



WETLANDS PERMIT APPLICATION

Water Division/ Wetlands Bureau
Land Resources Management



Check the status of your application: www.des.nh.gov/onestop

RSA/Rule: [RSA 482-A/ Env-Wt 100-900](#)

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

1. REVIEW TIME: Indicate your Review Time below. To determine review time, refer to [Guidance Document A](#) for instructions.

- Standard Review (Minimum, Minor or Major Impact) Expedited Review (Minimum Impact only)

2. MITIGATION REQUIREMENT:
If mitigation is required a Mitigation-Pre Application meeting must occur prior to submitting this Wetlands Permit Application. To determine if Mitigation is Required, please refer to the [Determine if Mitigation is Required Frequently Asked Question](#).

Mitigation Pre-Application Meeting Date: Month: ___ Day: ___ Year: ____
 N/A - Mitigation is not required

3. PROJECT LOCATION:
Separate wetland permit applications must be submitted for each municipality that wetland impacts occur within.

ADDRESS: **NH ROUTE 16** TOWN/CITY: **ERROL**

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

USGS TOPO MAP WATERBODY NAME: **Magalloway River** NA STREAM WATERSHED SIZE: NA

LOCATION COORDINATES (If known): **44°49'08.3"N 71°05'01.7"W** Latitude/Longitude

4. PROJECT DESCRIPTION:
Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.

This project along NH 16 is approximately 1550 LF in length along the western slope of the Magalloway River. This segment was identified as requiring slope stabilization since initial erosion and failures were observed in 2011. The temporary relocation of Route 16 westward onto the USF&W property necessitates a permanent solution. The project proposes to realign a portion of roadway and repair the failed roadway slope alongside the river.

5. SHORELINE FRONTAGE:
 NA This does not have shoreline frontage. SHORELINE FRONTAGE: **1182 LF**
Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

6. RELATED NHDES LAND RESOURCES MANAGEMENT PERMIT APPLICATIONS ASSOCIATED WITH THIS PROJECT:
Please indicate if any of the following permit applications are required and, if required, the status of the application. To determine if other Land Resources Management Permits are required, refer to the [Land Resources Management Web Page](#).

Permit Type	Permit Required	File Number	Permit Application Status
Alteration of Terrain Permit Per RSA 485-A:17	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Individual Sewerage Disposal per RSA 485-A:2	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Subdivision Approval Per RSA 485-A	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Shoreland Permit Per RSA 483-B	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED

7. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:
See the Instructions & Required Attachments document for instructions to complete a & b below.

- a. Natural Heritage Bureau File ID: NHB 17 - 3089
- b. [Designated River](#) the project is in ¼ miles of _____; and date a copy of the application was sent to the [Local River Management Advisory Committee](#): Month: ___ Day: ___ Year: ____
 N/A

8. APPLICANT INFORMATION (Desired permit holder)

LAST NAME, FIRST NAME, M.I.: **STATE OF NEW HAMPSHIRE**

TRUST / COMPANY NAME: **NH DEPT OF TRANSPORTATION** MAILING ADDRESS: **7 HAZEN DRIVE**

TOWN/CITY: **CONCORD** STATE: **NH** ZIP CODE: **03302**

EMAIL or FAX: **603-271-7025** PHONE: **603-271-2171**

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

9. PROPERTY OWNER INFORMATION (If different than applicant)

LAST NAME, FIRST NAME, M.I.:

TRUST / COMPANY NAME: MAILING ADDRESS:

TOWN/CITY: STATE: ZIP CODE:

EMAIL or FAX: PHONE:

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

10. AUTHORIZED AGENT INFORMATION

LAST NAME, FIRST NAME, M.I.: COMPANY NAME:

MAILING ADDRESS:

TOWN/CITY: STATE: ZIP CODE:

EMAIL or FAX: PHONE:


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

11. PROPERTY OWNER SIGNATURE:

See the Instructions & Required Attachments document for clarification of the below statements

By signing the application, I am certifying that:

1. I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application.
2. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document.
3. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900.
4. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type.
5. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative.
6. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47.
7. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance.
8. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project.
9. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate.
10. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action.
11. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining.
12. The mailing addresses I have provided are up to date and appropriate for receipt of NHDES correspondence. NHDES will not forward returned mail.

 Property Owner Signature	Tobey Reynolds Print name legibly	4/30/18 Date
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MUNICIPAL SIGNATURES

12. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.

	Print name legibly	Date
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DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review **ONLY** requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will be reviewed in the standard review time frame.

13. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), 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.

	Print name legibly	Town/City	Date
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DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will **NOT** receive the expedited review time.
2. **IMMEDIATELY** sign the original application form and four copies in the signature space provided above;
3. 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.
4. **IMMEDIATELY** distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

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

14. IMPACT AREA:

For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact

Permanent: impacts that will remain after the project is complete.

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

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.	ATF	TEMPORARY Sq. Ft. / Lin. Ft.	ATF
Forested wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Scrub-shrub wetland	1088	<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Emergent wetland	1049	<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Wet meadow		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Intermittent stream		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Perennial Stream / River	958 / 203	<input type="checkbox"/> ATF	2319 / 230	<input type="checkbox"/> ATF
Lake / Pond	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Bank - Intermittent stream	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Bank - Perennial stream / River	2379 / 210	<input type="checkbox"/> ATF	2222 / 594	<input type="checkbox"/> ATF
Bank - Lake / Pond	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Tidal water	/	<input type="checkbox"/> ATF	/	<input type="checkbox"/> ATF
Salt marsh		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Sand dune		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Prime wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Prime wetland buffer		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Undeveloped Tidal Buffer Zone (TBZ)		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Previously-developed upland in TBZ		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - Lake / Pond		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - River		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Docking - Tidal Water		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Vernal Pool		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
TOTAL	5474 / 413		4541 / 824	

15. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

Minimum Impact Fee: Flat fee of \$ 200

Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking) 10015 sq. ft. X \$0.20 = \$ 2003

Temporary (seasonal) docking structure: _____ sq. ft. X \$1.00 = \$

Permanent docking structure: _____ sq. ft. X \$2.00 = \$

Projects proposing shoreline structures (including docks) add \$200 = \$

Total = \$ 2003

The Application Fee is the above calculated Total or \$200, whichever is greater = \$ 2003

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

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

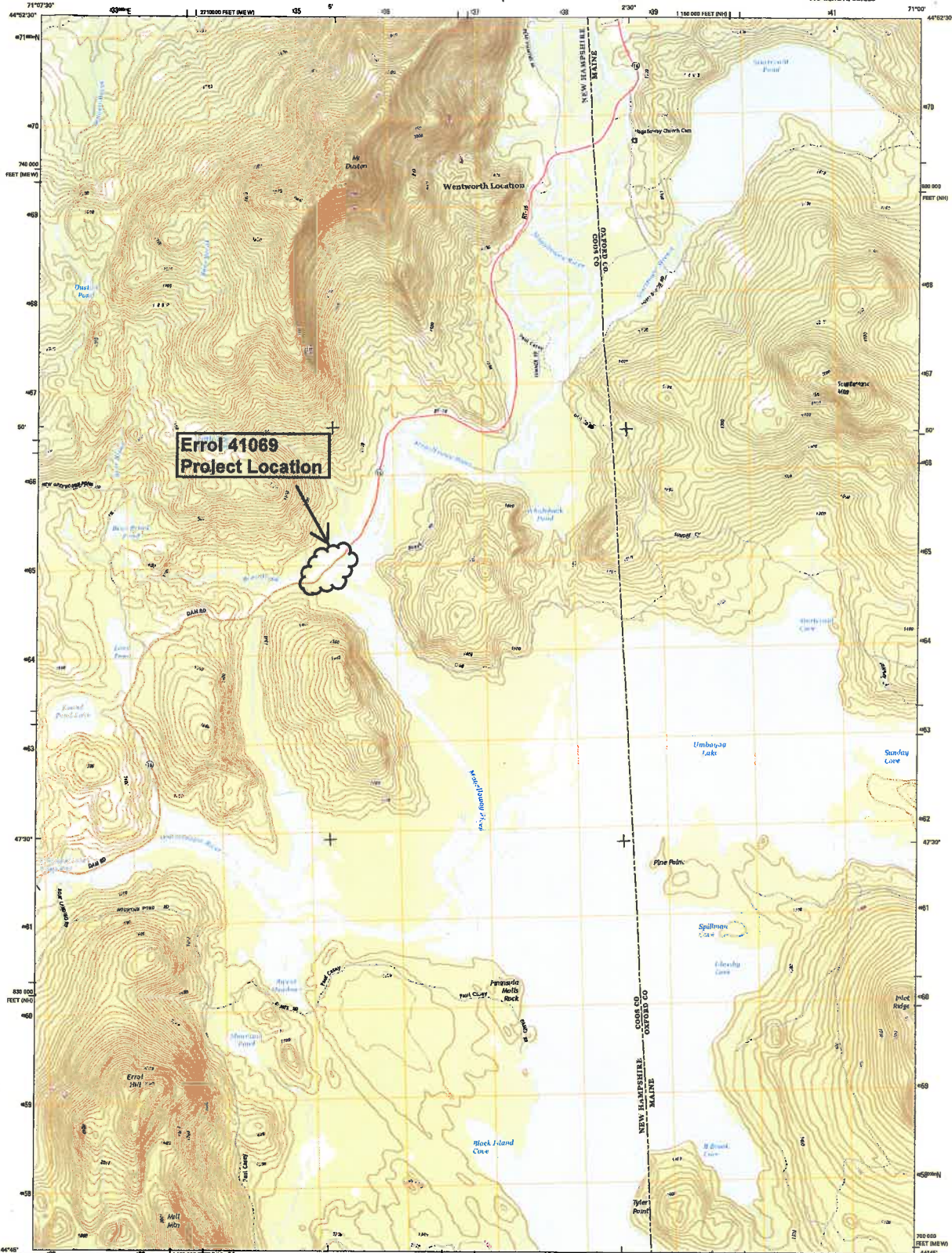
www.des.nh.gov



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



UMBAGOG LAKE NORTH QUADRANGLE
NEW HAMPSHIRE-MAINE
7.5-MINUTE SERIES

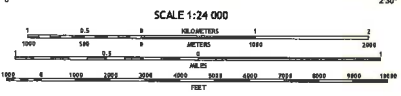
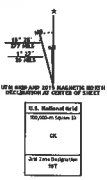


**Errol 41069
Project Location**

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84), Projection and
1000-foot grid; Universal Transverse Mercator, Zone 18T
10 000-foot scale; New Hampshire Coordinate System of 1983,
State Coordinate System of 1983 (east-west)

This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
trusts may not be shown. Obtain permission before
entering private lands.

Imagery: 2013
Roads: 2013
Hydrography: 2013
Contours: 2013

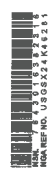


CONTINUOUS INTERVAL 10 FEET
JOINT ANTILOGarithmic VERTICAL DATUM OF 1988

This map was produced in conformance with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is at version 2.0.18.

1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10

UMBAGOG LAKE NORTH, NH-ME
2015



41069 Errol APE



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0 0.25 0.5 1 Miles

1:24,000



**WETLANDS PERMIT APPLICATION – ATTACHMENT A
MINOR AND MAJOR - 20 QUESTIONS**
Land Resources Management
Wetlands Bureau



Check the Status of your application: www.des.nh.gov/onestop

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

<p>Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project’s design in assessing the impact of the proposed project to areas and environments under the department’s jurisdiction. Respond with statements demonstrating:</p>
<p>1. The need for the proposed impact.</p> <p>This project along NH 16 – (Dam Road) is located approximately 4.6 miles north of the NH16/NH26 intersection in Errol. The project is approximately 1550 LF in length along the western slope of the Magalloway Rive. This segment of NH 16 was identified as requiring slope stabilization at the time of an initial observation of erosion and failures in 2011. In 2011 approximately 40 feet of the roadway embankment in this location fell into the Magalloway River. Attempts have been made by the Department’s District forces to armor the slope and protect Route 16. Unfortunately, these efforts did not prevent an additional 75 feet length of roadway slope from falling shortly after the initial failure. NH 16 was determined to be in danger of collapsing and an agreement was reached to move Route 16 onto U.S. Fish and Wildlife Service (USF&WS) Umbagog National Wildlife Refuge property. NH Route 16 and the bank of the Magalloway River need to be protected to ensure the road is open for traffic. Currently, a failure of the bank could result in a road closure. This route is very important to the travelling public in the area and a road closure would require a lengthy detour. A river study was conducted and the Magalloway River is very deep at the project location. Due to the depth and steepness of the bank, stabilization to move the road back to the original location would be expensive and was not recommended. The soil in this area has been found to be quite weak, so some of the traditional treatments, like stone riprap, would not be ideal unless the treatment extended all the way to the bottom of the river. The intent of this project is to realign a portion of roadway (the shift of Route 16 will include 800 linear feet of offline work and 800 linear feet of match work). The project will also repair the failed roadway slope along the original edge of NH 16 with a ‘ballasted deflector engineered log jam’ (engineered log jam).</p>
<p>2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.</p> <p>The proposed action at the NH Route 16 slope failure is to shift a 1600’ section of roadway and stabilize a 200’ section of river bank with an “engineered log jam”, alternatives were considered and evaluated to meet the project need while minimizing environmental impacts.</p> <p>The alternatives for the NH Route 16 slope failure, not including the Proposed Action, included:</p> <ol style="list-style-type: none"> 1) No Build. 2) Rehabilitation of existing roadway in-place and slope stabilization work using stone fill placement. 3) Offline Shift with major realignment of NH Route 16. <p>The No-Build alternative would not impact wetlands, but would not improve the structural integrity of the bank or protect the adjacent roadway surface, this would not meet the Purpose and Need of the project and could result in continued deterioration of the slope and continual erosion of the roadway surface.</p> <p>The On-line replacement with stone fill stabilization would substantially increase costs, decrease infrastructure life span and riprap along the length of the bank would have a significant negative environmental impact.</p> <p>The Offline Shift with major realignment of NH Route 16 would introduce a new road through an undisturbed wooded area along the north side of the existing section, would have additional wetland impacts, as well as disrupting wildlife connectivity through the wetland area. This option is also significantly more costly.</p>

3. The type and classification of the wetlands involved.

Wetlands were delineated and classified under the Cowardin et al. (1979) wetland classification system as follows for this project:
Emergent - PEM1Ed (Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated, Ditched).
Scrub-Shrub - PSS1E (Palustrine, Scrub-Shrub, Deciduous, Seasonally Flooded/Saturated).
Riverine - R2UB2,3 (Riverine, Lower Perennial, Unconsolidated Bottom, Sand-Mud).

