

STATE OF NEW HAMPSHIRE INTER-DEPARTMENT COMMUNICATION

DATE: December 8, 2023

FROM: Joshua Brown
Wetlands Program Analyst

AT (OFFICE): Department of
Transportation

SUBJECT Shoreland Application
Nashua-Merrimack-Bedford, 13761A

Bureau of
Environment

TO Calvin Deissner, NHDES Shoreland Program
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the Shoreland application package prepared by NH DOT Bureau of Highway Design for the subject project. The proposed NHDOT 13761A project is part of the larger Nashua-Merrimack-Bedford, 13761 project that involves widening three (3) segments of the existing two-lane portions of the F.E. Everett Turnpike in Nashua, Merrimack, and Bedford, New Hampshire. The 13761A is the southernmost segment located in Nashua and Merrimack. The project begins just north of the Tinker Road overpass at Exit 8 in Nashua, and continues north for approximately 2.2 miles, ending approximately 400 feet north of the Industrial Drive overpass at Exit 10 in Merrimack. A wetland standard dredge and fill application for this section of the project was submitted to NHDES on December 1, 2023.

This project was reviewed at the Natural Resource Agency Coordination Meeting on May 17, 2023. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link: <https://www.dot.nh.gov/projects-plans-and-programs/programs/environmental-management-system/project-management-section-0>.

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

The lead people to contact for this project are Wendy Johnson, Bureau of Highway Design (271-3909 or Wendy.A.Johnson@dot.nh.gov) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-3226 or Andrew.O'Sullivan@dot.nh.gov).

A payment voucher has been processed for this application (Voucher #77007) in the amount of \$3,750.

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

JRB;
cc:
BOE Original
Towns of Nashua & Merrimack (4 copies via certified mail)

Karl Benedict, NHDES
Kevin Nyhan, BOE (via electronic notification)

S:\Environment\PROJECTS\NASHUA\13761\Wetlands\13761A\Shoreland Application\Application Submission Documents\WETAPP - Coverletter.doc



**Nashua-Merrimack-
Bedford, 13761A**

NHDES Shoreland Permit Application



Prepared By:



**F.E. Everett Turnpike
Widening Project:
Southern Segment**

November 2023

New Hampshire Department of Transportation
Nashua-Merrimack-Bedford, 13761A
F.E. Everett Turnpike Widening Project: Southern Segment
NHDES Shoreland Permit Application
November 2023

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NHDES Shoreland Permit Application Form



SHORELAND PERMIT APPLICATION

Water Division/ Land Resources Management Shoreland Program



[Check the Status of your Application](#)

RSA/Rule: RSA 483-B, Env-Wq 1400

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

This is an application for a permit to excavate, fill, construct new structures, or remove structures within the protected shoreland as regulated under RSA 483-B.

SECTION 1 - PROJECT DESCRIPTION (Env-Wq 1406.07)			
Provide a concise description of the proposed project: The proposed 13761A project is the southernmost segment of the larger NHDOT Nashua-Merrimack-Bedford 13761 project. The 13761A project involves widening the F.E. Everett Turnpike from two to three travel lanes in both the NB and SB directions, beginning in Nashua, just north of the Tinker Road overpass at Exit 8, continuing north for approximately 2.2 miles, terminating approximately 400 feet north of the Industrial Drive overpass in Merrimack. The proposed project also involves the replacement of the existing bridges that carry the turnpike over Bowers Pond (Pennichuck Brook) and stormwater/drainage improvements. The purpose of the project is to improve the safety and capacity of the F.E. Everett Turnpike.			
SECTION 2 - PROJECT LOCATION (Env-Wq 1406.07)			
ADDRESS: F.E. Everett Turnpike	TOWN/CITY: Nashua & Merrimack	STATE: NH	ZIP CODE: 03063/54
WATERBODY NAME: Bowers Pond & Harris Pond (Pennichuck Brook)	TAX MAP/ BLOCK/LOT NUMBER : N/A - ROW		
SECTION 3 - PROPERTY OWNER & DEED INFORMATION (Env-Wq 1406.07)			
The legal name of each property owner must be as it appears on the deed of record. If the owner is a trust or a company, then the name of the trust or company should be written as the owner's name.			
LAST NAME, FIRST NAME, M.I.: New Hampshire Department of Transportation Attn: Wendy Johnson			
MAILING ADDRESS: 7 Hazen Drive	TOWN/CITY: Concord	STATE: NH	ZIP CODE: 03302
PHONE: (603) 271-3909	EMAIL (if available): Wendy.A.Johnson@dot.nh.gov		
REGISTRY OF DEED COUNTY _____, BOOK NUMBER _____, PAGE NUMBER _____			
SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER), IF DIFFERENT THAN OWNER (Env-Wq 1406.07)			
If the applicant is a trust or a company, then the name of the trust or company should be written as the applicant's name. If the applicant is the owner, leave blank and check the following box: <input checked="" type="checkbox"/> .			
LAST NAME, FIRST NAME, M.I.: _____			
MAILING ADDRESS: _____	TOWN/CITY: _____	STATE: _____	ZIP CODE: _____

