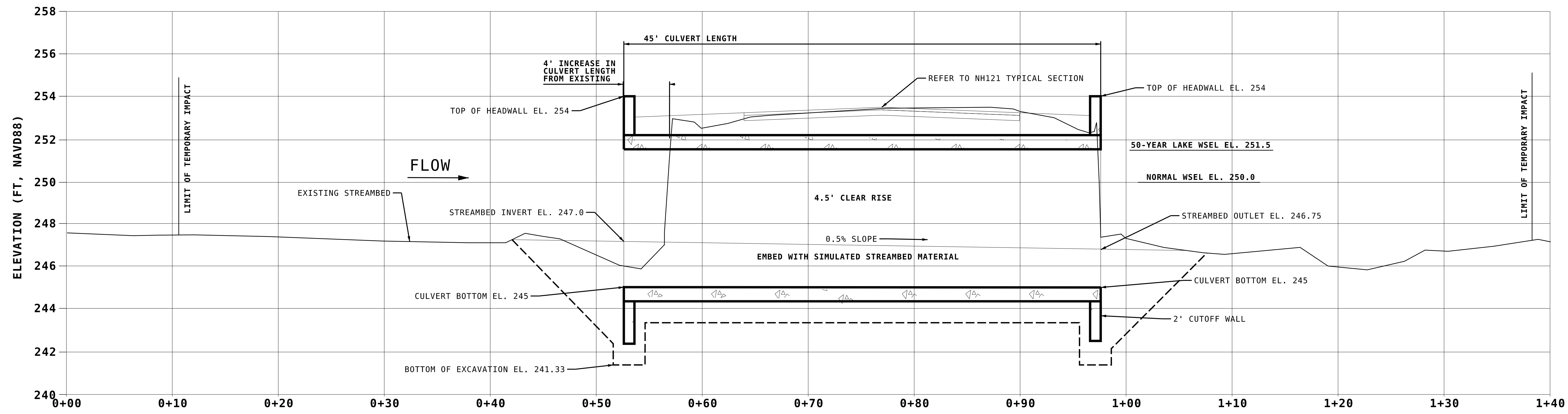
**SCOPE OF WORK**

STA 103+46:  
 REPLACE EXISTING 60" DIA. 41' LONG CMP CULVERT WITH 9' SPAN X 5' RISE (4' CLEAR HEIGHT) X 45' LONG PRECAST CONCRETE BOX CULVERT EMBEDDED 1' BELOW STREAMBED. CONSTRUCT CONCRETE HEADWALLS AT BOTH ENDS ANGLED AT 45 DEGREES TOWARDS THE BANK.  
  
 SEE DETAILS FOR MATCHING NEW CULVERT TO EXISTING STREAM.  
 USE APPROVED WETLAND SEED MIX TO RESTORE JURISDICTIONAL WETLAND AREAS.

