

# STATE OF NEW HAMPSHIRE INTER-DEPARTMENT COMMUNICATION

**DATE:** May 10, 2024

**FROM:** Joshua Brown  
Wetlands Program Specialist

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

**SUBJECT** Dredge & Fill Application  
Newton, 29617

Bureau of  
Environment

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

Forwarded herewith is the application package prepared by NHDOT Bureau of Highway Design for the subject major impact project. The proposed project involves the reconstruction of the intersection along NH Rte. 108 with Amesbury Rd and Maple Ave in the Town of Newton, NH. Wetland impacts for this project are for associated road widening, intersection work, construction of a stormwater treatment swale and replacement of a failing culvert. The culvert will be replaced with a 60-inch reinforced concrete pipe and a 36-inch reinforced concrete overflow pipe.

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

The lead people to contact for this project are Timothy Dunn, Bureau of Highway Design (271-1618 or [Timothy.d.dunn@dot.nh.gov](mailto:Timothy.d.dunn@dot.nh.gov)) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-3226 or [Andrew.O'Sullivan@dot.nh.gov](mailto:Andrew.O'Sullivan@dot.nh.gov)).

A payment voucher has been processed for this application (Voucher #755791) in the amount of \$2,369.20.

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

JRB;  
cc:  
BOE Original  
Town of Newton (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)



# STANDARD DREDGE AND FILL WETLANDS PERMIT APPLICATION

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



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

**APPLICANT'S NAME:**

**TOWN NAME:**

|                               |                               |                               |            |
|-------------------------------|-------------------------------|-------------------------------|------------|
| Administrative<br>Use<br>Only | Administrative<br>Use<br>Only | Administrative<br>Use<br>Only | File No.:  |
|                               |                               |                               | Check No.: |
|                               |                               |                               | Amount:    |
|                               |                               |                               | Initials:  |

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

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

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

|   |  |
|---|--|
| For dredging projects, is the subject property contaminated?<br>• If yes, list contaminant: | <input type="checkbox"/> Yes <input type="checkbox"/> No |
|---|--|

|   |  |
|---|--|
| Is there potential to impact impaired waters, class A waters, or outstanding resource waters? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
|---|--|

For stream crossing projects, provide watershed size (see [WPPT](#) or Stream Stats):

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

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

ADDRESS:

TOWN/CITY:

TAX MAP/BLOCK/LOT/UNIT:

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

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

|   |  |                              |                 |
|---|--|------------------------------|-----------------|
| <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, 7 Hazen Dr.  |  |                              |                 |
| TOWN/CITY: Concord  |  | STATE: NH                    | ZIP CODE: 03302 |
| EMAIL ADDRESS: <i>timothy.d.dunn@dot.nh.gov</i>   |  |                              |                 |
| FAX:  |  | PHONE: <i>(603) 271-1618</i> |                 |
| ELECTRONIC COMMUNICATION: By initialing here, I hereby authorize NHDES to communicate all matters relative to this application electronically. <i>TDD</i> |  |                              |                 |
| <b>SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))</b>  |  |                              |                 |
| <input checked="" type="checkbox"/> N/A   |  |                              |                 |
| LAST NAME, FIRST NAME, M.I.:  |  |                              |                 |
| COMPANY NAME:   |  |                              |                 |
| MAILING ADDRESS:  |  |                              |                 |
| TOWN/CITY:  |  | STATE:                       | ZIP CODE:       |
| EMAIL ADDRESS:  |  |                              |                 |
| FAX:  |  | PHONE:                       |                 |
| ELECTRONIC COMMUNICATION: By initialing here, I hereby authorize NHDES to communicate all matters relative to this application electronically.            |  |                              |                 |
| <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:   |  |                              |                 |
| MAILING ADDRESS:  |  |                              |                 |
| TOWN/CITY:  |  | STATE:                       | ZIP CODE:       |
| EMAIL ADDRESS:  |  |                              |                 |
| FAX:  |  | PHONE:                       |                 |
| ELECTRONIC COMMUNICATION: By initialing here, I hereby authorize NHDES to communicate all matters relative to this application electronically.            |  |                              |                 |

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

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

**SECTION 8 - AVOIDANCE AND MINIMIZATION**

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

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

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

**SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)**

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

Mitigation Pre-Application Meeting Date: Month: Day: Year: 2/17/2021

N/A - Mitigation is not required

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

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

N/A – Compensatory mitigation is not required

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

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

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

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

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

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

| JURISDICTIONAL AREA |  | PERM.<br>SF | PERM.<br>LF | PERM.<br>ATF             | TEMP.<br>SF | TEMP.<br>LF | TEMP.<br>ATF             |
|---------------------|--|-------------|-------------|--------------------------|-------------|-------------|--------------------------|
| Wetlands            | Forested Wetland                               |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Scrub-shrub Wetland                            |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Emergent Wetland                               |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Wet Meadow                                     |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Vernal Pool                                    |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Designated Prime Wetland                       |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Duly-established 100-foot Prime Wetland Buffer |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
| Surface             | Intermittent / Ephemeral Stream                |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Perennial Stream or River                      |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Lake / Pond                                    |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Docking - Lake / Pond                          |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Docking - River                                |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
| Banks               | Bank - Intermittent Stream                     |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Bank - Perennial Stream / River                |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Bank / Shoreline - Lake / Pond                 |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
| Tidal               | Tidal Waters                                   |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Tidal Marsh                                    |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Sand Dune                                      |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Undeveloped Tidal Buffer Zone (TBZ)            |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Previously-developed TBZ                       |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
|                     | Docking - Tidal Water                          |             |             | <input type="checkbox"/> |             |             | <input type="checkbox"/> |
| <b>TOTAL</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):                                | SF | × \$0.40 = | \$ |
| Seasonal docking structure:   | SF | × \$2.00 = | \$ |
| Permanent docking structure:  | SF | × \$4.00 = | \$ |
| Projects proposing shoreline structures (including docks) add \$400 = |    |            | \$ |
| Total =   |    |            | \$ |

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

|   |   |   |
|---|---|---|
| <b>SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)</b>  |   |   |
| Indicate the project classification.  |   |   |
| <input type="checkbox"/> Minimum Impact Project   | <input type="checkbox"/> Minor Project  | <input checked="" type="checkbox"/> Major Project |
| <b>SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)</b>   |   |   |
| Initial each box below to certify:  |   |   |
| Initials:<br><i>TDD</i>   | To the best of the signer's knowledge and belief, all required notifications have been provided.  |   |
| Initials:<br><i>TDD</i>   | The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.  |   |
| Initials:<br><i>TDD</i>   | 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> </ul> |   |
| Initials:<br><i>TDD</i>   | If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.   |   |
| <b>SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)</b>   |   |   |
| SIGNATURE (OWNER):<br><i>[Signature]</i>  | PRINT NAME LEGIBLY:<br><i>Timothy Dunn</i>  | DATE:<br><i>5/2/2024</i>                          |
| SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER):   | PRINT NAME LEGIBLY:   | DATE:   |
| SIGNATURE (AGENT, IF APPLICABLE):   | PRINT NAME LEGIBLY:   | DATE:   |
| <b>SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))</b>  |   |   |
| 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:<br><small>State agency exempt per RSA 482-A:3, I(a)</small>   |   |
| 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".

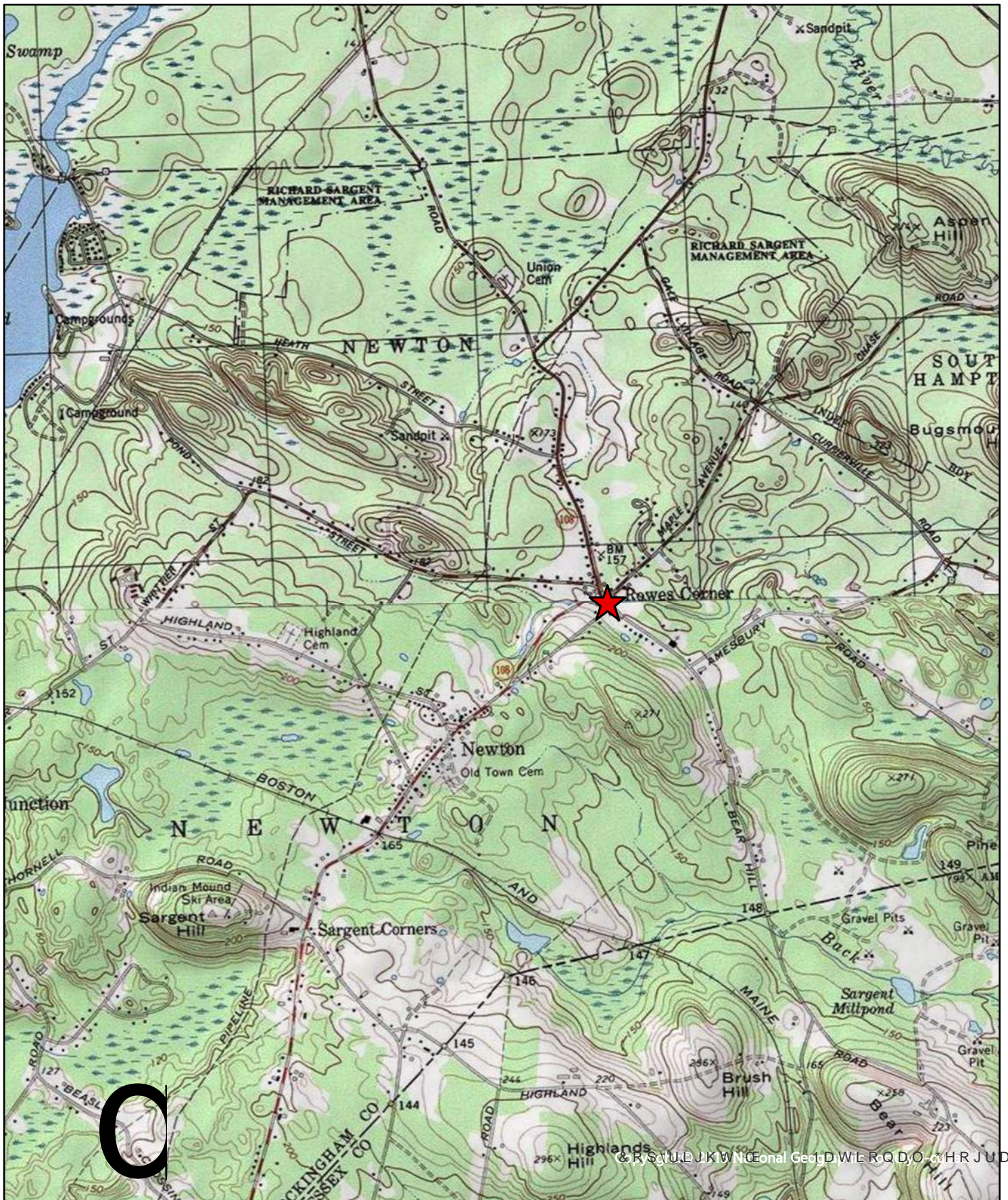
[irm@des.nh.gov](mailto:irm@des.nh.gov) or (603) 271-2147

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

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



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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:** Newton

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 UNDER AMESBURY ROAD WOULD REPLACE THE EXISTING 48" CONCRETE ARCH CULVERT WITH A 13' BOX CULVERT. SIGNIFICANT TEMPORARY WIDENING, WHICH WOULD IMPACT THE WETLAND ON BOTH SIDES OF AMESBURY ROAD, WOULD BE REQUIRED ON BOTH SIDES OF THE ROADWAY TO ACCOMMODATE THE PHASED CONSTRUCTION UNLESS THE ROAD COULD BE CLOSED. THE APPROXIMATE COST ESTIMATE FOR THIS OPTION IS MORE THAN THREE TIMES THE COST OF THE PROPOSED DESIGN. SECURING FUNDING AND ADDITIONAL DESIGN TIME FOR THIS OPTION WOULD REQUIRE A DELAY IN THE START OF CONSTRUCTION OF 3-5 YEARS OR LONGER. A DELAY OF THIS MAGNITUDE MAY RISK FAILURE OF THE EXISTING PIPE AND/OR OVERTOPPING OF HIGH FLOWS DUE TO THE SUBMERGENCE OF THE EXISTING CONCRETE ARCH. THE ESTIMATE DOES NOT INCLUDE MANY SITE SPECIFIC DETAILS. THIS DESIGN IS NOT CONSIDERED PRACTICAL UNDER THIS PROGRAM DUE TO BUDGETARY, RIGHT-OF-WAY, AND POTENTIAL HISTORIC RESOURCE CONSTRAINTS NEAR THE CULVERT. A HYDRAULIC DESIGN IS PROPOSED TO PASS THE 50-YEAR EVENT WITHOUT OVERTOPPING THE ROADWAY. SEVERAL ALTERNATIVES WERE ANALYZED CONSIDERING HYDRAULIC ADVANTAGES, ECOLOGICAL IMPACTS, AND TIMELY REPLACEMENT TO REDUCE THE RISK OF FAILURE. A 60" REINFORCED CONCRETE PIPE AND A 36" REINFORCED CONCRETE CULVERT IN THE DRY WAS SELECTED. PERMANENT IMPACTS FOR THE CULVERT REPLACEMENT ARE LIMITED TO THE VICINITY AROUND THE PROPOSED INLET AND OUTLET TO CONSTRUCT HEADWALLS, ADD 8' OF CULVERT LENGTH AT THE OUTLET, AND TO GRADE THE STREAM CHANNEL. PERMANENT SLOPE IMPACTS TO WETLANDS ARE ALSO REQUIRED ON THE EASTERN AND WESTERN SIDES OF AMESBURY RD TO ACCOMMODATE ROADWAY IMPROVEMENTS AND GUARDRAIL INSTALLATION. TO MINIMIZE WETLAND IMPACTS, 2:1 SLOPES WILL BE USED WHEN APPROPRIATE.

[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 36"-48" concrete arch culvert provides a hydrologic connection between the un-named stream on each side of Amesbury Rd. The proposed structures are a 60" reinforced concrete pipe and a 36" reinforced concrete culvert intended for dry riparian critter crossing in addition to surge flow. The proposed invert elevations will be set such that the inlet and outlet areas match the existing streambed upstream and downstream. The permanent impacts to the channel are needed in the vicinity of the inlets and outlets to regrade the channel for the proposed larger than existing 60" culvert and new 36" RCP inverts, while also intending to provide more effective energy dissipation than the existing conditions. 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 resources present within the project area that will be impacted consist of the un-named stream (R2UB2), palustrine emergent (PEM1E)/palustrine scrub-shrub wetland (PSS1Eh), and palustrine forested wetland (PFO1E). There will be no change in function of these wetlands due to the project.

There are no vernal pools or exemplary natural communities known to occur in the project area. The NH Natural Heritage Bureau (NHNHB) reviewed the project area for records of protected species and exemplary natural communities near the project area. The review found records of Blanding's turtles (state endangered) and Spotted turtles (state threatened) in their database. NHF&G recommendations will be followed to accommodate the wildlife, including the utilization of sloped granite and bituminous curb to make the curbs more traversable, alternate catch basin grate sizes, concrete pipes in lieu of plastic or metal to accommodate wildlife passage, and avoidance of erosion control methods containing welded plastic netting or thread.

The project area is within range of the Northern Long-Eared Bat (NLEB), which is listed as a threatened species under the Federal Endangered Species Act. The US Fish and Wildlife Service (USFWS) has communicated concurrence with the "may effect, likely to adversely affect" (LAA) finding and that the project conforms to the Range-wide Programmatic Consultation for Indiana Bat and NLEB and will not cause any take that is prohibited. The LAA determination comes from the need to clear trees during the NLEB active season. All appropriate Avoidance and Mitigation Measures will be included in the contract document and no further consultation with USFWS is needed.

**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 an identified fishing location. The project will have no permanent effect on public commerce, navigation, or recreation. The proposed design/work will allow traffic to continue along Amesbury Road, NH 108, and Maple Avenue.

**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.

Based on existing FEMA mapping, the project area does not include FEMA-mapped regulatory floodways or 100 year floodplains. As the proposed project does not include work within a regulatory floodway or any designated floodplains, the work as proposed will not present any new obstructions to floodways or result in an increase in an established base flood elevation or create a significant risk to human life or property.

**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 and the need for slope improvements for the widened roadway to increase safety to the traveling public. The proposed design has the least impact to wetlands of any practicable alternative.

The permanent impacts to the riverine wetlands and forest/scrub-shrub wetlands in the project area are limited to the vicinity of the inlet and outlet of the proposed culverts and both sides of Amesbury Road for slope work due to roadway safety improvements. To minimize wetland impacts, 2:1 slopes will be used when appropriate. Temporary impacts to jurisdictional areas will be restored to existing conditions and will not have a permanent effect on the functions and values of the wetlands.

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

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

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

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

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

Avoidance of all impacts is impractical due to the size and poor structural condition of the existing culvert. The proposed 60" RCP and 36" RCP overflow pipe will provide increased ecological services, improve geomorphic compatability, and increase the hydraulic capacity. Permanent impacts to the stream channel are the minimum necessary to match the new culvert to the existing stream channel.

The proposed closed drainage system and curbing around the NH Rte. 108, Amesbury Road, and Maple Avenue intersection will decrease the amount of untreated intersection water runoff to the un-named stream. The closed drainage system will outlet the water to the proposed grassed treatment swale southeast of the intersection.

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

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

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

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

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

N/A

**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> REBECCA MARTIN, DEIDRA BENJAMIN, AND RHONA THOMSON   |  |
| <b>DATE OF ASSESSMENT:</b> 9/27/2023  |  |
| Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT:<br><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:<br><input type="checkbox"/> |  |
| Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.  |  |

# BUREAU OF ENVIRONMENT CONFERENCE REPORT

**SUBJECT:** NHDOT Monthly Natural Resource Agency Coordination Meeting

**DATE OF CONFERENCE:** February 17, 2021

**LOCATION OF CONFERENCE:** Virtual meeting held via Zoom

**ATTENDED BY:**

**NHDOT**

Sarah Large  
Matt Urban  
Andrew O’Sullivan  
Ron Crickard  
Mark Hemmerlein  
Arin Mills  
James McMahon  
Rebecca Martin  
Hans Weber  
Dan Prehemo  
Don Lyford  
Tim Mallette  
Meli Dube  
Chris Carucci  
Kirk Mudgett  
Tobey Reynolds

**ACOE**

Christopher Marron

**EPA**

Jeanie Brochi

**NHDES**

Lori Sommer  
Karl Benedict  
Ann-Elizabeth Pelonzi  
Phil Trowbridge

**NHB**

Amy Lamb

**NH Fish & Game**

Carol Henderson  
John Magee

**The Nature Conservancy**

Pete Steckler

**Consultants/ Public  
Participants**

Kimberly Peace  
Deb Coon

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

|                                   |   |
|-----------------------------------|---|
| Finalize Meeting Minutes.....     | 2 |
| Milan, #43228 .....               | 2 |
| Newton, #29617 (X-A004(206))..... | 4 |
| Bow, #42704 (X-A004(950)).....    | 7 |

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

the numbers provided are the longest and follow the sinuosity of the channel. Sarah did mention the line will be calculated as straight (as the crow flies) and Sarah did get 1:1 for impacts vs created based on her calculations. Lori would like to know what other additional planting will be used on the project and would like a post construction report and couple years of monitoring for bank revegetation. Lori thinks there may be a need for mitigation; Sarah will meet with DES to confirm mitigation needs prior to application submittal.

Carol appreciates removal of perch and improved connectivity. She confirmed the use of natural stream bottom throughout crossing, Jim confirmed that the design includes natural/ simulated streambed material through the crossing and within the stream channel impact areas. The site is upstream of Cedar Pond where there is a documented Loon nest; the site is a ¼ mile upstream of the Pond and therefore would not cause disturbance of Loon nesting.

Amy L does not have record of PRA (bog) nor the wetland being an exemplary natural community, or records of rare plants in area. She offered review of planting plans if needed. Chris M said Request for Project Review) RPR will be required, and Arin and Matt U said the internal cultural review and qualified for Appendix B of Programmatic Agreement and will be included with the application package. Canada lynx, no effect. Any trees >3" dbh being cut and Jim confirmed will at outlet. Arin confirmed consistency letter was obtained for the bat.

Jeanie had no comments. Pete S had question why a wider structure was not proposed to accommodate wildlife passage and meet geomorphic compatibility. Jim explained there is a flat shelf inside the box to accommodate wildlife passage in times of low flow. Phil T and Liz had no additional comments.

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

#### **Newton, #29617 (X-A004(206))**

Hans Weber provided an introduction to the project. He explained that the project proposes improvements to the NH Route 108, Amesbury Road, and Maple Avenue intersection in Newton, NH. This intersection is known as Rowe's Corner. He described the project schedule including the public informational meeting that was held in August 2020 and a proposed public hearing in spring 2021. H. Weber explained the project is needed to address the uncertainty for drivers that currently exists at the intersection. Currently NH Route 108 does not stop at the intersection, but Maple Avenue and Amesbury Road have stop signs. There is a flashing beacon in the intersection. Since Route 108 takes a distinct curve through the intersection and there are multiple slip ramps, the intersection can be confusing for drivers. H. Weber noted the crash history at the intersection.

Two alternatives had been considered for the intersection, a four way stop with elimination of the slip ramps and a roundabout. The Newton Select Board had indicated that the four-way stop is the preferred alternative, so the NHDOT is planning to pursue the four way stop as the preferred alternative.

H. Weber showed a preliminary plan for the four way stop (preferred) alternative, not including the culvert work. He explained that the green areas represents slope impacts (cuts and fills). Truck aprons are also proposed. H. Weber also explained that there is a culvert on Amesbury Road of unknown age that will be addressed as part of the project. Feedback is needed on the best alternative for replacement. Photos of the inlet and outlet of the culvert were shown. The culvert was not originally part of the Newton 29617 project. The Bureau of Environment and Maintenance (District) have encouraged that the culvert be addressed as part of the project due to its poor condition. The project budget cannot support a compliant sized structure,

so the team intends to apply for an alternative design. A water quality feature (BMP) is proposed in the bottom south east corner of the intersection, a conservation property. If the culvert were replaced, the impacts at the culvert outlet would also extend onto this Town owned conservation property. On the southern two quadrants, effort is being made to construct slopes with minimal impacts to wetlands.

The Amesbury Road culvert seems to have been extended with multiple materials. The date of construction and the original materials are unknown.

Rebecca Martin explained that the wetland delineation and stream crossing assessment were completed for the project. The Amesbury Road culvert is an unnamed Tier 2 stream. A compliant structure, which is not proposed, would be 13' wide. There is another crossing on NH Route 108 located west of the project area and upstream of the subject culvert (36" sliplined culvert) and upstream of that crossing is a private dam. The project does not propose any impacts to the culvert or dam upstream. R. Martin briefly described the types of wetlands in the project area, including palustrine forested and palustrine emergent/palustrine scrub shrub wetlands. She commented that the project area is in an MS4 community and stormwater treatment is planned. The Northern Long Eared Bat was identified as potentially being in the project area. R. Martin shared that the new Natural Heritage Bureau report includes the Spotted turtle and Blanding's turtle. She said that she initiated coordination with NH Fish and Game Department and recommendations will be taken into account during project design.

The quadrant where the stormwater treatment swale is proposed is located is on Town owned conservation land. No LCHIP, LCIP/CLS, or LWCF funds were used to purchase the property. R. Martin has contacted the Conservation Commission to ask about the terms of the easement on the property, but hasn't received a response to date.

R. Martin described that the Wildlife Action Plan did not include any areas within the project area, but Green- highest ranked habitat in region and Orange- supporting landscape are located downstream of the Amesbury Road crossing. The Nature Conservancy's Connect the Coast effort did cover this area, but no corridors or habitat blocks are located in the project area.

H. Weber provided more details about the existing 48" equivalent diameter cast in place culvert under Amesbury Road that is proposed to be replaced. We are unclear on the exact size of the pipe, due to it being buried. District has been asked and has not informed the project team of any flooding issues. There are no floodplains or floodways mapped in the project area. The existing system would be expected to overtop the road at 55 cubic feet per second and the outlet velocity is 7.4 feet per second.

H. Weber explained that due to project constraints including the budget, right-of-way, and potential historic resources near the culvert, an alternative design is proposed. Two options are being considered and input about which would be preferred would be helpful moving forward. The first alternative, which seems to be preferred, is to replace the structure with a 60" embedded RCP with a 36" CMP overflow pipe, which would usually be dry and could function as a critter crossing. The second option is for twin 48" RCPs. Material would deposit in the pipes during storms and gradually over time and be transported through the culvert during high flows. There is some concern about the compaction between the 48" RCPs. H. Weber also mentioned that there is the option to do nothing and continue to try to maintain the current pipe. The 60" embedded RCP with a 36" CMP overflow pipe would overtop the road at 202 cubic feet per second, with an outlet velocity of 9.0 feet per second. The twin 48" pipes were modeled with no embedment and that system would overtop the road at 266 cubic feet per second, with an outlet velocity of 9.7 feet per second. A cross section of the 60" RCP plus 36" CMP was shown. It depicts some separation at the inlet (around 15 feet) with the outlets being close together in the existing channel.

Karl Benedict shared his comments on the project:

- According to 904.07, Tier 2 stream crossings must pass a 100-year storm event.
- Commented that the preferred alternative would be an alternative design.
- The preferred alternative fails to meet design criteria from the perspective of hydrology and geomorphology. \* T. Mallette added for the minutes that this is in part because of an historic privately owned dam upstream.
- It would be challenging to permit the preferred option.
- He recommends a third hydraulically sized option be explored that accommodates the Ordinary High Water and the 100 year storm.
- Asked about 2:1 slopes in the southwest quadrant to minimize wetland impacts.
- Recommended reviewing AoT and MS4 compliance needs.

Tim Mallette shared some additional details of the hydraulic analysis, including that the design flows were based on information provided by the Dam Bureau from their recent breach analysis, which are very conservative. T. Mallette also commented on the bath tub like landscape at the culvert inlet and very organic sediment. He explained that the current design would be trying to keep up with the 36” sliplined culvert upstream under NH Route 108. He explained that a 100-year storm (estimated at approximately 226 cubic feet per second) could overtop NH Route 108 upstream. T. Mallette has shared that the 60” RCP with the 36” CMP will overtop Amesbury Road at approximately the 89 year storm event using 20” of embedment.

- T. Mallette noted (for the minutes) that for some projects in the past passing a 100-year storm has been interpreted to mean safely pass the event. That does not necessarily mean the road will not overtop – especially for areas that are ponding on both sides of the road with a relatively low head drop for a short duration. Culverts are designed for the 50 yr. event.

Lori Sommer shared her comments on the project:

- Concerned about Priority Resource Area for the State listed turtle species. R. Martin explained that the turtle records were a distance from the project area.
- Asked about an alternative location for the treatment swale; H. Weber explained why the other possible locations were not preferred due to the slope of the intersection, reducing wetland impacts and reducing ROW impacts.
- Commented that impacts on the conservation land may need to be coordinated with the Charitable Trust Bureau.
- Generally concerned about the size of the “preferred alternative” (60” RCP w/ 36”CMP overflow). She wonders if a third pipe might be dry more often and commented on turtle passage. T. Mallette explained that the crowns of the 60” and 36” pipe are currently matching, so the 36” structure would be dry until a little before the 10-year storm.

Carol Henderson shared her comments on the project:

- Commented that she has no concerns with the 4-way stop being the preferred alternative for the intersection.
- She commented that if AoT applies, it may be appropriate to complete a habitat survey in the project area. She mentioned the turtle species in the area.
- Suggested considering improved aquatic organism passage.
- She asked for new NHB number, which Amy Lamb provided as NHB21-0493.

Amy Lamb commented:

- No state listed plants or exemplary natural communities are in the project area.

Chris Marron:

- Began to express concern about clearing needed for construction, but R. Martin explained the NLEB FHWA Programmatic Agreement would apply and the project will probably be a Likely to Adversely Affect project.

Pete Steckler:

- Raised the issue of a flood mitigation report from 2016 that identified Newton's North Main Street as a flood risk area.
- Concerned about outlet erosion protection with the two different sized pipes and tying in the 36" pipe. Suggested considering how to stabilize the outlet without using angular riprap.
- Concerned about whether the outlet water could back up into overflow pipe and inhibit terrestrial passage through the intended dual purpose "critter pipe".

Tim Mallette agreed that no stone need be in the outlet pool. He said the outlet would be in the same pool where it is located now and the dissipation in the pool is adequate to reduce water velocities. He commented that he had seen catfish when he visited the stream. T. Mallette said that the invert outlet of the 36" CMP could be adjusted to keep it dry.

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

**Bow, #42704 (X-A004(950))**

Chris Carucci gave an overview of the project, presented existing conditions data and discussed the proposed NR impacts. The project involves the rehabilitation of two corrugated metal pipe culverts (CMP) located under Interstate 89 NB and SB travel lanes just west of the crossing under Interstate 93 in the Town of Bow. The western culvert is a 292' long 48" diameter CMP that conveys an unnamed Tier 1 stream with a drainage area of 144.4 acres and outlets directly into the Turkey River. The eastern culvert is a 223' long 18" diameter CMP with a drainage area of 14 acres that acts as an equalizer pipe conveying stormwater runoff from a wetland on the south side of I-89 under the highway and outlets directly into the Turkey River. The eastern culvert is within the ¼ mile buffer of the Merrimack River. The goal of the project is to rehabilitate the culverts to prevent further deterioration so that they remain fully functional. The proposed method of rehabilitation will be sliplining the 48" CMP using a cured-in-place liner, and sliplining the 18" CMP with a 12" smooth interior pipe liner.

Karl Benedict opened the discussion by inquiring how bypassed water will be handled during construction for the 48" CMP. C. Carucci stated this will be up to the Contractor's Stormwater Pollution Prevention Plans (SWPPP) means and methods, but that stream flow could be pumped through the 48" pipe for most of the duration of work. He also stated the pipe would need to be dry for a short period of time, maybe only a few days, to install the liner and that they could allow for water to pond at the inlet since there is room depending on flows at that time. Any bypass water would need to be pumped to a dewatering basin/bag before outletting.

K. Benedict said that it would be good to aim for low flow periods and what is presented seems to be appropriate for managing water. He concurred with slip lining under Env-Wt 904.08 and Env-Wt 904.01 as long as AOP is met. The permitting path would be a single minor permit for the project (both culverts) because the work is rehabilitation, and impacts would be temporary, with no mitigation unless Lori says otherwise.

K. Benedict asked if the project is located in FEMA-mapped floodplain. C. Carucci stated yes but fill in the floodplain is not anticipated.



# AVOIDANCE AND MINIMIZATION CHECKLIST

## Water Division/Land Resources Management Wetlands Bureau



[Check the Status of your Application](#)

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

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

For the construction or modification of non-tidal shoreline structures over areas of surface waters without wetland vegetation, complete only Sections 1, 2, and 4 (or the applicable sections in [Attachment A: Minor and Major Projects \(NHDES-W-06-013\)](#)).

The following definitions and abbreviations apply to this worksheet:

- “A/M BMPs” stands for [Wetlands Best Management Practice Techniques for Avoidance and Minimization](#) dated 2019, published by the New England Interstate Water Pollution Control Commission (Env-Wt 102.18).
- “Practicable” means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes (Env-Wt 103.62).

| SECTION 1 - CONTACT/LOCATION INFORMATION   |   |   |
|--|---|---|
| APPLICANT LAST NAME, FIRST NAME, M.I.: NH Dept. of Transportation                      |   |   |
| PROJECT STREET ADDRESS: Intersection of NH Route 108, Amesbury Road, and Maple Avenue. | PROJECT TOWN: Newton  |   |
| TAX MAP/LOT NUMBER: N/A NHDOT ROW  |   |   |
| SECTION 2 - PRIMARY PURPOSE OF THE PROJECT   |   |   |
| Env-Wt 311.07(b)(1)  | Indicate whether the primary purpose of the project is to construct a water-access structure or requires access through wetlands to reach a buildable lot or the buildable portion thereof. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |

[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)



If you answered “no” to this question, describe the purpose of the “non-access” project type you have proposed:

The purpose of the project is to address safety concerns associated with the existing alignment of NH Route 108. The proposed project involves the reconstruction of the intersection along NH Route 108 with Amesbury Rd and Maple Ave; also known as Rowe's Corner. Proposed work also includes the replacement of a culvert under Amesbury Road that is in poor condition to support long term and safe use of the State's public transportation network.

**SECTION 3 - A/M PROJECT DESIGN TECHNIQUES**

Check the appropriate boxes below in order to demonstrate that these items have been considered in the planning of the project. Use N/A (not applicable) for each technique that is not applicable to your project.

|   |   |   |
|---|---|---|
| Env-Wt 311.07(b)(2)   | For any project that proposes new permanent impacts of more than one acre or that proposes new permanent impacts to a Priority Resource Area (PRA), or both, whether any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, could be used to achieve the project’s purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs. | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| Env-Wt 311.07(b)(3)   | Whether alternative designs or techniques, such as different layouts, construction sequencing, or alternative technologies could be used to avoid impacts to jurisdictional areas or their functions and values.  | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| Env-Wt 311.07(b)(4)<br>Env-Wt 311.10(c)(1)<br>Env-Wt 311.10(c)(2) | The results of the functional assessment required by Env-Wt 311.03(b)(10) were used to select the location and design for the proposed project that has the least impact to wetland functions.  | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |
| Env-Wt 311.07(b)(4)<br>Env-Wt 311.10(c)(3)                        | Where impacts to wetland functions are unavoidable, the proposed impacts are limited to the wetlands with the least valuable functions on the site while avoiding and minimizing impacts to the wetlands with the highest and most valuable functions.  | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |
| Env-Wt 313.01(c)(1)<br>Env-Wt 313.01(c)(2)<br>Env-Wt 313.03(b)(1) | No practicable alternative would reduce adverse impact on the area and environments under the department’s jurisdiction and the project will not cause random or unnecessary destruction of wetlands.   | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| Env-Wt 313.01(c)(3)   | The project would not cause or contribute to the significant degradation of waters of the state or the loss of any PRAs.  | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |

|   |  |   |
|---|--|---|
| Env-Wt 313.03(b)(3)<br>Env-Wt 904.07(c)(8)        | The project maintains hydrologic connectivity between adjacent wetlands or stream systems.   | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| Env-Wt 311.10<br>A/M BMPs                         | Buildings and/or access are positioned away from high function wetlands or surface waters to avoid impact.   | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| Env-Wt 311.10<br>A/M BMPs                         | The project clusters structures to avoid wetland impacts.  | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| Env-Wt 311.10<br>A/M BMPs                         | The placement of roads and utility corridors avoids wetlands and their associated streams.   | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| A/M BMPs  | The width of access roads or driveways is reduced to avoid and minimize impacts. Pullouts are incorporated in the design as needed.  | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| A/M BMPs  | The project proposes bridges or spans instead of roads/driveways/trails with culverts.   | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |
| A/M BMPs  | The project is designed to minimize the number and size of crossings, and crossings cross wetlands and/or streams at the narrowest point.  | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| Env-Wt 500<br>Env-Wt 600<br>Env-Wt 900            | Wetland and stream crossings include features that accommodate aquatic organism and wildlife passage.  | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| Env-Wt 900  | Stream crossings are sized to address hydraulic capacity and geomorphic compatibility.   | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| A/M BMPs  | Disturbed areas are used for crossings wherever practicable, including existing roadways, paths, or trails upgraded with new culverts or bridges.                                  | <input checked="" type="checkbox"/> Check<br><input type="checkbox"/> N/A |
| <b>SECTION 4 - NON-TIDAL SHORELINE STRUCTURES</b> |  |   |
| Env-Wt 313.03(c)(1)                               | The non-tidal shoreline structure has been designed to use the minimum construction surface area over surfaces waters necessary to meet the stated purpose of the structure.       | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |
| Env-Wt 313.03(c)(2)                               | The type of construction proposed for the non-tidal shoreline structure is the least intrusive upon the public trust that will ensure safe navigation and docking on the frontage. | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |
| Env-Wt 313.03(c)(3)                               | The non-tidal shoreline structure has been designed to avoid and minimize impacts on the ability of abutting owners to use and enjoy their properties.                             | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |

|                     |  |   |
|---------------------|--|---|
| Env-Wt 313.03(c)(4) | The non-tidal shoreline structure has been designed to avoid and minimize impacts to the public’s right to navigation, passage, and use of the resource for commerce and recreation.   | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |
| Env-Wt 313.03(c)(5) | The non-tidal shoreline structure has been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.  | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |
| Env-Wt 313.03(c)(6) | The non-tidal shoreline structure has 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. | <input type="checkbox"/> Check<br><input checked="" type="checkbox"/> N/A |

# Compensatory Mitigation Report

## Newton, 29617

### Project Description:

As requested by the New Hampshire (NH) Department of Transportation (DOT), this report was prepared by the NHDOT Bureau of Environment (BOE) for the proposed project as a supplement to coordination with NH Department of Environmental Services (DES). The project location is the intersection of NH Route 108 and Maple Ave in the Town of Newton, NH. The purpose of the project is to increase safety for the traveling public, which will be accomplished through the proposed work found in this application.