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

The project proposes to impact the bank of the Magalloway River and nearby wetlands that drain into the Magalloway River. Wetlands are also located in the ditches adjacent to NH Route 16. Wetlands to be impacted by the proposed project include a collection points in the flatter areas located on the north side of the proposed roadway and at roadside ditches located along the northern side of NH Route 16 carrying roadway runoff. The project area is located in a low lying area between the main channel of the Magalloway River and Bear Brook (a tributary to the Magalloway River). Just north east of the project area Bear Brook enters the Magalloway.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

The emergent and scrub-shrub wetlands are abundant throughout the County and State. The Magalloway River is not a NH Designated River and is not included in the list of National Wild and Scenic Rivers. The Magalloway River is an important feature of the Umbagog National Wildlife Refuge and is used for paddling and fishing. The project is anticipated to serve a benefit to the Refuge by ensuring continued access via Route 16 to the Refuge.

6. The surface area of the wetlands that will be impacted.

A total of 5,474 sq. ft. of wetlands will be permanently impacted by the proposed project. Permanent impacts result from the necessary shift of NH Route 16 away from the river bank. Permanent impacts will also result from the slope protection for the proposed log jam treatment on the river bank.

Temporary impacts of 2,639 sq. ft. are anticipated to occur beyond the limits of the proposed slope work to accommodate construction of the project. These areas will be restored to preconstruction conditions following completion of the work.

7. The impact on plants, fish and wildlife including, but not limited to:
 - a. Rare, special concern species;
 - b. State and federally listed threatened and endangered species;
 - c. Species at the extremities of their ranges;
 - d. Migratory fish and wildlife;
 - e. Exemplary natural communities identified by the DRED-NHB; and
 - f. Vernal pools.

a. The NH Natural Heritage Bureau was consulted for record of rare plants and animal species within the project vicinity and the USFW Information for Planning and Consultation tool and the NHF&G were consulted regarding potential impacts of the proposed project on Federally or State listed threatened or endangered species. The NH NHB database search concluded that there are no recorded occurrences for sensitive species near the project area.

b. The IPaC Official Species list for the project area includes the Northern Long Eared Bat (NLEB) and the Canada Lynx. The project will include a small amount of tree clearing which is likely to occur during the active season for the NLEB. The proposed project adheres to the criteria and conditions of the FHWA, FRA, FTA USFWS Range-wide NLEB and IBat Programmatic Consultation, as outlined in the biological assessment (BA) and biological opinion (BO) and is not anticipated to cause jeopardy to the species. The NH DOT has coordinated with New Hampshire Natural Heritage Bureau and the New Hampshire Fish and Game Nongame and Endangered Wildlife Program to ascertain that there are no known NLEB maternity roost trees or hibernacula in the project area or in the vicinity of the project. All project tree clearing will be within 300 feet of the road surface. The project may affect, is likely to adversely affect (LAA) the NLEB, as the project includes tree clearing that will be conducted during the NLEB active season in Errol. The NHDOT will employ appropriate Avoidance and Mitigation Measures as indicated in the BA and BO.

The Errol project will impact a small forested area in the range of the Canada Lynx, and so, has the potential to impact the Canada Lynx. However, the species is considered unlikely to inhabit the project area during project construction. Therefore, the NH DOT has determined that the project may affect, but is not likely to adversely affect (NLAA) the Canada Lynx.

c. The project area is not known to include species at the extremities of their ranges. (Continued after Q 20)

8. The impact of the proposed project on public commerce, navigation and recreation.

The proposed project will improve commerce by increasing safety through the project area, shifting the NH Route 16 roadway away from possible future bank instability, thus helping to prevent closure of any lanes of NH 16 during previous failure events. Temporary impacts to daily traffic could occur during construction, like minor changes in access to trail heads, although full access will be restored post-construction.

A Federal Lands Access Program Project Application for funds for the project was submitted with a letter of support from Paul Casey, the Umbagog National Wildlife Refuge Manager. In the letter Paul indicated that NH Route 16 is a major access road for the Refuge and that if the erosion were to continue, the public's access to the Refuge would be limited.

Informal fishing access points to the Magalloway River, along NH Route 16, may be temporarily restricted due to the construction effort along the highway slopes. The majority of these access points will be available again after construction is completed.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

There will be little to no aesthetic impacts associated with the project will result from the from slope stabilization work using the engineered log jam treatment and the associated cutting of trees to construct the shift of NH Route 16. These cleared areas of the existing roadway corridor will be re-vegetated and over a period of years this area will be softened and less aesthetically intrusive. The project is anticipated to be a benefit to the Umbagog Wildlife Refuge and will allow citizens to continue to travel to the Refuge and enjoy the aesthetics of the wilderness.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

The proposed action may temporarily inconvenience and disrupt motorists, pedestrians, and bicyclists during the construction period, but most of the work will be maintained offline.

Access to properties, including businesses will be maintained at all times. Informal passages or access to the Magalloway River may be temporarily restricted during construction, however these access points will be restored once construction is completed.

During construction of the engineered log jam for stabilization of the Magalloway River bank there may be some restrictions to use by recreational paddlers.

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

There are no abutting owners, pursuant to RSA 482-A:11, II, as all work associated with this project are contained solely within the Umbagog National Wildlife Refuge. The work to stabilize the stream bank is anticipated to have a positive impact on the Refuge and on the roadway. The Umbagog Refuge Managers are in support of the project. There are no impacts anticipated beyond the Refuge.

12. The benefit of a project to the health, safety, and well being of the general public.

The proposed project is expected to improve public safety to pedestrians, cyclists, and motorists along this section of NH Route 16 by providing a buffer from the river bank and updating the safety components of the road through full box reconstruction, slope stabilization, and drainage improvements. By stabilizing the slope, the roadway is anticipated to be preserved.

13. The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

The project will construct a grassed swale area in the center portion of the project. This will collect roadway runoff from a segment of NH Route 16, prior to discharging to Magalloway River. The proposed engineered log jam treatment will provide some benefit to the water quality and aquatic life of the river.

Appropriate erosion and sediment control measures and roadway construction methods will be employed during construction to control siltation and minimize disturbances to surface waters and any wetlands adjacent to the project. The contractor will be required to submit a professionally prepared Stormwater Pollution Prevention Plan (SWPPP), detailing the erosion and sedimentation control measures that will be used during construction. The SWPPP submitted will need approval by DOT prior to any work being performed.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

Standard pollution prevention measures will be employed to ensure that potential impacts are minimized and restricted to the construction phase of the project to the extent practicable.

The project is being designed to ensure that the proposed drainage crossings can properly convey runoffs and streams without ponding on abutting properties. The discharge through each of the proposed drainages structures will not be built to an extent that an increase in erosion or sedimentation should occur. The creation of the manmade ditch line along the center of the project is in an effort to prevent erosion as the ditche serves as a controlled passage to convey runoff and seepage.

All standard BMPs will be in place to prevent erosion or sedimentation within any of the surface waters.

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

The proposed NH Route 16 bank stabilization will reflect or redirects current or wave energy , the proposed engineered log jam treatment will Large wood has a large effect on stream velocities, shear stress distributions, and drag forces. This is why engineered log jams create hydraulic complexity in streams. Shear stress in particular can create scouring, which increases geomorphic complexity (Manners et al. 2006). This, in addition to hydraulic complexity, leads to enriched habitat, which is utilized by fish for foraging, refuge, and spawning. Engineered log jams are increasingly being utilized in restoration projects as they are seen as environmentally beneficial.

The proposed action associated with the roadway work, including upgrades and upsizing of existing drainage crossings and ditches, will improve ditch and crossing capacities. Existing drainage patterns will be maintained, as much as possible, during construction which will not cause damage or create hazards.

Manners, Rebecca B., M. W. Doyle, and M. J. Small. "Structure and Hydraulics of Natural Woody Debris Jams." Water Resources Research 43 (2006).

16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.

Not applicable. The project is to reconstruct public infrastructure, which is unlikely to be accomplished by abutters. Also, the impacts to the bank of the Magalloway River are anticipated to have an overall benefit to the River by preventing future failures and reducing erosion and siltation which could negatively impact water quality.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

The proposed project will result in permanent and temporary impacts to 8,113 sq. ft. of wetlands along NH Route 16 in Errol. It also results in 673 lf. of bank and channel impacts. This constitutes a major impact. Avoidance and minimization measures incorporated in the design of the project have reduced the magnitude of these impacts to the extent practicable.

Concurrence was reached with the Department's Natural Resource Partners that the project's bank and channel impacts could be properly addressed through mitigation in the form of using an engineered log jam treatment for stabilization along the river. This method of bank stabilization is seen as being beneficial to the River as it will reduce erosion and the amount of sediment in the River. Also, this method of stabilization is preferred over other more intrusive methods, such as rip rap placement.

Overall, there will be a small reduction in the values and functions of the wetlands in the project area due to the permanent loss of wetland resources. However, the shifted dichline will work to replace the functionality of the PEM1Ed (Palustrine, Emergent, Persistent, Seasonally Flooded, Ditched) wetlands along the left side of the project where functionality is lost due to impacts to the existing ditch line. Also, best management practices will be utilized during construction to protect the resources in and near the project area.

18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

The proposed project is not located in or near any listed or eligible National Natural Landmarks.

19. The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

The proposed project does not diminish the value of the Umbagog National Wildlife Refuge, in fact it secures public access to the Refuge and will prevent further erosion of the bank of the Magalloway River. The River is an important feature of the Refuge. NH Route 16 is the primary route used by visitors to access the northern portion of Umbagog National Wildlife Refuge. If this project is not built, the bank failure on the Magalloway River may continue to erode and be undermined, eventually endangering the Route 16 roadway. This project will protect the roadway, thereby ensuring safe access to the Refuge for visitors. Also, by preventing further erosion of the bank of the Magalloway River in the project area, the project is anticipated to protect the water quality of the Magalloway River.

20. The degree to which a project redirects water from one watershed to another.

The proposed project does not redirect water from one watershed to another. All surface water collected in the proposed drainage system will ultimately discharge to the Magalloway River as it does in the existing condition.

Additional comments

7. d. Migratory Fish and Wildlife

The project details were communicated with NOAA and the Magalloway River was determined not to be Essential Fish Habitat. The area has not been specified as including important habitat for migratory fish or wildlife.

7. e. Exemplary Communities

Neither the NH NHB nor the USFWS noted exemplary communities in the project area. However, the project area does include impacts in the Umbagog National Wildlife Refuge.

7. f. Vernal Pools

There are not any vernal pools known to be present in the project area.

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting
DATE OF CONFERENCE: October 18, 2017
LOCATION OF CONFERENCE: John O. Morton Building
ATTENDED BY:

NHDOT
Matt Urban
Sarah Large
Ron Crickard
Mark Hemmerlein
Marc Laurin
Tim Boodey
Doug Locker
Russ St. Pierre
Nancy Spaulding
Jason Tremblay
Tobey Reynolds
Rebecca Martin
Jason Abdulla

ACOE
Mike Hicks

EPA
Mark Kern

NHDES
Gino Infascelli
Lori Sommer

NHF&G
Carol Henderson

US Fish & Wildlife Services
Ian Drew
Paul Casey

**Consultants/Public
Participants**
Jameson Paine

(When viewing these minutes online, click on an attendee to send an e-mail)

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH:

(minutes on subsequent pages)

Postpone Finalization September 20 th , 2017 Meeting Minutes.....	2
Barrington, #41660 (Non-Federal)	2
Eaton – District 3 Project (Non-Federal).....	3
Meredith – District 3 Project (Non-Federal)	3
Bedford-Manchester, #40731 (X-A004(475)).....	3
Errol, #41069 (X-A004(565))	4
Dummer, #16304A (X-A003(835)).....	7

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

Bridge Maintenance Bureau, in consultation with F&G and Audubon, installed a nesting tray last year away from the proposed work areas of Piers 2 and 5 to provide the falcons the opportunity to use a nesting area away from the work zone. A recent meeting with F&G and Audubon was conducted to discuss the work and potential impacts to the falcons. It was agreed that the proposed work on the bridge should not be a major concern and that no work under the bridges would occur during a time of year restriction from March 1st to the end of June, if the falcons have nested on the bridge that year. If the falcons were to nest on the piers, or somewhere under the bridge beside the tray, the Department will coordinate with NHF&G and Audubon to schedule the prompt and safe relocation of the nest to the nesting tray located away from the work activity area. Phase 1 work for the eastbound bridge, will be on the south side of the bridge away from the nesting tray. Phase 2 work will be on the north side of the eastbound bridge where the nesting tray is located. However, in both Phase 1 and 2 the nesting tray location will be at a maximum distance from both Piers 2 and 5 (approximately 220 feet) thereby minimizing impacts to the falcons.