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

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

<http://www.des.nh.gov>

PHONE: [REDACTED]	EMAIL (if available): [REDACTED]		
SECTION 5 - CONTRACTOR OR AGENT (OPTIONAL)			
LAST NAME, FIRST NAME, M.I: Hoffmann, Stephen (McFarland-Johnson, Inc.)			
ADDRESS: 53 Regional Drive	TOWN/CITY: Concord	STATE: NH	ZIP CODE: 03301
PHONE: (802) 862-9381	EMAIL (if available): shoffmann@mjinc.com		
SECTION 6 - CRITERIA (Env-Wq 1406.07)			
Please check at least one of the following criteria:			
<input type="checkbox"/> This shoreland permit application requires neither a proposal to make the property more nearly conforming nor a request for a waiver of a minimum standard.			
<input type="checkbox"/> This shoreland permit application includes a proposal to make the structures and/or the property more nearly conforming in accordance with RSA 483-B:11.			
<input checked="" type="checkbox"/> This shoreland permit application includes a request for a waiver of the following minimum standard(s): RSA 483-B:9, V (a)(2)(C); (a)(2)(D); (b)(2)(A); (d)(3); (g)(1); (g)(3) .			
SECTION 7 - RELATED NHDES LAND RESOURCES MANAGEMENT PERMIT APPLICATIONS ASSOCIATED WITH THIS PROJECT (Env-Wq 1406.14)			
Please indicate if any of the following permits are required and, if required, the status of the application.			
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	N/A	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Individual Sewerage Disposal per RSA 485-A:29	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	N/A	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Subdivision Approval per RSA 485-A:29	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	N/A	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Wetlands Permit per RSA 482-A	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	PENDING	<input type="checkbox"/> APPROVED <input checked="" type="checkbox"/> PENDING <input type="checkbox"/> DENIED
SECTION 8 - REFERENCE LINE ELEVATION (Env-Wq 1406.07)			
Required for projects located on the protected shoreland of lakes or ponds. The reference line elevations for most lakes, ponds, and artificial impoundments greater than 10 acres in size are listed in the Consolidated List of Waterbodies Subject to the Shoreland Water Quality Protection Act. Please see RSA 483-B:4, XVII for the definition of reference line.			
REFERENCE LINE ELEVATION: 175 & 166 feet above sea level.			
SECTION 9 - APPLICATION FEE & SUBMITTAL (RSA 483-B:5-b, I(b); RSA 483-B:5-b, X)			
A non-refundable permit application fee of \$200 plus \$0.20 per total square feet of impact for restoration of water quality improvement projects, or \$400 plus \$0.20 per total square feet of impact for all other projects is required at the time the application is submitted. Applications for projects solely funded by municipal, county, state, or federal entities shall incur a permitting fee no greater than \$3,750.			
Please mail or hand deliver this application and all required attachments to the NHDES Wetlands Bureau, PO Box 95, Concord, NH 03302-0095. Missing information will delay processing your application and may result in denial of a shoreland permit application. Please make checks payable to the Treasurer, State of NH.			