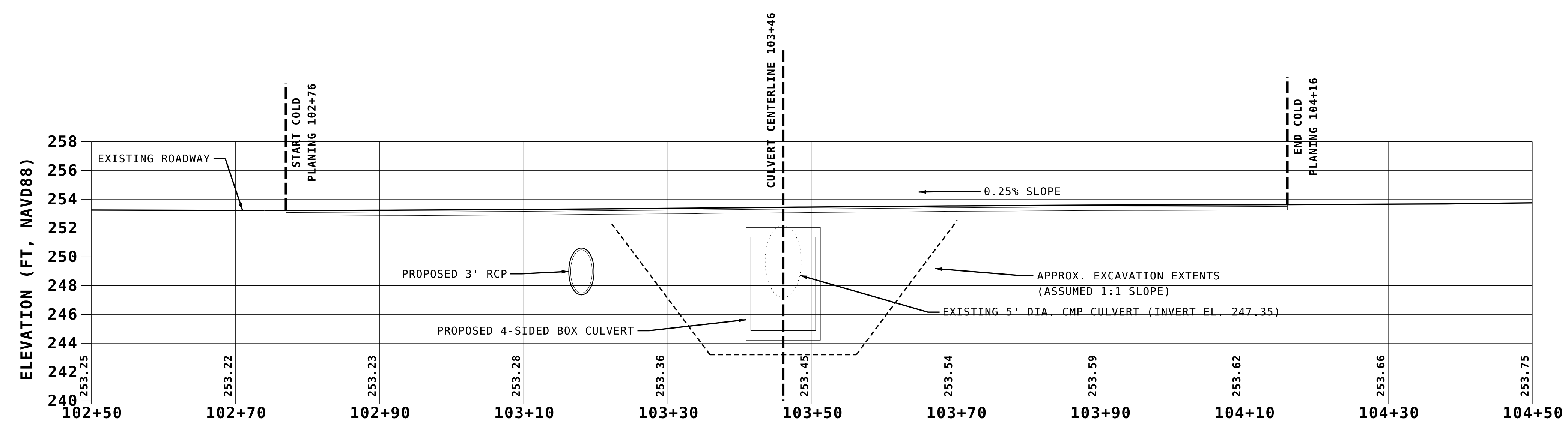


STATE OF NEW HAMPSHIRE AUBURN			
DEPARTMENT OF TRANSPORTATION		BUREAU OF HIGHWAY DESIGN	
<b>WETLAND IMPACT PLAN</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
04 44167-wetplan	44167	4	9

REVISIONS AFTER PROPOSAL		DESCRIPTION	
STATION		STATION	
DATE		DATE	
NUMBER		NUMBER	
SDR PROCESSED	SEL	DATE	5/23
NEW DESIGN	JSC	DATE	1/24
SHEET CHECKED	TSM	DATE	1/24
AS BUILT DETAILS		DATE	



NOTE: HEADWALL ELEVATIONS ARE SPECIFIED TO ALLOW FOR FUTURE RAISING OF NH121.



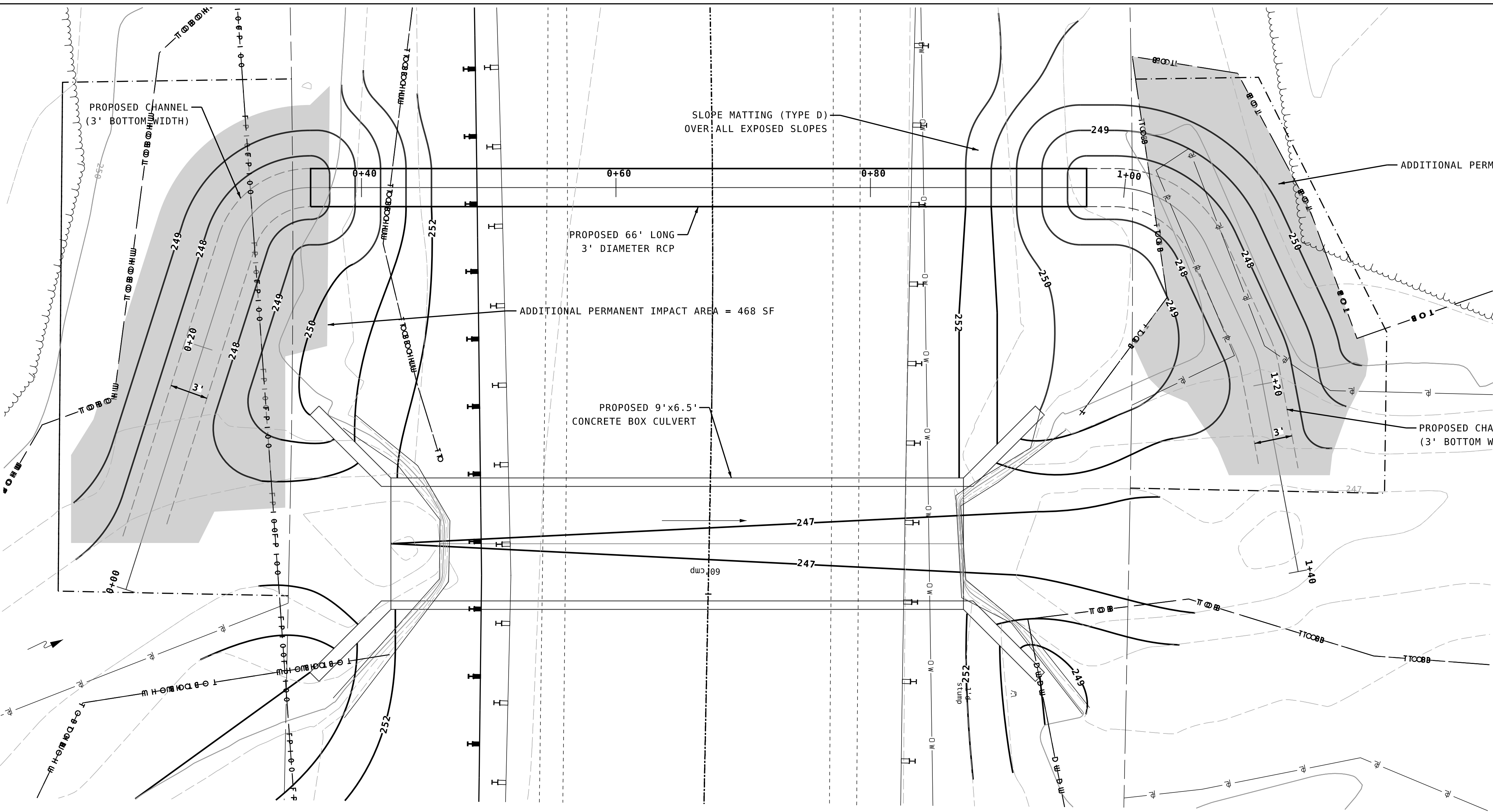
NOTE: SEE PAVEMENT PATCH DETAIL FOR PAVEMENT TIE-INS.