No concerns were expressed by the NH NHB as access for construction will be from barges, which will be launched from public boat launch, and from the top of the bridges. No known Northern Long-eared bat roosts within ¼ mile of the project limits have been identified by F&G and an inspection of the bridges did not identify any usage of the bridges by the bats. No trees greater than 3 inches in diameter are proposed to be cleared.

A DES Shoreland permit by notification will be completed, but there will be no need for a Wetlands Permit.

Mike Hicks inquired about any need for a coast guard permit. Matt Urban replied that the coast guard has been contacted and the proposed work will not require a bridge permit, but standard stipulations will need to be met. M. Hicks also asked whether the National Marine Fisheries Service (NMFS) had concerns with the project. Mike Johnson at NMFS stated that as the project does not involve work in the river, there is no adverse effect for Atlantic salmon or for any other species. Therefore, there is no requirement for a consultation with NMFS. M. Hicks stated that no Corps permit would be required.

Carol Henderson cautioned that falcons are territorial if fledglings are present. J. Tremblay stated that the location of the nesting box should shield the work area from the falcons.

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

Errol, #41069 (X-A004(565))

Tobey Reynolds presented slides sharing the evolution of the erosion issue on Route 16 adjacent the Magalloway River and subsequent design of the Errol 41069 project. He explained that the Magalloway River is dam controlled in this area and that the project area is within the Umbagog National Wildlife Refuge. In 2011 the slope failure required the Department to temporarily relocate Route 16 away from the Magalloway River onto Umbagog National Wildlife Refuge property. Our partners at the U.S. Fish and Wildlife Service were accommodating and agreed to the temporary solution of moving the road by around 14 feet. The Umbagog National Wildlife Refuge Manager, Paul Casey, and the Deputy Refuge Manager, Ian Drew, have been participating as partners in the development of the project design.

T. Reynolds shared photos on the evolution of the slope failure. He shared that the slope is still moving, but is not as active as it has been in the past and some vegetation is growing on the slopes. T. Reynolds described that a river study was conducted with sonar and the Magalloway River is very deep at the project location, the slope failure area goes approximately 50 feet to the toe of the slope. Due to the depth and steepness of the bank, stabilization to move the road back to the original location would be expensive. T. Reynolds described some of the shoreline stabilization alternatives that have been investigated and potential issues and benefits. The soil in this area has been found to be quite weak, so some of the traditional treatments, like stone riprap, would not be ideal unless the treatment extend to the bottom of the river. The Design team also considered a gabion mattress slope stabilization or steel sheet piles, each have their challenges due to cost and constructability due to the steep slope. There is a second area, just south of the slope failure, where the slope is showing signs of some movement.

The project team visited the project site and met with the Umbagog National Wildlife Refuge (Refuge) Manager, Paul Casey, and the Deputy Refuge Manager, Ian Drew. The Refuge Managers were in favor of moving Route 16, as they saw this as a more permanent solution than merely slope stabilization. The Department's Front Office also favors the concept to move the road away from the Magalloway River. Slope stabilization is being considered in conjunction with the road movement. T. Reynolds shows slides with plans for a 1,200 foot long minor shift of the roadway that would have approximately 1,970 square feet of wetland impacts, 250 linear feet of bank impacts and 207 linear feet of channel impacts. He also showed a major shift option, which is 2,500 feet long that would have approximately 25,210 square feet of wetland impacts, 250 linear feet of bank impacts and 207 linear feet of channel impacts. T. Reynolds commented that the geometry of Route 16 through this area is quite curvy and lends itself to a shift. He commented that there is a fairly sharp curve at the south end of the project. The major (larger) shift would likely make the geometry better. T. Reynolds commented that the major shift is a bit out of the current intended project scope.

If the road is shifted, there are additional options for stabilizing the bank, such as, flattening and vegetating the bank. A consultant, McFarland Johnson, and their sub-consultant, Milone and MacBroom, have prepared a draft Technical Memorandum to summarize their findings and recommendations for the permanent repair and slope stabilization of slope failure that occurred along NH Route 16. In the report McFarland Johnson and Milone and MacBroom explained that the slope failure was not due to water velocity in the Magalloway River, the River's velocity is actually low in the area. The issue is caused by the weak soils and the steepness of the bank. Possible stabilization recommendations included creating a more gradual slope and revegetating the area, stone stabilization with seeding, or a log jam grid. The Design team has requested that the consultant evaluate moving the road away from the Magalloway and leaving the road to naturally evolve to a stable slope. Jamie Sikora commented that it would be preferred to do some type of slope stabilization to protect the investment of moving the roadway.

T. Reynolds inquired of the group which stabilization would be preferred and explained that the cost of mitigation for bank impacts is a concern. Lori Sommer explained that she recently attended the Mid-Atlantic Stream Conference and the log jam/root wad method has been very successful and is preferred. She said this option would not require mitigation as it would be self-mitigating. She mentioned that she would send T. Reynolds materials about the method. L. Sommer also commented that EcoTone is a leader in the application of this technology and it has been used by Trout Unlimited and for an ARM fund project. L. Sommer explained that there is no maintenance needed for this log jam slope stabilization method. T. Reynolds explained that there will be trees removed for the road shift and these trees would be utilized, if the log jam method is selected. M. Hemmerlein commented that it takes a long time for trees to deteriorate underwater and L. Sommer commented that there can be plantings among the root wads. T. Reynolds explained that the dam can drop the water level by around 2 feet below the high water elevation and this is

the elevation being recommended for the log jam method. Gino Infascelli suggested coordinating the dam owners (Brookfield Power). They may lower the dam more during scheduled maintenance. The group discussed whether debris in the River might be caught in the log jam and cause damage. L. Sommer commented that the trees used are fairly long and a secure grid is generally constructed. T. Reynolds reiterated that the water velocity is low.

J. Sikora commented that the Refuge is a Section 4(f) resource. If the net impact is neutral, this project could be a de minimus impact. Paul Casey explained that the process has been started within USFWS for the land transfer. P. Casey also commented that the Refuge is not interested in picking up a problem area, meaning if the slope is not stabilized and would require continued maintenance, the Refuge would not want to acquire the area. Tom Geser, the Umbagog Realty Specialist has contacted the project design team to begin discussions. J. Sikora commented that the land transfer can be done individually or as a larger program, as was done with the White Mountain National Forest.

The group discussed the potential construction sequence, which would probably include: maintaining traffic while the new (shifted) road is constructed, stockpiling of trees, shifting traffic, and removing the old road and installing the log jam slope stabilization. T. Reynolds commented that the moderate is the preferred option because it meets the purpose and need of the project. Also, the moderate shift proposes less than 10,000 square feet of wetland impacts. Matt Urban commented that since the bank treatment is self-mitigating and the moderate shift is less than the threshold for mitigation, this would not require mitigation. M. Urban commented that the major shift would exceed the threshold and would require mitigation. L. Sommer commented that the wetland impacts may need to be considered to be cumulative with the Dummer project on Route 16. Therefore, mitigation for the wetland impacts for the Errol 41069 project should be considered. L. Sommer commented that the root wad/log jam opportunity could offset some of the projects' impacts. The projects are 5 miles apart. Mike Hicks commented that he could see justification for evaluating the wetland impacts together. M. Urban commented that if they are considered together, the ~1,970 square feet of wetland impacts would require mitigation.

**Not noted during meeting, but relevant- the Dummer Route 16 project is on the Androscoggin River and the Errol Route 16 project is on the Magalloway River.*

Refuge Manager, Paul Casey, commented that there have been several truck rollovers, at least one resulting in gasoline leaking onto Refuge land due to the steep curve at the southern portion of the project area. The Refuge management would prefer the major shift option to improve safety, but does understand that cost may be a limiting factor in the decision. L. Sommer commented that this is a good point, if the major shift is a better long term solution and would improve safety, consider that credit may be given for the log jam shoreline stabilization. The group discussed that traffic moves quite fast through the area, with a posted speed of 50 mph. T. Reynolds commented that with the smaller shift, signage could be improved to alert drivers to the curve. He also reminded the group of the purpose and need of the project. If the bank was stable, there would not be a project for this section of roadway.

M. Hemmerlein commented that the design team should consider whether it is possible to move ahead with a plan to acquire the area needed for the major shift, but move ahead with a design and construction of the moderate shift. If needed in the future, the Department would be better positioned to build the major shift. T. Reynolds said this is a good question. T. Reynolds commented that he thinks the moderate shift would result in a stable condition for many years. T. Reynolds confirmed that the geometry of the road and safety concerns, not the stability of the bank, would be the reason for the major shift. Mark Kern commented that he would be comfortable with either shift option. He said it was good that the bank impacts will be cancelled out by the stabilization. He does not have a preference.

J. Sikora commented that it might be good to plan for the major shift, conduct the land swap, and then select the alternative based on available funds.

M. Urban commented that he would like to have a future discussion regarding whether the Dummer and Errol project impacts should be considered to be cumulative.

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

Dummer, #16304A (X-A003(835))

No minutes have been submitted to date.

This project has been previously discussed at the 10/15/2017 and 7/19/2017 Monthly Natural Resource Agency Coordination Meetings.

Mitigation Summary Narrative

Errol – 41069

The proposed project is located on NH Route 16 in the Town of Errol. The proposed work consists of permanent realignment of NH Route 16 and repair and stabilization of approximately 200 linear feet of bank along the western slope of the Magalloway River with a ballasted deflector engineered log jam. Some design alternatives that were considered were installation of a large amount of rip-rap and construction of a gabion mattress. Both of these alternatives would be expensive and would significantly alter the characteristics of the river bank. .

An engineering study was performed by Milone and MacBroom to evaluate the conditions of the bank including an evaluation of the soils, the steepness of the bank, and the velocities of the river. It was identified that this section of the river was volatile and would need significant stabilization. The study determined that the soils on the bank were quite weak and that the failures were partially the result of inundation from the rise and fall of the river due to the influence of the dam downstream. Milone and MacBroom recommended that a bioengineered ballasted deflector engineered log jam is a viable option to stabilize the bank in this location. NHDOT reviewed the alternatives and the bioengineered alternative was selected as the preferred alternative. Through coordination with NH DES Wetlands Bureau this method was determined to be considered self-mitigating

This project does not exceed 10,000 sq. ft. of wetland impacts and therefore does not trigger the need to mitigate for the proposed permanent wetland impacts.

The proposed project will permanently impact approximately 200 linear feet of bank along the Magalloway River. However, as discussed at the October 18, 2017 natural resource agency meeting, mitigation will not be required for the proposed bank impacts since the Ballasted Deflector Engineered Log Jam, with plantings as detailed on sheet 5 on the plans, is considered self-mitigating.

Martin, Rebecca

From: Martin, Rebecca
Sent: Tuesday, April 3, 2018 9:23 AM
To: Urban, Matt
Subject: FW: Errol 41069 and Dummer 16304A

From: Nyhan, Kevin
Sent: Tuesday, April 3, 2018 9:18 AM
To: Hemmerlein, Mark; Martin, Rebecca
Subject: FW: Errol 41069 and Dummer 16304A

From: Adams, Collis
Sent: Friday, March 16, 2018 9:39 AM
To: Stamnas, Peter
Cc: Sommer, Lori; Infascelli, Gino; Nyhan, Kevin; Urban, Matt; Hicks, Michael C NAE
Subject: Errol 41069 and Dummer 16304A

Hi Pete –

This e-mail is in response to your letter of February 6, 2018 requesting concurrence for independent wetland impact assessment for the subject projects.

NHDES believes these two projects have independent utility with no demonstrated nexus between the two and as such, NHDES concurs with your argument that the two projects are independent and the wetland impacts will be evaluated separately, including the need for compensatory mitigation.

I trust this e-mail is adequate response to your request. If you would like to discuss further please feel free to contact me directly.

Regards;
Collis

Collis G. Adams, CWS, CPESC
NH Department of Environmental Services
Land Resources Management
Wetlands Bureau Administrator

29 Hazen Drive
Concord, NH 03302
(603) 271-4054
collis.adams@des.nh.gov

Visit DES Land Resources Management for helpful tools and information!



New Hampshire Natural Heritage Bureau

To: Rebecca Martin
7 Hazen Drive
PO Box 483
Concord, NH 03302

Date: 10/6/2017

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 10/6/2017

NHB File ID: NHB17-3089

Applicant: Rebecca Martin

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

Project Description: 41069: A road embankment failure occurred on the southeast side of NH Route 16 in Errol along the Magalloway River in 2011. Following the failure, NHDOT temporarily relocated the roadway approximately 15 feet west, away from the river onto the Umbagog National Wildlife Refuge. NHDOT also installed concrete barriers to protect the slope failure area. Various methods and options for stabilizing the slope are being considered along with potentially moving NH Route 16 away from the Magalloway River to prevent future failures.