The project purpose is to widen the road approaches and reconstruct the intersection due to a history of collisions with a goal to increase public safety. The stream crossing work was added to the scope due to the work being in proximity and the crossing being in poor condition. The culvert replacement also meets the objective of increasing public safety. A stream crossing assessment was completed by NHDOT BOE personnel on September 27, 2023, and the parameters collected are summarized within the application as a supplement to this report. The current structure is a 3-foot wide by 2-foot height box culvert. There is no history of flooding at this location.

### Mitigation Summary:

Wetland impacts considered for mitigation are related to work associated with: intersection reconstruction, road widening, and replacement of the aforementioned stream crossing. The NHDOT is not proposing compensatory mitigation for this project.

The crossing is a Tier 2 watershed by size (320 acres); however the crossing was upgraded to a Tier 3 due to the presence of NH protected species. Coordination occurred with NH Fish and Game (NHF&G) and that coordination is included in this application. Applicable recommendations from NHF&G were incorporated into the project design and the crossing was then downgraded back to a Tier 2 per Env-Wt 904.05(c).

The current crossing will be upsized to a 60-inch concrete pipe. A second, 36" concrete overflow pipe was added to help accommodate surge flows and also act as a dry wildlife crossing throughout periods of normal flow.

As designed, a Tier 2 replacement permitted under Env-Wt 904.08 can be accomplished through a closed bottom structure with stream simulation per Env-Wt 904.04(b). However, the addition of simulated streambed material would result in overtopping of the culvert at a 100-year storm event. Additionally, if the culvert were to be embedded, angular stone would be required to reinforce the material, which could be harmful to aquatic life. The 100-year profile does not overtop Amesbury Road if embedment is not placed in the 60" RCP culvert and sediment is allowed to fill-in naturally. In order to meet and improve geomorphic compatibility, hydraulic capacity, and ecological services, the culvert cannot be embedded. As such, this project is being proposed as an alternative design, for reasons that are further explained within the technical report. The structure is being upsized from a 2x3-foot box to a 60-inch concrete pipe with a larger hydraulic opening. The increased size will enhance items found in Env-Wt 904.08

## Compensatory Mitigation Report Newton, 29617

including: hydraulic capacity, AOP, connection of upstream and downstream reaches, and the crossing's ability to handle flood events.

The project proposes less than 5,000 ft<sup>2</sup> of permanent wetland impact and 224 linear feet of impact; however, the project is self-mitigating due to the improved hydraulic capacity, improved AOP and improved geomorphic compatibility. The proposed project also does not impact any Priority Resource Areas (PRA) due to incorporation of New Hampshire Fish & Game conservation recommendations. The following table breaks down specific permanent impacts by resource type to meet Env-Wt 800.

| <b>Resource Type:</b>               | <b>Permanent FT<sup>2</sup></b> | <b>Permanent Linear Feet</b> | <b>Proposed Mitigation:</b>   |
|-------------------------------------|---------------------------------|------------------------------|---|
| <b>PRA<sup>1</sup> Wetlands</b>     | 0                               | -                            | NHDOT completed coordination with NHF&G and thus no PRA's are impacted and no mitigation is proposed. |
| <b>Non-PRA Wetlands:</b>            | 3,302                           | -                            | Below the threshold. No mitigation proposed.  |
| <b>Stream (Bank &amp; Channel):</b> | 990                             | 224                          | The proposed crossing is self-mitigating. No mitigation proposed.                                     |
| <b>Total:</b>                       | 4,292                           | 224                          |   |

*Table 1 - Mitigation Impact Summary*

---

<sup>1</sup> Priority Resource Areas are defined in Env-Wt 103.66 and includes: (a) Has documented occurrences of protected species or habitat; (b) Is a bog; (c) Is a floodplain wetland contiguous to a tier 3 or higher watercourse; (d) Is a designated prime wetlands; (e) Is a duly-established 100-foot buffer of a designated prime wetlands; (f) Is a sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone; or (g) Is any combination of (a) through (f), above.

## Thomson, Rhona

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**From:** OSullivan, Andrew  
**Sent:** Monday, February 26, 2024 1:50 PM  
**To:** Martin, Rebecca; Thomson, Rhona  
**Cc:** Brown, Joshua  
**Subject:** RE: Newton 29617 - follow-up meeting notes

Hi Rhona,

I would include this in the application after the NRAM minutes and label Additional Coordination. You may want to also include a summary of the Proposed Mitigation approach. We can meet to discuss further if you like.

Thanks,

Andy

**From:** OSullivan, Andrew <[Andrew.M.OSullivan@dot.nh.gov](mailto:Andrew.M.OSullivan@dot.nh.gov)>  
**Sent:** Monday, June 6, 2022 11:38 AM  
**To:** Weber, Hans <[Hans.S.Weber@dot.nh.gov](mailto:Hans.S.Weber@dot.nh.gov)>  
**Subject:** RE: Newton 29617 - NHDES Questions Response

Hi Hans,

I just spoke with Karl and he is fine with sending the application over without going to the NRAM. In the narrative about the by-pass pipe indicate that the velocities are not scour critical due to the pipe being backwatered when experiencing higher flows. If the velocities do not merit scour treatment, just incorporate a vegetative strip or level spreader, and we should be good. Let me know if you have questions.

Andy

**From:** Weber, Hans <[Hans.S.Weber@dot.nh.gov](mailto:Hans.S.Weber@dot.nh.gov)>  
**Sent:** Monday, June 6, 2022 10:41 AM  
**To:** OSullivan, Andrew <[Andrew.M.OSullivan@dot.nh.gov](mailto:Andrew.M.OSullivan@dot.nh.gov)>  
**Subject:** RE: Newton 29617 - NHDES Questions Response

Hi Andy,

Karl's response makes me hopeful. To clarify, it sounds like he wants more explanation about our proposed energy dissipation methodology before he would officially "sign off" on the alternative design?

Let me know your thoughts,

Hans

**From:** Benedict, Karl <[Karl.D.Benedict@des.nh.gov](mailto:Karl.D.Benedict@des.nh.gov)>  
**Sent:** Monday, June 6, 2022 10:37 AM  
**To:** OSullivan, Andrew <[Andrew.M.OSullivan@dot.nh.gov](mailto:Andrew.M.OSullivan@dot.nh.gov)>  
**Cc:** Weber, Hans <[Hans.S.Weber@dot.nh.gov](mailto:Hans.S.Weber@dot.nh.gov)>  
**Subject:** RE: Newton 29617 - NHDES Questions Response

Hi Andy,

Thank you for providing the overview of the design approach for this location given the previous discussion and potential issues identified at the crossing. The scope below confirms the approach to address hydraulic, geomorphic,

and AOP considerations under alternative design. I would be interested in discussing the impacts associated with the proposed ways to accomplish energy dissipation at the 36" overflow pipe.

Thanks for the further coordination,

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

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**We greatly appreciate your feedback, please take a moment to fill out our NHDES-LRM [customer satisfaction survey](#)**

**From:** OSullivan, Andrew <[Andrew.M.OSullivan@dot.nh.gov](mailto:Andrew.M.OSullivan@dot.nh.gov)>  
**Sent:** Thursday, May 26, 2022 1:28 PM  
**To:** Benedict, Karl <[Karl.D.Benedict@des.nh.gov](mailto:Karl.D.Benedict@des.nh.gov)>  
**Cc:** Weber, Hans <[Hans.S.Weber@dot.nh.gov](mailto:Hans.S.Weber@dot.nh.gov)>  
**Subject:** FW: Newton 29617 - NHDES Questions Response

Hi Karl,

As a follow-up to our teams meeting at the end of March regarding Newton 29617, I have coordinated with the design team to address your concerns with the project. The project team is hoping to attend the upcoming June 15, 2022 NRAM to present the project for concurrence on the proposed design. Please let me know if these responses below are acceptable in order to move the project forward and utilize the existing overall project funding to accomplish upgrading the 48" culvert.

1. *PE certification on hydraulics, any history of flooding?*
  - a. The NHDOT PE Certification on the hydraulic design is intended for public safety rather than wildlife/environmental considerations. Our design modeling shows that extreme flooding events will not compromise the road or cause adverse effects for the traveling public.
  - b. There is very little flooding history in the area, and the modeling shows that the alternative design will not create adverse impacts upstream or downstream for 50-year or 100-year events.
2. *Will the culvert be backwatered when completed (what storm events or always)? (This may allow F&G to be OK with no stream simulation for turtle passage)*
  - a. Similar to the existing condition, the channel for the 60" culvert will have a permanent depth of water and will further backwater as the downstream wetland is inundated during storm events. This should accommodate turtle passage at all times.
3. *Discuss the geomorphic alignment of pipes with separation at inlet and outlet. Discuss the alignment and geomorphic braiding of stream down stream of culvert.*
  - a. The 36" overflow pipe is intended to only operate during larger storm events, while otherwise offering dry critter passage opportunities to wildlife traversing between the wetlands separated by Amesbury Road. The intent of the separated inlet is to avoid impacting the overflow pipe prematurely for smaller storm events, while the outlet directs water to the same area as the 60" culvert in order to avoid creating multiple downstream channels.

- b. Two primary channels exist today in the downstream wetland: one from the culvert under Amesbury Road, and one from a Town culvert under Maple Avenue. These two channels meet approximately 250' downstream. When the surface water rises during storm events to depths greater than ~2-2.5', multiple shallow channels form in the overbank that navigate through the densely vegetated terrain and eventually converge to an average 7' wide woodland channel. The proposed alternatives should not drastically alter this behavior for the downstream condition.
4. *Will velocities of the 36" overflow pipe cause scour of bank at outlet? Is there a treatment that can be added to prevent scour?*
- a. The higher velocity at the 36" culvert outlet during peak storm events can be accommodated through energy dissipation methods such as stone armoring. The goal is to transition the peak flow into the natural channel downstream of the 60" culvert without causing erosion.
  - b. Routine seasonal flows should not erode or perch the outlet if the stone armoring is in place. As the design progresses, we will be investigating ways to accomplish energy dissipation without creating a barrier to wildlife species that may traverse the 36" overflow pipe.
5. *Can slopes be brought in more and steepened to avoid impacts?*
- a. The slopes along the south-western quadrant of the intersection have already been steepened to 2:1 in order to limit wetland impacts. On the south-eastern quadrant, the slopes are currently designed as 4:1 to limit the need for guardrail and to best blend into the existing condition along Amesbury Road. The wetland impacts (outside of the culvert area where impacts are near guaranteed) to the east are small, but we might be able to tighten up the slopes and lengthen our guardrail if that is desired.
6. *DOT needs to also talk about the overall benefits of doing this now, and how it provides increased safety.*
- a. This culvert has been rehabbed and retrofit a few different times throughout its long lifespan, and is in need of replacement. Our District Maintenance representatives have made it quite clear that they would like to see the culvert replaced, because they consider it at risk of failure. A nearby property owner has told us that work crews are seen refilling sinkholes by the western headwall on a yearly basis, indicating a problematic movement of soils around the structure. If the crossing was to fail under the newly constructed roadway, the high-trafficked Amesbury Road would need to be temporarily closed to the travelling public in order to replace the structure, which would very likely be an in-kind replacement for cost and expediency. The proposed alternative design will keep water safely moving under the roadway for the future, and the updated guardrail design will better protect traveling vehicles from reaching the hazard (headwall structures and the stream/bottom of slope).

I am available to coordinate further if you have any questions.

Thank you,

Andrew O'Sullivan  
Wetlands Program Manager  
New Hampshire Department of Transportation  
Bureau of Environment  
7 Hazen Drive, PO Box 483  
Concord NH, 03301-0483  
603-271-0556

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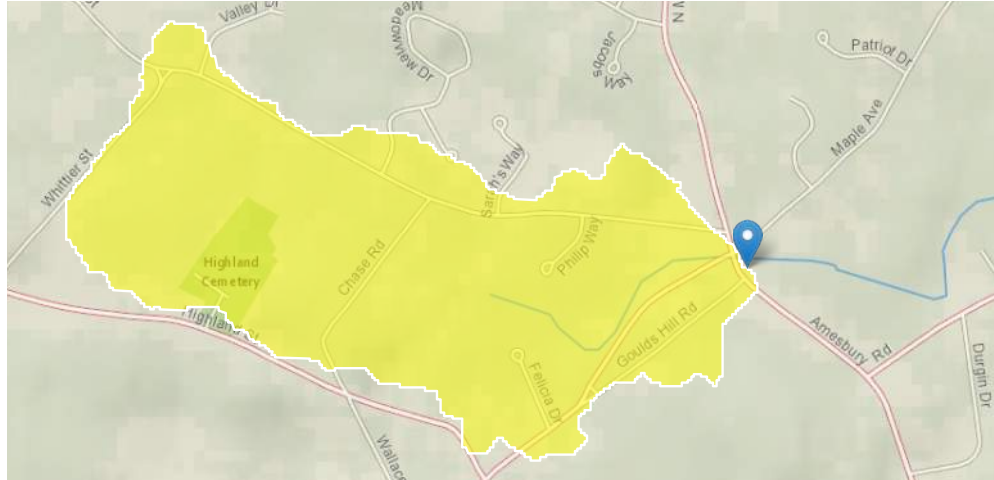
**From:** Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>  
**Sent:** Thursday, February 22, 2024 10:53 AM  
**To:** Thomson, Rhona <Rhona.C.Thomson@dot.nh.gov>



# Newton 29617 StreamStats

Region ID:  
 Workspace ID:  
 Clicked Point (Latitude, Longitude):  
 Time:

NH  
 NH20190726154348303000  
 42.87502, -71.02485  
 2019-07-26 11:44:05 -0400



Basin Characteristics

| Parameter Code | Parameter Description   | Value   | Unit         |
|----------------|---|---------|--------------|
| DRNAREA        | Area that drains to a point on a stream   | 0.5     | square miles |
| CONIF          | Percentage of land surface covered by coniferous forest   | 7.9721  | percent      |
| PREBC0103      | Mean annual precipitation of basin centroid for January 1 to March 15 winter period   | 8.74    | inches       |
| BSLDEM30M      | Mean basin slope computed from 30 m DEM   | 3.644   | percent      |
| MIXFOR         | Percentage of land area covered by mixed deciduous and coniferous forest  | 27.0511 | percent      |
| PREG_03_05     | Mean precipitation at gaging station location for March 16 to May 31 spring period  | 9.4     | inches       |
| TEMP           | Mean Annual Temperature   | 48.081  | degrees F    |
| TEMP_06_10     | Basinwide average temperature for June to October summer period   | 63.879  | degrees F    |
| PREG_06_10     | Mean precipitation at gaging station location for June to October summer period   | 17.4    | inches       |
| ELEVMAX        | Maximum basin elevation   | 237.019 | feet         |
| APRAVPRE       | Mean April Precipitation  | 4.273   | inches       |
| WETLAND        | Percentage of Wetlands  | 2.9605  | percent      |
| CSL10_85       | Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known | 42.1    | feet per mi  |

Seasonal Flow Statistics Parameters[Low Flow Statewide]

| Parameter Code | Parameter Name                   | Value   | Units        | Min Limit | Max Limit |
|----------------|----------------------------------|---------|--------------|-----------|-----------|
| DRNAREA        | Drainage Area                    | 0.5     | square miles | 3.26      | 689       |
| CONIF          | Percent Coniferous Forest        | 7.9721  | percent      | 3.07      | 56.2      |
| PREBC0103      | Jan to Mar Basin Centroid Precip | 8.74    | inches       | 5.79      | 15.1      |
| BSLDEM30M      | Mean Basin Slope from 30m DEM    | 3.644   | percent      | 3.19      | 38.1      |
| MIXFOR         | Percent Mixed Forest             | 27.0511 | percent      | 6.21      | 46.1      |
| PREG_03_05     | Mar to May Gage Precipitation    | 9.4     | inches       | 6.83      | 11.5      |

**New Hampshire Department of Transportation  
Bureau of Environment  
Stream Crossing Summary Report**

**Project:** Newton 29617

**Coordinates (Lat/Long):** 42.874997, -71.025102

**Date of Assessment:** 9/27/23

**Assessment Completed By:** Rebecca Martin, Deidra Benjamin, Rhona Thomson

**Stream Information:**

**Stream Name:** Unnamed

**Stream Tier:** 2

**Watershed Area:** 320 acres

**Wetland Classification:** R2UBH

**Average Reference Reach Values:**

**Average Bankfull Width:** 8'

**Average Slope:** <1%

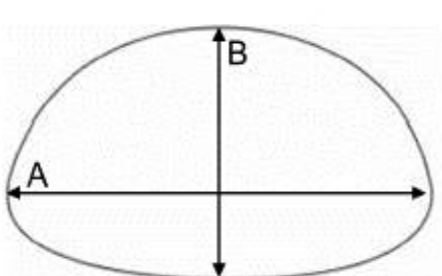
**Average Floodprone Width:** 75'

**Entrenchment Ratio:** 10.4

**Average Bankfull Depth:** 0.7'

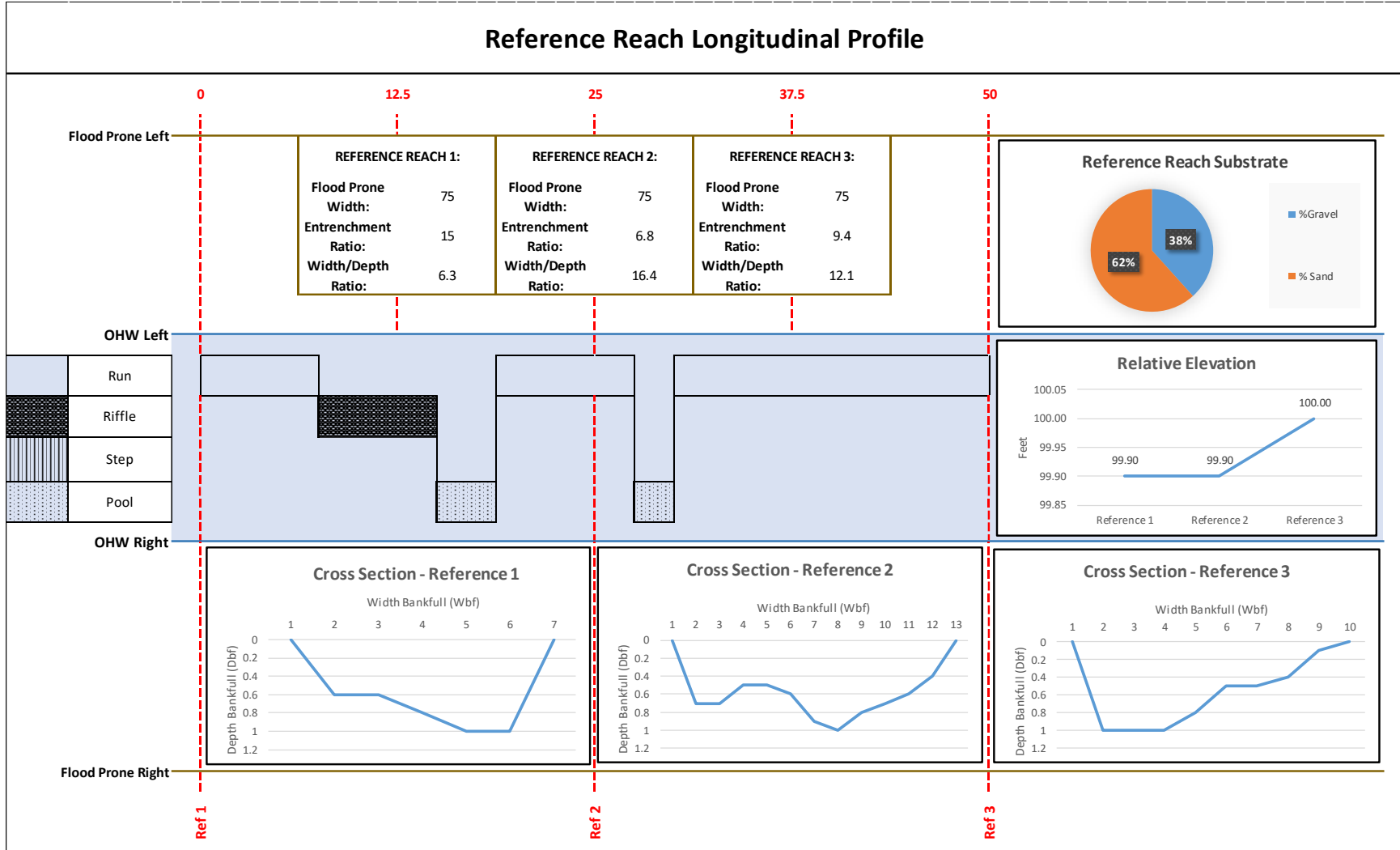
**Rosgen Classification:** Type E

**Existing Arch Pipe Cross Section:**

|  |  |            |           |            |                      |         |           |                |                |  |     |            |  |
|--|--|------------|-----------|------------|----------------------|---------|-----------|----------------|----------------|--|-----|------------|--|
| <p><b>SQUASH PIPE</b></p>  <p style="text-align: center;">A = 3'<br/>B = 2'</p> | <p><b>EXISTING CROSSING METRICS:</b></p> <p>Is the crossing perched?      No</p> <p>Dominant Channel Material:    Sand, Gravel</p> <p>Pool present?                    No</p> <p>If Yes, dimensions:              N/A</p> <hr/> <p style="text-align: center;"><b>RIPARIAN ZONE:</b></p> <p><b>Density of Vegetation:</b>      High</p> <p><b>Dominant Species (Common Name):</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Grapevine</td> <td>Red Maple</td> <td>Royal Fern</td> </tr> <tr> <td>Oriental Bittersweet</td> <td>Red Oak</td> <td>Goldenrod</td> </tr> <tr> <td>Speckled Alder</td> <td>Sensitive Fern</td> <td></td> </tr> <tr> <td>Elm</td> <td>Poison Ivy</td> <td></td> </tr> </table> | Grapevine  | Red Maple | Royal Fern | Oriental Bittersweet | Red Oak | Goldenrod | Speckled Alder | Sensitive Fern |  | Elm | Poison Ivy |  |
| Grapevine  | Red Maple  | Royal Fern |           |            |                      |         |           |                |                |  |     |            |  |
| Oriental Bittersweet   | Red Oak  | Goldenrod  |           |            |                      |         |           |                |                |  |     |            |  |
| Speckled Alder   | Sensitive Fern   |            |           |            |                      |         |           |                |                |  |     |            |  |
| Elm  | Poison Ivy   |            |           |            |                      |         |           |                |                |  |     |            |  |

**New Hampshire Department of Transportation  
Bureau of Environment  
Stream Crossing Summary Report**

**Reference Reach Longitudinal Profile**



New Hampshire Department of Transportation  
Bureau of Environment  
Stream Crossing Summary Report

Photos:



**Photo 1:** *View of Outlet – Looking upstream*

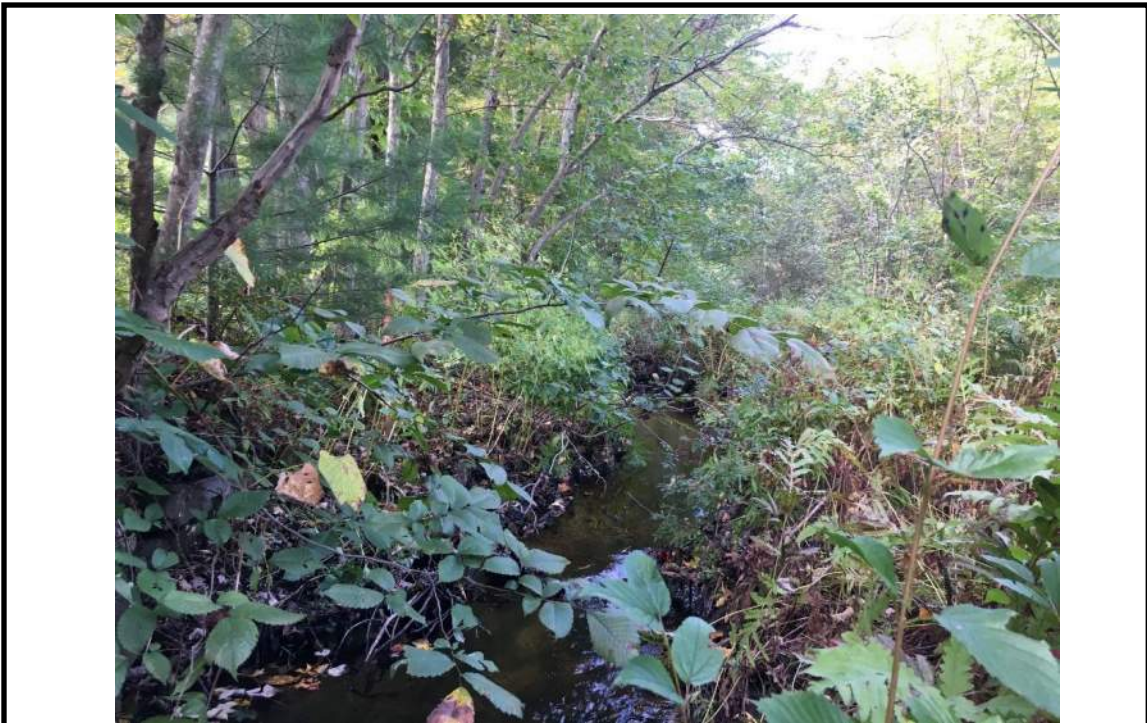


**Photo 2:** *View of Outlet Area – Looking downstream*

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Bureau of Environment  
Stream Crossing Summary Report



**Photo 3:** *View of Inlet – Looking downstream*



**Photo 4:** *View of Inlet Area – Looking upstream*

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**Photo 5:** *Reference Reach One – Looking upstream*



**Photo 6:** *Reference Reach One – Looking downstream*

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**Photo 7:** *Reference Reach Two – Looking upstream*



**Photo 8:** *Reference Reach Two – Looking downstream*

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*Photo 9: Reference Reach Three – Looking upstream*



*Photo 10: Reference Reach Three - Looking downstream*





# WETLANDS PERMIT APPLICATION STREAM CROSSING WORKSHEET

Water Division/Land Resources Management  
Wetlands Bureau



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

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

|   |   |
|---|---|
| <b>SECTION 1 - TIER CLASSIFICATIONS</b>   |   |
| Determine the contributing watershed size at <a href="#">USGS StreamStats</a> .   |   |
| Note: Plans for tier 2 and 3 crossings shall be designed and stamped by a professional engineer who is licensed under RSA 310-A to practice in New Hampshire.   |   |
| Size of contributing watershed at the crossing location: <input style="width: 50px;" type="text" value="320"/> acres  |   |
| <input type="checkbox"/> <b>Tier 1:</b> A tier 1 stream crossing is a crossing located on a watercourse where the contributing watershed size is less than or equal to 200 acres.   |   |
| <input type="checkbox"/> <b>Tier 2:</b> A tier 2 stream crossing is a crossing located on a watercourse where the contributing watershed size is greater than 200 acres and less than 640 acres.  |   |
| <input checked="" type="checkbox"/> <b>Tier 3:</b> A tier 3 stream crossing is a crossing that meets <b>any</b> of the following criteria: <ul style="list-style-type: none"> <li><input type="checkbox"/> On a watercourse where the contributing watershed is more than 640 acres.</li> <li><input type="checkbox"/> Within a <a href="#">designated river corridor</a> unless:                         <ul style="list-style-type: none"> <li>a. The crossing would be a tier 1 stream based on contributing watershed size, or</li> <li>b. The structure does not create a direct surface water connection to the designated river as depicted on the national hydrography dataset as found on GRANIT.</li> </ul> </li> <li><input type="checkbox"/> Within a <a href="#">100-year floodplain</a> (see Section 2 below).</li> <li><input checked="" type="checkbox"/> In a jurisdictional area having any protected species or habitat (<a href="#">NHB DataCheck</a>).</li> <li><input type="checkbox"/> In a prime wetland or within a duly-established 100-foot buffer, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b) and Env-Wt 706. Review the <a href="#">Wetlands Permit Planning Tool (WPPT)</a> for town prime wetland and prime wetland buffer maps to determine if your project is within these areas.</li> </ul> |   |
| <input type="checkbox"/> <b>Tier 4:</b> A tier 4 stream crossing is a crossing located on a tidal watercourse.  |   |
| <b>SECTION 2 - 100-YEAR FLOODPLAIN</b>  |   |
| Use the <a href="#">FEMA Map Service Center</a> to determine if the crossing is located within a 100-year floodplain. Please answer the questions below:  |   |
| <input checked="" type="checkbox"/> <b>No:</b> The proposed stream crossing <i>is not</i> within the FEMA 100-year floodplain.  |   |
| <input type="checkbox"/> <b>Yes:</b> The proposed project <i>is</i> within the FEMA 100-year floodplain. Zone = <input style="width: 50px;" type="text"/>   |   |
| Elevation of the 100-year floodplain at the inlet: <input style="width: 50px;" type="text"/> feet (FEMA El. or Modeled El.)   |   |
| <b>SECTION 3 - CALCULATING PEAK DISCHARGE</b>   |   |
| Existing 100-year peak discharge (Q) calculated in cubic feet per second (CFS): <input style="width: 50px;" type="text" value="181"/> CFS   | Calculation method: <input style="width: 100px;" type="text" value="SCS/HydroCAD"/> |
| Estimated bankfull discharge at the crossing location: <input style="width: 50px;" type="text" value="25"/> CFS   | Calculation method: <input style="width: 100px;" type="text" value="SCS/HydroCAD"/> |

[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)

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

**SECTION 4 - PREDICTED CHANNEL GEOMETRY BASED ON REGIONAL HYDRAULIC CURVES**

*For tier 2, tier 3 and tier 4 crossings only.*

Bankfull Width: 8.9 feet      Mean Bankfull Depth: 1.1 feet

Bankfull Cross Sectional Area: 9.5 square feet (SF)

**SECTION 5 - CROSS SECTIONAL CHANNEL GEOMETRY: MEASUREMENTS OF THE EXISTING STREAM WITHIN A REFERENCE REACH**

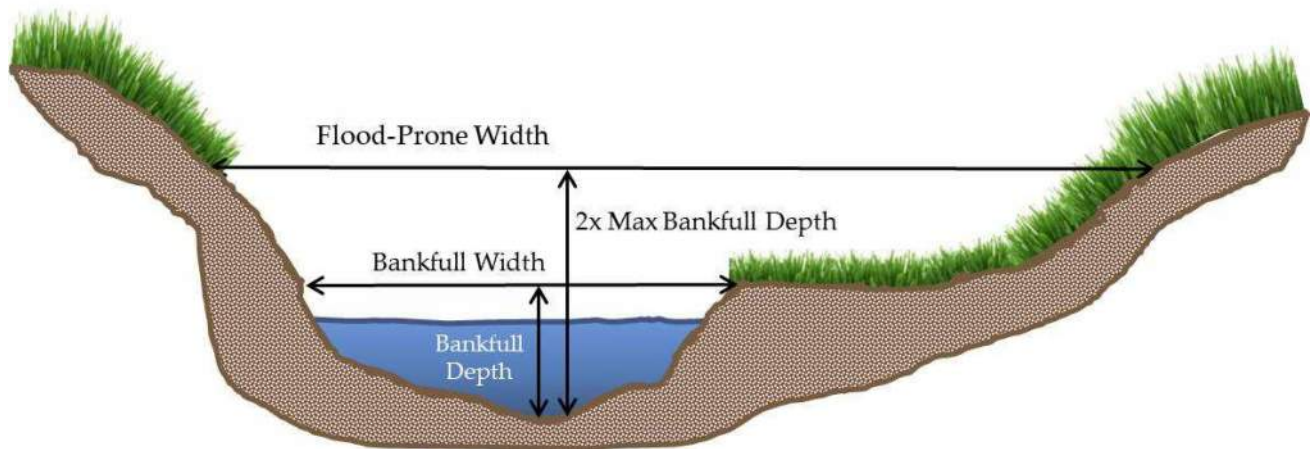
*For tier 2, tier 3 and tier 4 crossings only.*

Describe the reference reach location: Upstream, developed

Reference reach watershed size: 320 acres

| Parameter                                     | Cross Section 1<br>Describe bed form<br>Run<br><i>(e.g. pool, riffle, glide)</i> | Cross Section 2<br>Describe bed form<br>Run<br><i>(e.g. pool, riffle, glide)</i> | Cross Section 3<br>Describe bed form<br>Run<br><i>(e.g. pool, riffle, glide)</i> | Range          |
|---|--|--|--|----------------|
| <a href="#">Bankfull Width</a>                | 5 feet   | 11 feet  | 8 feet   | 5 - 11 feet    |
| <a href="#">Bankfull Cross Sectional Area</a> | 4 SF   | 7.4 SF   | 5.3 SF   | 4 - 7.4 SF     |
| Mean <a href="#">Bankfull Depth</a>           | 0.8 feet   | 0.7 feet   | 0.7 feet   | 0.7 - 0.8 feet |
| <a href="#">Width to Depth Ratio</a>          | 6.3  | 16.4   | 12.1   | 6.3 - 16.4     |
| Max <a href="#">Bankfull Depth</a>            | 1 feet   | 1 feet   | 1 feet   | 1 feet         |
| <a href="#">Flood Prone Width</a>             | 75 feet  | 75 feet  | 75 feet  | 75 feet        |
| <a href="#">Entrenchment Ratio</a>            | 15   | 6.8  | 9.4  | 6.8 - 15       |

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



**Figure 1:** Determining the Reference Reach Attributes.

**SECTION 6 - LONGITUDINAL PARAMETERS OF THE REFERENCE REACH AND CROSSING LOCATION**

*For tier 2, tier 3 and tier 4 crossings only.*

Average Channel Slope of the Reference Reach: <1%

Average Channel Slope at the Crossing Location: 2%

**SECTION 7 - PLAN VIEW GEOMETRY**

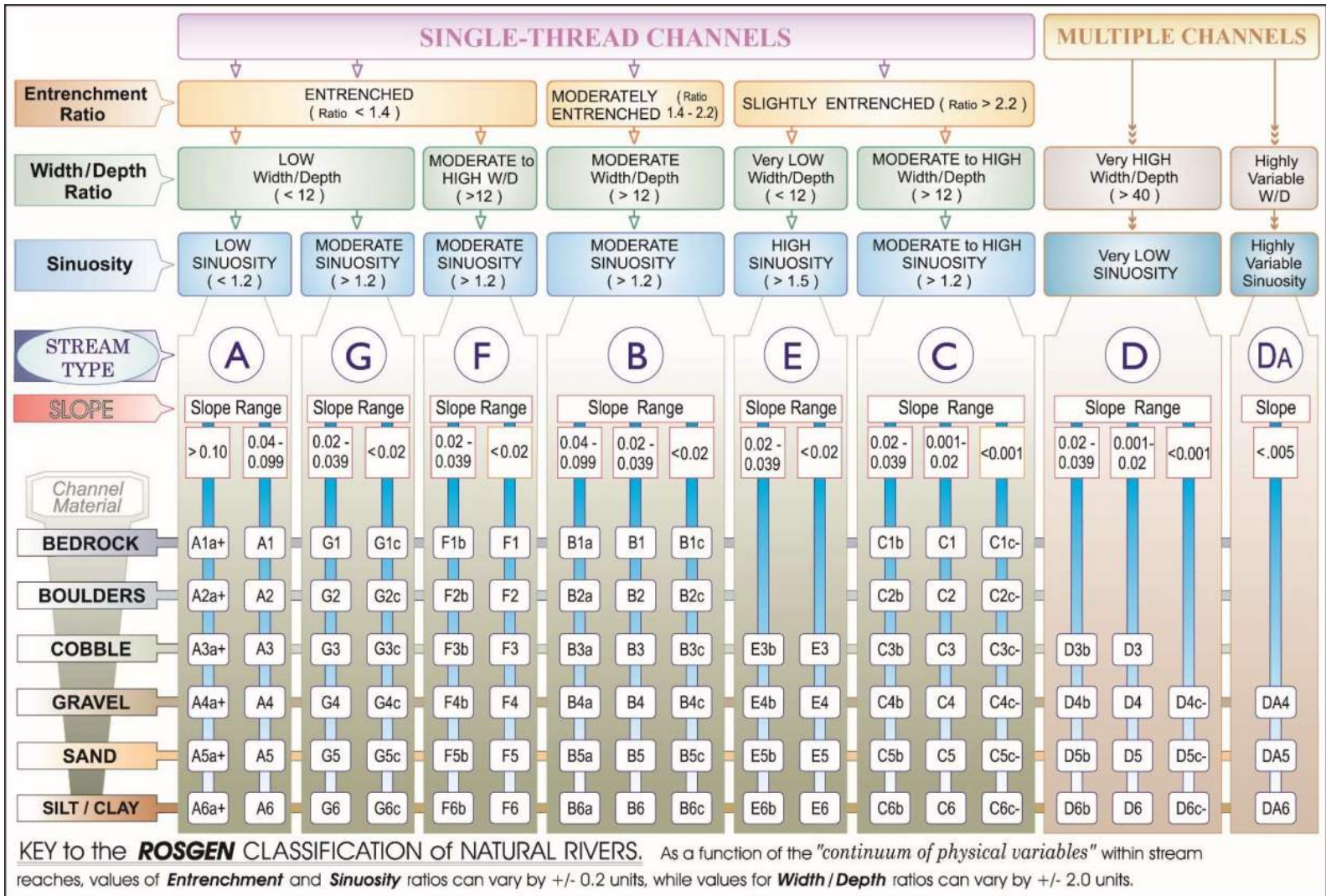
Note: Sinuosity is measured a distance of at least 20 times bankfull width, or 2 meander belt widths.