NOTE: VERTICAL DATUM IS NAVD88.

STATE OF NEW HAMPSHIRE			
AUBURN			
DEPARTMENT OF TRANSPORTATION		BUREAU OF HIGHWAY DESIGN	
<b>CULVERT AND ROADWAY PROFILES</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
05 44167-Profiles	44167	5	8

Profile-1 [Sheet]

SDR PROCESSED		SEL	DATE	5/23
NEW DESIGN		JSC	DATE	2/24
SHEET CHECKED		JSC	DATE	2/24
AS BUILT DETAILS			DATE	



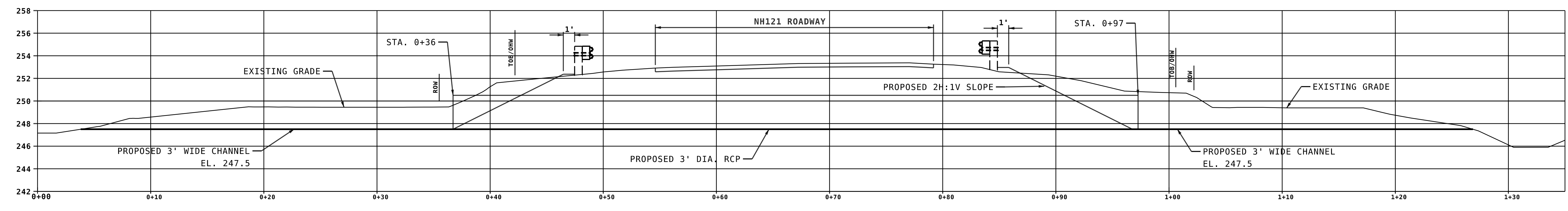
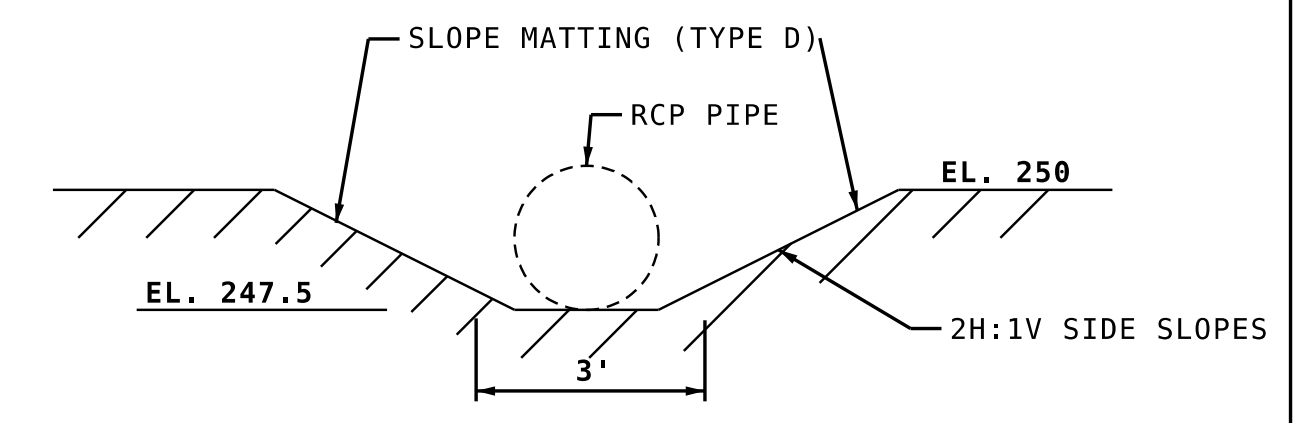
# RCP CULVERT PLAN