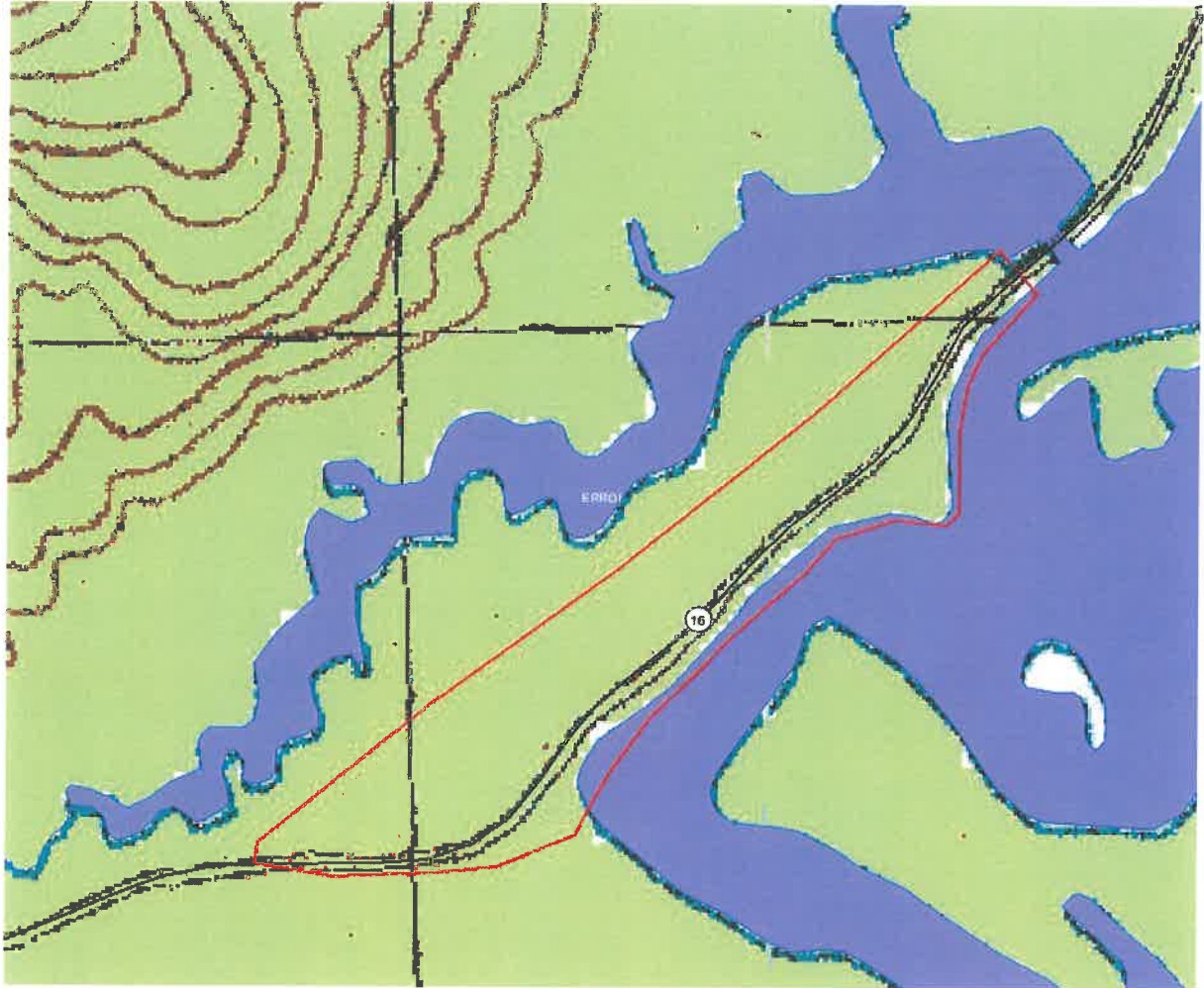
The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded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

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

This report is valid through 10/5/2018.



MAP OF PROJECT BOUNDARIES FOR NHB FILE ID: NHB17-3089





United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:
Consultation Code: 05E1NE00-2018-SLI-0740
Event Code: 05E1NE00-2018-E-01715
Project Name: Errol 41069

January 24, 2018

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

To Whom It May Concern:

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

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

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

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

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

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

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-0740

Event Code: 05E1NE00-2018-E-01715

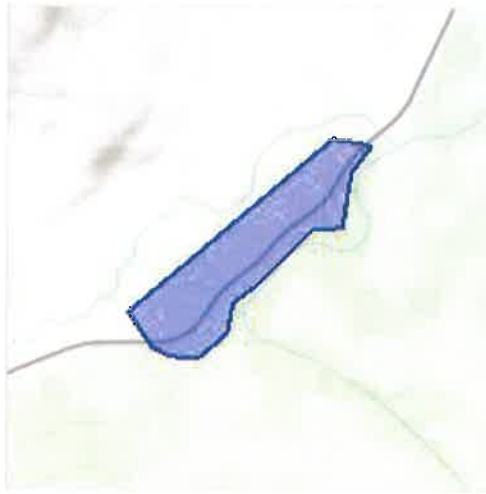
Project Name: Errol 41069

Project Type: TRANSPORTATION

Project Description: A slope failure on N.H. Route 16 adjacent the Magalloway River required a temporary shift of Route 16 onto Umbagog National Wildlife Refuge and subsequent design of the Errol 41069 project. The project area is within the Umbagog National Wildlife Refuge. In 2011-2012 the slope failure required the Department to temporarily relocate Route 16 away from the Magalloway River onto Umbagog National Wildlife Refuge property. A more permanent solution is needed. The Umbagog National Wildlife Refuge Manager, Paul Casey, and the Deputy Refuge Manager, Ian Drew, have been participating as partners in the development of the project design. Due to the depth and steepness of the river bank, stabilization to move the road back to the original location would be expensive. The soil in this area has been found to be quite weak, so some of the traditional treatments, like stone riprap, would not be ideal unless the treatment extend to the bottom of the river. The project proposes a shift of Route 16 including 800 linear feet of offline work and 800 linear feet of match work. In addition log jam stabilization of the river bank is proposed. The plan for the shift of the roadway would have approximately 1,970 square feet of wetland impacts, 250 linear feet of bank impacts and 207 linear feet of channel impacts. A land swap with Umbagog is being coordinated.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/44.81952586133346N71.083766883587W>



Counties: Coos, NH

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. 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.

Mammals

NAME	STATUS
Canada Lynx <i>Lynx canadensis</i> Population: Wherever Found in Contiguous U.S. There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

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



Victoria F. Sheehan
Commissioner

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



William Cass, P.E.
Assistant Commissioner

March 16, 2018

Subject: Errol 41069: X-A004(565)
FHWA, FRA, FTA Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat
Consultation Code: 05E1NE00-2018-SLI-0740

Thomas Chapman, New England Field Office
70 Commercial St, Suite 300
Concord, NH 03301-5087

Dear Mr. Chapman,

Please find enclosed the LAA Consistency Letter: FHWA, FRA, FTA Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bat generated through the Information for Planning and Consultation (IPaC) website regulatory review. NH DOT Project Errol 41069 is a project that proposes a shift of NH Route 16 away from a slope failure on the bank of the Magalloway River. The proposed project adheres to the criteria and conditions of the FHWA, FRA, FTA USFWS Range-wide Programmatic Consultation, as outlined in the biological assessment (BA) and biological opinion (BO).

The project will include 800 linear feet of offline work and 800 linear feet of match work to shift NH Route 16 away from the river. In addition, log jam stabilization of the Magalloway River bank is proposed. The plan for the shift of the roadway would have approximately 1,970 square feet of wetland impacts, 250 linear feet of bank impacts and 207 linear feet of channel impacts. A land swap with Umbagog National Wildlife Refuge is being coordinated. Approximately 0.78 acres of tree clearing will be required for construction of the project. Most of the project activities will take place during the NLEB active season.

The Official Species List for the project area includes the Northern Long-eared Bat and the Canada Lynx. A meeting was held at the NH Department of Transportation with David Simmons, the Endangered Species Program Supervisor of the New England Fish and Wildlife Office, to discuss potential project impacts on the Canada Lynx. The project was determined 'may affect, not likely to adversely affect' the Canada Lynx.

The NH DOT has coordinated with New Hampshire Natural Heritage Bureau and the New Hampshire Fish and Game Nongame and Endangered Wildlife Program to ascertain that there are no known NLEB maternity roost trees or hibernacula in the project area or in the vicinity of the project. All project tree clearing will be within 300 feet of the road surface.

The IPaC FHWA, FRA, FTA Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bat Determination Key was utilized to review the project area and activities. The NH DOT has

determined that the project may affect, is likely to adversely affect (LAA) the NLEB, as the project includes tree clearing that will be conducted during the NLEB active season in Errol. The NHDOT will employ appropriate Avoidance and Mitigation Measures as indicated in the LAA Consistency Letter for the project.

Please feel free to contact me with any questions or concerns about the project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rebecca Martin', with a long horizontal flourish extending to the right.

Rebecca Martin
Senior Environmental Manager
NH DOT Bureau of Environment
(603)271-6781

Enclosures



United States Department of the Interior



FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
<http://www.fws.gov/newengland>

March 15, 2018

Rebecca Martin
New Hampshire Department of Transportation
7 Hazen Drive
P.O. Box 483
Concord, New Hampshire 03302-0483

RECEIVED
BUREAU OF ENVIRONMENT

MAR 19 2018

NH DEPARTMENT OF
TRANSPORTATION

RE: NH Route 16 Roadway Shift, Errol, NH

Dear Ms. Martin:

This responds to your letter dated February 9, 2018, and received in our office on February 13, 2018, requesting our concurrence with your determination that the New Hampshire Department of Transportation's (NHDOT) proposed realignment of Route 16 (Project) in Errol, New Hampshire, may affect, but is not likely to adversely affect, the federally threatened Canada lynx (*Lynx canadensis*). The NHDOT made this request acting as a non-Federal representative of the Federal Highway Administration (FHWA). The Project also may affect the federally threatened northern long-eared bat (*Myotis septentrionalis*); however, the NHDOT will address any impacts to this species through the northern long-eared bat rangewide programmatic consultation for transportation agencies. Your request and our response are provided in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended: 16 U.S.C. 1531, et seq.) (ESA).

The NHDOT proposes to relocate Route 16 away from the Magalloway River in Errol, New Hampshire, and stabilize the riverbank to address safety, maintenance, and erosion concerns. The project corridor would be approximately 1,600 feet long and would require a few acres of tree clearing. The work season in this area of the State is limited to the summer months.

The proposed project area is located within the range of the Canada lynx. There are no known occurrence records for Canada lynx in the project area; however, if a Canada lynx is observed in the project area during project activities, the NHDOT will cease work until the individual leaves the area on its own accord. In addition, the project area contains poor quality lynx habitat, because it contains a busy roadway and is immediately adjacent to a substantial waterbody. Therefore, the chance of a Canada lynx occurring in the project area during project activities is discountable. Further, the proposed tree clearing would affect poor quality habitat, would be distributed along a narrow corridor, and would disturb a small area relative to the large size of a typical lynx

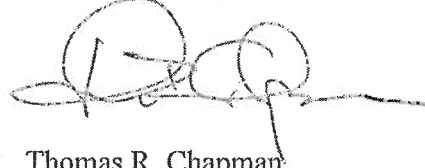
Rebecca Martin
March 15, 2018

2

homerange. Accordingly, the effects of habitat disturbance from the project on the Canada lynx would be insignificant. For these reasons, we concur with your determination that the proposed project may affect, but is not likely to adversely affect the Canada lynx.

Further consultation with us under section 7 of the ESA is not required at this time. Should project plans change such that a listed species may be affected in a manner not considered in this letter, or if additional information on listed species becomes available, the NHDOT or FHA should contact our office to determine if additional consultation is necessary. Thank you for your cooperation, and please contact David Simmons of this office at (603) 227-6425 if you need any further assistance.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'T. Chapman', written over a horizontal line.

Thomas R. Chapman
Supervisor
New England Field Office

Rebecca Martin
March 15, 2018

3

cc: Reading file
Jamie Sikora, Federal Highway Administration
Paul Casey, Umbagog National Wildlife Refuge
ES: DSimmons:03-15-18:603-227-6425



Victoria F. Sheehan
Commissioner

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



William Cass, P.E.
Assistant Commissioner

ERROL
X-A004(565)
41069
RPR 8333

No Historic Properties Affected Memo

Pursuant to the New Hampshire Division of Historical Resources response on January 23, 2017 to the Request for Project Review, and for the purpose of compliance with regulations of the National Historic Preservation Act and the Advisory Council on Historic Preservation's *Procedures for the Protection of Historic Properties* (36 CFR 800), the NH Division of Historical Resources (NHDHR), the NH Division of the Federal Highway Administration (FHWA), and the US Fish & Wildlife Service (USFWS) have coordinated the identification and evaluation of historical and archaeological resources.