*For tier 2, tier 3 and tier 4 crossings only.*

Sinuosity of the Reference Reach: 1.45

|   |        |
|---|--------|
| Sinuosity of the Crossing Location: 1.00                                |        |
| <b>SECTION 8 - SUBSTRATE CLASSIFICATION BASED ON FIELD OBSERVATIONS</b> |        |
| <i>For tier 2, tier 3 and tier 4 crossings only.</i>                    |        |
| % of reach that is bedrock:   | 0 %    |
| % of reach that is boulder:   | 0 %    |
| % of reach that is cobble:  | 0 %    |
| % of reach that is gravel:  | 38 %   |
| % of reach that is sand:  | 62 %   |
| % of reach that is silt:  | 0 %    |
| <b>SECTION 9 - STREAM TYPE OF REFERENCE REACH</b>                       |        |
| <i>For tier 2, tier 3 and tier 4 crossings only.</i>                    |        |
| Stream Type of Reference Reach:   | Type E |

Refer to Rosgen Classification Chart (Figure 2) below:



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

| SECTION 10 - CROSSING STRUCTURE METRICS  |  |   |   |                          |                                     |
|--|--|---|---|--------------------------|-------------------------------------|
| <b>Existing Conditions</b>   | <b>Existing Structure Type:</b> <input type="checkbox"/> Bridge span<br><input type="checkbox"/> Pipe arch<br><input type="checkbox"/> Open-bottom culvert<br><input checked="" type="checkbox"/> Closed-bottom culvert<br><input type="checkbox"/> Closed-bottom culvert with stream simulation<br><input type="checkbox"/> Other: <input type="checkbox"/> |   |   |                          |                                     |
|  | <b>Existing Crossing Span:</b><br><i>(perpendicular to flow)</i>   | <input type="checkbox"/> feet   | <b>Culvert Diameter:</b> <input type="checkbox"/> feet<br><b>Inlet Elevation:</b> El. <input type="checkbox"/> feet |                          |                                     |
|  | <b>Existing Crossing Length:</b><br><i>(parallel to flow)</i>  | <input type="checkbox"/> 51 feet  | <b>Outlet Elevation:</b> El. <input type="checkbox"/> feet<br><b>Culvert Slope:</b> <input type="checkbox"/>        |                          |                                     |
| <b>Proposed Conditions</b>   | <b>Proposed Structure Type:</b>  | <b>Tier 1</b>   | <b>Tier 2</b>   | <b>Tier 3</b>            | <b>Alternative Design</b>           |
|  | Bridge Span  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            |
|  | Pipe Arch  | <input type="checkbox"/>  | <input type="checkbox"/>  |                          | <input type="checkbox"/>            |
|  | Closed-bottom Culvert  | <input type="checkbox"/>  | <input type="checkbox"/>  |                          | <input checked="" type="checkbox"/> |
|  | Open-bottom Culvert  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            |
|  | Closed-bottom Culvert with stream simulation   | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/>            |
|  | <b>Proposed Structure Span:</b><br><i>(perpendicular to flow)</i>  | <input type="checkbox"/> feet   | <b>Culvert Diameter:</b> 5 feet<br><b>Inlet Elevation:</b> El. <input type="checkbox"/> 142.54 feet                 |                          |                                     |
| <b>Proposed Structure Length:</b><br><i>(parallel to flow)</i>   | <input type="checkbox"/> 55 feet   | <b>Outlet Elevation:</b> El. <input type="checkbox"/> 142.18 feet<br><b>Culvert Slope:</b> <input type="checkbox"/> 0.007 |   |                          |                                     |
| <b>Proposed Entrenchment Ratio:* 15</b><br><i>For Tier 2, Tier 3 and Tier 4 Crossings Only. To accommodate the entrenchment ratio, floodplain drainage structures may be utilized.</i> |  |   |   |                          |                                     |

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

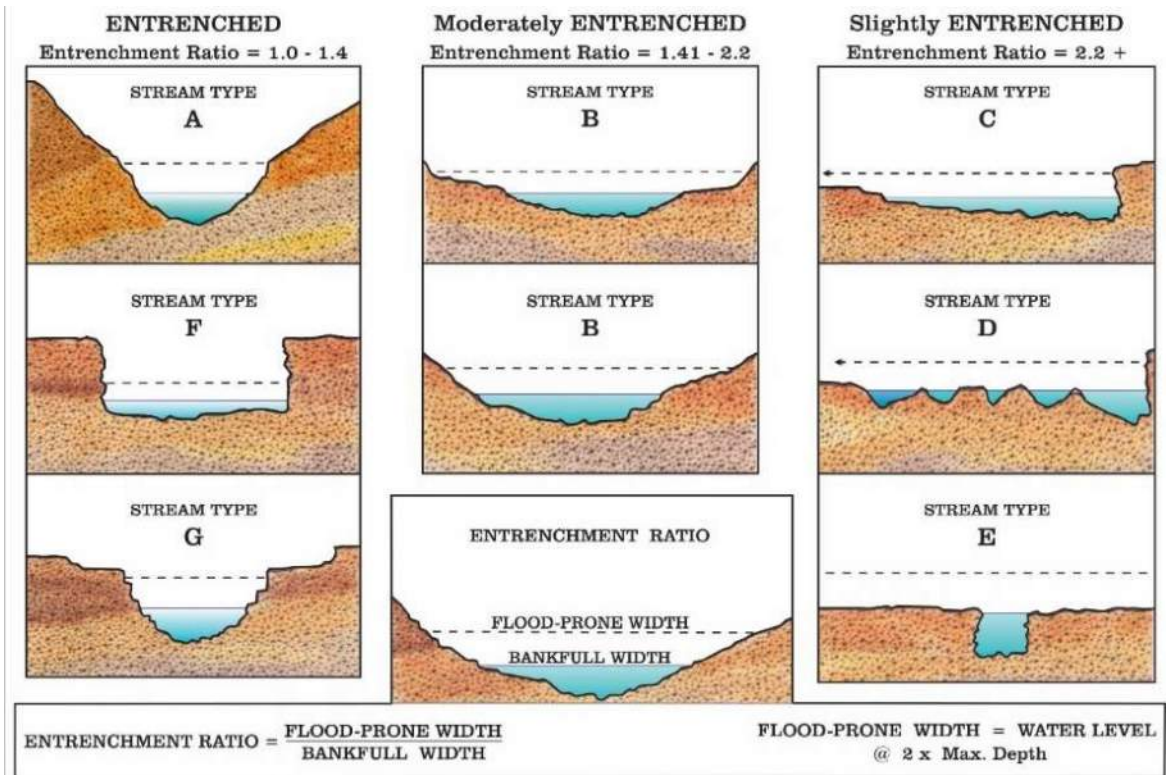


Figure 3: Reference from Applied River Morphology, Rosgen, 1996.

| SECTION 11 - CROSSING STRUCTURE HYDRAULICS   |          |          |
|--|----------|----------|
|  | Existing | Proposed |
| 100 year flood stage elevation at inlet:   | 150.8    | 148.6    |
| Flow velocity at outlet in feet per second (FPS):  | 8.1      | 8.8      |
| Calculated 100 year peak discharge (Q) for the <i>proposed</i> structure in CFS:   |          | 227      |
| Calculated 50 year peak discharge (Q) for the <i>proposed</i> structure in CFS:  |          | 181      |
| SECTION 12 - CROSSING STRUCTURE OPENNESS RATIO   |          |          |
| <i>For tier 2, tier 3 and tier 4 crossings only.</i>   |          |          |
| Crossing Structure Openness Ratio* = 4.28 (proposed)   |          |          |
| * Openness box culvert = (height x width)/length   |          |          |
| Openness round culvert = (3.14 x radius <sup>2</sup> )/length  |          |          |
| SECTION 13 - GENERAL DESIGN CONSIDERATIONS   |          |          |
| Env-Wt 904.01 requires all stream crossings to be designed and constructed according to the following requirements. Check each box if the project meets these general design considerations. |          |          |
| All stream crossings shall be designed and constructed so as to:   |          |          |
| <input checked="" type="checkbox"/> Not be a barrier to sediment transport.  |          |          |
| <input checked="" type="checkbox"/> Prevent the restriction of high flows and maintain existing low flows.   |          |          |
| <input checked="" type="checkbox"/> Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.     |          |          |
| <input checked="" type="checkbox"/> Not cause an increase in the frequency of flooding or overtopping of banks.  |          |          |
| <input checked="" type="checkbox"/> Maintain or enhance geomorphic compatibility by:   |          |          |

[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)

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

b. Preserving the natural alignment of the stream channel.

Preserve watercourse connectivity where it currently exists.

Restore watercourse connectivity where:

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

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

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

Not cause water quality degradation.

#### SECTION 14 - TIER-SPECIFIC DESIGN CRITERIA

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

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

#### SECTION 15 - ALTERNATIVE DESIGN

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

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



## NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

To: Rebecca Martin, NH DOT  
7 Hazen Drive PO Box 483  
Concord, NH 03302  
rebecca.a.martin@dot.nh.gov

From: NHB Review  
NH Natural Heritage Bureau  
Main Contact: Ashley Litwinenko - [nhbreview@dncr.nh.gov](mailto:nhbreview@dncr.nh.gov)

cc: NHFG Review

Date: 08/10/2023 (valid until 08/10/2024)

Re: DataCheck Review by NH Natural Heritage Bureau and NH Fish & Game

Permits: NHDES - Wetland Standard Dredge & Fill - Major, USACE - General Permit, USCEQ - Federal: NEPA Review

**NHB ID: NHB23-2344**

Town: Newton

Location: Rowe's Corner Intersection

**Project Description:** NHB22-2006, NHB21-0493, The project proposes intersection improvement at the Rowe's Corner intersection, drainage improvements, a stormwater treatment swale, improvements to the Goulds Hill Road intersection with Amesbury Road just south of Rowe's Corner and replacement of the culvert under Amesbury Road just south of Rowe's Corner.

### **Next Steps for Applicant:**

NHB's database has been searched for records of rare species and exemplary natural communities. Please carefully read the comments and consultation requirements below.

**NHB Comments:** No comments at this time.

**NHFG Comments:** Please refer to NHFG consultation requirements below.

### **NHB Consultation**

If this NHB DataCheck letter includes records of rare plants and/or natural communities/systems, please contact NHB and provide any requested supplementary materials by emailing [nhbreview@dncr.nh.gov](mailto:nhbreview@dncr.nh.gov).

If this NHB DataCheck letter DOES NOT include any records of rare plants and/or natural communities/systems, no further consultation with NHB is required.



## NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

### **NH Fish and Game Department Consultation**

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

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

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

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





## NHB DataCheck Results Letter

NH Natural Heritage Bureau

Please note: maps and NHB record pages are **confidential** and shall be redacted from public documents.

### NHB Database Records:

The following record(s) have been documented in the vicinity of the proposed project. Please see the map and detailed information about the record(s) on the following pages.

| Vertebrate species                                | State <sup>1</sup> | Federal | Notes  |
|---|--------------------|---------|--|
| Blanding's Turtle ( <i>Emydoidea blandingii</i> ) | E                  | --      | Contact the NH Fish & Game Dept (see below). |
| Spotted Turtle ( <i>Clemmys guttata</i> )         | T                  | --      | Contact the NH Fish & Game Dept (see below). |

<sup>1</sup>Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list.

An asterisk (\*) indicates that the most recent report for that occurrence was 20 or more years ago.

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

**Disclaimer:** NHB's database can only tell you of known occurrences that have been reported to NHFG/NHB. Known occurrences are based on information gathered by qualified biologists or members of the public, reported to our offices, and verified by NHB/NHFG.

However, many areas have never been surveyed, or have only been surveyed for certain species.

NHB recommends surveys to determine what species/natural communities are present onsite.



# United States Department of the Interior



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

In Reply Refer To:  
Project Code: 2024-0052702  
Project Name: Newton 29617

February 22, 2024

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

## To Whom It May Concern:

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

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

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

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

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

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

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

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

## OFFICIAL SPECIES LIST

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

This species list is provided by:

**New England Ecological Services Field Office**

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

## PROJECT SUMMARY

Project Code: 2024-0052702

Project Name: Newton 29617

Project Type: Road/Hwy - Maintenance/Modification

Project Description: The project is located in the Town of Newton. The proposed project involves the reconstruction of the intersection along NH Rte. 108 with Amesbury Rd and Maple Ave; also known as Rowe's Corner. The project seeks to address safety concerns associated with the existing alignment of NH Rte. 108. The intersection approach legs of NH Rte. 108, Amesbury Rd., and Maple Ave. will be reconstructed up to approximately 300 LF in each direction. At the intersection, an all-way stop condition is proposed to reduce driver uncertainty and to better accommodate the similar traffic volumes experienced by the NH Rte. 108 and Amesbury Rd legs throughout the day.

More specifically, the proposed work will widen the roadway approaches to include two (2) 11-foot travel lanes and two (2) adjacent 5-foot wide shoulders for the NH Rte. 108 and Amesbury Rd legs and two (2) adjacent 2-foot wide shoulders for Maple Ave. A closed drainage system is being included within the project limits to accommodate water quality. This includes proposed curbing and drainage structures on all approaches to capture storm water and direct it to a grassed treatment swale (to be constructed in the south-east quadrant). A single culvert in poor condition under Amesbury Road will be replaced with a 60-inch reinforced concrete pipe and a 36-inch reinforced concrete overflow pipe to the north of the main culvert (pipe). The existing culvert's inlet header is crumbling and the outlet header was repaired using stacked granite curbs. Failure to address the structural risks of aging culvert infrastructure could cause serious impacts to the traveling public.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.87524465,-71.02517900466415,14z>



Counties: Rockingham County, New Hampshire

## ENDANGERED SPECIES ACT SPECIES

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

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

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

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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

## MAMMALS

| NAME   | STATUS     |
|--|------------|
| Northern Long-eared Bat <i>Myotis septentrionalis</i><br>No critical habitat has been designated for this species.<br>Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a> | Endangered |

## INSECTS

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

## CRITICAL HABITATS

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

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

## **IPAC USER CONTACT INFORMATION**

Agency: New Hampshire Department of Transportation

Name: Rhona Thomson

Address: 7 Hazen Drive

City: Concord

State: NH

Zip: 03302

Email: rhona.c.thomson@dot.nh.gov

Phone: 6032717966





## United States Department of the Interior



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

In Reply Refer To:  
Project code: 2024-0052702  
Project Name: Newton 29617

February 22, 2024

Subject: Consistency letter for the 'Newton 29617' project under the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (NLEB).

To whom it may concern:

The U.S. Fish and Wildlife Service (Service) has received your request dated February 22, 2024 to verify that the **Newton 29617** (Proposed Action) may rely on the amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion (dated March 23, 2023) for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) to satisfy requirements under section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you provided (Project Description shown below), you have determined that the Proposed Action will have no effect on the endangered Indiana bat (*Myotis sodalis*) or the endangered northern long-eared bat (*Myotis septentrionalis*). If the Proposed Action is not modified, **no consultation is required for these two species**. If the Proposed Action is modified, or new information reveals that it may affect the Indiana bat and/or northern long-eared bat in a manner or to an extent not considered in the PBO, further review to conclude the requirements of ESA section 7(a)(2) may be required.

**For Proposed Actions that include bridge/culvert or structure removal, replacement, and/or maintenance activities:**

If your initial bridge/culvert or structure assessment failed to detect Indiana bats and/or NLEBs use or occupancy, yet later detected prior to, or during construction, please submit the Post Assessment Discovery of Bats at Bridge/Culvert or Structure Form (User Guide Appendix E) to this Service Office within 2 working days of the incident. In these instances, potential incidental take of Indiana bats and/or NLEBs may be exempted provided that the take is reported to the Service.

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

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

- Monarch Butterfly *Danaus plexippus* Candidate

## PROJECT DESCRIPTION

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

### NAME

Newton 29617

### DESCRIPTION

The project is located in the Town of Newton. The proposed project involves the reconstruction of the intersection along NH Rte. 108 with Amesbury Rd and Maple Ave; also known as Rowe's Corner. The project seeks to address safety concerns associated with the existing alignment of NH Rte. 108. The intersection approach legs of NH Rte. 108, Amesbury Rd., and Maple Ave. will be reconstructed up to approximately 300 LF in each direction. At the intersection, an all-way stop condition is proposed to reduce driver uncertainty and to better accommodate the similar traffic volumes experienced by the NH Rte. 108 and Amesbury Rd legs throughout the day.

More specifically, the proposed work will widen the roadway approaches to include two (2) 11-foot travel lanes and two (2) adjacent 5-foot wide shoulders for the NH Rte. 108 and Amesbury Rd legs and two (2) adjacent 2-foot wide shoulders for Maple Ave. A closed drainage system is being included within the project limits to accommodate water quality. This includes proposed curbing and drainage structures on all approaches to capture storm water and direct it to a grassed treatment swale (to be constructed in the south-east quadrant). A single culvert in poor condition under Amesbury Road will be replaced with a 60-inch reinforced concrete pipe and a 36-inch reinforced concrete overflow pipe to the north of the main culvert (pipe). The existing culvert's inlet header is crumbling and the outlet header was repaired using stacked granite curbs. Failure to address the structural risks of aging culvert infrastructure could cause serious impacts to the traveling public.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.87524465,-71.02517900466415,14z>



## DETERMINATION KEY RESULT

Based on the information you provided, you have determined that the Proposed Action will have no effect on the endangered Indiana bat and/or the endangered northern long-eared bat.

Therefore, no consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required for these two species.

## QUALIFICATION INTERVIEW

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

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

**Automatically answered**

*No*

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

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

**Automatically answered**

*Yes*

3. [Semantic] Does your proposed action intersect an area where Indiana bats and northern long-eared bats are not likely to occur?

**Automatically answered**

*Yes*

## **DETERMINATION KEY DESCRIPTION: FHWA, FRA, FTA PROGRAMMATIC CONSULTATION FOR TRANSPORTATION PROJECTS AFFECTING NLEB OR INDIANA BAT**

This key was last updated in IPaC on October 30, 2023. Keys are subject to periodic revision.

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

This decision key should only be used to verify project applicability with the Service's [amended February 5, 2018, FHWA, FRA, FTA Programmatic Biological Opinion \(dated March 23, 2023\) for Transportation Projects](#). The programmatic biological opinion covers limited transportation activities that may affect either bat species, and addresses situations that are both likely and not likely to adversely affect either bat species. This decision key will assist in identifying the effect of a specific project/activity and applicability of the programmatic consultation. The programmatic biological opinion is not intended to cover all types of transportation actions. Activities outside the scope of the programmatic biological opinion, or that may affect ESA-listed species other than the Indiana bat or NLEB, or any designated critical habitat, may require additional ESA Section 7 consultation.

## **IPAC USER CONTACT INFORMATION**

Agency: New Hampshire Department of Transportation

Name: Rhona Thomson

Address: 7 Hazen Drive

City: Concord

State: NH

Zip: 03302

Email: rhona.c.thomson@dot.nh.gov

Phone: 6032717966



**THE STATE OF NEW HAMPSHIRE**  
**DEPARTMENT OF TRANSPORTATION**



*Victoria F. Sheehan*  
*Commissioner*

*William Cass, P.E.*  
*Assistant Commissioner*

NEWTON  
X-A004(206)  
29617  
RPR 12117

**No Adverse Effect Memo**

In order to assist the Federal Highway Administration (FHWA) in complying with Section 106 of the National Historic Preservation Act of 1966 and its amendments, The New Hampshire Department of Transportation (NHDOT), in consultation with the New Hampshire Division of Historical Resources (SHPO), has reviewed this undertaking according to the standards and procedures detailed in the 2018 Programmatic Agreement regarding the Federal-Aid Highway Program in New Hampshire.

Project Description

This project will reconstruct the intersection of NH Rte. 108, Amesbury Rd., and Maple Ave., also known as "Rowe's Corner", in Newton. The improvements will remove the existing slip ramps on Amesbury Rd. and Maple Ave., as well as alter the approaches of NH Rte. 108, reconfiguring the intersection to a traditional four-way stop design. The proposed work will extend approximately 225 ft. north and west along NH Rte. 108, approximately 250 ft. south along Amesbury Rd., and approximately 175 ft. east along Maple Ave. Pavement overlay may extend an additional 150' from each of these locations, however will not extend outside of existing pavement limits.

The preferred alternative will create a four-way stop condition that would add stop signs to the NH Rt. 108 approaches while removing slip-ramps and reducing the overall pavement footprint. This alternative will reduce the uncertainty of vehicle priorities that exists today due to the combination of free-flow (NH Rt. 108), yield-condition and stop-controlled movements. This alternative also proposes to relocate utility poles to the outside of the roadway/intersection.

In addition to adding a four-way stop condition, the following actions are occurring within the project area:

NE quadrant:

- Slip ramp will be removed and the roadway moved away from house
- Potential to remove two maple trees
- Stonewall impacts will be avoided
- A well for parcel 18 is located on the opposite (south) side of Maple Ave. from the house, however the well would not be impacted

NW quadrant:

- Roadway will be moved away from house
- Curbing will be installed near barn driveway to direct water to treatment areas
- Impacts to a modern rock garden and two trees to accommodate sight distance concerns with the truck apron

SW quadrant

- Slip ramp removed



- Roadway work expected to tie into Gould's Hill Rd intersection
- The Amesbury Rd culvert (non-contributing to the district) will be replaced, which will include new headwalls, slope reconstruction, tree removal and guardrail extension
- The retaining wall associated with the electric streetcar railroad near the culvert headwall will be impacted
- A town culvert connecting from a manhole on Goulds Hill Rd to the headwall of the Amesbury Rd culvert will need to be replaced

#### SE quadrant

- Slip ramp removed
- A stormwater treatment swale will be constructed, which will include some tree removal and slope work
- Two large oak trees will be removed
- The guardrail associated with the Amesbury Rd culvert replacement will be extended

#### Identification

The Rowe's Corner Historic District was identified as an eligible resource in March 2021. It is significant under Criterion A for representing local patterns of road and village development and significant under Criterion C as the vernacular properties are not individually significant, but form a distinguishable entity of inter-related properties. The APE is located entirely within the Rowe's Corner Historic District. No individually eligible resources were identified.

The SHPO response (10/1/2020) to the initial RPR noted portions of the project area may be archaeologically sensitive and that a Phase IA Archaeological Sensitivity Assessment may be necessary depending on design. Additional information relating to the DHR Review and Compliance (R & C 12117) was submitted and the SHPO response (11/24/2020) concluded, "DHR no longer has archaeological concerns," due to previous disturbance and the presence of wetlands.

#### Public Consultation

SHPO consultation was initiated with the Request for Project Review that was reviewed October 2020. Meetings with SHPO were held in October 2020 and June 2021. Initial contact letters were sent to local public officials, including the Newton Historical Society in May 2020, no response was received. A Public Informational meeting was held in August 2020.

#### Determination of Effect

The following actions are occurring within the Rowe's Corner Historic District:

**4-way stop condition** – Currently Route 108 traffic does not stop, and the approaches from Amesbury Rd. and Maple Ave. do stop. The proposal is to have all traffic stop, which reduces driver uncertainty within the intersection. An air and noise project review was completed and determined that a noise impact assessment was not necessary and that the proposed will not result in any meaningful changes in traffic volume. It was also determined that improvements at the intersection will not have an adverse effect on air quality. The intersection has already seen alterations from the historic layout. The NH Rt. 108 through movement was widened for two lane traffic at some point, which removed the north-west slip ramp island. It is believed that the remaining slip ramp islands have also been reduced in size to accommodate wider paved roadways. Utility poles have been added to the southwest island, and the current configuration has been supplemented with signing and a flashing signal to aid traffic flows.

**Removal of slip ramps** – In the areas where the slip ramps will be removed, the areas will be seeded and be left as open grassy areas. No tree planting is proposed. As the area is to remain open it will not adversely affect the district.

**Tree removal** – There is a possibility to remove up to 6 large trees within the project area, which is heavily wooded outside of the immediate intersection and roadway areas. Historically the intersection was very open with very few trees within and adjacent, removal will help promote the historic feel of the open intersection. The removal of 6 trees will not adversely affect the district, as DOT has reduced impacts to trees as much as possible and spoken with property owners to hear their concerns. No historic concerns have been raised by property owners.

**Installation of storm water treatment** – the proposed treatment location is located on a vacant parcel of land, and will be primarily within the previous roadway location and necessary tree removal will be in areas of newer growth. Some slope work will occur in the SE quadrant. This area was reviewed for archaeological sensitivity by SHPO and DOT and was determined not to be sensitive. The grassed swale proposed will look like a gradually graded grassed ditch, similar to the open grass slope proposed for the SW quadrant.

**Replace Amesbury Rd culvert** – The culvert is a non-contributing resource within the historic district. Excavation will be necessary to replace the culvert. The surrounding slope will be reconstructed and returned to existing condition as much as possible. The existing inlet headwall measures 30.5' high and is a joint structure with a Town stormwater pipe coming from Gould's Hill Rd. The Gould's Hill Rd pipe has visible joint separation and is proposed to be replaced in-kind. The Amesbury Rd culvert will be replaced with a 60" culvert with a 36" overflow pipe. The larger pipe will share a concrete L-shaped inlet head wall with the Gould's Hill Rd pipe on the west side, while the 36" pipe will have its own detached head wall. The two pipes crossing under Amesbury Rd will come together at a joint head wall on the east side of the road, outletting into a wetland at the existing outlet location. Some smaller trees will need to be cleared for the slope reconstruction.

There are buried remnants of a stone wall alignment that was likely a retaining wall associated with the former electric railroad located just north of parcel 2 adjacent to the Amesbury Rd pipe inlet headwall that will be impacted as part of the culvert replacement. The current stones are mostly buried and are no longer functioning as a retaining wall. The electric railroad was determined not to contribute to the Rowe's Corner Historic District as there is very little of the line remaining. The railroad operated in this location from 1902 to 1928. The area adjacent to 14 Gould's Hill Rd (modern ranch house) contains portions of the old railroad berm, however any ROW associated with the railroad is gone.

Also, at the Amesbury Rd location the guardrail will be extended on both sides of Amesbury Rd. On the west side of the road it will cross over in front of the old railroad bed and extend approximately 25 feet further south. On the east side of the road it will extend 75 feet further south.

**Install curbing in NW quadrant** – The DOT will coordinate with the property owner regarding the installation of curbing and formalizing a driveway apron for the barn driveway. All impacts associated with this action will be within the existing DOT ROW. These actions will not adversely affect the district.

Applying the criteria of effect at 36 CFR 800.5, we mutually agreed that the above actions will result in **No Adverse Effect**. No additional survey is required for the project as proposed. An Effects Review evaluation for the Rowe's Corner Historic District was completed and concurred with by SHPO. It contains additional figures and photographs associated with this No Adverse Effect argument.

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



9/29/2022

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Jill Edelman  
Cultural Resources Manager

Date

Concurred with by the NH State Historic Preservation Officer:



10/24/22

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

Date

c.c. Marika Labash, NHDHR      Rebecca Martin, NHDOT  
      Jamie Sikora, FHWA         Tim Dunn, NHDOT

S:\Environment\PROJECTS\NEWTON\29617\Cultural\EffectMemo\29617 NoAdverse Effect v.2.docx

**CULVERT REPLACEMENT  
AMESBURY ROAD  
NEWTON, NH  
NHDOT PROJECT NO. 29617  
SUPPLEMENTAL NARRATIVE**

**Project Description**

The project will replace an existing 36"-48" (indeterminate size due to age degradation and buried field condition) concrete arch under Amesbury Road downstream from a private dam and a 36" plastic culvert under NH 108. The proposed alternative design is a culvert system composed of a 60" concrete pipe with inverts that would allow natural sediment transport to embed stream simulation material, and a 36" concrete culvert in the dry. Constructing an L shaped concrete headwall at the inlet will support the 60" RCP and the 18" outlet replacement stormwater pipe from Goulds Hill Road runoff. Grading around the culvert ends will match existing conditions upon completion of the project. Incidental work is limited to matching the inverts to the adjacent streambed predominantly within the Right-of-Way.

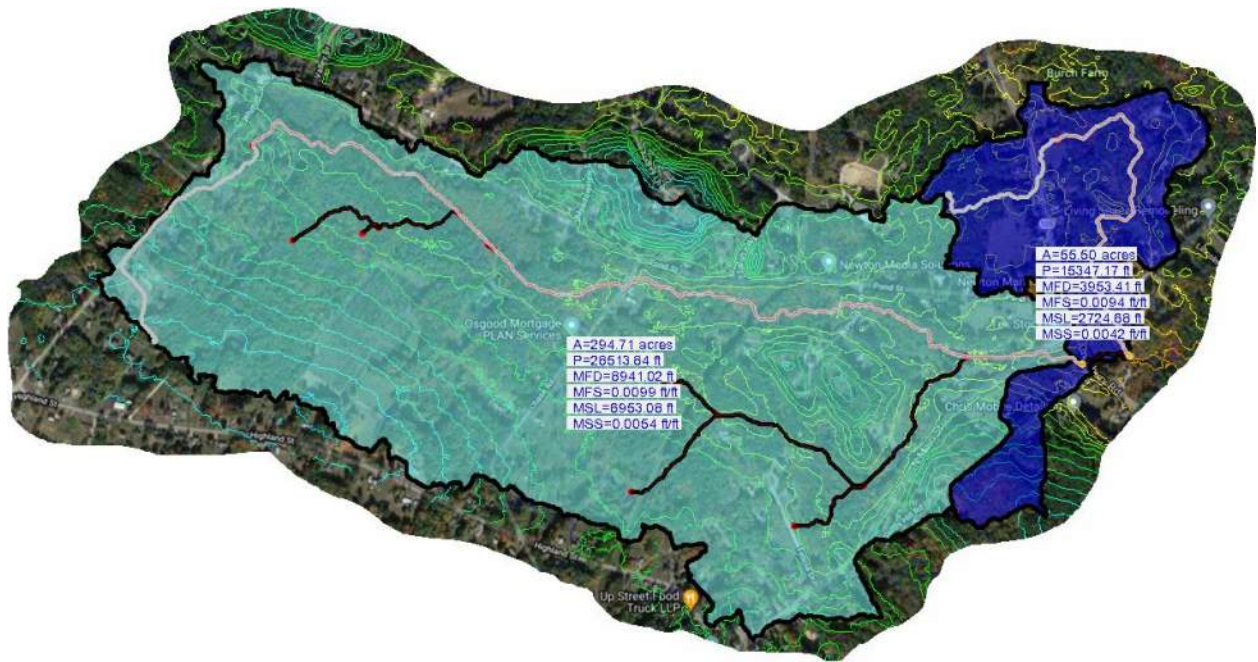
This is a federally funded project. The proposed advertising date is 07/16/2024, with construction anticipated to begin in the summer of 2025 and be completed by the fall of 2025.

The culvert design was initiated because of the proximity to planned highway work for the nearby intersection. It does not rate among the highest statewide priority culvert locations within the CRDR program. District 6 had previously stabilized the culvert with Betterment funds. The existing 36"-48" cast-in-place arch culvert appears to have been constructed in the early 1900s, based on the pre-1920s cast-in-place concrete arch, and it is well beyond the expected service life. Failure to address the structural risks of aging culvert infrastructure could cause serious impacts to the travelling public.