SCALE: 1"=5'

NOTE: THIS SHEET ONLY SHOWS THE ADDITIONAL PERMANENT WETLAND IMPACTS, WHICH HAVE PREVIOUSLY BEEN PERMITTED AS TEMPORARY IMPACTS.

# CHANNEL TYP. DETAIL

SCALE: 1"=4'



# RCP CULVERT PROFILE

SCALE: 1"=5'

STATE OF NEW HAMPSHIRE AUBURN			
DEPARTMENT OF TRANSPORTATION		BUREAU OF HIGHWAY DESIGN	
<b>RCP PLAN, PROFILE, AND CHANNEL DETAIL</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
07 44167-RCP	44167	6	8

RCP Bypass [Sheet]

# EROSION CONTROL NOTES AND STRATEGIES

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

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

GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES  
TABLE 1

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

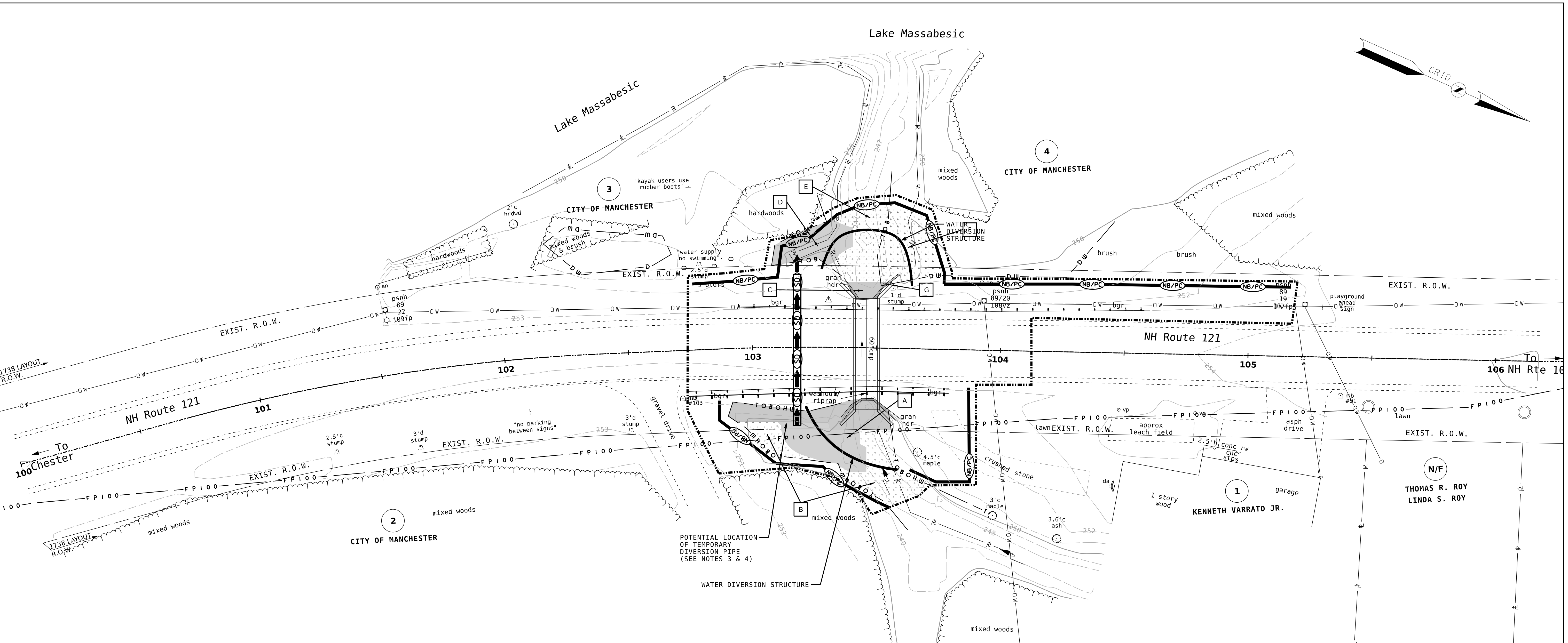
ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT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