Project Description

The project involves slope stabilization of the banks of the Megalloway River and roadway realignment of NH Route 16 (Dam Road), west of the Megalloway River. The chosen preferred alternative involves a permanent shift of NH Route 16 to the west away from the Megalloway River onto the Umbagog National Wildlife Refuge, a US Fish & Wildlife Service property.

Analysis

NHDOT Environmental Manager Rebecca Martin conducted a field review with Umbagog National Wildlife Manager Paul Casey and Umbagog National Wildlife Deputy Refuge Manager Ian Drew on December 6, 2016. A follow-up field review for wetland delineation confirmed there are no buildings or above ground structures within the project limits, including no stone box culverts or other historic infrastructure elements.

NHDOT Cultural Resources Program Specialist/Archaeologist Sheila Charles completed a Cultural Resources Sensitivity Review on December 22, 2016. Although no recorded archaeological sites were identified within the project area or in the vicinity, an Archaeological Phase IA/IB assessment was recommended due to Pre-Contact Period archaeological sensitivity along proposed new alignments or in areas where excavation or grading would be necessary.

Phase IA Archaeological Sensitivity Assessment and Phase IB Intensive Archaeological Investigation, conducted on November 11 and 12, 2017 prior to snowfall, resulted in negative findings. No further archaeological investigation was recommended, and the results were reviewed with the US Fish & Wildlife Service Regional Historic Preservation Officer.

Public Consultation

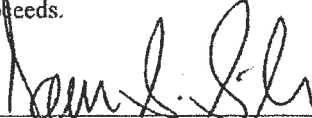
Initial contact letters and/or emails were sent to town officials, local organizations, and State and Federal agencies to solicit feedback on potential environmental concerns, and to help identify social, economic, and environmental issues and cultural and natural resources within a project area. The organizations included the Coos County Conservation Commission, Berlin & Coos County Historical Society, Coos County Planning Board, and Umbagog Chamber of Commerce. No concerns, beyond archaeological sensitivity, or consulting parties were identified.

Determination of Effect

Based on a review pursuant to 36 CFR 800.4, we agree that no historic or archaeological resources are affected in the project area and that no further survey work is needed.


Section 4(f) (to be completed by FHWA)	There Will Be:	<input checked="" type="checkbox"/> No 4(f);	<input type="checkbox"/> Programmatic 4(f);	<input type="checkbox"/> Full 4 (f); or
	<input type="checkbox"/> A finding of <i>de minimis</i> 4(f) impact as stated: In addition, with NHDHR concurrence of no adverse effect for the above undertaking, and in accordance with 23 CFR 774.3, FHWA intends to, and by signature below, does make a finding of <i>de minimis</i> impact. NHDHR's signature represents concurrence with both the no adverse effect determination and the <i>de minimis</i> findings. Parties to the Section 106 process have been consulted and their concerns have been taken into account. Therefore, the requirements of Section 4(f) have been satisfied.			

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


 Patrick Bauer, Administrator
 Federal Highway Administration
 Date: 1/11/18


 Jill Edelmann
 Cultural Resources Manager
 Date: 1/10/2018

Concurred with by the NH State Historic Preservation Officer:


 Elizabeth H. Muzzey
 State Historic Preservation Officer
 NH Division of Historical Resources
 Date: 1-12-18

- c.c. Chris St. Louis, NHDHR Rebecca Martin, NHDOT
 Jamie Sikora, FHWA Tobey Reynolds, NHDOT
 David Trubey, NHDHR Amy Wood, USFWS
 Edna Feighner, NHDHR



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

**U.S. Army Corps of Engineers
New Hampshire Programmatic General Permit (PGP)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)**

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to “work” include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See PGP, GC 5 regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*		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 SAS, shellfish beds, special wetlands and vernal pools (see PGP, GC 26 and Appendix A)? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) website, www.nhnaturalheritage.org , specifically the book Natural Community Systems of New Hampshire .		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	N/A	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	X	
2.5 The overall project site is more than 40 acres.		X
2.6 What is the size of the existing impervious surface area?	45,279 SF	
2.7 What is the size of the proposed impervious surface area?	40,255 SF	
2.8 What is the % of the impervious area (new and existing) to the overall project site?	32%	
3. Wildlife	Yes	No
3.1 Has the NHB 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 a NHB determination.)		X
3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”) Map information can be found at: <ul style="list-style-type: none"> • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 	X	
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the PGP, GC 21?	N/A	

4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	X	
5. Historic/Archaeological Resources		
If a minor or major impact project, has a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) been sent to the NH Division of Historical Resources as required on Page 5 of the PGP? **	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.

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

Wetland Impact A- PEM1E,d 07/31/2017



Wetland Impact B- PSS1E 07/31/2017



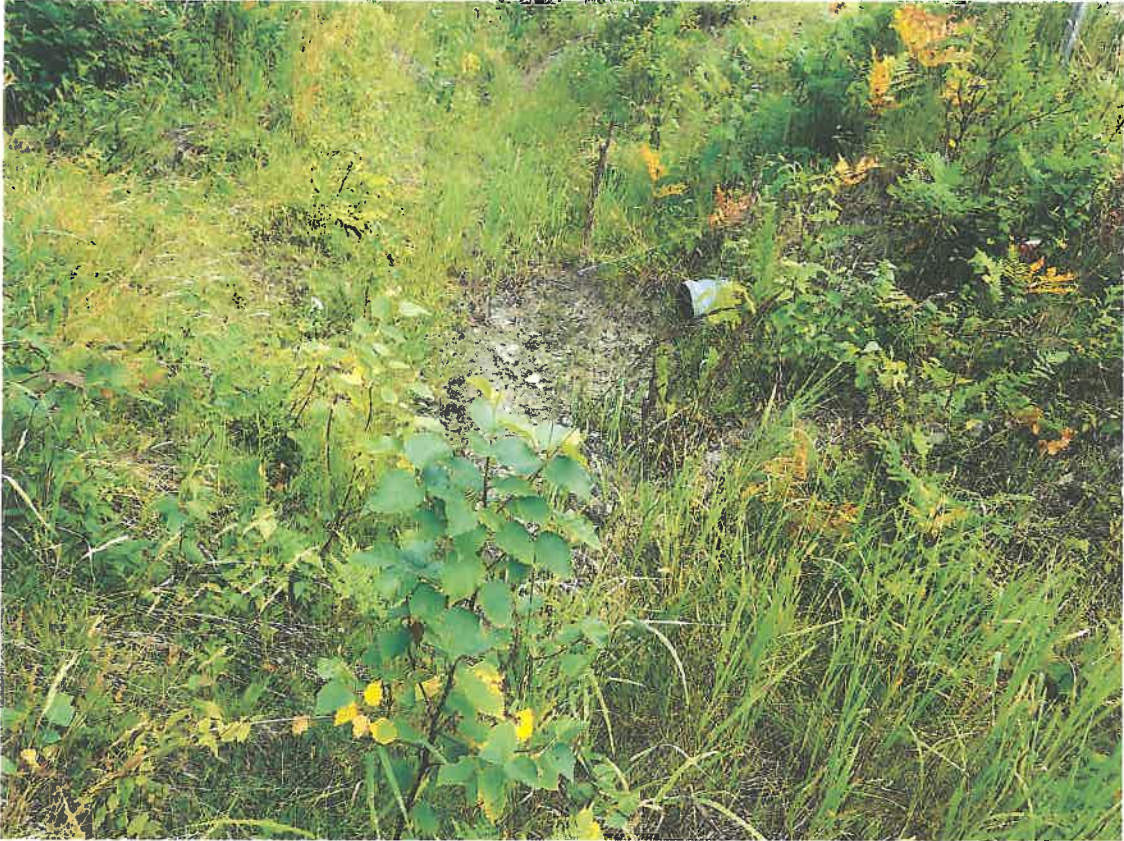
Wetland Impact B- PSS1E 07/31/2017



Wetland Impact C- PEM1E,d #11 - 07/31/2017



Wetland Impact C- PEM1E,d #11 - 07/31/2017



Wetland Impact D- R3UB2,3 16 & E- Bank 15 3/30/2017





Wetland Impact F- BANK #15 and Impact G- R3UB2,3 09/01/2017 facing north east



Errol 41069 Wetland Photos

Wetland Impact F- BANK #15 and Impact G- R3UB2,3 09/01/2017 facing south west



Wetland Impact F- BANK #15 and Impact G- R3UB2,3 7/27/2016



2018 Season

1. Winter- Utility Relocations and Tree Clearing (No grubbing of stumps until work progresses in 2019 season, unless authorized use for engineered log jam stock.)

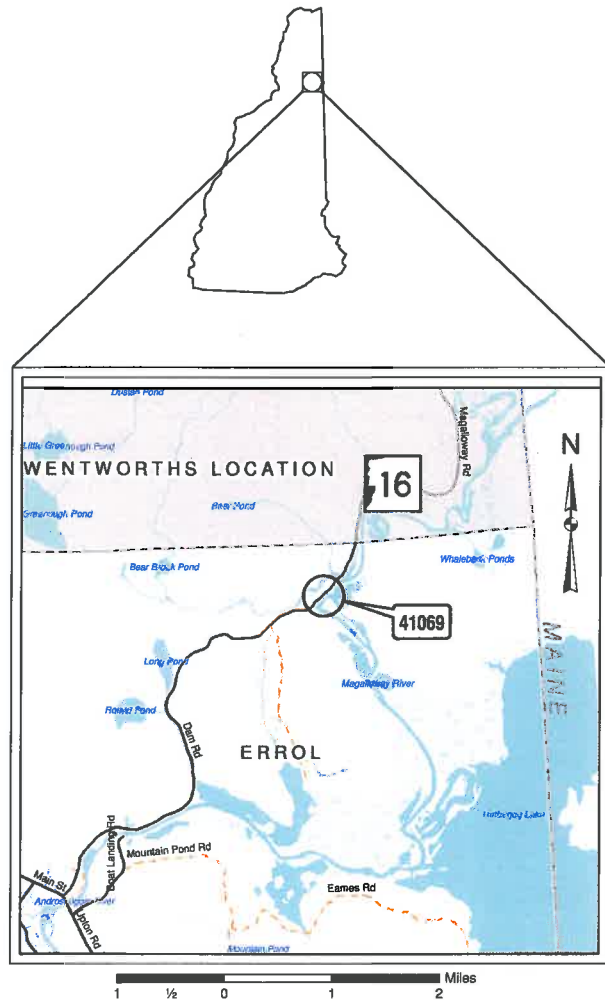
2019 Season

1. Install all perimeter controls and define maximum work limits for all grading and drainage work.
2. Start grubbing operation in work areas only.
3. Install proposed cross culverts, including outlet stone aprons, use clean water bypass as needed.
4. Start Roadway earthwork (including pavement) - Offline, still maintaining two-way traffic on existing NH Route 16.
5. Match proposed shift section ends into existing NH Route 16 utilizing alternating traffic.
6. Install signage including curve ahead and chevrons.
7. Shift all traffic to new NH Route 16 configuration.
8. Remove existing pavement of bypassed section of NH Route 16, fill with suitable materials to existing grades, plant trees, and seed excavated areas.
9. Install perimeter controls along shoreline including but not limited to; a turbidity curtain and dewatering items.
10. Construct Engineered Log Jam bank stabilization.
11. Stabilize all disturbed areas prior to completion.
12. Final Clean up.

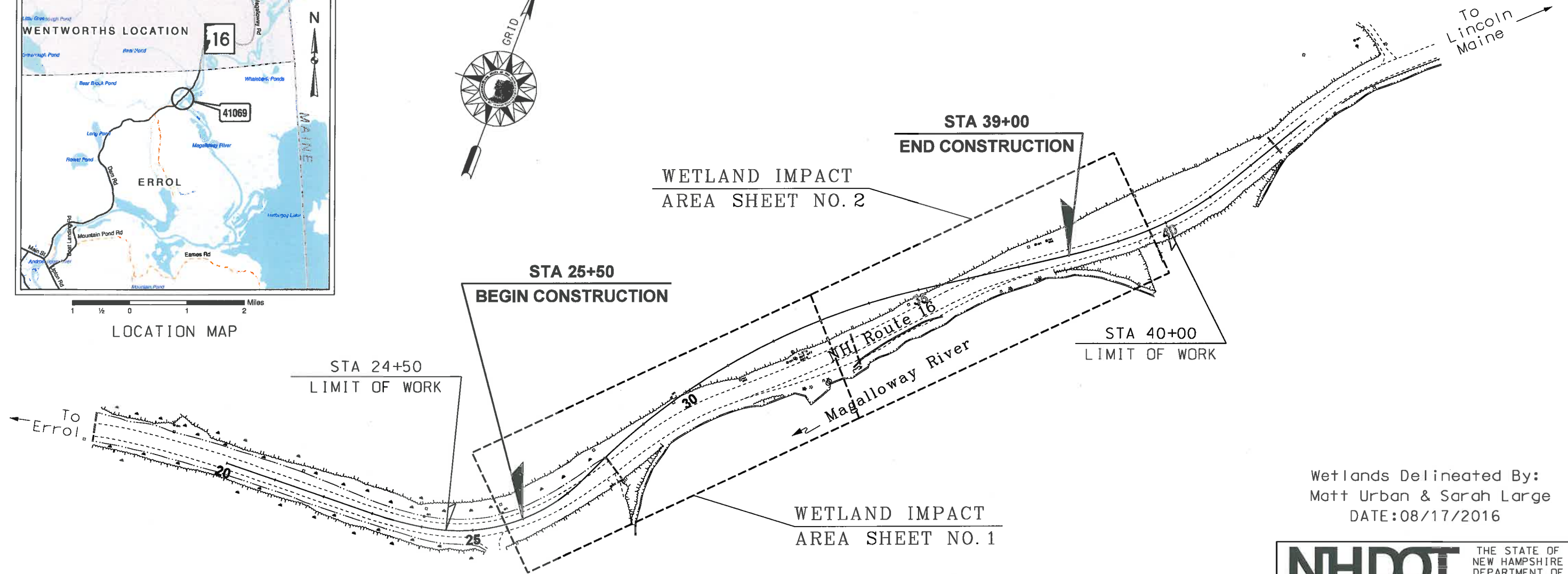
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
WETLANDS PLANS
FEDERAL AID PROJECT