**Existing Conditions**

The existing culvert is a cast-in-place concrete arch. It is 46 ft. long as measured by Dept. survey in 2019. The existing inverts are 142.54 & 142.18. The inlet header is crumbling, and the outlet header was repaired using stacked granite curbs. Embankment fill height is about 2 ft above the culvert. There is no current evidence of sinkholes on the embankment of Amesbury Road, however, there was property owner testimony that holes have existed and were filled in the past.

The culvert requires replacement due to age and condition. This crossing is classified as Tier 2 based on drainage area. The StreamStats boundary delineation reports an area of 0.49 square miles (313 acres). Using resource grade LIDAR the watershed was calculated to be 294.7 acres. An additional 55.5 acres of tributary flow feeds into the wetland immediately downstream (**Fig. 1**). The tailwater is controlled by the outlet of the wetland. Since the majority of runoff entering the downstream wetland flows over the dam and under Amesbury Road, it is unlikely that tailwater will rise independently of watershed runoff.



**Fig. 1** Watershed parameters

The culvert is in fair condition with cracks. Sections of the inlet are crumbling, and the inlet header is corroded and cracked, likely from road salt. The culvert outlet is in a bowl created by the crest of the tailwater pool where the downstream channel bends. Multiple pathways for runoff form when the tailwater depth exceeds the channel banks. All pathways converge to the channel outlet of the downstream wetland.

Amesbury Road is classified as a Tier 4 Major Collector highway with a forecasted Annual Average Daily Traffic (AADT) of 3810 vehicles for 2022 (DHV 420, DDHV 270). Amesbury Road provides access for commuters to and from residential properties. Traffic is anticipated to grow at 1% per year, and it has approximately 5% truck traffic. The paved width is about 26' and the existing ROW width at the culvert is approximately 61'.

A stream assessment was performed by the NHDOT Bureau of Environment on 9/27/2023. The average slope is <1%. Bankfull measurements ranged from 7 to 13 feet at the three reference reach cross sections. The stream is a Rosgen Type E stream with a large entrenchment ratio (typical of Type E streams), ranging from 6.8 to 15 at the reference reaches. The flood prone width at each cross section was 75 feet.

The embankment has moderate 3:1 slopes with guardrail on both sides. The slopes are stabilized with grass and woodland. There is aquatic vegetation along the bottom of the embankment slopes.

NHDOT Maintenance District 6 reports no history of flooding at Amesbury Road.

A challenge of construction at this location is the lack of available detours. The proposed construction work for the culvert replacement and installation and roadway widening will limit Amesbury Road to one-lane alternating, two-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:**

The federally listed threatened species Northern Long-Eared Bat was identified in the project area. The project adheres to the criteria and conditions of the FHWA, FRA, FTA, USFWS Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat. All applicable avoidance and minimization measures (AMMs) for a Programmatic “may affect, likely to adversely affect” (LAA) finding will be implemented during construction. The USFWS has communicated concurrence with the LAA finding and that the project conforms to the Range-wide Programmatic Consultation for Indiana Bat and NLEB. The project has been included in the Incidental Take Statement (ITS) issued by USFWS for Transportation Projects in the Range of the Indiana bat and Northern Long-Eared Bat. The ITS indicates the projects covered are within the scope of the programmatic action are not likely to jeopardize the continued existence of the NLEB, and no further correspondence with USFWS is needed for NLEB.

The Natural Heritage Bureau was contacted to review the NHB database for the proposed project areas for records of occurrences of rare plant species, rare wildlife species, or exemplary natural communities within or adjacent to the proposed project areas. The NHB data check identified two rare wildlife species adjacent to the project area but did not identify any rare plant or rare natural community records.

### **New Hampshire Fish & Game (NHF&G) Coordination**

The NHB data check identified the Blanding’s Turtle (State Endangered) and Spotted Turtle (State Threatened) in the vicinity of the project area. A meeting with NHF&G was held on 10/6/2022 to discuss NHF&G’s recommendations for the project based on the new rules approved by New Hampshire Department of Environmental Services (NHDES) and NHF&G relative to Threatened and Endangered Species.

The following NHF&G recommendations, provided via EMAIL on 2/17/2021, will be included into the proposed work:

- No vertical granite curbing will be utilized to accommodate easier wildlife traversal.
- Alternate catch basin grate sizes will be utilized to minimize wildlife falling through grate openings and becoming trapped in the structure.
- Reinforced Concrete Pipes (RCP) will be utilized for the closed drainage system and Amesbury culverts, as the increased roughness of the material aids with wildlife passage.

Welded plastic or ‘biodegradable plastic’ netting or thread in erosion control matting will be avoided, consistent with NHDOT’s Specifications for temporary erosion control.

Cultural Resources: The proposed work was reviewed by the Department’s Cultural Resources Program and was found to be consistent with the Section 106 Programmatic Agreement (Section 106 PA) among the FHWA, the New Hampshire State Historic Preservation Office, the Advisory

Council on Historic Preservation and the Department. The existing culvert is eligible for review under the Program Comment for Post-1945 Bridges and Culverts and is therefore considered to be non-historic. As such, the proposed work has been determined to have no potential to cause effects to historical resources under Appendix B of the Section 106 PA.

Wetlands: All impacts to wetlands are temporary and have been minimized.

Permanent slope impacts to wetlands are required on the eastern and western sides of Amesbury Road to accommodate roadway improvements and guardrail installation. 2:1 slopes will be constructed to minimize wetland impacts, where appropriate. Permanent impacts to wetlands are also required to grade the stream channel.

Water Quality: The project will not result in a negative impact on water quality in the project area. A grassed treatment swale is proposed, even though it is not required. The treatment swale will capture and treat water from the proposed closed drainage system. The closed drainage system will reduce the amount of pavement runoff water into the Tier 2 stream and wetland. A NPDES Discharge General Permit may be required if dewatering within the stream is required. Best Management practices will be utilized to prevent and reduce the likelihood of erosion or sediment entering the wetlands system. See the included erosion control plans for more details regarding BMPs.

Impaired Waters: The unnamed brook is not in the list of impaired water in Newton (2020/2022, 305(b)/303(d))

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

Floodplains: Based on existing FEMA mapping, the project area does not include FEMA-mapped regulatory floodways or 100-year floodplains. As the proposed project does not include work within a regulatory floodway or any designated floodplains, the work as proposed will not present any new obstructions to floodways or result in an increase in an established base flood elevation or create a significant risk to human life or property.

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 to the site during construction.

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

Wildlife Action Plan: Supporting landscape exists in the areas at the culvert inlet and outlet. The project area is identified as a wildlife corridor on Nature Conservancy’s Connect the Coast map.

Conservation Land: A review of the New Hampshire GRANIT Online Mapping Conservation Lands data layer did not indicate there are areas designated as Conservation Land within the project area. However, through coordination with the Town, it was learned that the parcel located

at the southeast of the intersection has been purchased by the Town and is designated for conservation. The project does propose some impacts to this conservation land. However, these impacts are minor, including slope and drainage improvements and construction of a small portion of the stormwater treatment swale. The impacts are not anticipated to impact the features or attributes of the conservation property and would ensure stormwater that drains to the wetlands in the project area will be treated.

NHDES Aquatic Restoration Mapper: Review of the NHDES Aquatic Restoration Mapper noted the Amesbury culvert to be in poor structural condition and has a drainage area of about 316 acres. Supporting Land for the Highest Ranked Wildlife Habitat is located east of the project area and Aquatic Organism Passage scored full passage.

### **Hydrology/Hydraulics Alternative Analysis:**

#### Alternative 1: Stream Crossing Rules Compliant 18' Span Structure

The compliant clear span is approximately 18ft. based on an assessment of the reference reach conducted by the NHDOT Bureau of Environment. Should funds be found for a box it is more likely to be a hydraulically sized box culvert rather than a bridge. Therefore, an 18' x 5' span embedded box would first be proposed as an alternative design. To construct a compliant span structure, excavation of the Amesbury Road embankment would be 10 ft. deep and traffic management would involve interruption to commerce and commuters. The shortest length that would be proposed is 48 ft. which would increase the length by 1.3 ft. compared to the existing concrete arch. Amesbury Road will overtop at approximately elevation 149.5 for the existing profile. Both embankment slopes would be graded to existing 6:1 slopes with guard rail on both sides of the culvert. Significant temporary widening would be required on both sides of the roadway to accommodate the phased construction unless the road could be closed. **The approximate cost estimate for this option is near \$600,000.** See the attached detailed cost estimate located at the end of this supplemental narrative. Note that above and beyond the structure costs, the 18' span would have roadway profile implications for the Amesbury Road approach; these costs were not explored given the already large cost difference between the compliant and proposed design structures within the project budget. Increased impacts and delay for proposed construction are factors to be considered. Securing funding and additional design time for this option would require a delay in the start of construction of 3 to 5 years, or longer. A delay of this magnitude may risk failure of the existing pipe and/or overtopping of high flows due to the submergence of the existing concrete arch.

#### Alternative 2: 31.78" ID HDPE Smooth Bore Slip-Line Pipe

The pipe would be slip-lined with an approximately 31" smooth bore liner, the annular space filled, and the headwalls repaired and/or reconstructed. This option would not involve interruption to commerce and commuters. **The approximate cost estimate for this option is near \$75,000.** See the attached detailed cost estimate located at the end of this supplemental narrative. Note that the estimates are only for structure costs to create an even comparison of alternatives.



Despite the lower cost, this alternative would have reduced hydraulic capacity compared to the existing condition. This pipe has a capacity of about 41-64 cfs, depending on tailwater. Overtopping of Amesbury Road would occur at 64 cfs, which is significantly lower than the capacity of the proposed design. A temporary bypass pipe would be needed to construct this alternative due to the submerged condition of the existing pipe.

Alternative 3/Proposed Design: 60” RCP with 36” Surge/Critter Pipe

The Alternative Design culvert system will have a peak design capacity of 181 cfs with a headwater elevation equal to 147.80. The 60” RCP is proposed to fill in naturally to establish a long-term stream profile. Calculations show that NH 108 will overtop at the 100 yr. event if embedment material is placed in the culvert. The 100-year profile does not overtop Amesbury Road if embedment is not placed in the 60” RCP culvert and sediment is allowed to fill-in naturally. In order to meet and improve geomorphic compatibility, hydraulic capacity, and ecological services, the culvert cannot be embedded.

The alternative design intent is to maximize flow capacity through the proposed culvert system while providing increased ecological services at normal flows. The 60” RCP will be partially filled with water during normal flow, serving as a conduit for aquatic organism passage (AOP). If the culvert were to be embedded, angular stone would be required to reinforce the streambed simulation material, as the stream is sediment starved due to the dam upstream. The angular stone would be harmful to aquatic life, making non-embedment the preferred option. Calculations using floodplain storage between NH 108 and Amesbury Road show that the headwater at the subject culvert for the design peak flow of 181 cfs is acceptable (headwater less than elevation 148). Additionally, during peak runoff the headwater elevation will rise faster than the tailwater elevation at this crossing. Velocity outside the downstream Right of Way is not anticipated to exceed 7-8 fps.

**The approximate cost estimate for this alternative is near \$150,000.** See the attached detailed cost estimate located at the end of this supplemental narrative. Note that the estimates are only for structure costs to create an even comparison of alternatives.

**Hydraulic Summary Table:**

| Pre & Post  | Headwater | Q (cfs) | Outlet Velocity | Tailwater |
|-------------|-----------|---------|-----------------|-----------|
| EX (2 yr)   | 145.70    | 25      | 5.9             | 144       |
| PR (2 yr)   | 144.37    | 25      | 2.0             | 144       |
| EX (50 yr)  | 150.63    | 181     | 10.8            | 146       |
| PR (50 yr)  | 147.60    | 181     | 12.2            | 146       |
| EX (100 yr) | 150.83    | 227     | 8.1             | 148       |
| PR (100 yr) | 148.63    | 227     | 8.8             | 148       |

Note: The culvert velocity is dependent on the downstream wetland water elevation. During peak flows it is anticipated that the proposed culvert will perform in inlet control for periods of higher runoff. The energy will quickly dissipate in the wetland channel. Outlet velocities will be lower should the tailwater pond elevations be higher due to downstream beaver activity and/or capacity of the outlet channel(s).

### Construction and Access Considerations:

Construction will be phased to maintain a single lane of travel along Amesbury Road for the duration of the construction period for the culvert replacement and installation and roadway widening. Access to the culvert will primarily be from the closed travel lanes and shoulders of Amesbury Road.

Access to the culvert inlet and outlet will be from the edges of Amesbury Road. Slopes are modest (6:1) with maintained grass and smaller saplings, so no special access concerns are expected. Where necessary and as directed by the NHDOT Engineer, stone over geotextile or other temporary stabilization methods will be used for stabilized construction entrances and to avoid excessive rutting and potential erosion of the roadway embankment.

Minimal clearing of trees greater than 3" dbh will be required. No grubbing / removal of stumps is anticipated. The vegetation will be allowed to reestablish naturally. Any disturbed jurisdictional areas will be stabilized using wetland seed mix, mulch, and wildlife friendly temporary erosion control matting (where slopes are steeper than 4:1).

The Erosion Control Plans show the stream to be maintained through the existing pipe and diverted to the proposed 36" pipe during the culverts' installations. Dewatering will occur by pumping the water north to the proposed treatment swale location. The Contractor's Stream Diversion Plan will address specific means and methods for managing water.

### Summary:

The proposed work would meet the requirements of Env-Wt. 904.05(e) (100 yr. flood frequency) and Env-Wt. 904 Alternative Design in that no increase in flood stages on adjacent property should occur as a result of the replacement of the existing Tier 2 crossing.

Based on the above noted interpretation, this application requests approval under Env-Wt. 904.10, Alternative Design. The specific requirements of Env-Wt. 904.10 are listed and addressed elsewhere in the application.



**HIGHWAY DESIGN CALCULATION SHEET**

|                                |   |
|--------------------------------|---|
| <b>PROJECT: NEWTON</b>         | <b>PROJECT NUMBER: 29617</b>  |
| ROAD: NH 108, Maple & Amesbury | COMPUTED BY: ETB      DATE: 4/1/2024<br>CHECKED BY: HSW      DATE: 4/3/2024 |

**ESTIMATE - 18' BOX CULVERT REPLACEMENT**

| <u>Item #</u>          | <u>Descrip.</u>        | <u>Qty</u> | <u>Unit</u> | <u>Unit Cost</u> | <u>Sum Cost</u> |
|------------------------|------------------------|------------|-------------|------------------|-----------------|
| <b>Earthwork Items</b> |                        |            |             |                  |                 |
| 206.1                  | Com Struc Exc (subs)   | 183.3      | CY          | N/A              | N/A             |
| 206.19                 | Com Struc Exc Exp      | 45.8       | CY          | \$75.00          | \$3,437.50      |
| 209.1                  | Granular Backfill      | 73.3       | CY          | \$50.00          | \$3,666.67      |
| <b>Structure Items</b> |                        |            |             |                  |                 |
| 503.101                | Water Diversion        | 1          | U           | \$25,000.00      | \$25,000.00     |
| 503.201                | Cofferdams             | 1          | U           | \$20,000.00      | \$20,000.00     |
| 508                    | Structural Fill (subs) | 24.44      | CY          | N/A              | N/A             |
| 529.001                | Precast Box Culvert    | 97.78      | CY          | \$5,000.00       | \$488,888.89    |
| 603.001                | Video Inspection       | 55         | LF          | \$8.00           | \$440.00        |

**Assumptions (consistent between box and double pipe estimates):**

*Can be built one half at a time, via cofferdam and one-lane alternating two-way traffic  
 Overall project work/cost assumed similar for each option (erosion control, traffic control, etc.)  
 For the above reasoning, this estimate intends to compare "apples to apples" of structure cost*

*Above and beyond the structure costs, the 13' span would have roadway profile implications for the Amesbury Road approach; these costs were not explored given the already large cost difference between the compliant and alternative design structures provided the budget for the project.*

|                   |                  |
|-------------------|------------------|
| <b>SUBTOTAL =</b> | <b>\$541,433</b> |
| <b>ROUNDING =</b> | <b>\$58,567</b>  |
| <b>TOTAL =</b>    | <b>\$600,000</b> |



**HIGHWAY DESIGN CALCULATION SHEET**

|                                |  |
|--------------------------------|--|
| <b>PROJECT: NEWTON</b>         | <b>PROJECT NUMBER: 29617</b>   |
| ROAD: NH 108, Maple & Amesbury | COMPUTED BY: HSW      DATE: 3/25/2024<br>CHECKED BY: ETB      DATE: 4/1/2024 |

**ESTIMATE - 31.78" ID HDPE Smooth Bore Sluice Line**

| <u>Item #</u>          | <u>Descrip.</u>      | <u>Qty</u> | <u>Unit</u> | <u>Unit Cost</u> | <u>Sum Cost</u> |
|------------------------|----------------------|------------|-------------|------------------|-----------------|
| <b>Earthwork Items</b> |                      |            |             |                  |                 |
| 206.1                  | Com Struc Exc (hw)   | 7.4        | CY          | \$50.00          | \$370.37        |
| 206.19                 | Com Struc Exc Exp    | 1.9        | CY          | \$75.00          | \$138.89        |
| 520.32                 | Grout in Backfill    | 1.0        | CY          | \$1,000.00       | \$1,000.00      |
| <b>Structure Items</b> |                      |            |             |                  |                 |
| 503.101                | Water Diversion      | 1          | U           | \$30,000.00      | \$30,000.00     |
| 602.011                | Annular Space Fill   | 2.34       | CY          | \$1,500.00       | \$3,506.80      |
| 602.11036              | Sluice Line 36" Pipe | 47         | LF          | \$700.00         | \$32,900.00     |

**Assumptions (does not match other estimates):**

*Can be built without impacting traffic, but will require more water diversion effort  
Some excavation at inlet/outlet to allow for construction staging and sediment removal  
Overall project work/cost assumed similar for each option (erosion control, traffic control, etc.)  
For the above reasoning, this estimate intends to compare "apples to apples" of structure cost*

*Despite the lower cost of this alternative, it is not recommended due to the reduced hydraulic capacity when compared to even the existing condition.*

|                   |                 |
|-------------------|-----------------|
| <b>SUBTOTAL =</b> | <b>\$67,916</b> |
| <b>ROUNDING =</b> | <b>\$7,084</b>  |
| <b>TOTAL =</b>    | <b>\$75,000</b> |



**HIGHWAY DESIGN CALCULATION SHEET**

|                                |  |
|--------------------------------|--|
| <b>PROJECT: NEWTON</b>         | <b>PROJECT NUMBER: 29617</b>   |
| ROAD: NH 108, Maple & Amesbury | COMPUTED BY: HSW      DATE: 3/25/2024<br>CHECKED BY: ETB      DATE: 4/1/2024 |

**ESTIMATE - 60" w/ 36" OVERFLOW CULVERT REPLACEMENT**

| <u>Item #</u>          | <u>Descrip.</u>       | <u>Qty</u> | <u>Unit</u> | <u>Unit Cost</u> | <u>Sum Cost</u> |
|------------------------|-----------------------|------------|-------------|------------------|-----------------|
| <b>Earthwork Items</b> |                       |            |             |                  |                 |
| 206.1                  | Com Struc Exc (hw)    | 56.0       | CY          | \$50.00          | \$2,797.92      |
| 206.19                 | Com Struc Exc Exp     | 14.0       | CY          | \$75.00          | \$1,049.22      |
| 209.1                  | Granular Backfill     | 59.8       | CY          | \$50.00          | \$2,989.70      |
| <b>Structure Items</b> |                       |            |             |                  |                 |
| 503.101                | Water Diversion       | 1          | U           | \$10,000.00      | \$10,000.00     |
| 503.201                | Cofferdams            | 2          | U           | \$12,000.00      | \$24,000.00     |
| 508                    | Structural Fill (12") | 5.91       | CY          | \$70.00          | \$413.52        |
| 520.1                  | Conc Class A (hw)     | 32.21      | CY          | \$2,000.00       | \$64,420.00     |
| 544                    | Reinforcing Steel     | 373        | LB          | \$4.00           | \$1,492.00      |
| 603.001                | Video Inspection      | 106.5      | LF          | \$8.00           | \$852.00        |
| 603.00236              | 36" RCP, 2000D        | 51.5       | LF          | \$250.00         | \$12,875.00     |
| 603.00260              | 60" RCP, 2000D        | 55         | LF          | \$350.00         | \$19,250.00     |

**Assumptions (consistent between box and double pipe estimates):**

*Can be built one half at a time, via cofferdam and one-lane alternating two-way traffic  
 Overall project work/cost assumed similar for each option (erosion control, traffic control, etc.)  
 For the above reasoning, this estimate intends to compare "apples to apples" of structure cost*

|                   |                  |
|-------------------|------------------|
| <b>SUBTOTAL =</b> | <b>\$140,139</b> |
| <b>ROUNDING =</b> | <b>\$9,861</b>   |
| <b>TOTAL =</b>    | <b>\$150,000</b> |

**NH Department of Transportation  
Bureau of Highway Design  
Project, #29617 Newton  
Env-Wt 904.10 Alternative Design  
TECHNICAL REPORT  
For Rehabilitation of an Existing Tier 1 or Tier 2/Tier 3 Legal Crossing  
Prepared by: T. Mallette, PE**

*Rules effective 12-15-19 and modified to match rules amended 10-23-20*

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

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

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

This is a federally funded project. The project's purpose is to improve the safety and operations of the intersection with NH Route 108, Amesbury Road, and Maple Avenue. However, after examination of the culvert south of the intersection on Amesbury Road, it was determined that the culvert is in poor structural condition and requires replacement. Culvert work is proposed to address roadway safety and drainage needs to the highest degree possible. In prior years, rehabilitation of this culvert was planned by NHDOT District 6 Betterment. Replacement with a compliant span structure would have a construction cost estimate four times the preferred alternative. Alternative funding sources would need to be identified for design and construction of alternatives that significantly exceed the project budget.

Other rehabilitation options were considered, but they do not all meet capacity and/or equivalent service life and resilience of the preferred alternative design. Higher than in-kind capacity is necessary to avoid significant headwater rise at less frequent runoff events, such as the 100 yr. chance flood. Ecological services as well as hydraulic advantages would be realized for the preferred alternative design. The chosen alternative design balances the available wetland floodplain storage, service life, and environmental resources. The crossing conveys flows discharged from a private dam and a 36" culvert upstream to the wetland downstream.

**Env-Wt 904.10(b)(1) – Clearly explain how the proposed alternative meets the criteria for approval specified in Env-Wt 904.10(d):**

The physical limitations of the site are described in the supplemental narrative and the plans created from the ground survey and environmental study. The proposed design alternative minimizes wetland disturbance and disruption of commerce and commuter traffic. The hydraulic analysis shows that hydrologic peak flow design values will not overtop Amesbury Road for the estimated 100-year event. The proposed culverts will increase hydraulic capacity, improve geomorphic compatibility, and increase ecological services. It should be noted that the 100-year profile would overtop Amesbury Road if embedment is placed in the 60" RCP culvert.

**Env-Wt 904.10(d)(1) – Demonstrate that adhering to the rules is not practicable:**

An open bottomed embedded box culvert alternative was considered. However, the deterrent is primarily that the extent of excavation and the traffic management required are beyond the scope of the project. An open box would require other sources of funds due to the limits of funding in the existing project. Traffic management and foundation design / construction would exceed the budget for the current project. An 18ft. Stream Crossing Rule compliant span was determined by the NHDOT Bureau of Environment stream assessment.

**Env-Wt 904.08 (b)(1)** – The existing stream crossing does not have a history of causing or contributing to flooding that damages the crossing, other infrastructure, or protected species or habitat, or any combination thereof;

*Damage to the existing crossing is due mainly to age and operation during extended service life. The crossing does not have a reported history of flooding, nor is there a reported history of flooding on adjacent property. Cracks and separation of the cast in place concrete arch are evident from underwater photos. The preferred Alternative Design uses materials intended for long lasting service, including some truck traffic. The proposed replacement culvert follows Env-Wt 904.07(c)(2). Hydraulic capacity findings are in the supplemental narrative on page 5.*

**Env-Wt 904.08 (b)(2) a** – The proposed stream crossing will meet or exceed general criteria specified (1) – (9) listed Env-Wt 904.01 to the maximum practical extent dictated by ongoing risk and physical limitations. Erosion, aggradation, and/or scouring have not been a problem and should not initiate a problem with the proposed culvert system. Maintaining watercourse connectivity will continue.

**Env-Wt 904.01 General Design Considerations**

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

1) Not be a barrier to sediment transport;

*The existing culvert has been in service for over 50 years, with no evidence of obstructing sediment transport (primarily silt and leaves at this crossing), and the proposed design has no features that would be a barrier to sediment transport through the culvert. The proposed culvert will have velocities like the existing conditions over a range of flows. The inverts and increased freeboard of the proposed design will better enable sediment conveyance through the culvert over a wider range of flows.*

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

*The proposed culvert system will maintain similar conveyance and depths for the range of high and low flows.*

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

*The proposed design will not disrupt the movement of aquatic life indigenous to the unnamed stream. The depth of flow within the proposed 60” concrete culvert will be equal to or greater than the stream reaches immediately adjacent to the culvert inlet and outlet. Velocities within the culvert will not disrupt aquatic life during normal, or somewhat above normal flows. The proposed design will not significantly change low flow conditions. Passage of aquatic life will be maintained. If the culvert were to be embedded, angular stone would be required to reinforce the streambed simulation material, as the stream is sediment starved due to the dam upstream. The angular stone would be harmful to aquatic life, making non-embedment the preferred option. A*

*second 36" concrete culvert with an inlet located 22 ft from the primary culvert is intended for dry riparian critter crossing in addition to accommodating surge flows without roadway overtopping.*

- 4) Not cause an increase in the frequency of flooding or overtopping of banks;  
*The proposed culvert system will increase the hydraulic capacity of the crossing. It will not have a significant effect on flood flow or flood elevations upstream or downstream of the existing culvert. Runoff from the 295-acre Tier 3 watershed is metered by the upstream dam and culvert under NH 108. The stream is a Tier 2 stream crossing by area definition, but due to the presence of two protected turtle species, the stream was upgraded to a Tier 3. Overbank conveyance downstream is controlled by the capacity of the outlet at the opposite side of the wetland from where the project culvert is located.*
- 5) Maintain or enhance geomorphic compatibility by:
  - a. Minimizing the potential for inlet obstruction by sediment, wood, or debris; and  
*The existing culvert does not have a history of debris blockage. Sediment is largely organic and seasonal, whereas, larger debris is blocked by the upstream dam and/or culvert under NH 108. An L shaped headwall will help direct primary flow, and the secondary 36" concrete culvert inlet will be separated from the header thereby further minimizing the potential for debris blockage. Finally, vegetation in the overbank upstream may capture sediment depending on the season.*
  - b. Preserving the natural alignment of the stream channel;  
*The proposed design will not alter the existing culvert alignment. The existing culvert is approximately perpendicular to Amesbury Road, as constructed in the early 1900s. The existing alignment will be preserved.*
- 6) Preserve watercourse connectivity where it currently exists;  
*The proposed design will increase both open area connectivity within the primary channel, and dry riparian area within the secondary culvert. The inlet and outlet areas will be regraded such that the streambed matches the inverts. The existing culvert is not perched. The proposed design will not significantly disrupt the movement of aquatic life indigenous to the unnamed stream. The depth of flow within the proposed 60" concrete culvert will be equal to or greater than the stream reaches immediately adjacent to the culvert inlet and outlet. Velocities within the culvert will not disrupt aquatic life during normal flow. The proposed design will not significantly change low flow conditions. Passage of aquatic life will be maintained. A second 36" concrete culvert with an inlet located 22 ft from the primary culvert is intended for dry riparian critter crossing in addition to accommodating surge flows.*
- 7) Restore watercourse connectivity where:
  - a. Connectivity was disrupted by human activity; and low flows and the hydrologic connection is maintained by the existing culvert. *Floodplain connectivity will be restored and the open area under Amesbury Road will be increased.*
  - b. Restoration of connectivity will benefit aquatic life upstream and/or downstream of the crossing;  
*The proposed culvert system will increase connectivity between the larger wetland downstream and the smaller riparian area between Amesbury Road and NH 108.*



8) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and  
*The proposed design will have no significant effect on upstream hydraulics, and sediment transport through the culvert will be improved by constructing a larger culvert with a natural profile and a secondary culvert that will be dry under normal conditions. Setting the downstream invert slightly higher than existing conditions will continue to promote positive drainage in the downstream channel.*

9) Not cause water quality degradation.  
*The project includes BMPs to treat impervious runoff and ensure continued water quality.*

(b) For stream crossing over tidal waters, the stream crossing shall be designed to:

1) Match the velocity, depth, cross-sectional area, and substrate of the natural stream: and  
*N/A – This is not a tidal crossing.*

2) Be of sufficient size to not restrict bi-directional tidal flow over the natural tide range above, below, and through the crossing.  
*N/A – This is not a tidal crossing.*

**Env-Wt 904.08 (b)(2) b. - The proposed stream crossing will maintain or enhance the hydraulic capacity of the crossing:**

*The replacement culvert system will significantly increase the hydraulic capacity of the crossing compared to the existing culvert. The bell side inlet of the secondary culvert will provide additional capacity when flowing in inlet control.*

**Env-Wt 904.08 (b)(2) c - The proposed stream crossing will maintain or enhance the capacity of the crossing to accommodate aquatic organism passage, or both:**

*The proposed design will maintain the movement of aquatic life indigenous to the unnamed stream. The depth of flow within the proposed 60" concrete culvert will be equal to or greater than the stream reaches immediately adjacent to the culvert inlet and outlet. Velocities within the culvert will not disrupt aquatic life during normal flows. The proposed design will not significantly change low flow conditions. Passage of aquatic life will remain similar to the existing potential. If the culvert were to be embedded, angular stone would be required to reinforce the streambed simulation material, as the stream is sediment starved due to the dam upstream. The angular stone would be harmful to aquatic life, making non-embedment the preferred option. A second 36" concrete culvert with an inlet located 22 ft from the primary culvert is intended for dry riparian critter crossing in addition to accommodating surge flows.*

**Env-Wt 904.08 (b)(2)d The proposed stream crossing will maintain or enhance the connectivity or the stream reaches upstream or downstream of the crossing, or both:**

*The proposed design will have no significant effect on upstream hydraulics, and sediment transport through the culvert will be improved by constructing a larger culvert and a secondary culvert that will be dry under normal conditions. Setting the downstream invert slightly higher than existing conditions will maintain positive drainage to the downstream channel.*

**Env-Wt 904.08 (b)(2)e The proposed stream crossing will not cause an increase in the frequency of flooding or overtopping of banks upstream or downstream of the crossing, or both:**

*The proposed culvert system will increase the hydraulic capacity of the crossing. It will not have a significant effect on flood flow or flood elevations upstream or downstream of the existing culvert. Runoff from the 295-acre Tier 3 watershed is metered by the upstream dam and culvert under NH 108. Overbank conveyance downstream is controlled by the capacity of the outlet at the opposite side of the wetland from where the project culvert is located.*

**Env-Wt 904.10(d)(2) a The proposed alternative design meets the general design criteria established in Env-Wt 904.01:**

*See responses above under General Conditions 1-9 above.*

**Env-Wt 904.10(d)(2)b - The proposed alternative design meets the applicable design criteria established in Env-Wt 904.08 for Tier 3 stream crossings to the maximum extent practicable, as specified below.**

*Crossing is a Tier 2 by area definition, but is upgraded to a Tier 3 stream based on the presence of protected species, making the area a Priority Resource Area (PRA). The proposed alternative meets the Tier 2 stream design criteria and adds connectivity with increased open area within the crossing system, including dry area in the 36" RCP for normal flow.*

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

- (a) Unless otherwise specified, all design criteria in this section shall apply to new and replacement tier 2, tier 3, and tier 4 crossings.

*This is not a new crossing. The proposed culvert replacement system meets all of the requirements to the maximum extent practicable.*

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

*The modifications to the crossing match the NH Stream Crossing Guidelines to the maximum extent practicable and the alternative design improves ecological services.*

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

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

*See responses above under General Conditions 1-9 above.*

- 2) Of sufficient size to accommodate the greater of:

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

*The reconstructed crossing will not overtop NH 108 at the 100-year 24-hour design storm event. The proposed culverts will improve hydraulics and capacity. If the proposed 60" culvert were to be embedded, Amesbury Road would overtop during the 100-year design event.*

*There will be no change to upstream or downstream flooding because of the proposed culvert system. Equalization of the wetland floodplain storage is anticipated to be more effective during high flows.*

*There is no evidence of the culvert obstructing sediment transport or causing channel instability. The proposed design will not significantly alter sediment transport capacity or flow conditions.*

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

*The Alternative Design provides a good balance between capacity and velocity. The 60" concrete culvert will have a natural profile and the 36" concrete culvert will be dry under normal sunny day flows.*

- 4) To provide a vegetated bank on both sides of the watercourse or to provide a wildlife shelf of suitable substrate and access to allow for wildlife passage.  
*The 36" concrete culvert is located to perform similar to how a wildlife shelf within the primary culvert would. Good approach grading to both ends of the supplemental culvert will help promote wildlife use.*

- 5) To preserve the natural alignment and gradient of the stream channel, to accommodate natural flow regimes and the functioning of the natural floodplain.  
*The proposed rehabilitation maintains the existing alignment and approximate gradient of the crossing. The increased open area will improve the natural floodplain function.*

- 6) To simulate a natural stream channel.  
*The 60" concrete culvert will simulate the natural low flow stream channel.*

- 7) So as not to alter sediment transport competence.  
*The proposed design will maintain sediment transport competence. Existing culvert velocities are sufficient to prevent aggregation.*

- 8) To avoid and minimize impacts to the stream in accordance with Env-Wt 313.03  
*The project was designed to avoid and minimize wetland impacts to the maximum extent practicable. Additional details are provided within Attachment A: Minor and Major Projects.*

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


*N/A – Crossing is not a Tier 4*

**Env-Wt 904.10(d)(2)c – A hydraulic analysis shows that the proposed stream crossing can accommodate the applicable design storm or that the crossing, together with the associated roadway and roadway embankment, can safely accommodate overtopping flows:**

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


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

**DATE:** April 26, 2023

**FROM:** Daniel L. Prehemo, P.E.   
Roadway Section Group Leader

**AT (OFFICE):** Department of Transportation  
Bureau of Highway Design

**SUBJECT:** Newton 29617  
X-A004(206)  
**Threatened and Endangered Species  
Accommodations Summary**

**THRU:** James A. Marshall, P.E.   
Administrator  
Bureau of Highway Design

**TO:** Rebecca Martin  
Plant and Wildlife Program Manager  
Bureau of Environment

**MEMORANDUM**

**Background:**

Recently approved New Hampshire Department of Environmental Services (NHDES) and New Hampshire Fish and Game (NHF&G) rules relative to Threatened and Endangered Species have resulted in the NHDOT developing a process for addressing project needs where these species are present within the project evaluation area. This process involves coordinating with NHF&G relative to accommodations/recommendations to be evaluated for incorporation into the project proposal. (*See Memorandum of Agreement between NHF&G and NHDOT regarding environmental review of NHDOT projects (RSA 212-A:9,III), dated February 2022.*) The intent of this memorandum is to document and summarize Highway Design's evaluation of the provided NHF&G recommendations and proposed accommodations specific to this project.