**NOTES:**

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

<b>STATE OF NEW HAMPSHIRE</b>				
AUBURN				
DEPARTMENT OF TRANSPORTATION		BUREAU OF HIGHWAY DESIGN		
 <b>EROSION CONTROL PLANS</b> 				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
erosstrat-ce 07-31-2023	08 44167-erostrat-ce	44167	7	8

SDR PROCESSED	SEL	DATE	05/23/23
NEW DESIGN	GRR	DATE	06/08/23
SHEET CHECKED	JSC	DATE	09/23
AS BUILT DETAILS		DATE	



EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	CHANNEL PROTECTION STONE CHECK DAMS STRAW MATS CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE
	STREAM DIVERSION PUMP THROUGH PIPE DRAIN THROUGH PIPE OR CHANNEL
	UNIMPACTED RIVERINE SURFACE WATERS NO WORK AND/OR IMPACT
	ROUTINE ROADWAY QUALIFYING ACTIVITY BMP

**GENERAL NOTES**

- 1) LIMITS OF TEMPORARY DISTURBANCE ARE BASED ON CONSTRUCTION OF THE CULVERT HALF AT A TIME WHILE MAINTAINING ONE LANE OF TRAFFIC THROUGH THE WORK AREA. ALL AREAS OF TEMPORARY DISTURBANCE SHALL BE RESTORED TO EXISTING GRADE.
- 2) A COFFERDAM ITEM WILL BE INCLUDED IN THE CONTRACT FOR SUPPORT OF THE ROAD AND IF NECESSARY FOR SUPPORT OF THE EXCAVATION AND CONTROL OF GROUNDWATER. SEDIMENT BAGS FOR DEWATERING MAY BE PLACED BETWEEN THE EDGE OF PAVEMENT AND THE ROW, WITH APPROPRIATE SEPARATION FROM WETLANDS.
- 3) A WATER DIVERSION ITEM WILL BE INCLUDED IN THE CONTRACT FOR MANAGING SURFACE WATER. STREAM FLOW SHALL BE PASSED THROUGH THE 3' DIA. RCP CULVERT. AT A MINIMUM, THE WATER DIVERSION SHALL BE DESIGNED TO ACCOMMODATE A 2 YEAR STORM.
- 4) COFFERDAM, DEWATERING, AND WATER DIVERSION DETAILS SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO NHDOT FOR APPROVAL.

**SCOPE OF WORK**

STA 103+46:  
 REPLACE EXISTING 60" DIA. 41' LONG CMP CULVERT WITH 9' SPAN X 5' RISE (4' CLEAR HEIGHT) X 45' LONG PRECAST CONCRETE BOX CULVERT EMBEDDED 1' BELOW STREAMBED. CONSTRUCT CONCRETE HEADWALLS AT BOTH ENDS ANGLED AT 45 DEGREES TOWARDS THE BANK.

STA 103+18  
 CONSTRUCT NEW 3' DIAMETER 66' LONG REINFORCED CONCRETE PIPE WITH A 3' WIDE CHANNEL CONNECTING THE STREAM CHANNEL TO THE INLET AND OUTLET.



STATE OF NEW HAMPSHIRE AUBURN			
DEPARTMENT OF TRANSPORTATION		BUREAU OF HIGHWAY DESIGN	
<b>EROSION CONTROL PLAN</b>			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
09 44167-erplan	44167	9	9