X-A004(565)
N.H. PROJECT NO. 41069
NH ROUTE 16

DESIGN DATA	
AVERAGE DAILY TRAFFIC 20_09	650
AVERAGE DAILY TRAFFIC 20_XX	XX
PERCENT OF TRUCKS	XX
DESIGN SPEED	50 MPH
LENGTH OF PROJECT	1550 LF



LOCATION MAP



TOWN OF ERROL
COUNTY OF COOS

SCALE: 1" = 100'

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE CONSTRUCTION PLANS

Wetlands Delineated By:
Matt Urban & Sarah Large
DATE: 08/17/2016



NH ROUTE 16
WETLAND IMPACT PLANS
TOWN OF ERROL
02-01-2018

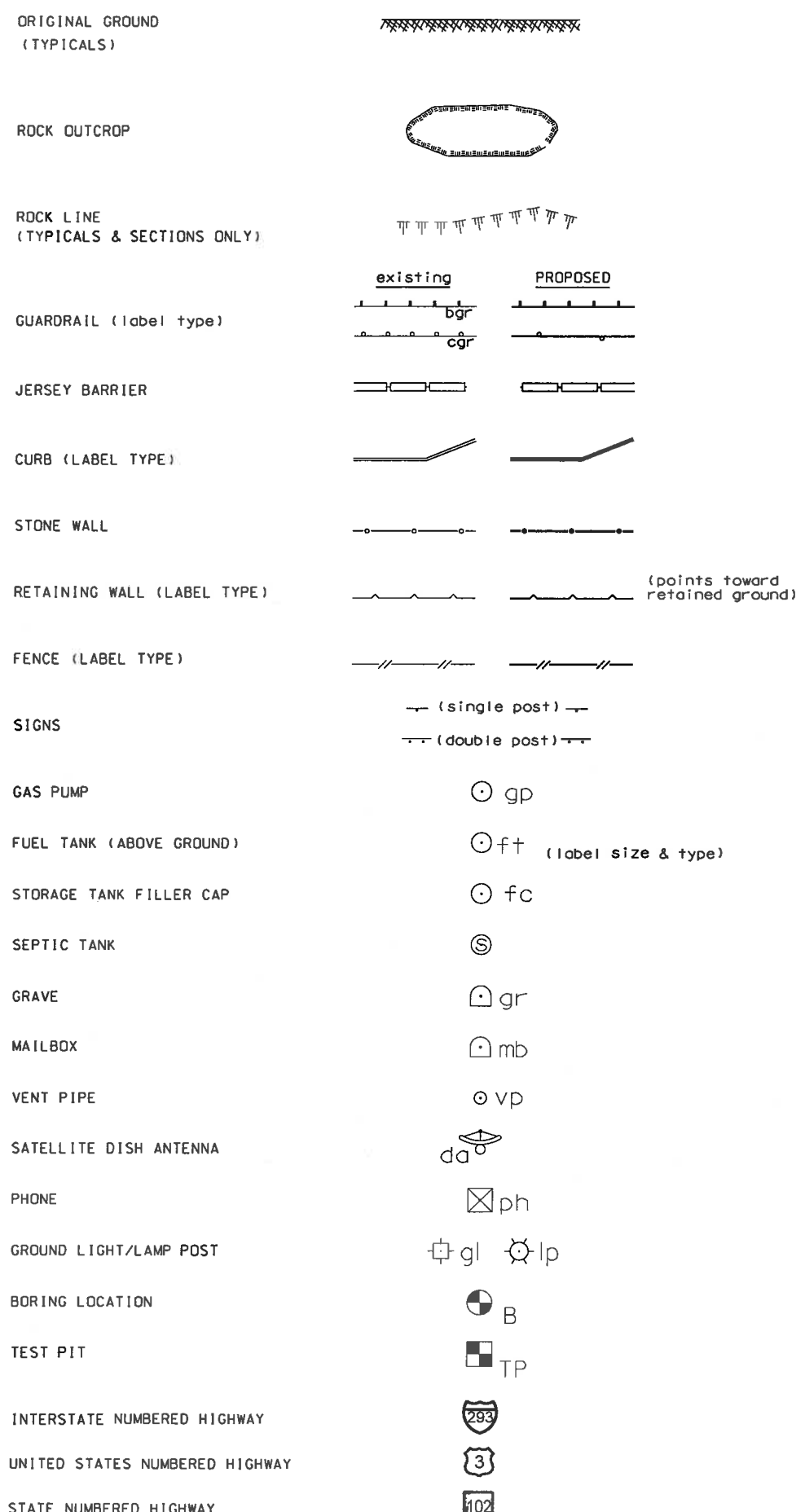
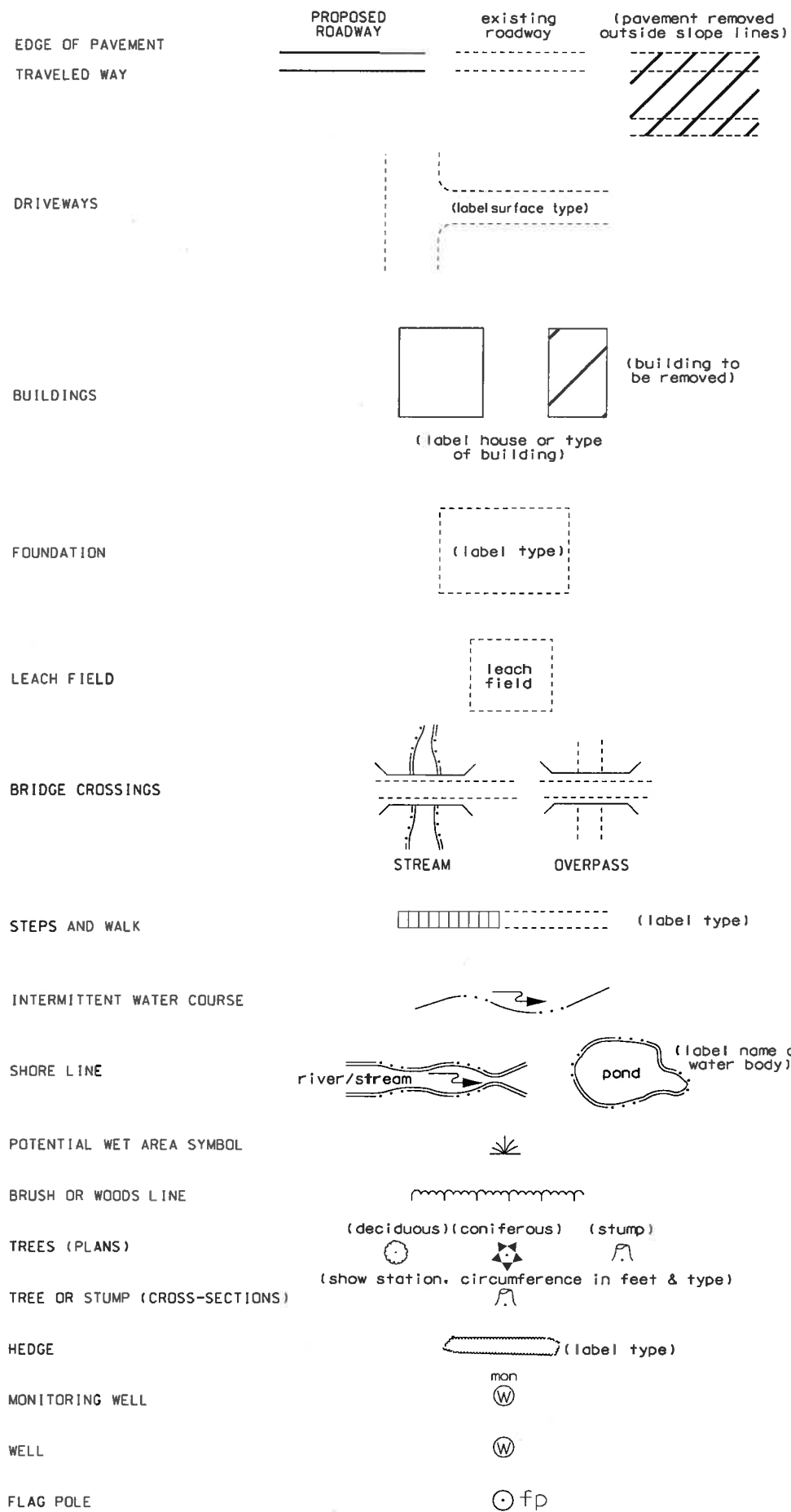
INDEX OF SHEETS

- 1 FRONT SHEET
- 2-3 STANDARD SYMBOLS SHEETS
- 4-5 WETLAND IMPACT PLANS
- 6 EROSION CONTROL STRATEGIES
- 7-8 EROSION CONTROL PLANS

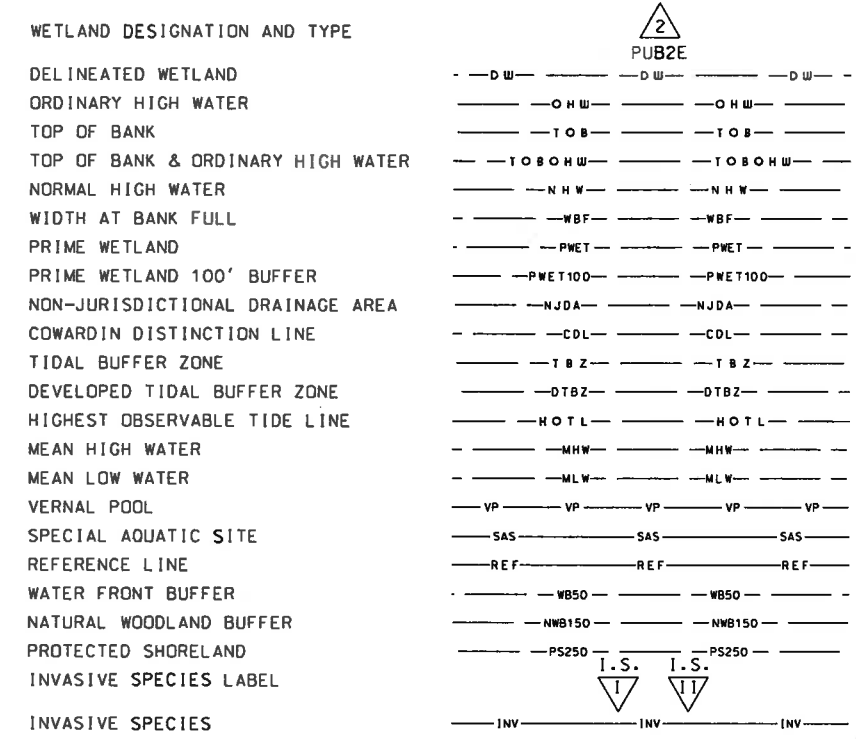
FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
X-A004(565)	41069	1	8

DATE 02/2018
DATE XX
DRAWN BY JCC
CHECKED BY XX

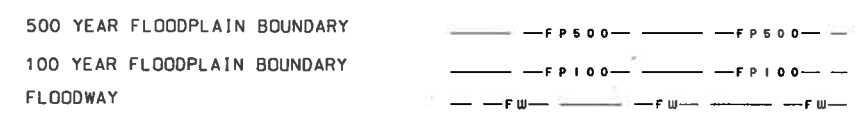
GENERAL



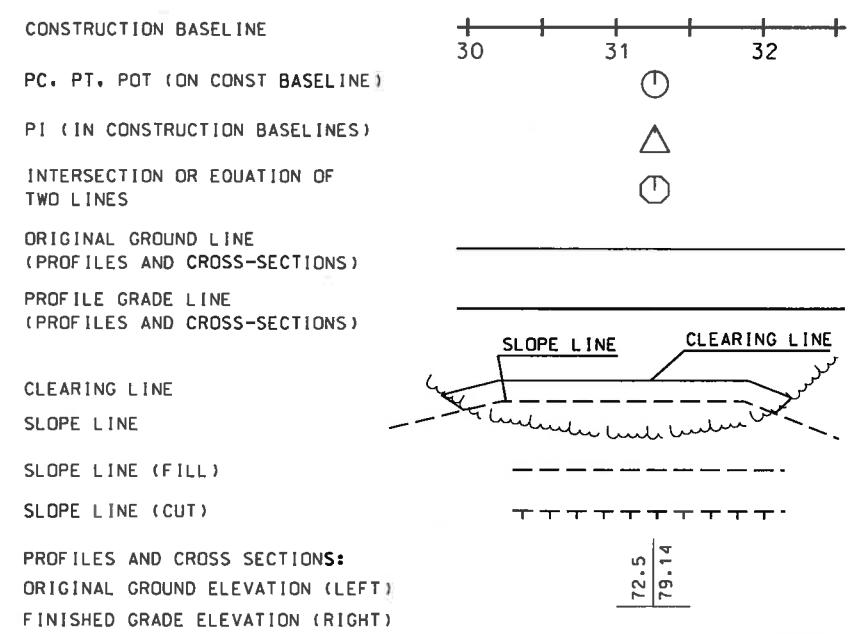
SHORELAND - WETLAND



FLOODPLAIN / FLOODWAY



ENGINEERING



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

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	stdsyml-2	41069	2	8

DRAINAGE

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

BOUNDARIES / RIGHT-OF-WAY

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

UTILITIES

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

TRAFFIC SIGNALS / ITS

MAST ARM (existing)			30' MA (NOTE ANGLE FROM 0)
OPTICOM RECEIVER			
OPTICOM STROBE			
TRAFFIC SIGNAL			
PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT			
SIGNAL CONDUIT			
CONTROLLER CABINET			
METER PEDESTAL			
PULL BOX			
LOOP DETECTOR (QUADRUPOLE)			(label size)
LOOP DETECTOR (RECTANGULAR)			(label size)
CAMERA POLE (CCTV)			
FIBER OPTIC DELINEATOR			
FIBER OPTIC SPLICE VAULT			SVF
ITS EQUIPMENT CABINET			ITS
VARIABLE SPEED LIMIT SIGN			
DYNAMIC MESSAGE SIGN			
ROAD AND WEATHER INFO SYSTEM			