(The Bureau of Environment will coordinate directly with NHF&G, as appropriate. The intent is to obtain concurrence on included accommodations that are amenable to both NHDOT and NHF&G.)

**Project Description/Introduction:**

This project is located in Rockingham County, NH in the Town of Newton at the intersection of NH Rte. 108, Amesbury Road and Maple Avenue (colloquially known as "Rowe's Corner"). The purpose of the project is to improve the safety and operations of the intersection; in the existing configuration, NH Rte. 108 is the thru movement despite turning ninety-degrees at the four-way intersection. Amesbury Road and Maple Avenue are stop controlled with channelized right turns under yield control. Traffic volumes at the

intersection vary throughout the day, but Amesbury Road carries a similar volume as the NH Rte. 108 portions. NH Rte. 108 will be reconstructed to approx. 225 LF west of the intersection and approx. 175 LF north of the intersection. Amesbury Road will be reconstructed to approx. 300 LF south of the intersection, including pavement rehabilitation work at the Goulds Hill Road intersection and Maple Avenue will be reconstructed to approx. 175 LF east of the intersection. At the intersection, an all-way stop condition is proposed in order to reduce driver uncertainty and to better accommodate the similar traffic volumes experience by the NH Rte. 108 and Amesbury Road legs throughout the day.

More specifically, the proposed work will widen the roadway approaches to include two (2) 11-foot travel lanes and two (2) adjacent 5-foot wide shoulders for the NH Rte. 108 and Amesbury Road legs, and two (2) 11-foot travel lanes and two (2) adjacent 2-foot wide shoulders for Maple Avenue. Truck aprons are proposed at the north-west and south-west quadrants of the intersection in order to accommodate larger vehicles that are known to travel through this area. A closed drainage system is being included within the project limits to accommodate water quality. This includes proposed curbing and drainage structures on all approaches to capture stormwater and direct it to a grassed treatment swale (to be constructed in the south-east quadrant). A grassed sidewalk panel is also included on the north-west quadrant of the intersection to facilitate the potential future construction of a sidewalk by the Town. A single culvert under Amesbury Road will be replaced with a 64-inch reinforced concrete pipe and a 36-inch reinforced concrete overflow pipe to the north of the main culvert (pipe).

### **Fish & Game Recommendations:**

The following recommendation were received by NHF&G (via EMAIL on February 17, 2021) to be evaluated for inclusion into the proposed work associated with this project.

- CATCH BASIN SUMPS: Remove sumps from proposed catch basins.
- CURBING: Use sloped bituminous curb (preferred over sloped granite curb). Avoid vertical curb.
- CATCH BASIN GRATES: Utilize alternative catch basin grates with smaller openings than the DOT standard (with approximate 2"x4" openings); 2"x 3", or 2"x 2" preferred.
- CATCH BASIN GRATE OFFSETS TO CURBLINE: Offset catch basin grates by at least 3" from the curblines.
- PIPE MATERIALS: Utilize concrete pipes (preferred), follow by corrugated metal. Avoid plastic pipes.
- EROSION CONTROL MATTING: Avoid using plastic/synthetic netting or thread for erosion control matting.

### **Proposed Improvements/recommendations summary:**

Highway Design has evaluated NHF&G's recommendations and has documented/summarized the results below. This includes identifying NHDOT Standard practices/applications, and documenting the Department's position relative to each recommendation, including the proposed accommodations to be included in the project proposal.

**CATCH BASIN SUMPS: [Remove sumps from proposed catch basins.]**

- NHDOT Standard Catch Basin Sumps application: NHDOT closed drainage systems typically consist of catch basins and pipe networks to address stormwater flows along the State roadway network. These can consist of pavement (on-roadway) systems as well as ditchline systems. More specifically, on-roadway systems, in areas where curbing is utilized, the closed system networks are intended to collect and carry stormwater flows off the roadway (pavement), to an appropriate outlet location, such as an existing channel, stream, or river, or to a water quality treatment feature, etc. The catch basins are detailed as shown on NHDOT Standard DR-5, which incorporates a typical 3 ft deep sump, below the outletting pipe. The sumps have two main purposes:
  - They are intended to collect sediment and minimize the potential for clogging within the pipes themselves. These are inspected and maintained as needed by the NHDOT Highway Maintenance forces. Without the sumps, sediment could potentially build up within the pipe networks, until such time as a flooding problem appears at the roadway surface, potentially causing more extensive overall roadway network damage (i.e., embankment erosion, pavement degradation, and associated icing, etc.). This is especially concerning during a severe weather event, or during the winter season, where the problem could potentially not be addressed until warmer weather (non-frozen conditions), creating a number of various safety issues for an extended period of time.
  - Sumps also function as a Stormwater Pre-Treatment Practice (Env-Wq 1508.15) and are included in the NHDES NH Stormwater Manual as a Standard Practice. They are reasonably effective in removing fine and very fine sediment (approximately 20%).

Each sump holds approximately one cubic yard of material and is cleaned on a 5 year cycle (as a minimum) per the Department's Standard Operating Procedures.

- Sump removal; Project proposal: Based upon the above noted justification for utilizing sumps in closed system networks, this project proposal will continue to include sumps in the catch basins, per NHDOT Standards and Specifications.

**CURBING: [Use sloped bituminous curb (preferred over sloped granite curb). Avoid vertical curb.]**

- NHDOT Standard Curbing applications:
  - Vertical granite curb is the NHDOT's standard curbing for sidewalk applications, and in areas where increased positive protection is needed for channelization purposes (general roadway delineation) and for protection of adjacent infrastructure such as utilities, traffic signal elements, ROW limitations/private property encroachment concerns (generally associated with urban, or sub-urban settings).
  - Sloped granite curbing is typically utilized for raised median islands, and for similar applications as described for vertical granite curbing above, with the exception of where sidewalks are proposed. In sidewalk locations, sloped granite curb is not acceptable for safety concerns.
  - Sloped bituminous curbing is typically utilized in guardrail areas only, as it is not by itself, durable enough to withstand winter maintenance operations (plowing).

- **Curbing type; Project proposal:** In light of the project site and context, the NHDOT is amenable to include slope granite curb (per NHF&G recommendation) rather than the currently proposed vertical granite curb treatment for this project. The proposed sidewalk panel on this project is an accommodation for potential future infrastructure. Should a sidewalk be constructed at some point in the future, the curbing type will need to be modified accordingly. The Amesbury Road portion of the project will include proposed guardrail, and as such, sloped bituminous curbing will be utilized under the guardrail where warranted. In summary, based on NHF&G's recommendation, no vertical granite curbing will be utilized on this project.

**CATCH BASIN GRATES: [Utilize alternative catch basin grates with smaller openings than the DOT standard (with approximate 2"x4" openings); 2"x 3", or 2"x 2" preferred.]**

- **NHDOT Standard Catch Basin Grate application:** The NHDOT closed drainage systems typically consist of catch basins and pipe networks to address stormwater flows along the State roadway network. These can consist of pavement (on-roadway) systems as well as ditchline systems. More specifically, on-roadway systems (in areas where curbing is utilized), the closed system networks are intended to collect and carry stormwater flows off the roadway (pavement), to an appropriate outlet location, such as an existing channel, stream, or river, or to a water quality treatment feature, etc. The NHDOT standard application for catch basin grates in pavement, where bicycle traffic is anticipated, is the Type "B" Grate, as identified and detailed on NHDOT Standard DR-1. This grate has a free open area of approximately 2.55 square feet (SF), and provides reasonable hydraulic efficiency. In addition, this large open area minimizes the potential for clogging (leaves, sticks, and other misc debris that may accumulate along the curb line) and minimizes icing potential during the winter conditions. (For reference (comparison) below, this grate consists of an 8 x4 opening grid, with each opening approximately 2.25" x 4.5" in length).
- **Alternative Grates; Project proposal:** The NHDOT has investigated the use of an alternate catch basin grate to address NHF&G's reduced opening recommendation. A grate consisting of a 7 x 7 opening grid, with each opening approximately 2.5" x 2.5" in length, with a total open area of 2.08 square feet (SF) has been analyzed for hydraulic capacity and comparison with the Department's Standard Type "B" grate. In summary, there are two items of concern associated with this alternate grate.
  - **Hydraulic performance:** The reduced open area associated with this grate results in a slight reduction in performance (ability to capture flow), however, it is generally acceptable for use on the roadway network. (Lower performance translates to the need for added basins/structures to accommodate the design flows.)
  - **Maintenance and Safety:** The smaller openings associated with this grate relate to the above noted issues. More specifically, increased clogging potential, and additional safety concern during winter conditions. These issues overall result in additional maintenance needs posing safety concerns for State maintenance workers, as well as for the traveling public. As such, consideration of this grate will need be made on a site specific basis, to address specific concerns and/or needs.

In summary, based on the project site and context, the NHDOT is amenable to utilize alternate grates on this project (per NHF&G recommendation). Additionally, in this case (site specific), this will include all of the proposed grates associated with the project proposal.

**CATCH BASIN GRATE OFFSETS TO CURBLINE: [Offset catch basin grates by at least 3” from the curblines.]**

- **Standard Grate offsets; NHDOT application:** The NHDOT closed drainage systems typically consist of catch basins and pipe networks to address stormwater flows along the State roadway network. These can consist of pavement (on-roadway) systems as well as ditchline systems. More specifically, on-roadway systems, in areas where curbing is utilized, the closed system networks are intended to collect and carry stormwater flows off the roadway (pavement), to an appropriate outlet location, such as an existing channel, stream, or river, or to a water quality treatment feature, etc. The NHDOT Standard treatment/layout for in pavement catch basin grates is detailed on NHDOT Standard DR-2, where the grates are positioned along the curb line, and a pavement depression is constructed to maximize the amount of pavement stormwater runoff entering the catch basin. This is especially important during low flow conditions, and also in sag (roadway profile low point) locations, where there is a greater potential for ponding. It is noted that where slope granite curb is utilized however, the resulting grate offset to the curb line at the final pavement surface is by default (physical limitation) approximately 2.5” (see NHDOT Granite Slope Curb Standard CR-1 for sloped granite curb detailing).
- **Standard Grate offsets; Project proposal:** Introducing an increased offset from catch basin grates to the curb lines would decrease the efficiency of overall closed drainage system, as well as pose increased potential for water ponding and icing in sag locations. These items pose a safety concern for State maintenance workers, as well as for the traveling public. It is noted that all proposed curbing in non-guardrail areas within the project limits will utilize sloped granite curb as identified in the CURBING section above, and hence will include a 2.5” offset as explained above (approaching the NHF&G 3” offset recommendation).

In summary, the NHDOT intends to construct the closed drainage system catch basin and grate layout per DOT Standards, and is not proposing to include increased catch basin grate offsets (over the noted 2.5”) with the project proposal.

**PIPE MATERIALS: [Utilize concrete pipes (preferred), follow by corrugated metal. Avoid plastic pipes.]**

- **Pipe Materials; NHDOT application:** The NHDOT utilizes primarily Reinforced Concrete Pipes (RCP's), and Plastic Pipes for closed system networks as well as for culverts along the State's roadway network. Plastic pipe is becoming more commonly used due to its lower cost, ease of installation (due to weighing less), and increased hydraulic performance (due to low roughness). Concrete pipes are preferred where increased strength is needed, and also utilized in wet/waterway



areas where there is a concern for the lighter plastic pipe to succumb to buoyancy forces (stability concerns). Corrugated Metal pipes are generally avoided due to their shorter service life, and resulting maintenance needs.

- Pipe Materials; Project proposal: Although plastic pipe could be utilized for a good portion of the closed system network for this project, and in light of the project size, the NHDOT is amenable to utilizing all RCP pipes for the closed drainage system and Amesbury Road culverts on this project (per NHF&G's recommendation).

**EROSION CONTROL MATTING: [Avoid using plastic/synthetic netting or thread for erosion control matting.]**

- Erosion Control Matting; NHDOT application: The NHDOT Specifications for temporary erosion control do not allow for the use of welded plastic netting or thread. The NHDOT Qualified Products List identifies only Wildlife Friendly matting for temporary erosion control.
- Erosion Control Matting; Project proposal: The NHDOT utilizes only wildlife friendly Erosion Control Matting as defined in the NHDOT Standard Specifications for temporary erosion control, consistent with F&G's recommendations.

**Summary:**

The Bureau of Highway Design has evaluated the recommendations from NH Fish & Game and has provided the above noted information with respect to the proposed action and conservation recommendations for this project. The accommodations noted in this memorandum are expected to achieve goals for wildlife conservation in the project area and result in a project that meets NHDOT safety standards and does not cause undue maintenance burdens for NHDOT Maintenance forces.

The attached plans, profiles and cross section are intended to compliment the information detailed in this memorandum. Additionally, it is noted that the referenced NHDOT Standards are available on the NHDOT website.

Should more information or further details be needed, do not hesitate to contact Dan Prehemo or Hans Weber in Highway Design.

DLP/dlp

cc: Mike Servetas, Brian Schutt, Tim Dunn, Trent Zanes, Hans Weber

Attachments: 29617 Preliminary Plans, X-Sections, Profiles



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

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

**Required Information**

In order for USACE to properly evaluate your application, applicants must submit the following information for all projects along with the NHDES Wetlands Bureau application or permit notification forms. Some projects may require more information. Check with USACE at (978) 318-8832 for project-specific requirements. For your convenience, this Appendix B is also attached to the NHDES Wetlands Bureau application and Permit by Notification forms.

- NHDES Wetlands Permit Application.
- Request for Project Review Form by the NH DHR: <https://www.nh.gov/nhdhr/review/rpr.htm>.
- Photographs of wetland/waterway to be impacted.
- Purpose of the project.
- Legible, reproducible plans no larger than 11"x17" with bar scale. Provide locus map and plan views of the entire property.
- Typical cross-section views of all wetland and waterway fill areas and wetland replication areas.
- In navigable waters, show MLW and MHW elevations. Show the HTL elevations when fill is involved. In other waters, show the OHW elevation.
- On each plan, show the following for the project:
  - Vertical datum and the NAVD 1988 equivalent with the vertical units as U.S. feet. In coastal waters this may be mean higher high water (MHHW), MHW, MLW, mean lower low water (MLLW) or other tidal datum with the vertical units as U.S. feet. MLLW and MHHW are preferred. Provide the correction factor detailing how the vertical datum (e.g., MLLW) was derived using the latest National Tidal Datum Epoch for that area, typically 1983 - 2001.
  - Horizontal state plane coordinates in U.S. survey feet based on the Traverse Mercator Grid system for the State of New Hampshire (Zone 2800) NAD 83.
  - Project limits with existing and proposed conditions.
  - Limits of any FNP in the vicinity of the project area and horizontal State Plane Coordinates in U.S. survey feet for the limits of the proposed work closest to the FNP.
  - Volume, type, and source of fill material to be discharged into waters and wetlands, including the area(s) (in square feet or acres) of fill in wetlands, below the OHW in inland waters and below the HTL in coastal waters.
  - Delineation of all waterways and wetlands on the project site.
- Use Federal delineation methods and include USACE wetland delineation data sheets (GC 2).
- For activities involving discharges of dredged or fill material into waters of the U.S., include a statement describing how impacts to waters of the U.S. are to be avoided and minimized, and either a statement describing how impacts to waters of the U.S. are to be compensated for (or a conceptual or detailed mitigation plan) or a statement explaining why compensatory mitigation should not be required for the proposed impacts. Please contact USACE for guidance.



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

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

**USACE Section 404 Checklist**

1. Attach any explanations to this checklist. Lack of information could delay a USACE permit determination.
2. All references to “work” include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 3 for information on single and complete projects.
4. Contact USACE at (978) 318-8832 with any questions.
5. The information requested below is generally required in the NHDES Wetland Application. See page 61 for NHDES references and Admin Rules as they relate to the information below.

| 1. Impaired Waters   | Yes     | No |
|--|---------|----|
| 1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See the following to determine if there is an impaired water in the vicinity of your work area. *<br><a href="https://nhdes-surface-water-quality-assessment-site-nhdes.hub.arcgis.com/">https://nhdes-surface-water-quality-assessment-site-nhdes.hub.arcgis.com/</a><br><a href="https://www.des.nh.gov/water/rivers-and-lakes/water-quality-assessment">https://www.des.nh.gov/water/rivers-and-lakes/water-quality-assessment</a><br><a href="https://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx">https://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx</a> |         | X  |
| 2. Wetlands  | Yes     | No |
| 2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?   | X       |    |
| 2.2 Are there proposed impacts to tidal SAS, prime wetlands, or priority resource areas? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at <a href="https://www4.des.state.nh.us/NHB-DataCheck/">https://www4.des.state.nh.us/NHB-DataCheck/</a> .  | X       |    |
| 2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?  | X       |    |
| 2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)   |         | X  |
| 2.5 The overall project site is more than 40 acres?  |         | X  |
| 2.6 What is the area of the previously filled wetlands?  | Unknown |    |
| 2.7 What is the area of the proposed fill in wetlands?   | 3302    |    |
| 2.8 What % of the overall project sire will be previously and proposed filled wetlands?  | Unknown |    |
| 3. Wildlife  | Yes     | No |
| 3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: <a href="https://www4.des.state.nh.us/NHB-DataCheck/">https://www4.des.state.nh.us/NHB-DataCheck/</a> . USFWS IPAC website: <a href="https://ipac.ecosphere.fws.gov/">https://ipac.ecosphere.fws.gov/</a>  | X       |    |

|  |     |    |
|--|-----|----|
| 3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”) Map information can be found at:<br><ul style="list-style-type: none"> <li>• PDF: <a href="https://wildlife.state.nh.us/wildlife/wap-high-rank.html">https://wildlife.state.nh.us/wildlife/wap-high-rank.html</a>.</li> <li>• Data Mapper: <a href="http://www.granit.unh.edu">www.granit.unh.edu</a>.</li> <li>• GIS: <a href="http://www.granit.unh.edu/data/downloadfreedata/category/databycategory.html">www.granit.unh.edu/data/downloadfreedata/category/databycategory.html</a>.</li> </ul> |     | X  |
| 3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?   |     | X  |
| 3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?  |     | X  |
| 3.5 Are stream crossings designed in accordance with the GC 31?  | X   |    |
| <b>4. Flooding/Floodplain Values</b>   | Yes | No |
| 4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?   |     | X  |
| 4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?  |     |    |
| <b>5. Historic/Archaeological Resources</b>  |     |    |
| For a minimum, minor or major impact project - a copy of the RPR Form ( <a href="http://www.nh.gov/nhdhr/review">www.nh.gov/nhdhr/review</a> ) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 37 GC 14(d) of the GP document**   | X   |    |
| <b>6. Minimal Impact Determination (for projects that exceed 1 acre of permanent impact)</b>   | Yes | No |
| Projects with greater than 1 acre of permanent impact must include the following:<br><ul style="list-style-type: none"> <li>• Functional assessment for aquatic resources in the project area.</li> <li>• On and off-site alternative analysis.</li> <li>• Provide additional information and description for how the below criteria are met.</li> </ul>   |     |    |
| 6.1 Will there be complete loss of aquatic resources on site?  |     |    |
| 6.2 Have the impacts to the aquatic resources been avoided and minimized to the greatest extent practicable?   |     |    |
| 6.3 Will all aquatic resource function be lost?  |     |    |
| 6.4 Does the aquatic resource (s) have regional significance (watershed or ecoregion)?   |     |    |
| 6.5 Is there an on-site alternative with less impact?  |     |    |
| 6.6 Is there an off-site alternative with less impact?   |     |    |
| 6.7 Will there be a loss to a resource dependent species?  |     |    |
| 6.8 Are indirect impacts greater than 1 acre within and adjacent to the project area?  |     |    |
| 6.9 Does the proposed mitigation replace aquatic resource function for direct, indirect, and cumulative impacts?   |     |    |

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

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

## Thomson, Rhona

---

**From:** Newton, Kevin  
**Sent:** Tuesday, April 23, 2024 3:08 PM  
**To:** Martin, Rebecca  
**Cc:** FGC: NHFG review; Thomson, Rhona  
**Subject:** RE: NHB23-2344 RE: Continued Consultation NHB22-2006 Newton 29617 RE: NHB21-0493 Newton 29617

Hi Rebecca and Rhona,

Thank you for providing this information. I agree with trying the modified 2.5" x 2.5" approach.

Can you please remind me, was a design alternative selected for the proposed? Digging through the old correspondence between Kim Tuttle and NHDOT, it sounds like NHDOT is proposing a 60" RCP with 36" overflow? If that is the case, NHFG has no further comments beyond the agreed upon recommendations below at this time.

Thank you for your coordination,

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.

---

**From:** Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>  
**Sent:** Tuesday, April 23, 2024 10:28 AM  
**To:** Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>  
**Cc:** FGC: NHFG review <NHFGreview@wildlife.nh.gov>; Thomson, Rhona <Rhona.C.Thomson@dot.nh.gov>  
**Subject:** NHB23-2344 RE: Continued Consultation NHB22-2006 Newton 29617 RE: NHB21-0493 Newton 29617

Hi Kevin,

I hope this message finds you well. Rhona Thomson has taken over as the Environmental Manager for the Newton 29617 project and the Newton 29617 project team is preparing to submit a wetland permit application soon. I wanted to check in with you about the conservation recommendations, since it have been quite some time since we checked in on this one. I added in the conservation recommendations that you have been providing for NHDOT projects in with the

29617 specific items to the list below. There is a newer NHB (NHB23-2344 attached) and the species are the same as previous.

Kevin Nyhan shared that he had coordinated with Mike Marchand about the catch basin grate size. At this point we would like to try the modification to the 2.5" by 2.5" and hope that it will still provide adequate drainage and is quite a bit smaller than our typical grate opening size.

Best wishes,  
Rebecca

- Blanding's Turtle (State endangered) and Spotted Turtle (state threatened) occur within the vicinity of the project area. Site operators shall be informed of the potential presence of these species and shall be provided flyers that help to identify these species along with NHFG contact information.
- Rare species information (e.g. identification, observation and reporting of observations, when to contact NHFG immediately and NHFG contact information) shall be communicated during the project's preconstruction meeting prior to work and rare species flyers shall be included on the project's bulletin board. The rare species commitments shall be included in the project's Summary of Environmental Issues and the rare species flyers shall be included in the project's contract.
- 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.
- Sightings of Blanding's Turtle and Spotted Turtle shall be reported immediately to NHFG wildlife biologists Melissa Winters (603-479-1129) or Josh Megyesy (978-578-0802). Immediate reporting of observations is critical as NHFG biologists will need to collect data on the individual.
- Catch basin grate size shall be reduced to 2.5" by 2.5" within the project area.
- Impacts to wetlands shall be in accordance with recommendations from NHDES Wetlands Bureau.
- Wetland impacts shall be minimized and buffers to wetlands are encouraged to be included in project designs when possible.
- No vertical granite curb shall be used in the project limits. In the areas with guardrail sloped bituminous curbing will be utilized. In areas without guardrail where curbing is planned, sloped granite curbing will be used.
- Improvements to the existing drainage shall incorporate equally sized or larger culverts than currently exist on site. CMP's, RCP's, or box culverts shall be utilized in place of HDPE culverts to facilitate the passage of small fish, amphibians, or turtles.
- 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;
- 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, if any, to assure the project does not appreciably jeopardize the continued existence of threatened and endangered species as defined in Fis 1002.04; and
- NHFG, including its employees and authorized agents, shall have access to the property during the term of the permit. NHFG shall contact the NHDOT's Contract Administrator or Environmental Coordinator for the project to coordinate access to the site. In the case of an emergency need for immediate access, NHFG shall contact Kevin Nyhan at 603-271-3226.

---

**From:** Newton, Kevin <[Kevin.M.Newton@wildlife.nh.gov](mailto:Kevin.M.Newton@wildlife.nh.gov)>  
**Sent:** Tuesday, May 30, 2023 2:36 PM  
**To:** Martin, Rebecca <[Rebecca.A.Martin@dot.nh.gov](mailto:Rebecca.A.Martin@dot.nh.gov)>  
**Cc:** Winters, Melissa <[Melissa.J.Winters@wildlife.nh.gov](mailto:Melissa.J.Winters@wildlife.nh.gov)>; FGC: NHFG review <[NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov)>  
**Subject:** RE: Continued Consultation NHB22-2006 Newton 29617 RE: NHB21-0493 Newton 29617

Hi Rebecca,

I acknowledge that Kim T. had recommended a 2" x 2" or 2" x 3" grate size and I agree that 2" x 2.5" is an improvement, but Kim had also recommended there be no sumps included. Since NHDOT will not meet the recommendation for sump removal, it would be best to go with the smaller option, in line with current F&G recommendations on other projects where this is a concern. Even at 2" x 2", newborn hatchings are small enough to fall through and become entrapped.

As always, I appreciate you're coordination efforts.

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

---

**From:** Martin, Rebecca <[Rebecca.A.Martin@dot.nh.gov](mailto:Rebecca.A.Martin@dot.nh.gov)>  
**Sent:** Tuesday, May 30, 2023 8:35 AM  
**To:** Newton, Kevin <[Kevin.M.Newton@wildlife.nh.gov](mailto:Kevin.M.Newton@wildlife.nh.gov)>  
**Cc:** Winters, Melissa <[Melissa.J.Winters@wildlife.nh.gov](mailto:Melissa.J.Winters@wildlife.nh.gov)>; FGC: NHFG review <[NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov)>  
**Subject:** RE: Continued Consultation NHB22-2006 Newton 29617 RE: NHB21-0493 Newton 29617

Hi Kevin,

For the Newton 29617 project, we had previously been told either 2" by 2" or 2" by 3" catch basin grate opening, so 2.5" by 2.5" seemed to be in that ballpark. The 2" by 3" opening would be 6 sq inches and the 2.5" by 2.5" would be 6.25 sq inches. I know we are coordinating on a project-by-project basis, so I want to check in with you before I reach back to our design team. Thanks for your help with this, it feels like there are a lot of projects going back and forth at the moment.

Best,  
Rebecca

---

**From:** Newton, Kevin <[Kevin.M.Newton@wildlife.nh.gov](mailto:Kevin.M.Newton@wildlife.nh.gov)>  
**Sent:** Friday, May 26, 2023 3:08 PM  
**To:** Martin, Rebecca <[Rebecca.A.Martin@dot.nh.gov](mailto:Rebecca.A.Martin@dot.nh.gov)>  
**Cc:** Winters, Melissa <[Melissa.J.Winters@wildlife.nh.gov](mailto:Melissa.J.Winters@wildlife.nh.gov)>; FGC: NHFG review <[NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov)>  
**Subject:** RE: Continued Consultation NHB22-2006 Newton 29617 RE: NHB21-0493 Newton 29617

Hi Rebecca,

Thank you for bringing NHFG up to speed with where NHDOT is at within the planning process for the proposed work in Newton referenced below.

If NHDOT is not able to remove sumps from the structures, the next best practice would be to reduce grate sizes, as was discussed during prior meetings. I see from the provided memo that NHDOT is proposing 2.5" x 2.5" grates. This is an improvement but NHFG has typically been recommending reducing to 2" x 2" in areas where turtle entrapment is a concern. Turtle hatchlings can be as small, if not smaller, than a quarter. Especially in close proximity to wet and grassy areas where turtles may frequent, reducing opening sizes could mitigate potential for individuals to become trapped in the closed drainage.

In talking this over with Melissa, in the absence of sump removal and in line with previous NHFG reviews, NHFG's recommendation is to utilize 2" x 2" grates. In higher priority landscapes, sump removal may be a requirement from NHFG.

Thank you,

Kevin

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

---

**From:** Martin, Rebecca <[Rebecca.A.Martin@dot.nh.gov](mailto:Rebecca.A.Martin@dot.nh.gov)>  
**Sent:** Tuesday, May 23, 2023 9:38 AM  
**To:** Newton, Kevin <[Kevin.M.Newton@wildlife.nh.gov](mailto:Kevin.M.Newton@wildlife.nh.gov)>  
**Cc:** Winters, Melissa <[Melissa.J.Winters@wildlife.nh.gov](mailto:Melissa.J.Winters@wildlife.nh.gov)>  
**Subject:** Continued Consultation NHB22-2006 Newton 29617 RE: NHB21-0493 Newton 29617

Hi Kevin,

I need to apologize, the Newton 29617 project design team was pulled into other projects and you have not heard about the project since last year. To refresh your memory, I have attached the notes from our meeting last June. Also attached is the current plan set and Highway Design's response to the conservation recommendations. As detailed in the attached *Newton 29617 T&E F&G Acc Memo\_4\_26\_23.pdf*, the design team is proposing to use sloped granite and sloped asphalt curb for the project and a smaller catch basin grate size. All the eligible temporary erosion control items on our Qualified Products List are wildlife friendly and the project will utilize RCP pipes as recommended. For the closed drainage system, the sumps are planned to be included, as we had discussed during the meeting last year. I am hopeful that the proposed conservation measures are acceptable and we appreciate your expertise and patience with the pace of the project design.

Thank you,  
Rebecca

---

**From:** Martin, Rebecca  
**Sent:** Wednesday, August 24, 2022 9:29 AM  
**To:** Winters, Melissa <[Melissa.J.Winters@wildlife.nh.gov](mailto:Melissa.J.Winters@wildlife.nh.gov)>; Newton, Kevin <[Kevin.M.Newton@wildlife.nh.gov](mailto:Kevin.M.Newton@wildlife.nh.gov)>  
**Cc:** Tuttle, Kim <[Kim.A.Tuttle@wildlife.nh.gov](mailto:Kim.A.Tuttle@wildlife.nh.gov)>  
**Subject:** NHB21-0493 Newton 29617 FW: Turtles- Catch Basin Grates- Request for Information-follow up coordination

Hello Melissa and Kevin,



The design team is working on their proposal for turtle considerations for the Newton project. Thanks very much for meeting with us about the project back at the end of June. One question has come up about catch basin grate size, it had been recommended by Kim to reduce the standard 2" by 4" to either a 2"x3" or 2"x2" opening. DOT's hydraulic engineer seems to be more comfortable with 2.5" by 2.5"- is it important that one of the dimensions is 2" or just that the open area is smaller than the typical 2" by 4" (8 sq in)? A 2" by 3" would be 6 sq in and a 2.5" by 2.5" would be 6.25 sq in.

Thank you,  
Rebecca

Newton 29617



**Photo 1:** *Culvert Outlet (5/6/2022)*



**Photo 2:** *Wetlands Downstream of Culvert Outlet (5/6/2022)*

Newton 29617



**Photo 3:** *Culvert Outlet from Amesbury Rd. (11/21/2019)*



**Photo 4:** *Culvert Outlet from Wetlands (5/6/2022)*



**Photo 5: Culvert Inlet (5/6/2022)**

Newton 29617



**Photo 6:** *Culvert Inlet (11/21/2019)*



**Photo 7:** *Upstream of Culvert Inlet (1/19/2021)*

Newton 29617



**Photo 8:** *Upstream of Culvert Inlet (5/2/2022)*



**Photo 9:** *NH 108/Amesbury Rd./Maple Ave. Intersection from Amesbury Culvert (5/6/2022)*

Newton 29617



**Photo 10:** Amesbury Rd. Southerly Facing Goulds Hill Rd. (8/15/2019)



**Photo 11:** NH 108W Facing the NH 108/Amesbury Rd./Maple Ave. Intersection (8/15/2019)



**Photo 12:** *The NH 108/Amesbury Rd./Maple Ave. Intersection Facing Maple Ave. (8/15/2019)*



**Photo 13:** *The NH 108/Amesbury Rd./Maple Ave. Intersection Facing Amesbury Rd. (8/15/2019)*



Newton 29617



**Photo 14:** Amesbury Rd. Facing NH 108W at the intersection (10/24/2018)



**Photo 15:** NH 108N Facing Pond St. (1/19/2021)

**Newton 29617****Construction Sequence****Advertising date: July 16, 2024****Begin Construction: Spring 2025**Winter 2024/2025

1. Perform necessary tree clearing and earthwork to begin utility relocations.
2. Utilities will relocate over the winter months.

2025 Construction Season

1. Perform any necessary clearing operations for access and staging.
2. Install perimeter sediment controls and install any necessary temporary erosion control measures prior to construction.
3. Construct dewatering basin at the proposed treatment swale location prior to Amesbury Rd. culvert work.
4. Construction of the Amesbury Rd. culverts to be determined by weather and water flows. Reconstruction work at the intersection could occur first if conditions are unsuitable for Amesbury culvert work. Culverts construction on Amesbury Road to be completed utilizing flaggers and one-lane alternating two-way traffic:
  - a. Use traffic barrels as necessary to separate traffic from these construction areas.
  - b. (TCP Phase 1) Shift traffic to the east side of Amesbury Rd.
    - i. Construct temporary culvert extension for existing 48” pipe on the west side of Amesbury Rd.
    - ii. Construct temporary widening on the west side of Amesbury Rd. for future phases.
  - c. (TCP Phase 2) Shift traffic to the west side of Amesbury Rd.
    - i. Maintain flow through existing 48” culvert and construct temporary culvert extension.
    - ii. Construct east half of the proposed 36” pipe and temporary culvert extension.
    - iii. Construct temporary widening on the east side of Amesbury Rd for future phases.
  - d. (TCP Phase 3) Shift Amesbury Road traffic onto temporary widened area on the east side
    - i. Construct remaining portion of the proposed 36” pipe and temporary culvert extension on the west side of Amesbury Rd.
    - ii. Construct temporary water diversion to direct flows through the 36” overflow pipe.
  - e. (TCP Phase 4) Keep traffic on the widened east side of Amesbury Rd.
    - i. Remove the west half of the existing 48” pipe and construct west half of the 60” RCP.
    - ii. Maintain temporary widening on the west side of Amesbury Rd for Phase 5.
  - f. (TCP Phase 5) Shift traffic onto temporary widened area on the west side of Amesbury Rd.

- i. Remove temporary widening and temporary pipe extensions on the east side of Amesbury.
    - ii. Remove remaining portion of existing 48" pipe.
    - iii. Construct remaining portion of 60" pipe and install dual headwall.
  - g. (TCP Phase 6) Shift traffic to the east side of Amesbury Rd.
    - i. Remove temporary widening and temporary pipe extensions on west side of Amesbury Rd.
    - ii. Place seed, mulch, and erosion control matting (where steeper than 4:1) on newly graded areas.
    - iii. Remove temporary water diversion.
5. Begin intersection and approach reconstruction work utilizing flaggers and one-lane alternating two-way traffic.
  - a. Install the proposed closed system drainage.
  - b. Construct the water quality treatment swale and connect to the proposed closed drainage system.
  - c. Complete full box work and roadway widening
  - d. Place seed, mulch, and erosion control matting (where steeper than 4:1) on newly graded areas.
6. Complete proposed Goulds Hill Rd. work.
  - a. Maintain access to Goulds Hill Rd. during construction to the extent practicable while rehabilitating the pavement.