CONSTRUCTION NOTES

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

SHEET 2 OF 2

STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
STANDARD SYMBOLS				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	stdsyml_2	41069	3	8

REVISIONS AFTER PROPOSAL

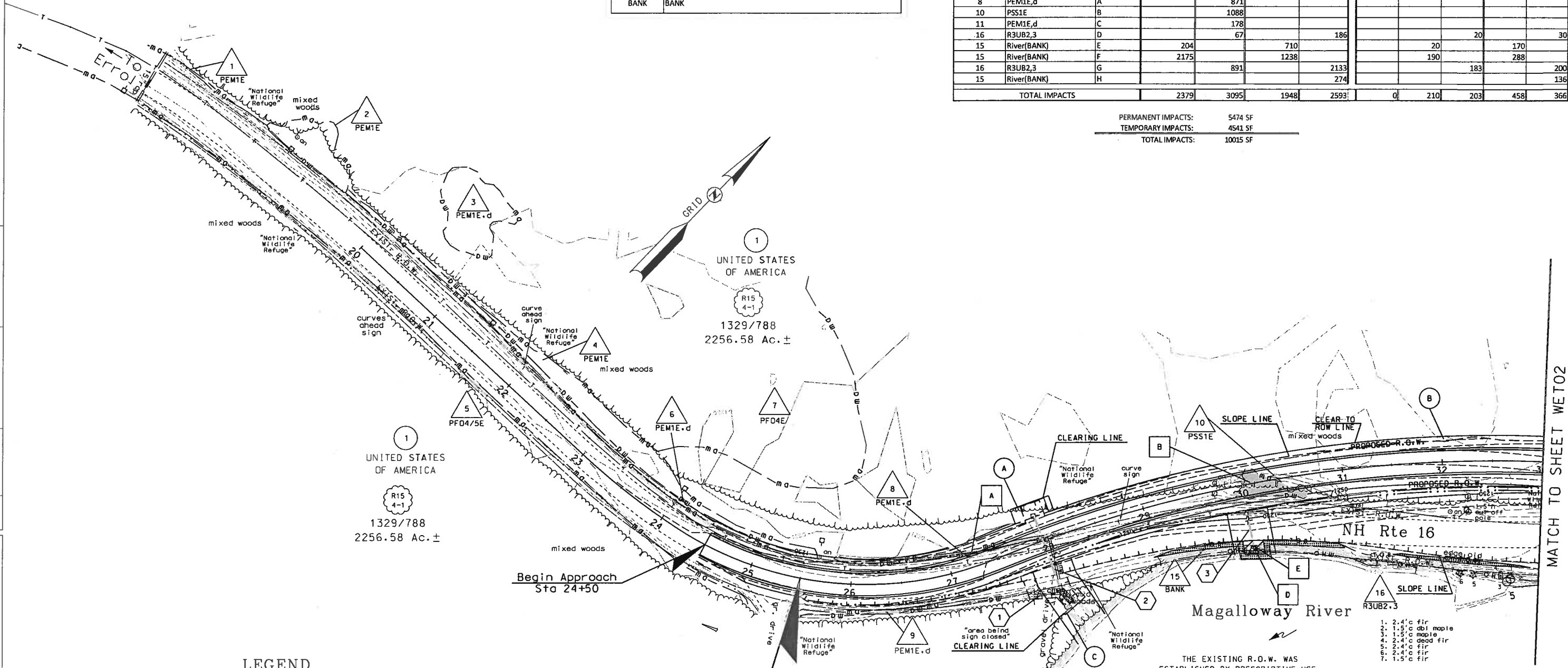
DESCRIPTION	STATION	DATE	NUMBER

DATE 09/01/17
 DATE 03/01/18
 DATE DATE3
 DATE DATE
 SDR PROCESSED SEL
 NEW DESIGN Joo
 SHEET CHECKED NAME3
 AS BUILT DETAILS

WETLAND CLASSIFICATION CODES	
PEM1Ed	PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED/SATURATED, DITCHED
PSS1E	PALUSTRINE, SCRUB-SHRUB, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
R2UB2,3	RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, SAND/MUD
BANK	BANK

WETLAND IMPACT SUMMARY														
WETLAND NUMBER	WETLAND CLASSIFICATION	LOCATION	AREA IMPACTS				LINEAR STREAM IMPACTS							
			PERMANENT		TEMPORARY		PERMANENT			TEMPORARY				
			N.H.W.B (NON WETLAND) (BANK)	N.H.W.B AND A.C.O.E. (WETLAND)	N.H.W.B (NON WETLAND) (BANK)	N.H.W.B AND A.C.O.E. (WETLAND)	BANK LEFT	BANK RIGHT	CHANNEL	BANK	CHANNEL			
			SF	SF	SF	SF	LF	LF	LF	LF	LF			
8	PEM1E,d	A			871									
10	PSS1E	B			1088									
11	PEM1E,d	C			178									
16	R3UB2,3	D			67									
15	River(BANK)	E		204		710				20		170		
15	River(BANK)	F		2175		1238				190		288		
16	R3UB2,3	G			891						183	200		
15	River(BANK)	H										136		
TOTAL IMPACTS					2379	3095	1948	2593		0	210	203	458	366

PERMANENT IMPACTS: 5474 SF
 TEMPORARY IMPACTS: 4541 SF
 TOTAL IMPACTS: 10015 SF



LEGEND

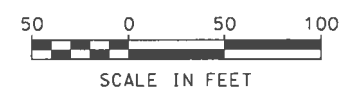
TYPE OF WETLAND IMPACT	SHADING/HATCHING	SYMBOL	DESCRIPTION
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	Diagonal hatching	Triangle with #	WETLAND DESIGNATION NUMBER
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	Solid grey	Square with #	WETLAND IMPACT LOCATION
TEMPORARY IMPACTS	Grid pattern	Diamond with #	WETLAND MITIGATION AREA
		Empty square	MITIGATION

BEGIN CONSTRUCTION STA 25+50

- 2 CONST. 78' X 15" 30000 R.C.P. 15" INV. OUT = 1247.00' 15" INV. IN = 1248.50'
- 3 CONST. 27.5' X 18" R.C.P. 18" INV. OUT = 1247.25' 18" INV. IN = 1248.50'

THE EXISTING R.O.W. WAS ESTABLISHED BY PRESCRIPTIVE USE.

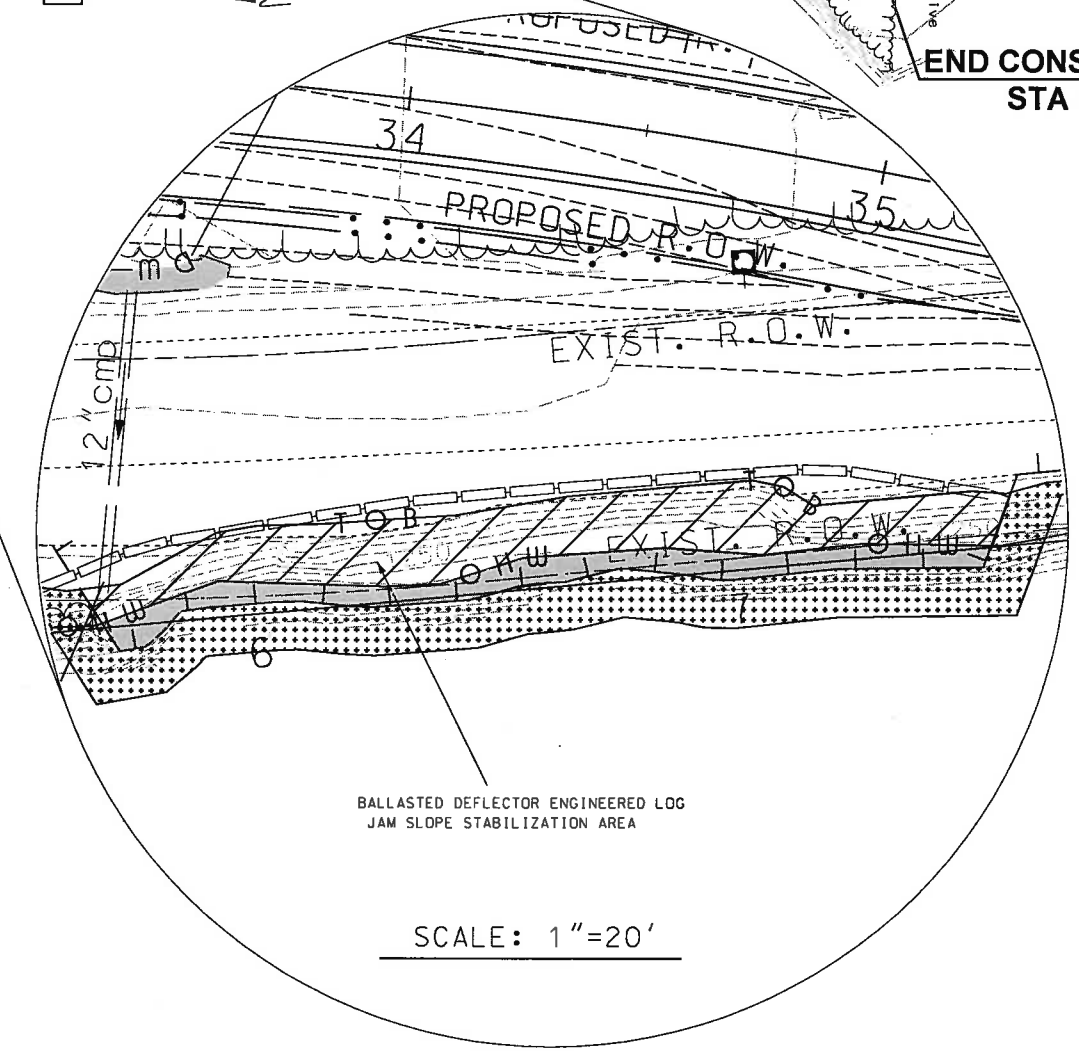
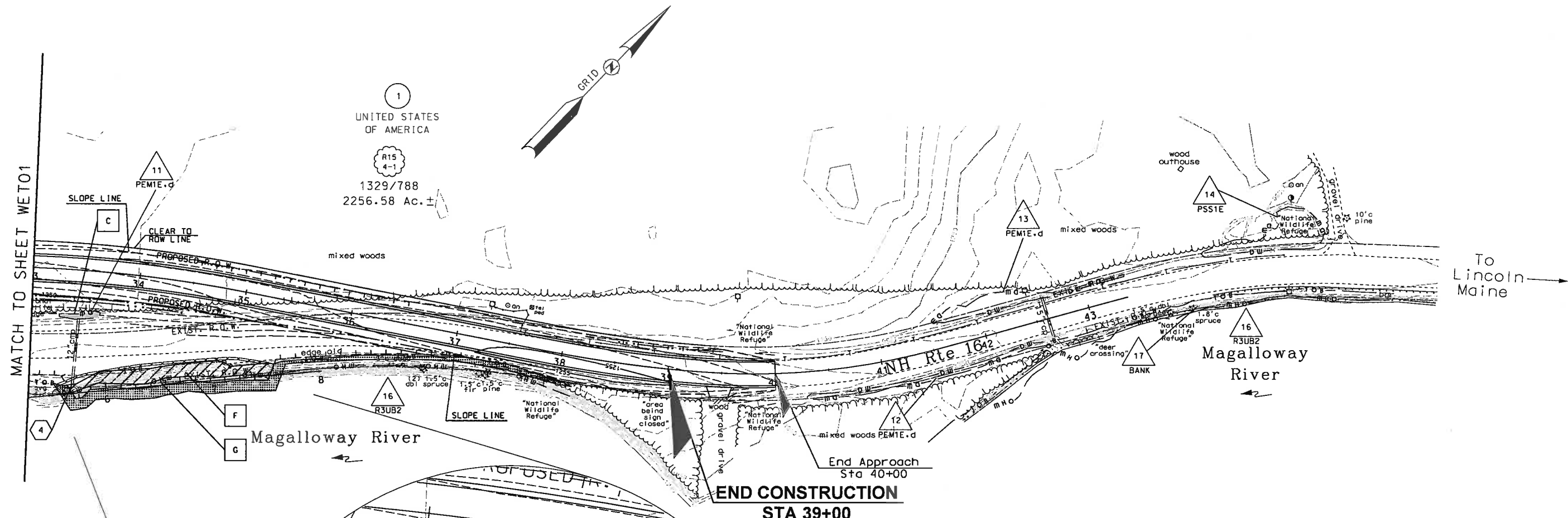
- 1. 2.4'c fir
- 2. 1.5'c dbi maple
- 3. 1.5'c maple
- 4. 2.4'c dead fir
- 5. 2.4'c fir
- 6. 2.4'c fir
- 7. 1.5'c fir