Notes:

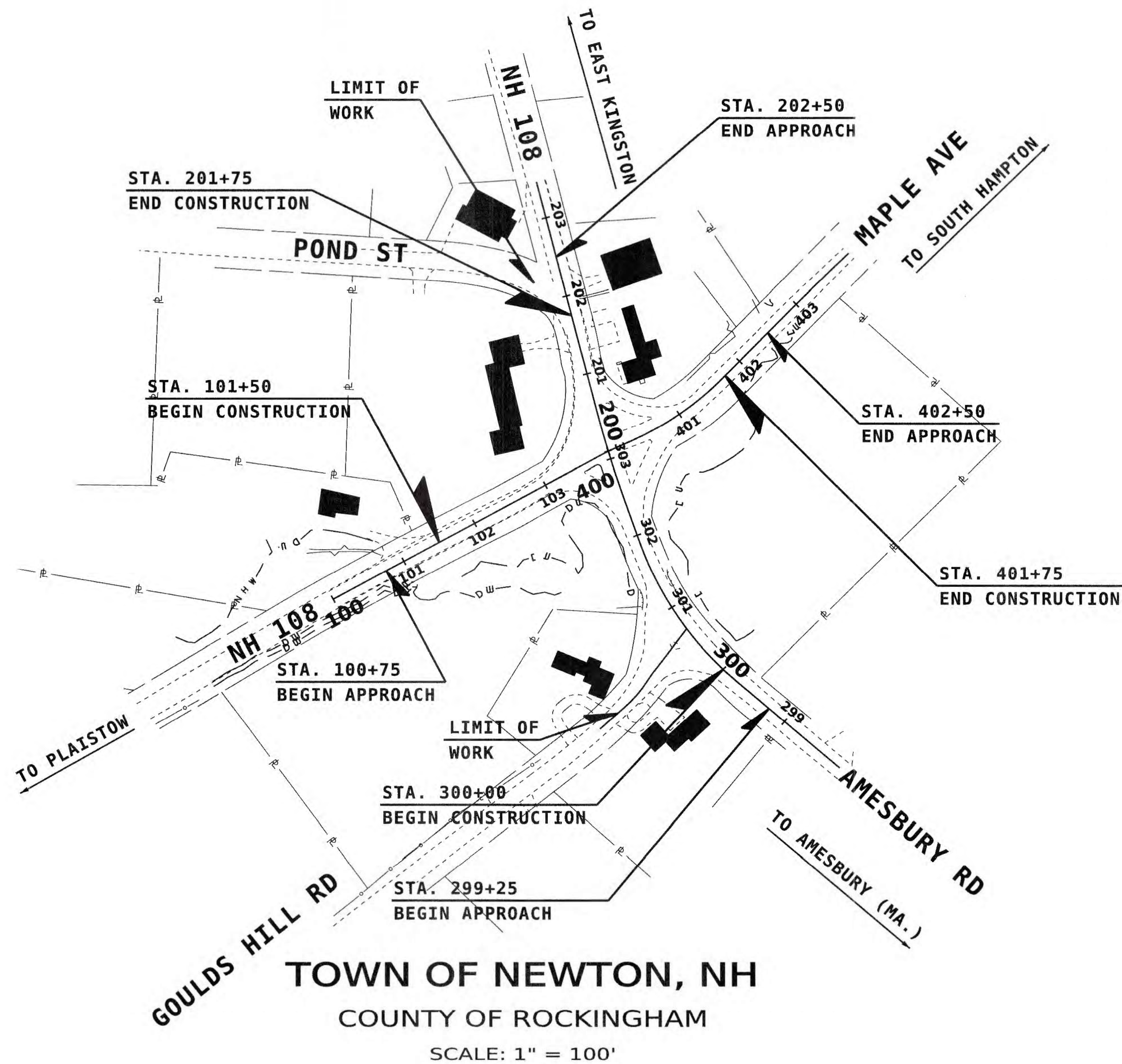
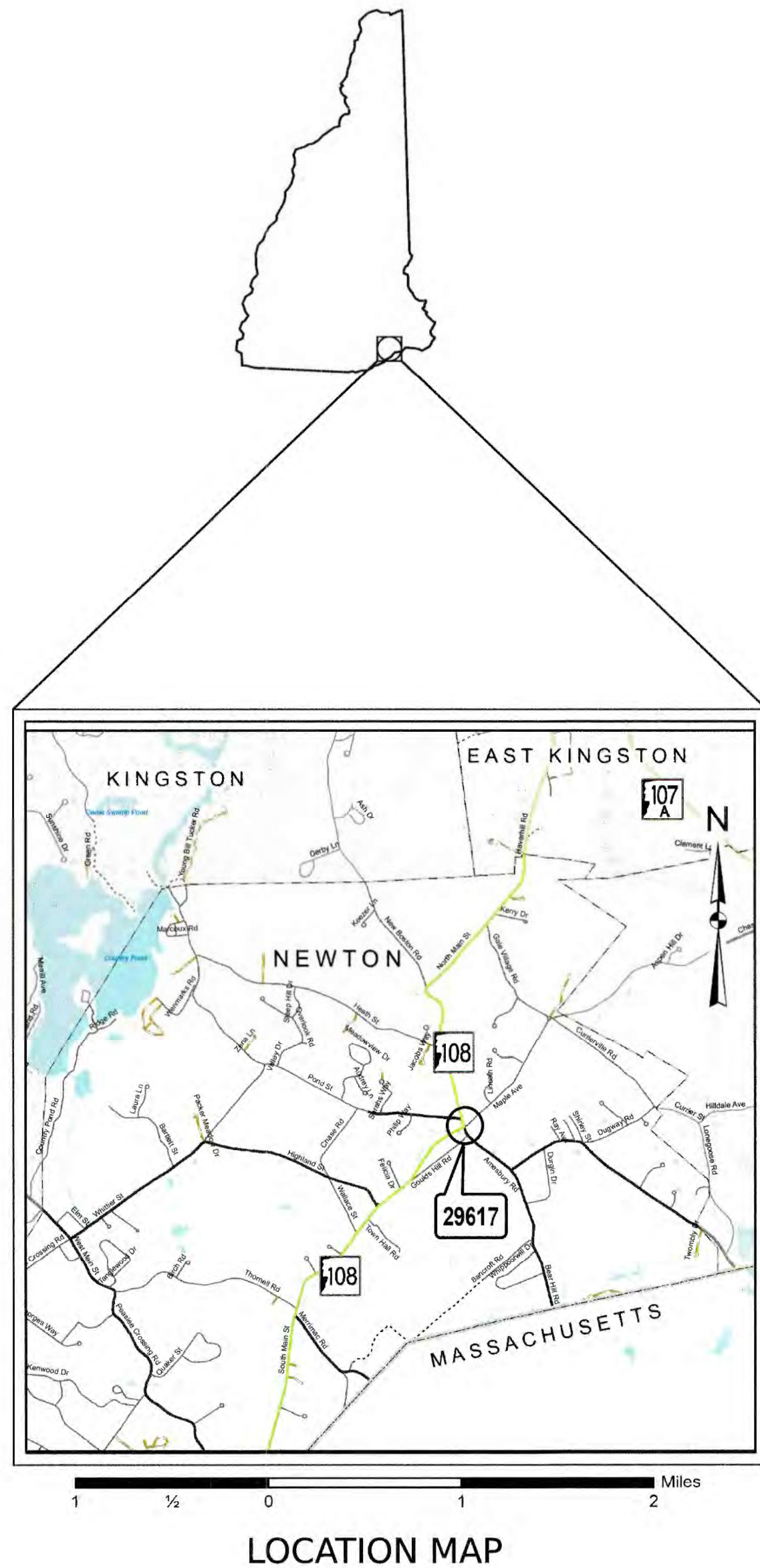
1. Maximum duration for running traffic on gravel to be 12 days and one weekend.

**Completion Date: Fall 2025**

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

**X-A004(206)  
N.H. PROJECT NO. 29617  
NH ROUTE 108**

| DESIGN DATA              |    |           |
|--------------------------|----|-----------|
| AVERAGE DAILY TRAFFIC 20 | 22 | 4430      |
| AVERAGE DAILY TRAFFIC 40 | 42 | 5410      |
| PERCENT OF TRUCKS        |    | 5.2%      |
| DESIGN SPEED             |    | 30        |
| LENGTH OF PROJECT        |    | 0.2 MILES |



DRAWN BY HSW  
 CHECKED BY ETB  
 DATE 2/14/2024  
 DATE 3/8/2024

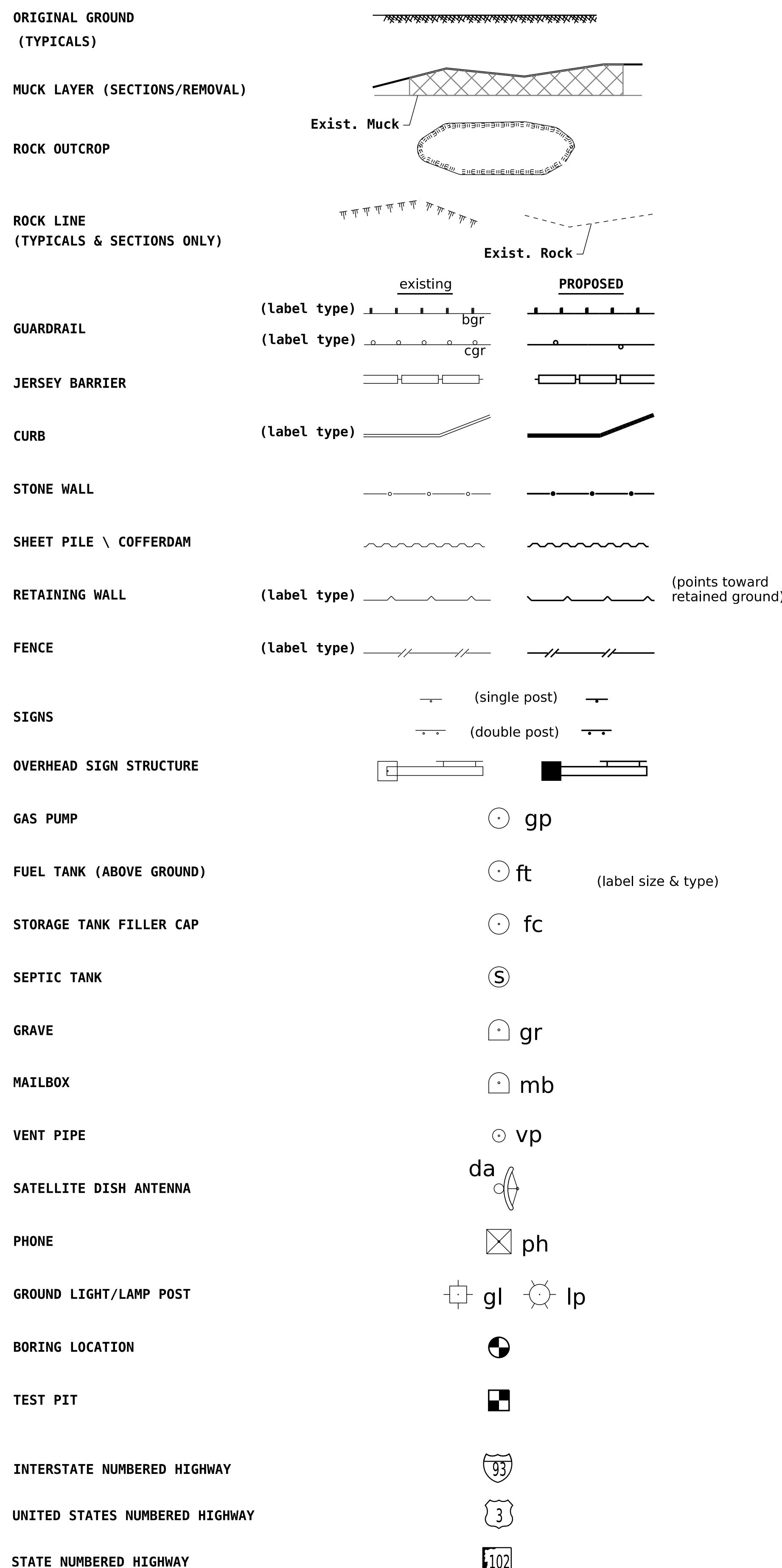
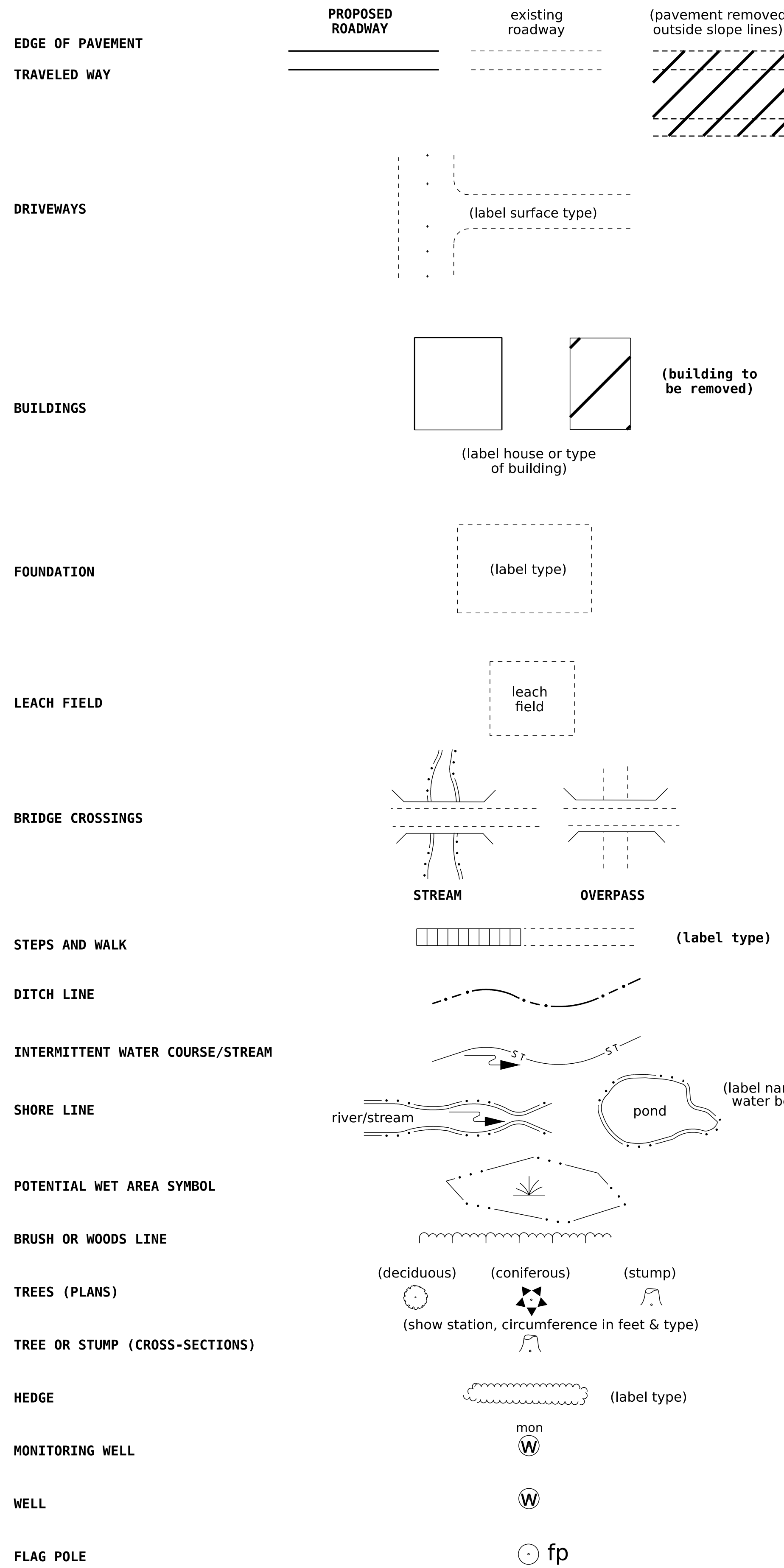
**INDEX OF SHEETS**

|       |                         |
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| 1     | FRONT SHEET             |
| 2-3   | STANDARD SYMBOLS SHEETS |
| 4-9   | WETLAND IMPACT PLANS    |
| 10-15 | EROSION CONTROL PLANS   |

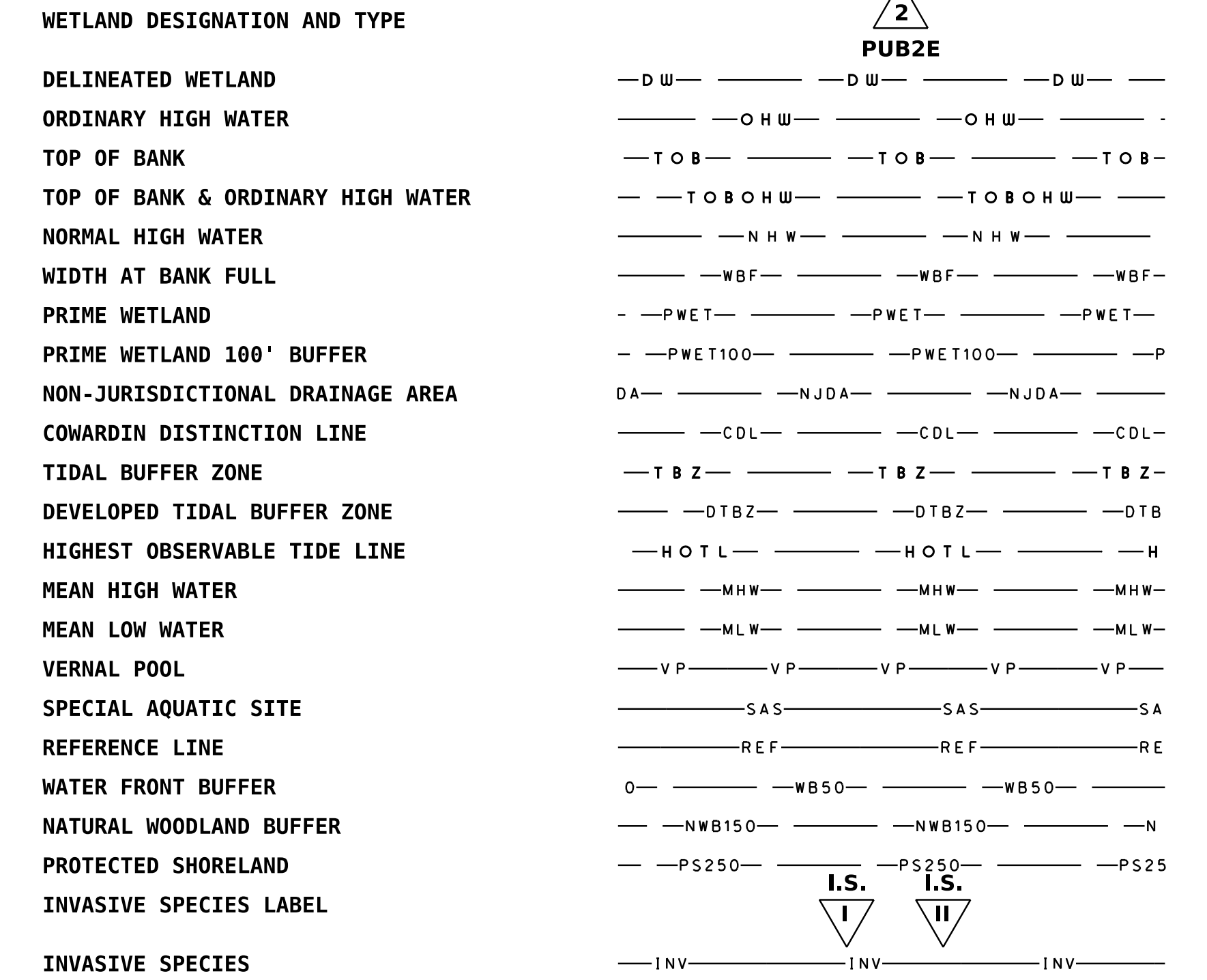
|  |                     |  |           |              |
|--|---------------------|--|-----------|--------------|
| PER WETLAND<br>PLANS RULE(S)<br>ENV-WT 311.05<br>FOR ENGINEERING |                     | THE STATE OF<br>NEW HAMPSHIRE<br>DEPARTMENT OF<br>TRANSPORTATION<br><br>WETLAND DELINEATION PER ENV-WE 406 BY:<br>NHDOT (SARAH LARGE AND REBECCA MARTIN) ON 7/9/2019 |           |              |
|  |                     |  |           |              |
| DRAWING NAME   | FEDERAL PROJECT NO. | STATE PROJECT NO.  | SHEET NO. | TOTAL SHEETS |
| 29617fsw   | X-A004(206)         | 29617  | 1         | 15           |

**FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE CONSTRUCTION PLANS**

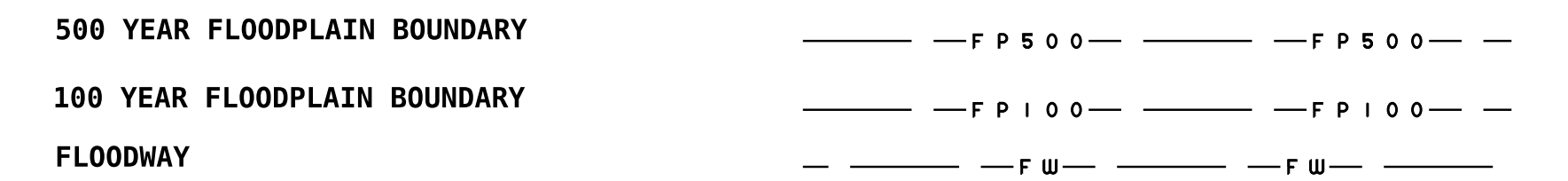
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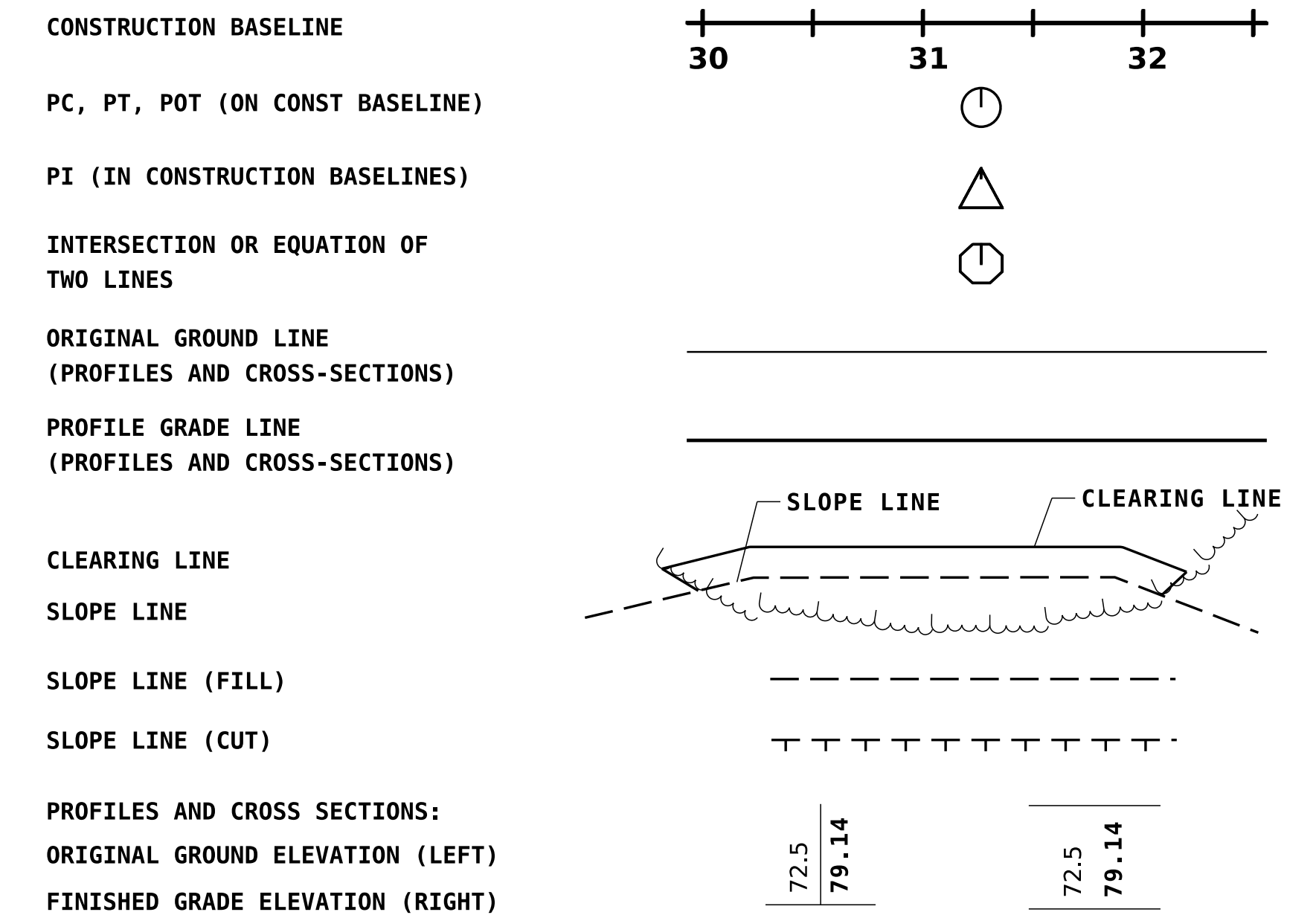
# SHORELAND - WETLAND



# FLOODPLAIN / FLOODWAY



# ENGINEERING

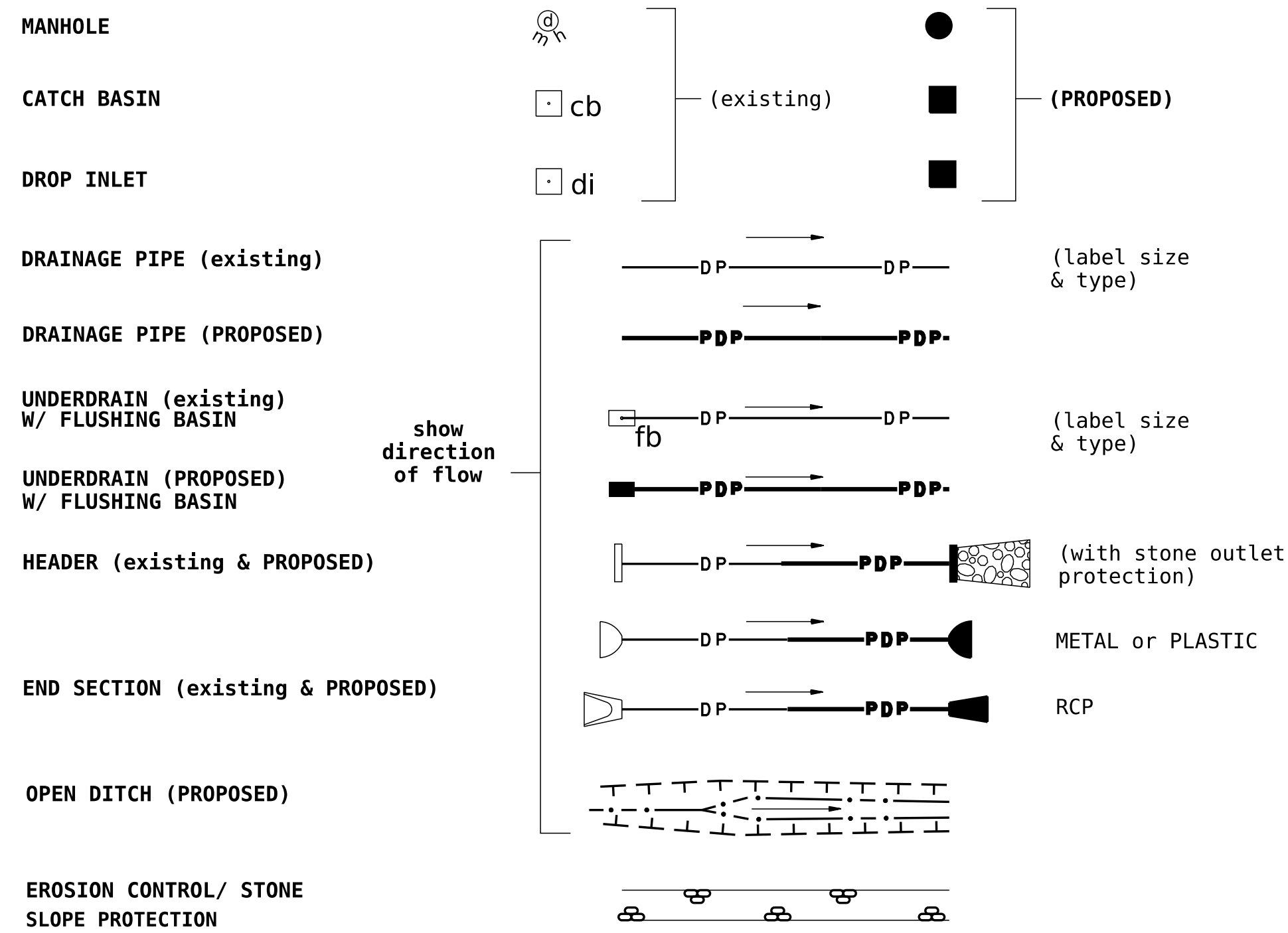


**STATE OF NEW HAMPSHIRE**  
**NEWTON**  
 DEPARTMENT OF TRANSPORTATION o BUREAU OF HIGHWAY DESIGN

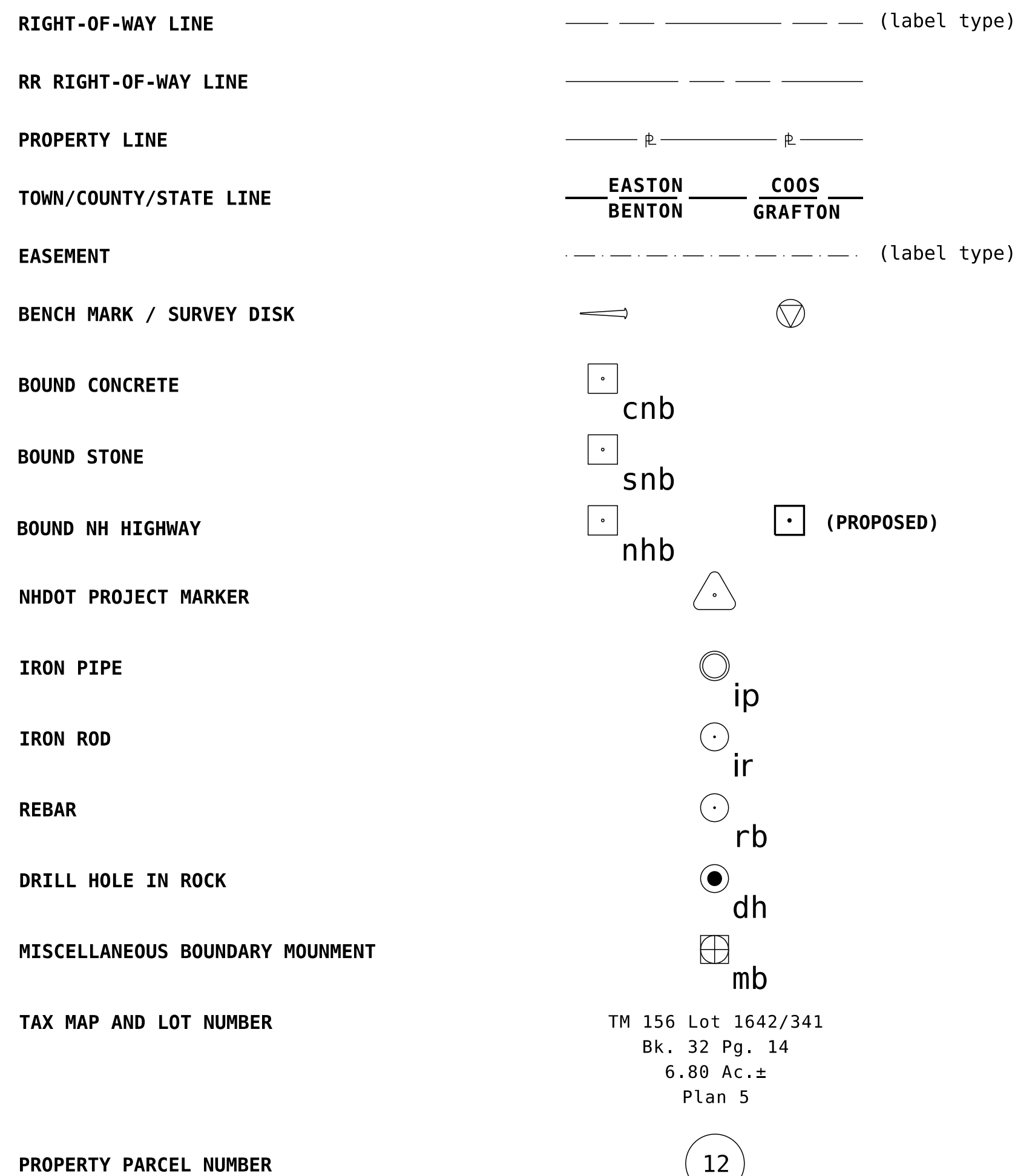
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| REVISION DATE | DGN                 | STATE PROJECT NO. | SHEET NO. | TOTAL SHEETS |
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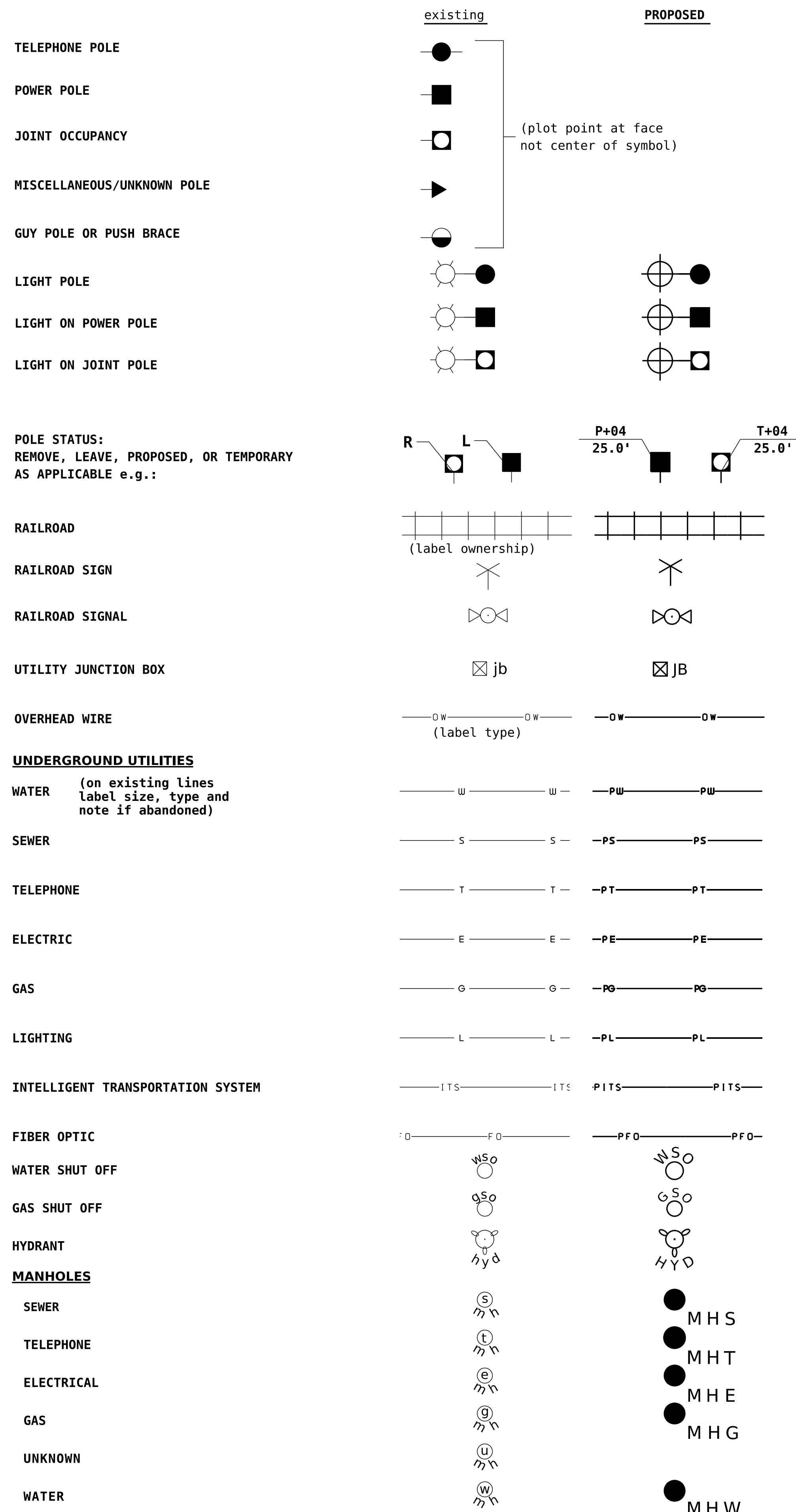
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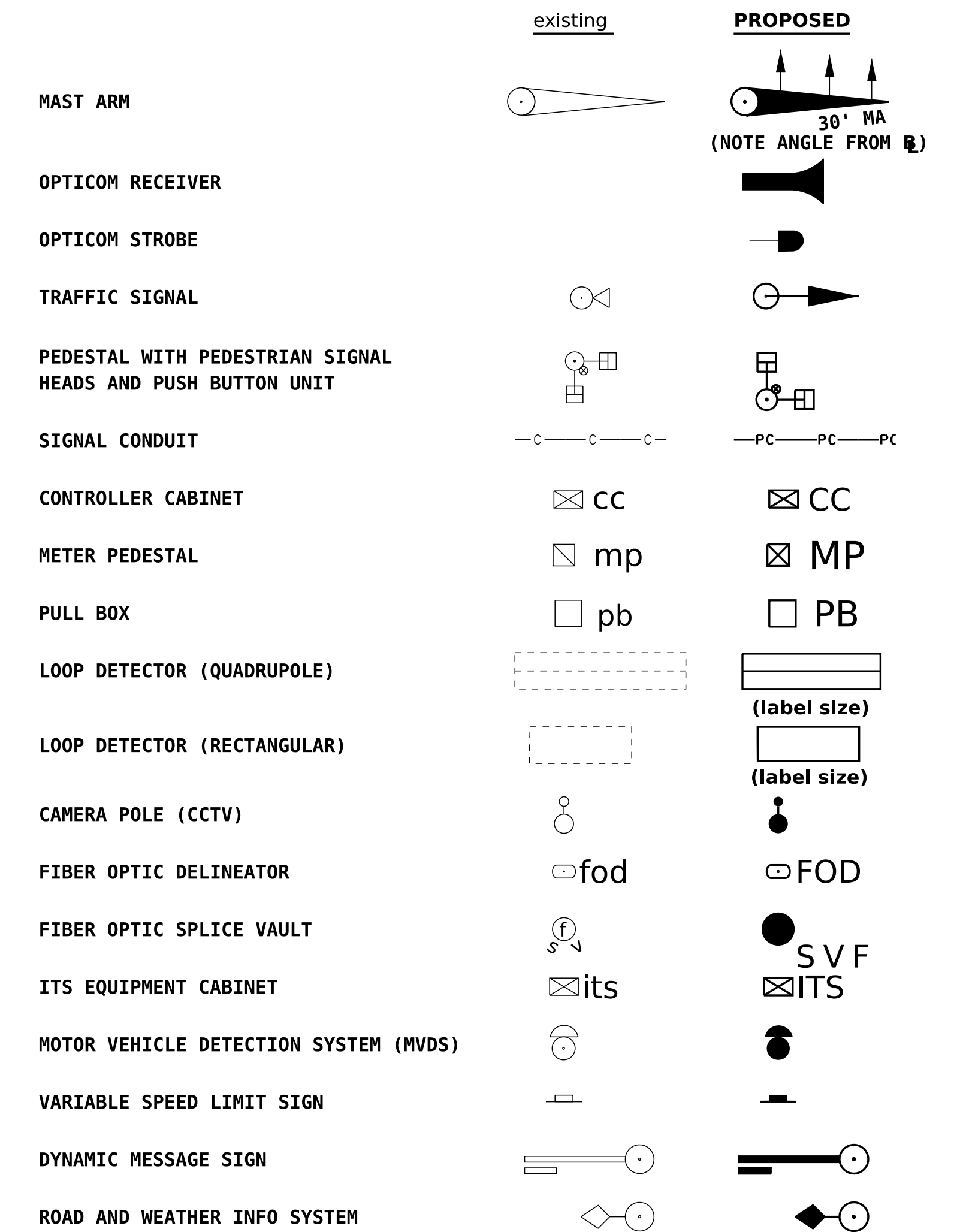
## BOUNDARIES / RIGHT-OF-WAY



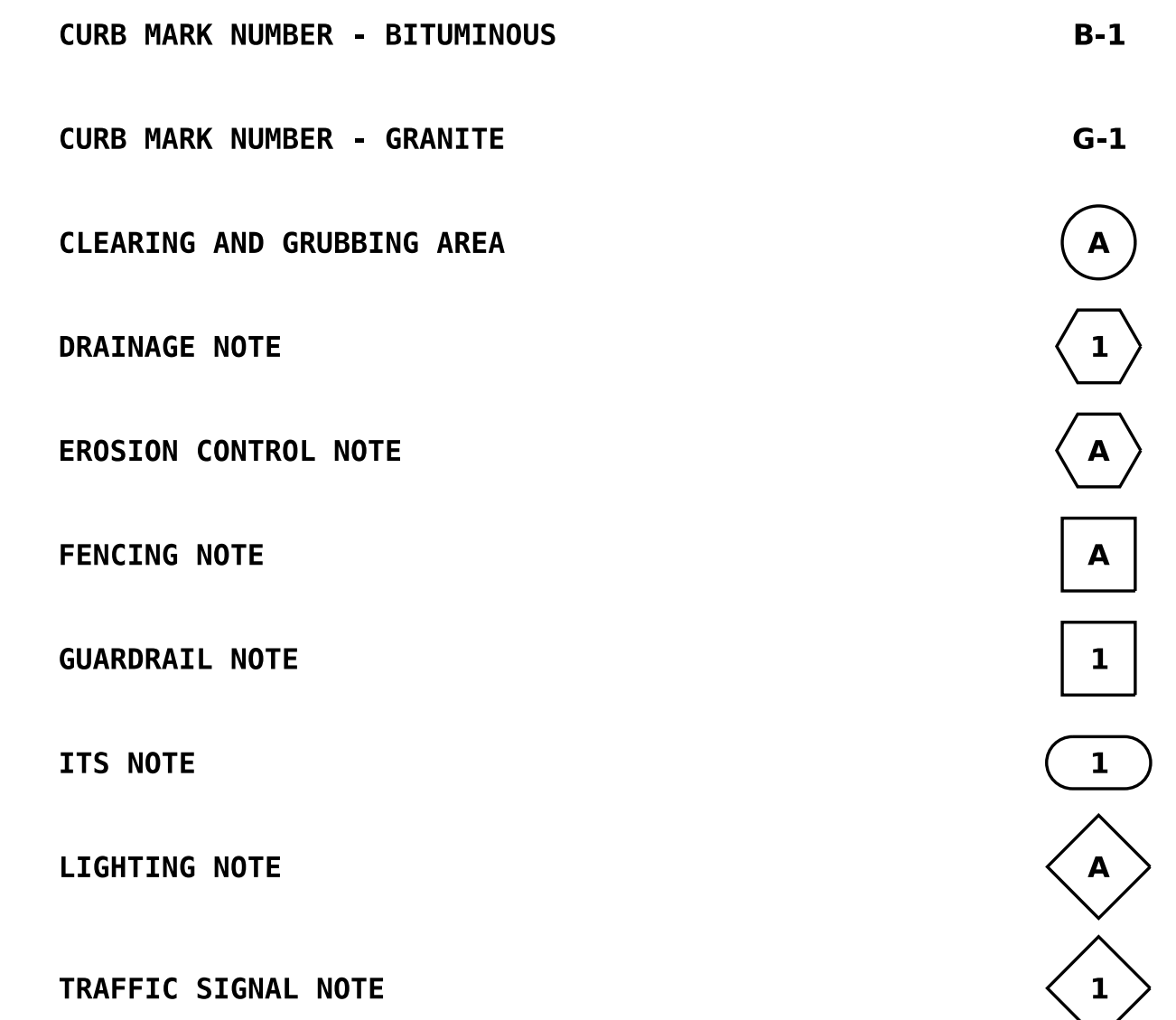
## UTILITIES



## TRAFFIC SIGNALS / ITS



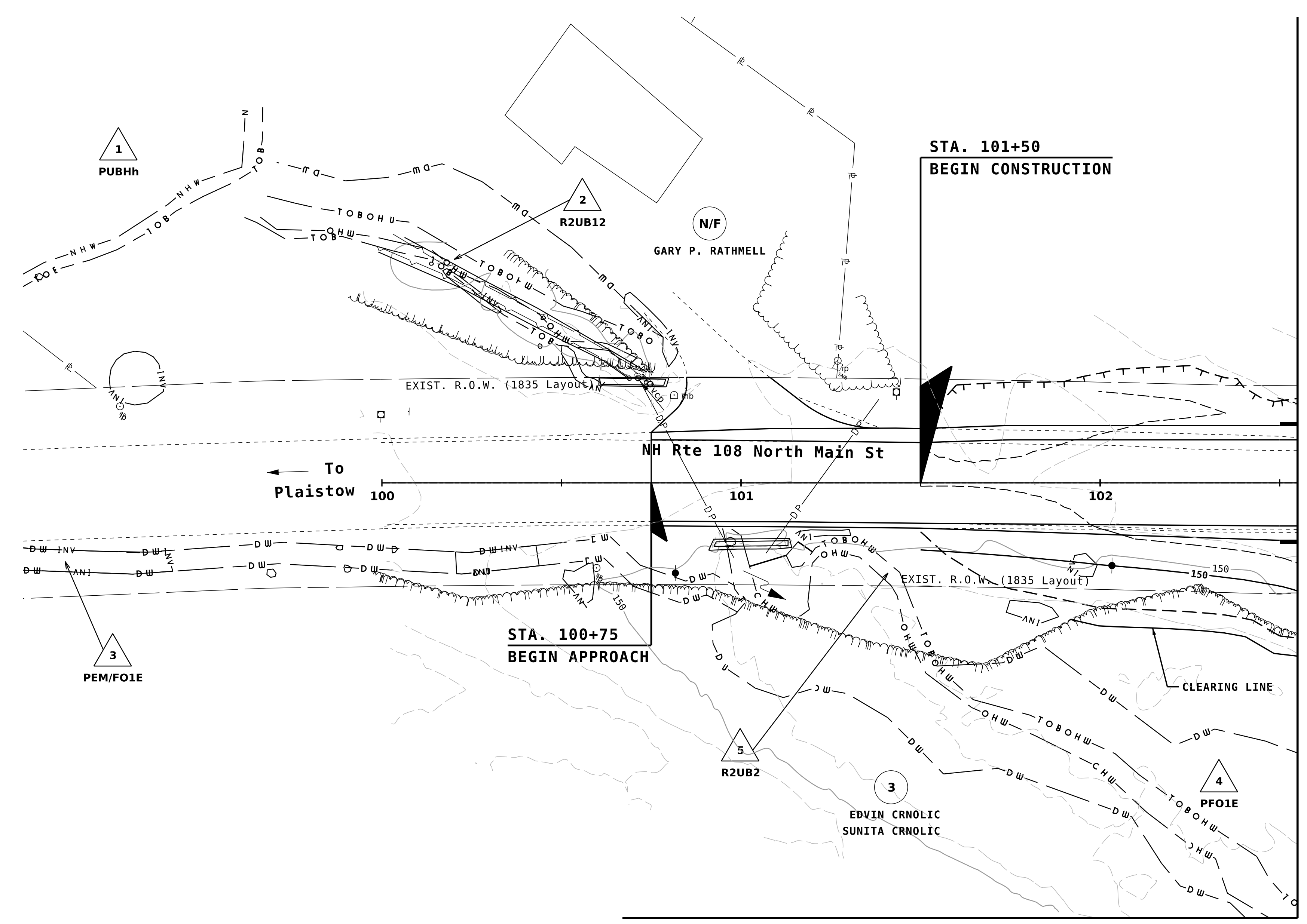
## CONSTRUCTION NOTES



|                               |                     |                          |           |              |
|-------------------------------|---------------------|--------------------------|-----------|--------------|
| <b>STATE OF NEW HAMPSHIRE</b> |                     |                          |           |              |
| <b>NEWTON</b>                 |                     |                          |           |              |
| DEPARTMENT OF TRANSPORTATION  |                     | BUREAU OF HIGHWAY DESIGN |           |              |
| <b>STANDARD SYMBOLS</b>       |                     |                          |           |              |
| REVISION DATE                 | DGN                 | STATE PROJECT NO.        | SHEET NO. | TOTAL SHEETS |
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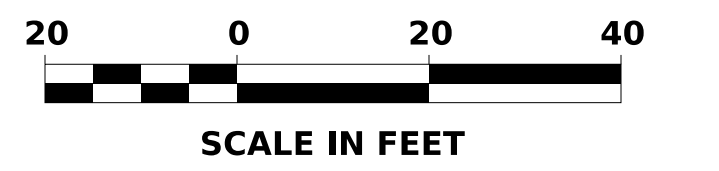
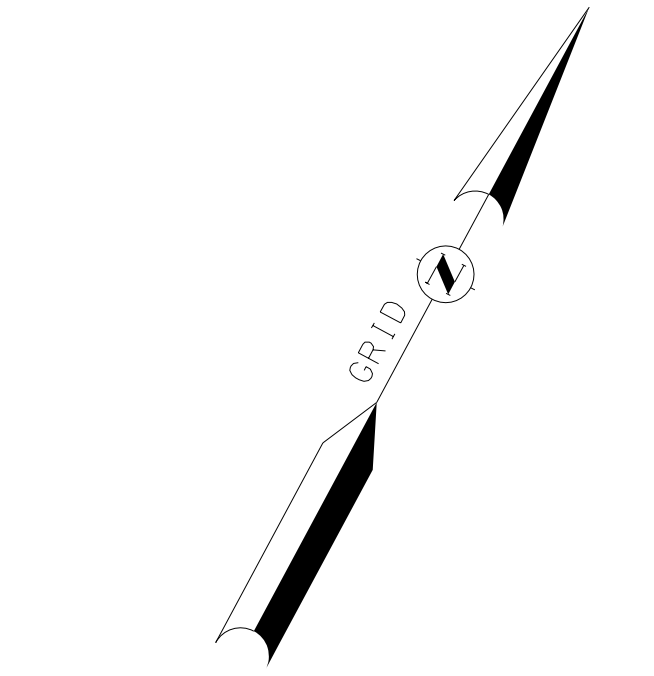


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| NEW DESIGN               |  | NAME2  | DATE | DATE1   | DATE    | DATE2   | DATE    | DATE3   | DATE    |                  |
| SHEET CHECKED            |  | NAME3  | DATE | DATE1   | DATE    | DATE2   | DATE    | DATE3   | DATE    |                  |
| REVISIONS AFTER PROPOSAL |  | NUMBER | DATE | STATION | STATION | STATION | STATION | STATION | STATION | DESCRIPTION      |



MATCH TO SHEET 02

MATCH TO SHEET 04

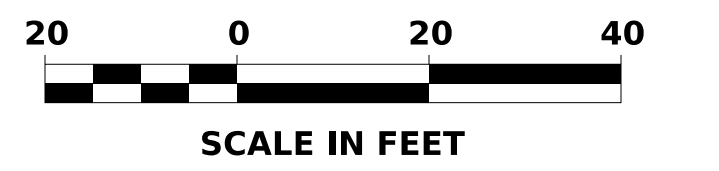
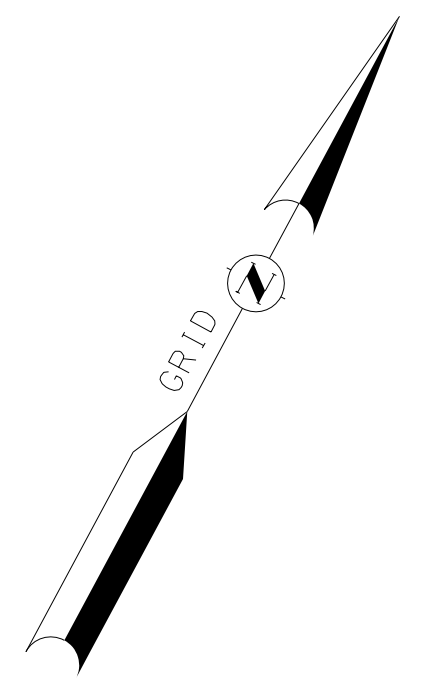
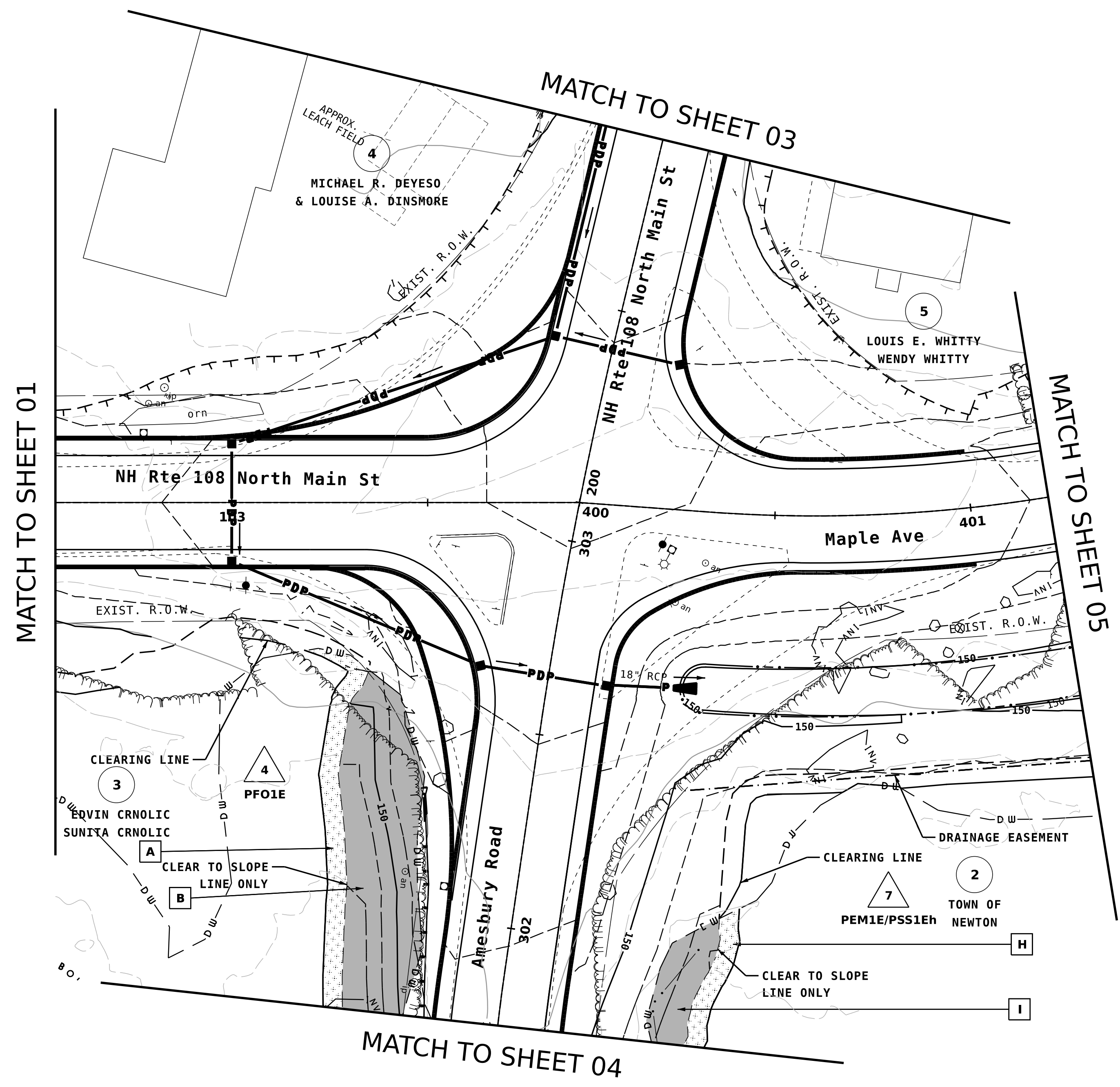


**SHEET 1 - NO WETLAND IMPACTS**

|  |                   |                          |              |
|--|-------------------|--------------------------|--------------|
| STATE OF NEW HAMPSHIRE<br>NEWTON                   |                   |                          |              |
| DEPARTMENT OF TRANSPORTATION                       |                   | BUREAU OF HIGHWAY DESIGN |              |
| <b>WETLAND IMPACT PLANS</b><br><b>SHEET 1 OF 5</b> |                   |                          |              |
| DGN  | STATE PROJECT NO. | SHEET NO.                | TOTAL SHEETS |
| 29617-wetplans                                     | 29617             | 5                        | 15           |



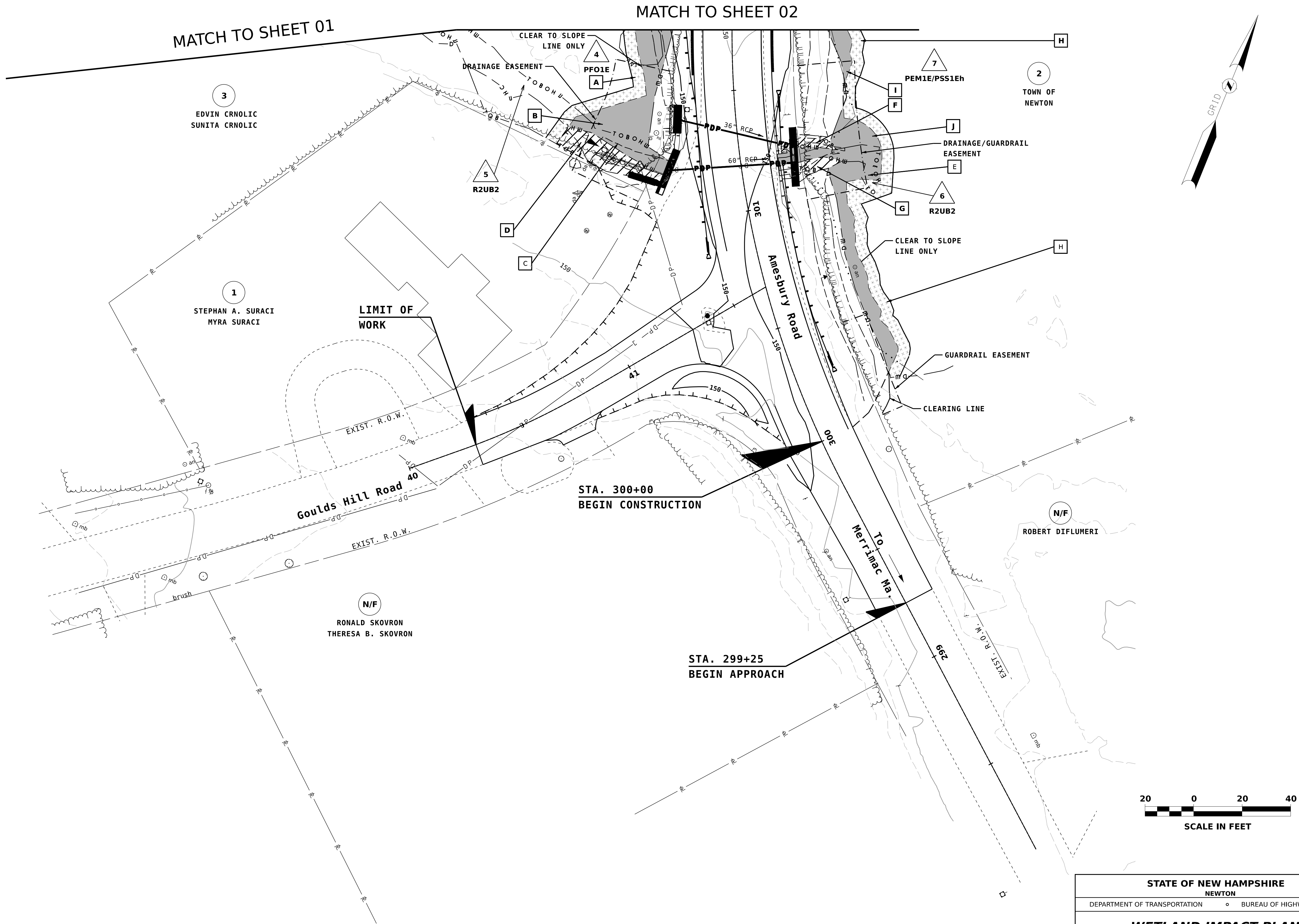
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| NEW DESIGN       |  | NAME2 | DATE | DATE2 | STATION                  | DESCRIPTION |
| SHEET CHECKED    |  | NAME3 | DATE | DATE3 | STATION                  | DESCRIPTION |
| AS BUILT DETAILS |  |       | DATE |       |                          |             |



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| STATE OF NEW HAMPSHIRE<br>NEWTON                   |                   |                          |              |
| DEPARTMENT OF TRANSPORTATION                       |                   | BUREAU OF HIGHWAY DESIGN |              |
| <b>WETLAND IMPACT PLANS</b><br><b>SHEET 2 OF 5</b> |                   |                          |              |
| DGN  | STATE PROJECT NO. | SHEET NO.                | TOTAL SHEETS |
| 29617-wetplans                                     | 29617             | 6                        | 15           |

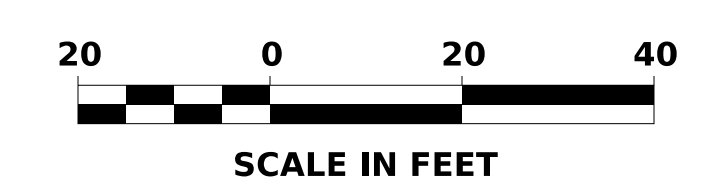
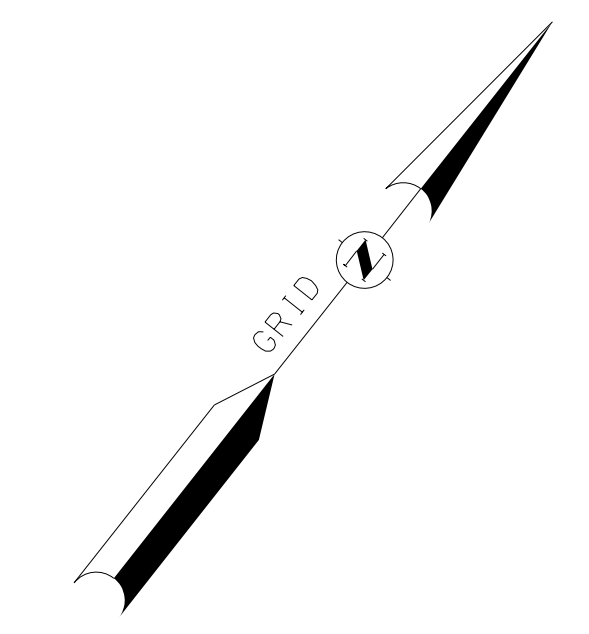
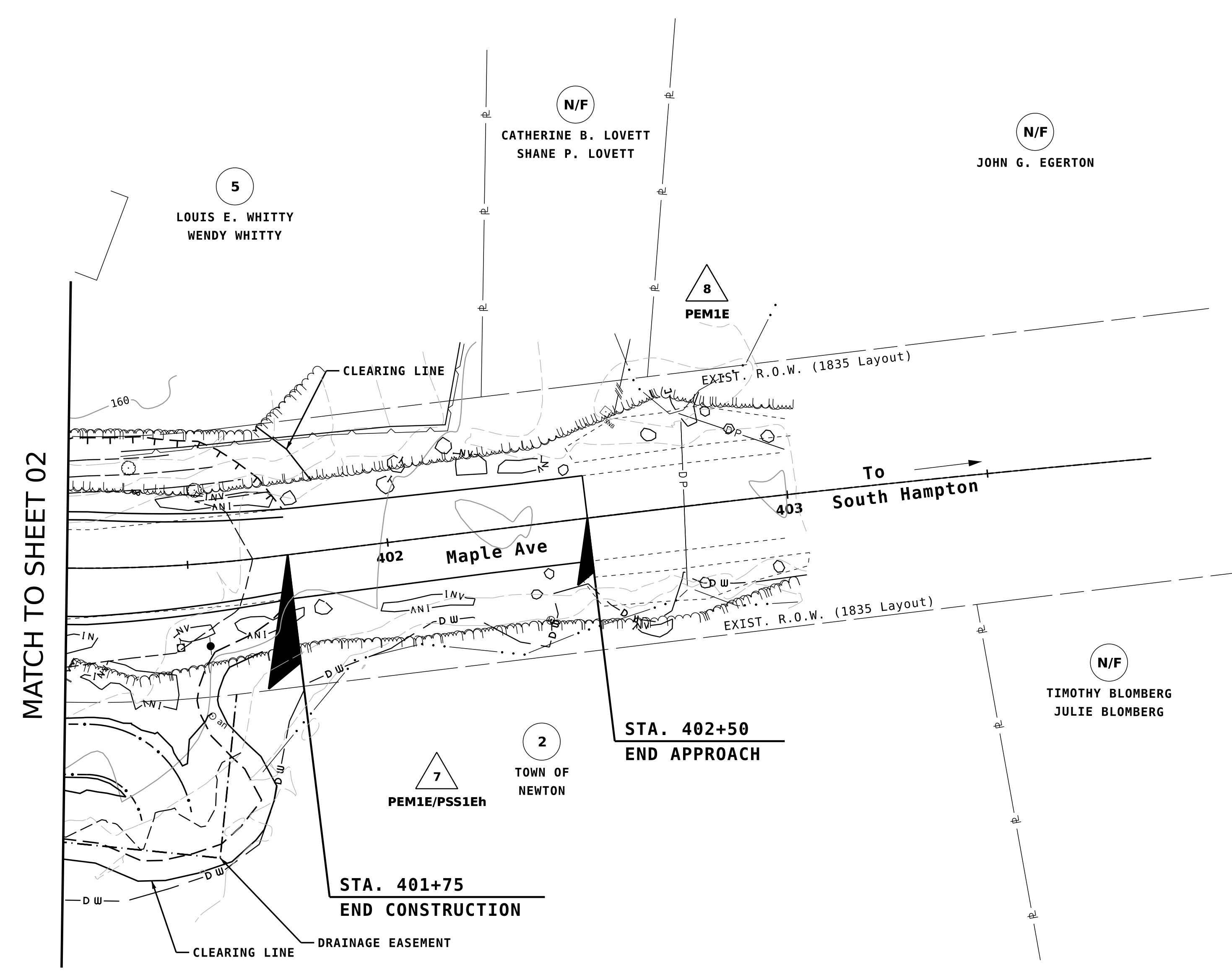


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|--------------------------|--|--------|------|---------|---------|-------------|------|-------|------|
| SDR PROCESSED            |  | NAME1  | DATE | DATE1   | DATE    | DATE2       | DATE | DATE3 | DATE |
| NEW DESIGN               |  | NAME2  | DATE | DATE1   | DATE    | DATE2       | DATE | DATE3 | DATE |
| SHEET CHECKED            |  | NAME3  | DATE | DATE1   | DATE    | DATE2       | DATE | DATE3 | DATE |
| AS BUILT DETAILS         |  |        | DATE |         |         |             |      |       |      |
| REVISIONS AFTER PROPOSAL |  | NUMBER | DATE | STATION | STATION | DESCRIPTION |      |       |      |



|  |                   |                          |              |
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| STATE OF NEW HAMPSHIRE<br>NEWTON                   |                   |                          |              |
| DEPARTMENT OF TRANSPORTATION                       |                   | BUREAU OF HIGHWAY DESIGN |              |
| <b>WETLAND IMPACT PLANS</b><br><b>SHEET 4 OF 5</b> |                   |                          |              |
| DGN  | STATE PROJECT NO. | SHEET NO.                | TOTAL SHEETS |
| 29617-wetplans                                     | 29617             | 8                        | 15           |

|                  |  |       |      |       |        |      |         |         |             |
|------------------|--|-------|------|-------|--------|------|---------|---------|-------------|
| SDR PROCESSED    |  | NAME1 | DATE | DATE1 | NUMBER | DATE | STATION | STATION | DESCRIPTION |
| NEW DESIGN       |  | NAME2 | DATE | DATE2 |        |      |         |         |             |
| SHEET CHECKED    |  | NAME3 | DATE | DATE3 |        |      |         |         |             |
| AS BUILT DETAILS |  |       | DATE |       |        |      |         |         |             |



**SHEET 5 - NO WETLAND IMPACTS**

|                               |                   |                          |              |
|-------------------------------|-------------------|--------------------------|--------------|
| <b>STATE OF NEW HAMPSHIRE</b> |                   |                          |              |
| NEWTON                        |                   |                          |              |
| DEPARTMENT OF TRANSPORTATION  |                   | BUREAU OF HIGHWAY DESIGN |              |
| <b>WETLAND IMPACT PLANS</b>   |                   |                          |              |
| <b>SHEET 5 OF 5</b>           |                   |                          |              |
| DGN                           | STATE PROJECT NO. | SHEET NO.                | TOTAL SHEETS |
| 29617-wetplans                | 29617             | 9                        | 15           |

# 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 October 15<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 October 15<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 October 15<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.