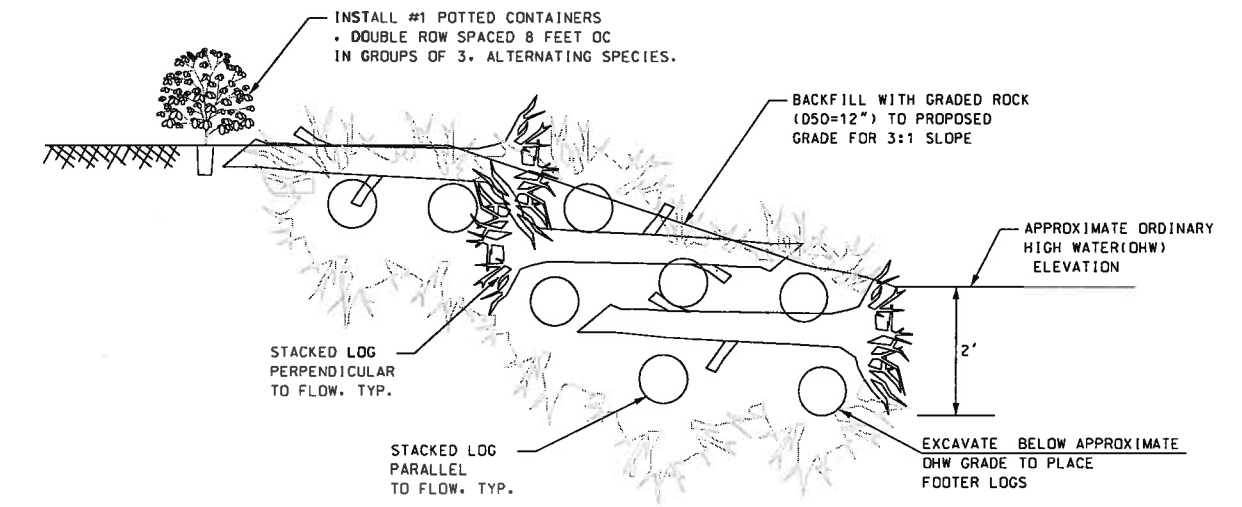
STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
WETLAND IMPACT PLANS				
MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
WET01	41069wetp1an	41069	4	8

MATCH TO SHEET WET02

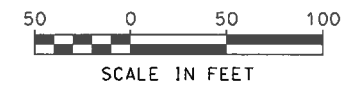
SDR PROCESSED	SEL	DATE	09/01/17
NEW DESIGN	Jao	DATE	03/01/18
SHEET CHECKED	NAME3	DATE	DATE3
AS BUILT DETAILS		DATE	DATE



SCALE: 1"=20'



BALLASTED DEFLECTOR ENGINEERED LOG JAM
NOT TO SCALE



STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
WETLAND IMPACT PLANS				
MODEL	DDN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
WET02	41069wetplan	41069	5	8

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
 - 1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
 - 1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
 - 1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
 - 1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
 - 1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WO 1500 REQUIREMENTS ([HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM](http://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM))
 - 1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.
 2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
 - 2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
 - 2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
 - 2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
 - 2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
 - (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
 - (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
 - 2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
 - 2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
 - 2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
 - 2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30th AND MAY 1st OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
 - (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15th, OR WHICH ARE DISTURBED AFTER OCTOBER 15th, SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
 - (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15th, OR WHICH ARE DISTURBED AFTER OCTOBER 15th, SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
 - (C) AFTER NOVEMBER 30th INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
 - (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER CONSTRUCTION PLAN HAS BEEN APPROVED BY NHDOT THAT MEETS THE REQUIREMENTS OF ENV-WO 1505.02 AND ENV-WO 1505.05.
 - (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WO 1505.05) AND INCLUDING THE REQUIREMENTS OF NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30th.
- GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS**
3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
 - 3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
 - 3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
 - 3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
 - 3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
 - 3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.
 4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
 - 4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
 - 4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
 - 4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1st THROUGH NOVEMBER 30th, OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.
 5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
 - 5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
 - 5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
 - 5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
 - 5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
 - 5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.
 6. PROTECT SLOPES:
 - 6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
 - 6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
 - 6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
 - 6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.
 7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
 - 7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
 - 7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.
 8. PROTECT STORM DRAIN INLETS:
 - 8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
 - 8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
 - 8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
 - 8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.
 9. SOIL STABILIZATION:
 - 9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
 - 9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
 - 9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR, IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
 - 9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.
 10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
 - 10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WO 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER. TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
 - 10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
 - 10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
 - 11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
 - 11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
 - 11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
 - 11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
 - 11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
 - 11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
 - 11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
 - 11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
 - 11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
 - 12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WO 1500: ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
 - 12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
 - 12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
 - 12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
 - 12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%, THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
 - 12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
 - 12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.
13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
 - 13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WO 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
 - 13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
 - 13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
 - 13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.
14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
 - 14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WO 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
 - 14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1, IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
 - 14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WO 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

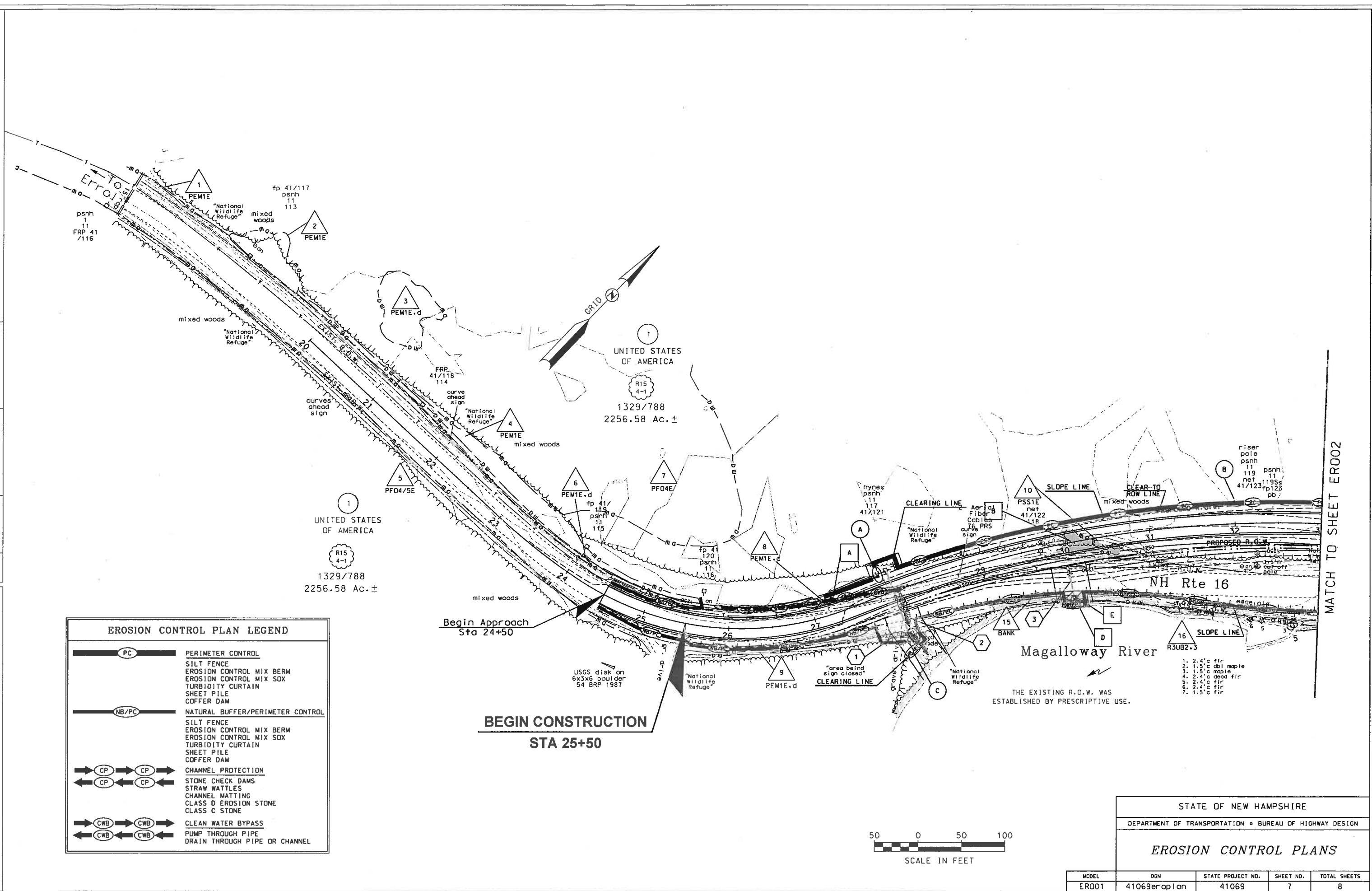
APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES ²				ROLLED EROSION CONTROL BLANKETS ³			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES ¹												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES ¹	YES ¹	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1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

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

- NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
 2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
 3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
EROSION CONTROL STRATEGIES				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
12-21-2015	erosstrat	41069	6	8

SDR PROCESSED	SEL	DATE	09/01/17
NEW DESIGN	JOO	DATE	03/01/18
SHEET CHECKED	NAME3	DATE	DATE3
AS BUILT DETAILS		DATE	DATE



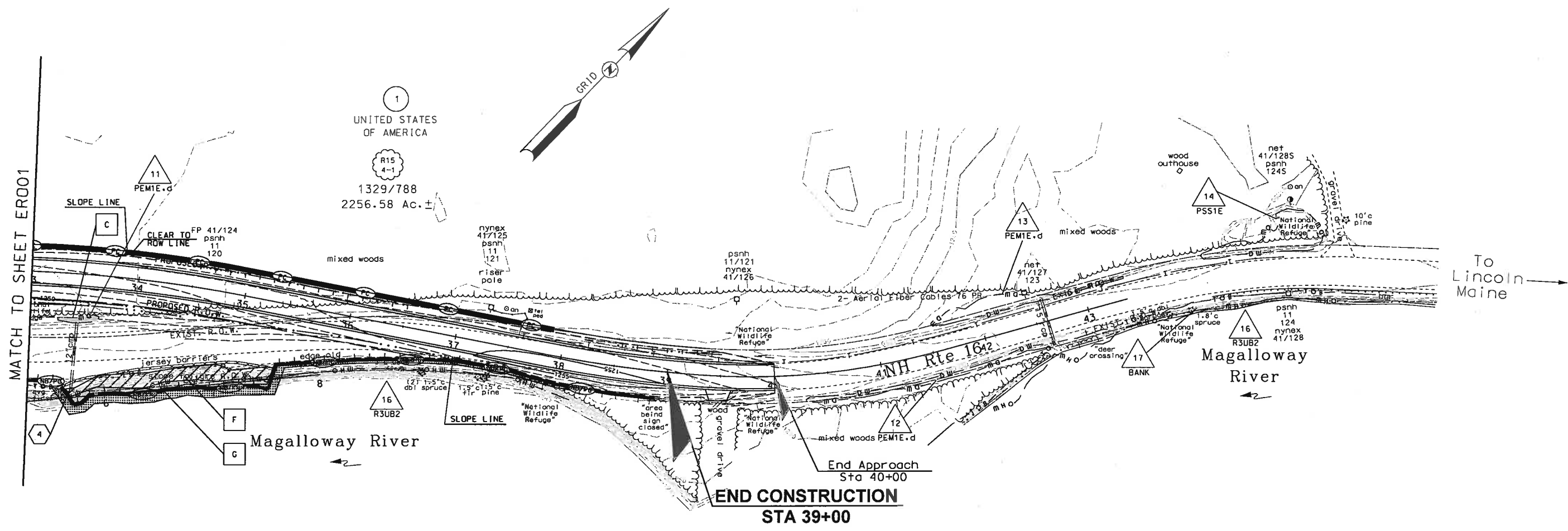
EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	CHANNEL PROTECTION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



STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
EROSION CONTROL PLANS				
MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ER001	41069eroplcn	41069	7	8

SDR PROCESSED	SEL	DATE	09/01/17
NEW DESIGN	100	DATE	03/01/18
SHEET CHECKED	NAME3	DATE	DATE3
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
EROSION CONTROL PLANS				
MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ER002	41069eroplan	41069	8	8