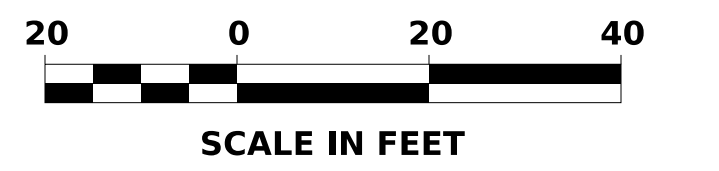
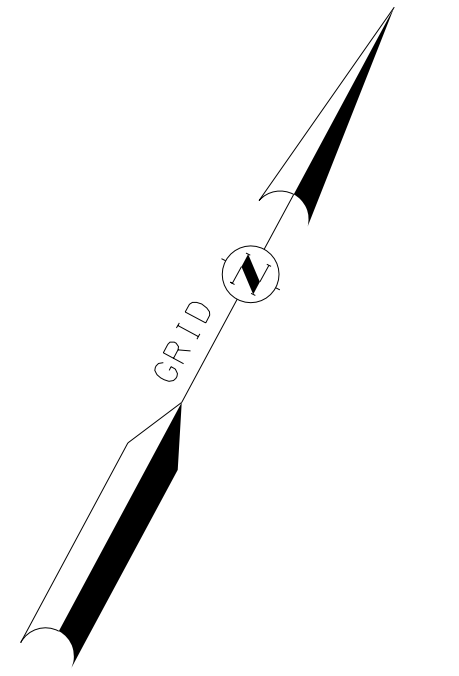
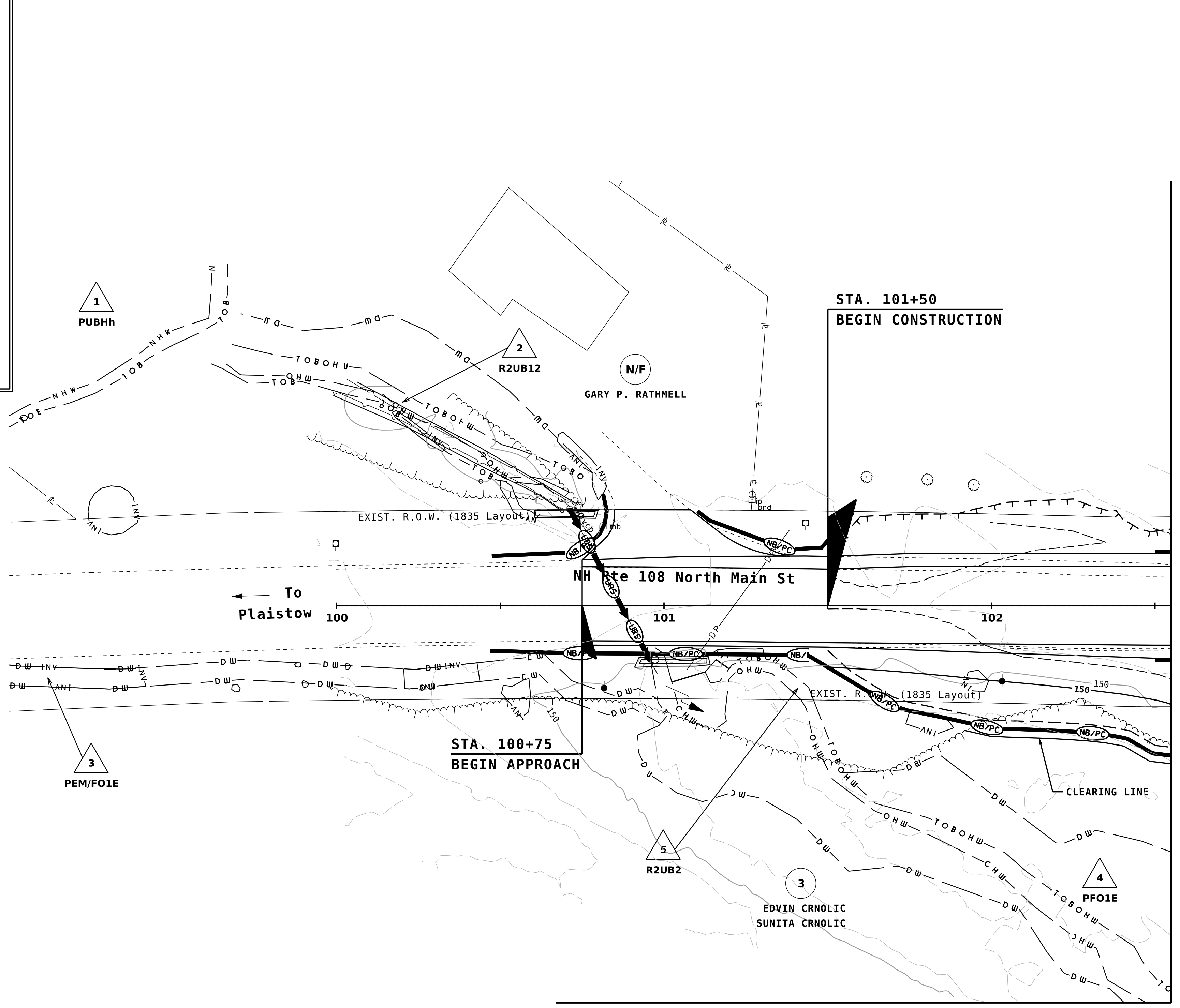
**STATE OF NEW HAMPSHIRE**  
**NEWTON**  
DEPARTMENT OF TRANSPORTATION      BUREAU OF HIGHWAY DESIGN

**EROSION CONTROL PLANS**

| REVISION DATE           | DGN               | STATE PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|-------------------------|-------------------|-------------------|-----------|--------------|
| erosstrat-ce 02-29-2024 | 29617-erostrat-ce | 29617             | 10        | 15           |

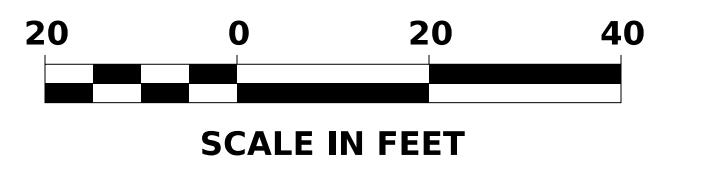
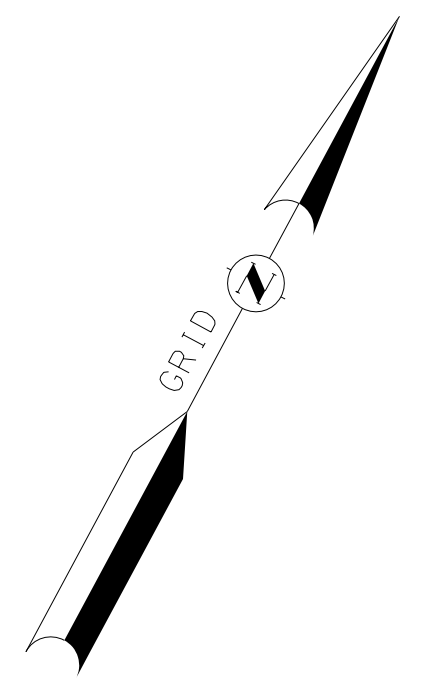
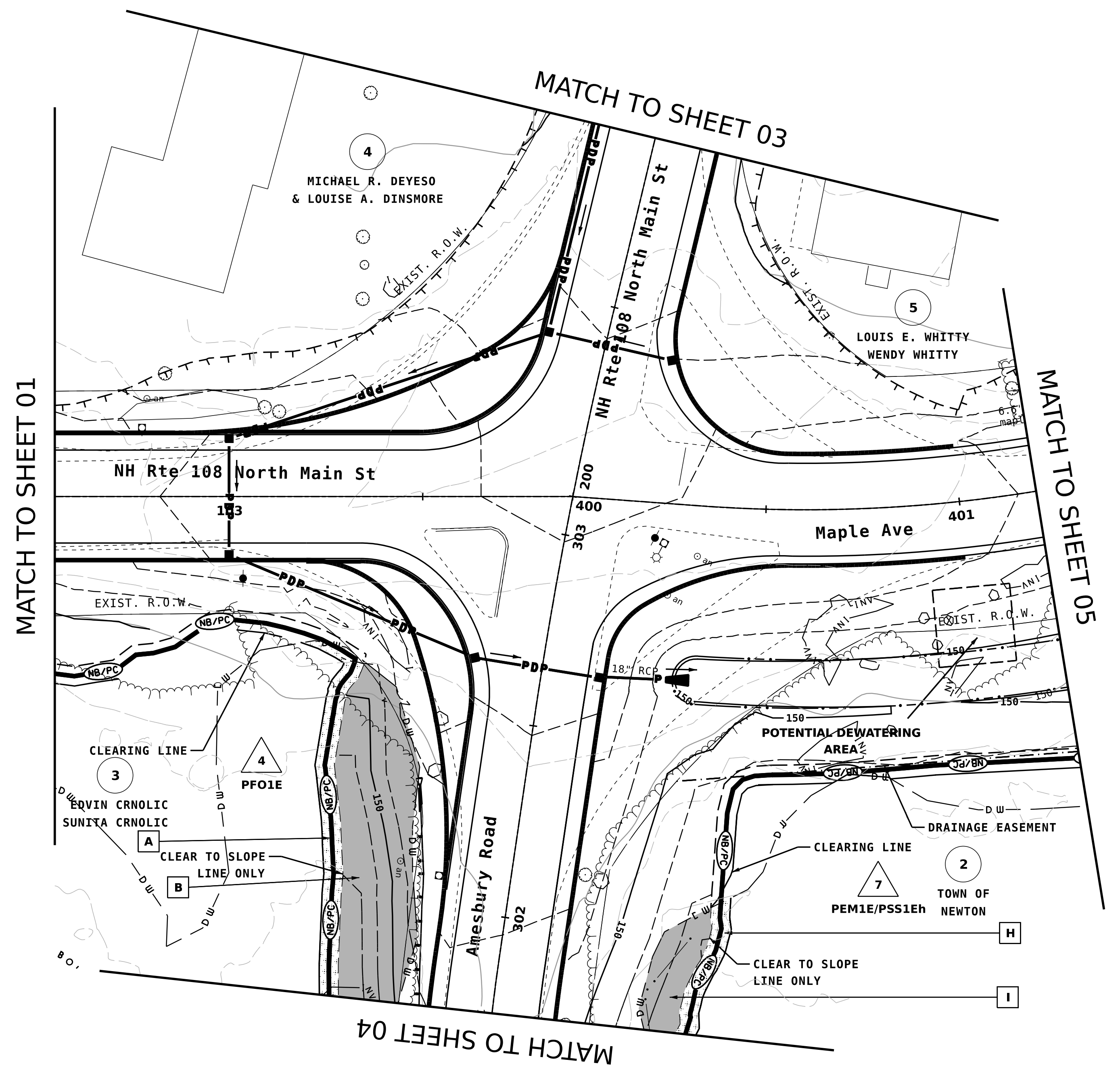
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|                          | NAME2       | DATE2   | DATE    | DATE | DATE   |
| NEW DESIGN               | NAME3       | DATE3   | DATE    | DATE | DATE   |
|                          | NAME4       | DATE4   | DATE    | DATE | DATE   |
| AS BUILT DETAILS         |             |         |         |      |        |
| REVISIONS AFTER PROPOSAL | DESCRIPTION | STATION | STATION | DATE | NUMBER |
|                          |             |         |         |      |        |

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

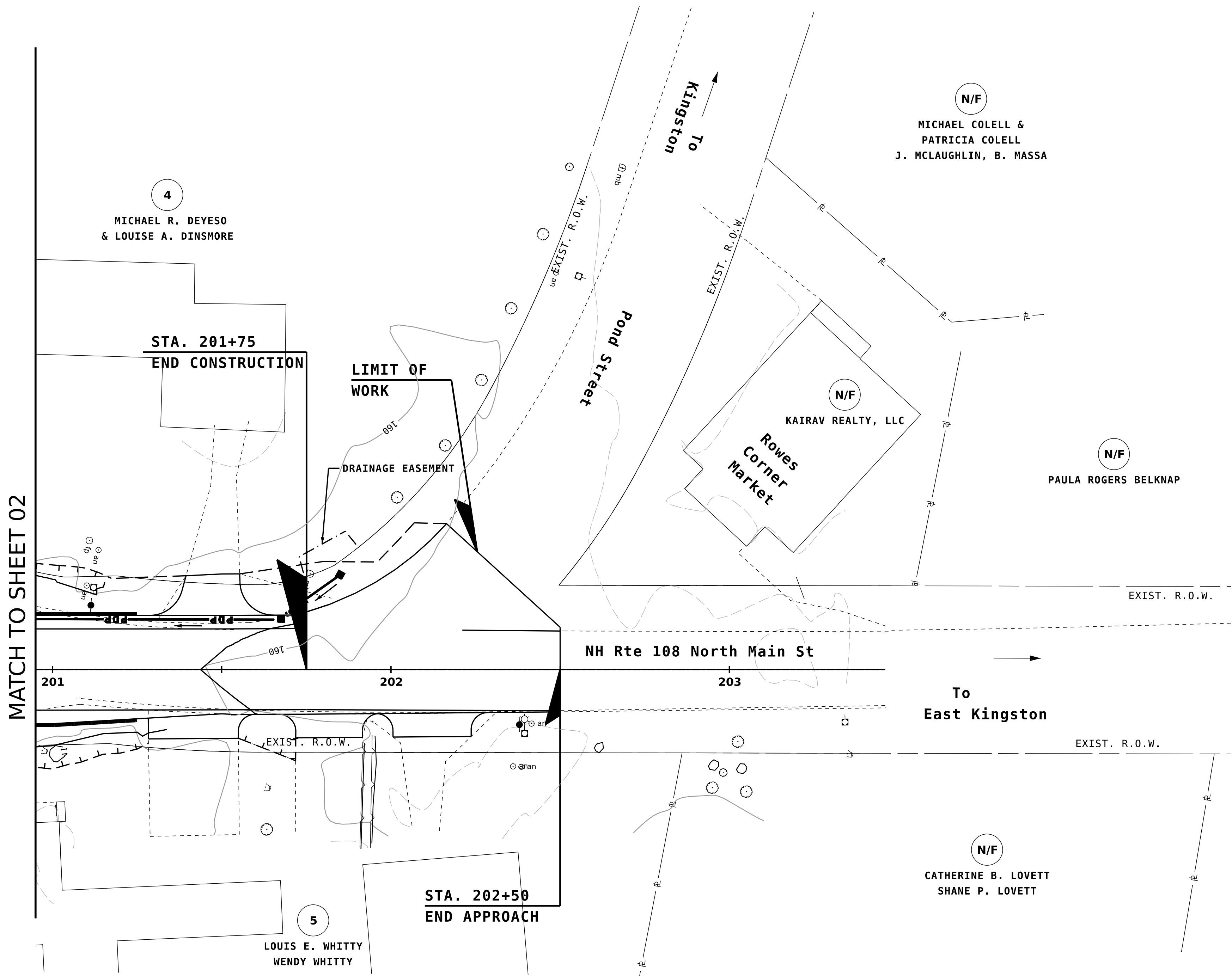
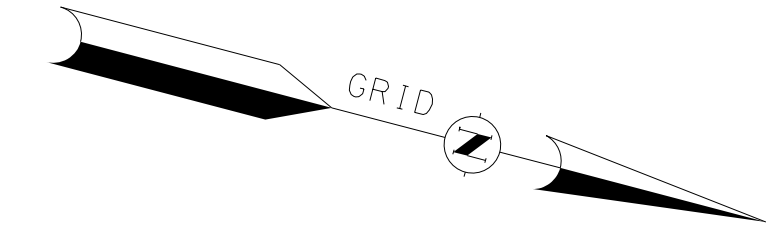


|   |                   |                          |              |
|---|-------------------|--------------------------|--------------|
| STATE OF NEW HAMPSHIRE<br>NEWTON                    |                   |                          |              |
| DEPARTMENT OF TRANSPORTATION                        |                   | BUREAU OF HIGHWAY DESIGN |              |
| <b>EROSION CONTROL PLANS</b><br><b>SHEET 1 OF 5</b> |                   |                          |              |
| DGN   | STATE PROJECT NO. | SHEET NO.                | TOTAL SHEETS |
| 29617-eroplans                                      | 29617             | 11                       | 15           |

|                  |  |       |      |       |                          |             |
|------------------|--|-------|------|-------|--------------------------|-------------|
| SDR PROCESSED    |  | NAME1 | DATE | DATE1 | REVISIONS AFTER PROPOSAL |             |
| NEW DESIGN       |  | NAME2 | DATE | DATE2 | NUMBER                   | STATION     |
| SHEET CHECKED    |  | NAME3 | DATE | DATE3 | DATE                     | DESCRIPTION |
| AS BUILT DETAILS |  |       | DATE |       |                          |             |



|   |                   |                          |              |
|---|-------------------|--------------------------|--------------|
| STATE OF NEW HAMPSHIRE<br>NEWTON                    |                   |                          |              |
| DEPARTMENT OF TRANSPORTATION                        |                   | BUREAU OF HIGHWAY DESIGN |              |
| <b>EROSION CONTROL PLANS</b><br><b>SHEET 2 OF 5</b> |                   |                          |              |
| DGN   | STATE PROJECT NO. | SHEET NO.                | TOTAL SHEETS |
| 29617-eroplans                                      | 29617             | 12                       | 15           |



| SDR PROCESSED    |      | REVISIONS AFTER PROPOSAL |         |
|------------------|------|--------------------------|---------|
| NAME1            | DATE | NUMBER                   | STATION |
| NAME2            | DATE |                          |         |
| NAME3            | DATE |                          |         |
| AS BUILT DETAILS |      |                          |         |

**STATE OF NEW HAMPSHIRE**  
NEWTON

DEPARTMENT OF TRANSPORTATION    BUREAU OF HIGHWAY DESIGN

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**EROSION CONTROL PLANS**  
**SHEET 3 OF 5**

| DGN            | STATE PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|----------------|-------------------|-----------|--------------|
| 29617-eroplans | 29617             | 13        | 15           |

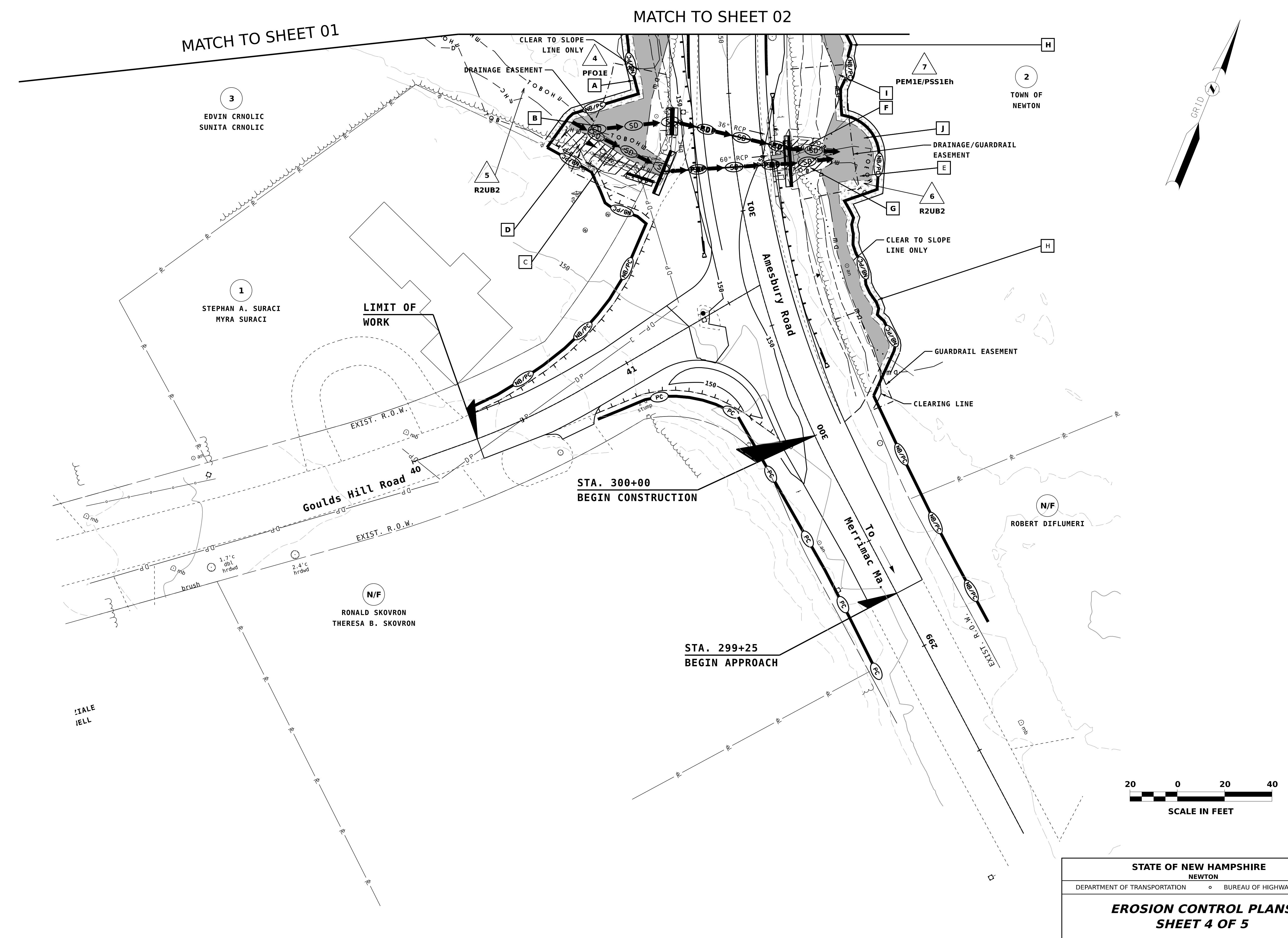


|               |                  |      |       |         |             |
|---------------|------------------|------|-------|---------|-------------|
| SDR PROCESSED | NAME1            | DATE | DATE1 | STATION | DESCRIPTION |
|               | NAME2            | DATE | DATE2 |         |             |
| SHEET CHECKED | NAME3            | DATE | DATE3 | NUMBER  | DATE        |
|               | AS BUILT DETAILS |      |       |         |             |

REVISIONS AFTER PROPOSAL

|        |      |         |             |
|--------|------|---------|-------------|
| NUMBER | DATE | STATION | DESCRIPTION |
|        |      |         |             |
|        |      |         |             |
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|      |      |      |      |
|------|------|------|------|
| DATE | DATE | DATE | DATE |
|      |      |      |      |

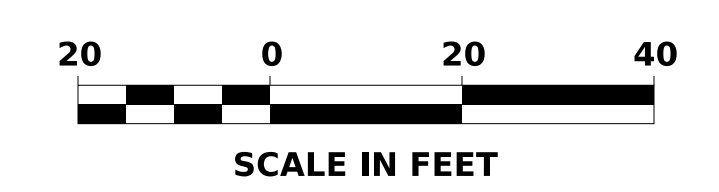
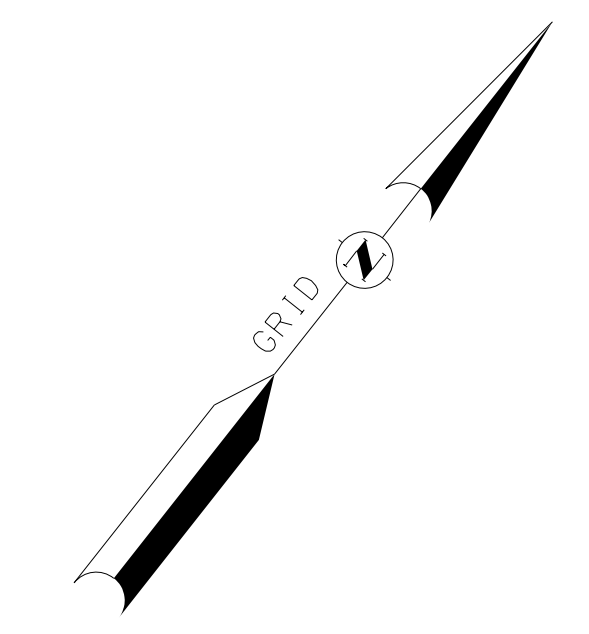
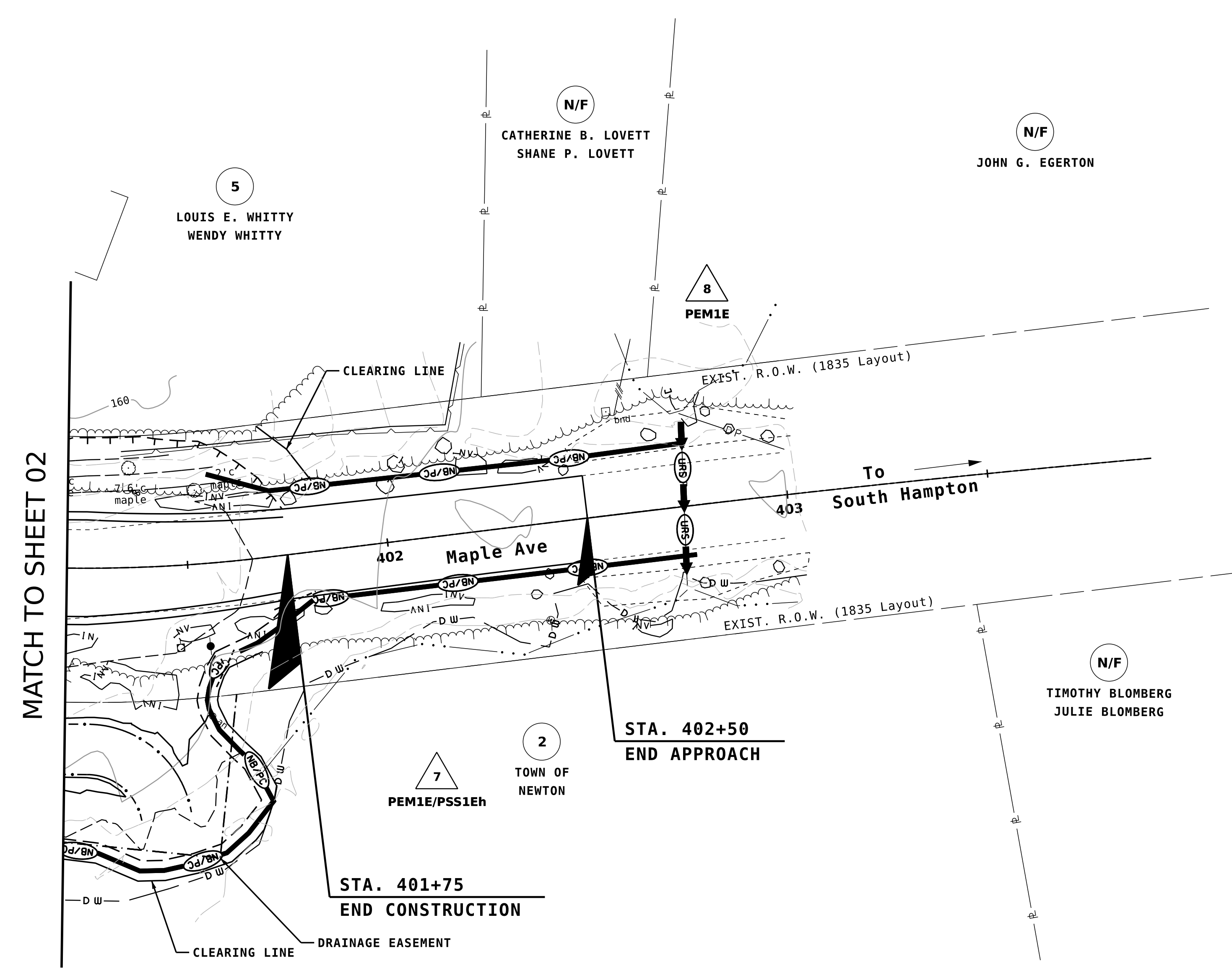


**STATE OF NEW HAMPSHIRE**  
NEWTON  
DEPARTMENT OF TRANSPORTATION     BUREAU OF HIGHWAY DESIGN

**EROSION CONTROL PLANS**  
**SHEET 4 OF 5**

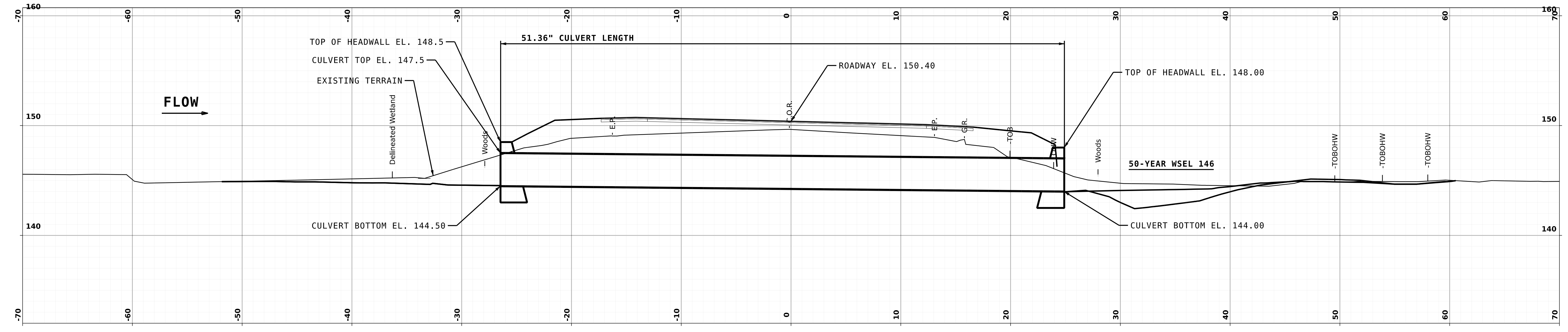
|                |                   |           |              |
|----------------|-------------------|-----------|--------------|
| DGN            | STATE PROJECT NO. | SHEET NO. | TOTAL SHEETS |
| 29617-eroplans | 29617             | 14        | 15           |

|                  |  |       |      |       |                          |             |
|------------------|--|-------|------|-------|--------------------------|-------------|
| SDR PROCESSED    |  | NAME1 | DATE | DATE1 | REVISIONS AFTER PROPOSAL |             |
| NEW DESIGN       |  | NAME2 | DATE | DATE2 | STATION                  | DESCRIPTION |
| SHEET CHECKED    |  | NAME3 | DATE | DATE3 | STATION                  | DESCRIPTION |
| AS BUILT DETAILS |  |       | DATE |       | NUMBER                   | DATE        |

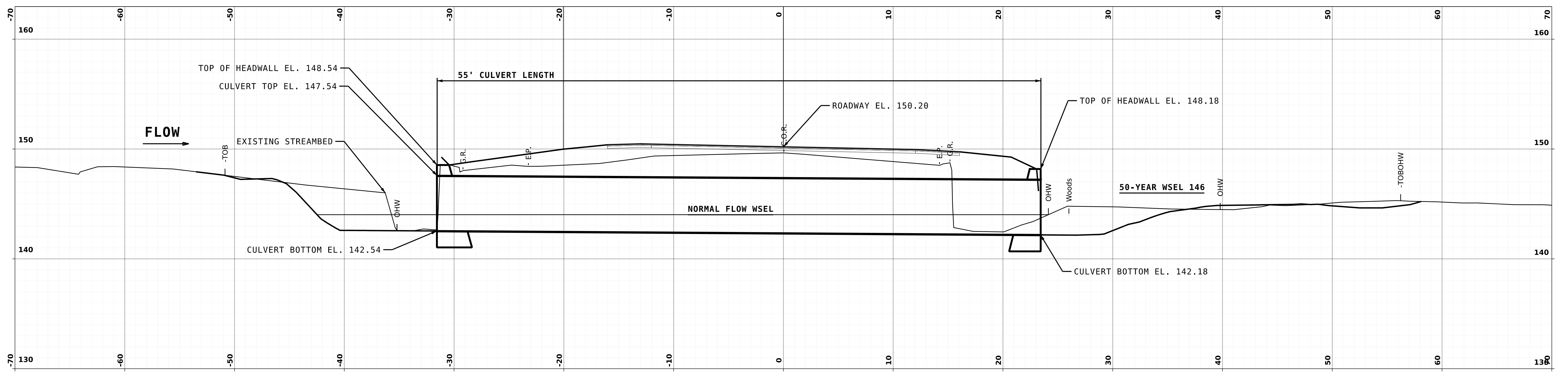
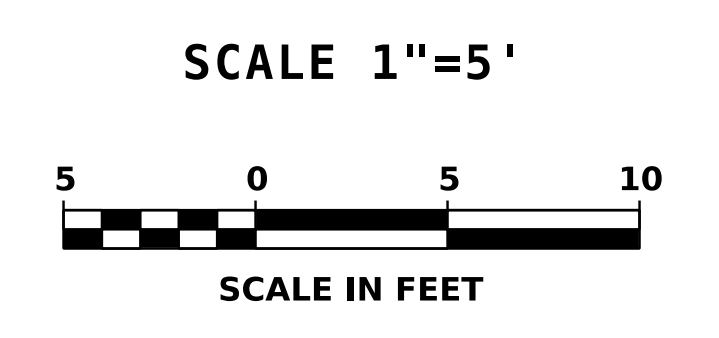


|   |                   |                          |              |
|---|-------------------|--------------------------|--------------|
| STATE OF NEW HAMPSHIRE<br>NEWTON                    |                   |                          |              |
| DEPARTMENT OF TRANSPORTATION                        |                   | BUREAU OF HIGHWAY DESIGN |              |
| <b>EROSION CONTROL PLANS</b><br><b>SHEET 5 OF 5</b> |                   |                          |              |
| DGN   | STATE PROJECT NO. | SHEET NO.                | TOTAL SHEETS |
| 29617-eroplans                                      | 29617             | 15                       | 15           |

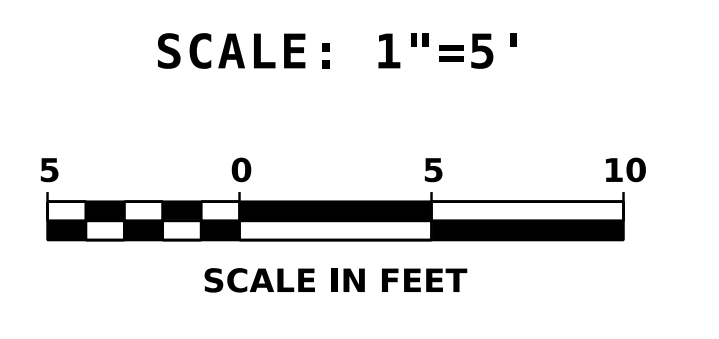
|                  |  |       |      |       |                          |             |
|------------------|--|-------|------|-------|--------------------------|-------------|
| SDR PROCESSED    |  | NAME1 | DATE | DATE1 | REVISIONS AFTER PROPOSAL |             |
| NEW DESIGN       |  | NAME2 | DATE | DATE2 | STATION                  | DESCRIPTION |
| SHEET CHECKED    |  | NAME3 | DATE | DATE3 | STATION                  | DESCRIPTION |
| AS BUILT DETAILS |  |       | DATE |       |                          |             |



### 36" CULVERT PROFILE



### 60" CULVERT PROFILE



|                               |                   |                                |              |
|-------------------------------|-------------------|--------------------------------|--------------|
| <b>STATE OF NEW HAMPSHIRE</b> |                   |                                |              |
| <b>NEWTON</b>                 |                   |                                |              |
| DEPARTMENT OF TRANSPORTATION  |                   | BUREAU OF MATERIALS & RESEARCH |              |
| <b>CULVERT PROFILES</b>       |                   |                                |              |
| DGN                           | STATE PROJECT NO. | SHEET NO.                      | TOTAL SHEETS |
| 29617-Amesbury-XS             | 29617             | 1                              | 1            |