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

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

<http://www.des.nh.gov>

SECTION 10 - CALCULATING TOTAL IMPACT AREA/ PERMIT APPLICATION FEE (RSA 483-B:5-b, I(b); RSA 483-B:5-b, X)		
Total impact area is calculated by determining the sum of all areas disturbed by regrading, excavating, filling, construction, or structure removal. Impacts often include, but are not limited to: constructing new driveways, constructing new structures, areas disturbed when installing septic systems and foundations, creating temporary access roads to drill a new well, and regrading associated with landscaping activities.		
TOTAL AREA IMPACTED WITHIN THE PROTECTED SHORELAND = 258,323 (A) square feet		
<ul style="list-style-type: none"> • For restoration of water quality improvement projects: Multiply line (A) by \$0.20 and add \$200. [(A) × \$0.20 + \$200] = \$ N/A Permit fee¹ • For all other projects: Multiply line (A) by \$0.20 and add \$400. [(A) × \$0.20 + \$400] = \$ \$3,750 (483-B:5-B X.) Permit fee¹ 		
SECTION 11 - REQUIRED CERTIFICATIONS (Env-Wq 1406.08; Env-Wq 1406.10(a))		
By initialing within the blank before each of the following statements, and signing below, you are certifying that:		
Initials: WJG	The information provided is true, complete, and not misleading to the knowledge and belief of the signer.	
Initials: WJG	I understand that: <ul style="list-style-type: none"> • Any permit or waiver granted based on false, incomplete, or misleading information shall be subject to revocation. • I am subject to the applicable penalties in RSA 641, Falsification in Official Matters. And • Obtaining a shoreland permit shall not exempt the work proposed from other state, local, or federal approvals. 	
Initials: WJG	I have notified the governing body of the municipality or municipalities in which the property is located by certified mail, in accordance with Env-Wq 1406.13.	
Initials: N/A	I have notified all abutters ² of the proposed impacts via certified mail, in accordance with Env-Wq 1406.13.	
Initials: WJG	<input type="checkbox"/> This project is within ¼ mile of a designated river and I have notified the Local River Management Advisory Committee (LAC) by providing the LAC with a copy of the complete application, including all supporting materials, via certified mail, in accordance with Env-Wq 1406.13. <input checked="" type="checkbox"/> This project is not within ¼ mile of a designated river.	
Initials: WJG	For any project proposing that the impervious area be at least 15% but not more than 20% within the protected shoreland, I certify that the impervious area is not more than 20%. <input type="checkbox"/> N/A	
SECTION 12 - REQUIRED SIGNATURES (Env-Wq 1406.08)		
Both the property owner and applicant must sign the application.		
SIGNATURE (OWNER): Wendy A. Johnson	PRINT NAME LEGIBLY: WENDY JOHNSON (NHDOT)	DATE: 12/06/23
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER):	PRINT NAME LEGIBLY:	DATE:

¹ Applications for projects solely funded by municipal, county, state, or federal entities shall incur a permitting fee no greater than \$3,750.

² "Abutter" means any person who owns property that is immediately contiguous to the property on which the proposed work will take place, or who owns flowage rights on such property. The term does not include those properties separated by a public road or more than ¼ mile from the limits of the proposed work. If contiguous properties are owned by the person who is proposing the work, then the term includes the person owning the next contiguous property, subject to the ¼ mile limitation.

SHORELAND APPLICATION WORKSHEET

This worksheet *must* be submitted to the NHDES Wetlands Bureau with every Shoreland Permit Application. **A separate shoreland application worksheet must be submitted for each individual lot of record where impacts are proposed.**

For the purposes of this worksheet, “**pre-construction**” impervious surface area³ means all human made impervious surfaces⁴ currently present within the protected shoreland of a lot, whether to be removed or to remain after the project is completed. “**Post-construction**” impervious area means all impervious surfaces that will exist within the protected shoreland of a lot upon completion of the project, including both new and any remaining pre-construction impervious surfaces. All answers shall be given in square feet.

Calculating the Impervious Area of a Lot

CALCULATING THE IMPERVIOUS AREA OF A LOT WITHIN 250 FEET OF THE REFERENCE LINE (Env-Wq 1406.12)			
	STRUCTURE DESCRIPTION	PRE-CONSTRUCTION IMPERVIOUS AREAS	POST-CONSTRUCTION IMPERVIOUS AREAS
PRIMARY STRUCTURE(S) House and all attached decks and porches.	Pavement	111,258 FT ²	176,024 FT ²
ACCESSORY STRUCTURES All other impervious surfaces excluding lawn furniture, well heads, and fences. Common accessory structures include, but are not limited to: driveways, walkways, patios, and sheds.	[REDACTED]	[REDACTED] FT ²	[REDACTED] FT ²
	[REDACTED]	[REDACTED] FT ²	[REDACTED] FT ²
	[REDACTED]	[REDACTED] FT ²	[REDACTED] FT ²
	[REDACTED]	[REDACTED] FT ²	[REDACTED] FT ²
	[REDACTED]	[REDACTED] FT ²	[REDACTED] FT ²
	[REDACTED]	[REDACTED] FT ²	[REDACTED] FT ²
TOTAL:		(A) 111,258 FT ²	(B) 176,024 FT ²
Area of the lot located within 250 feet of reference line:			(C) 574,363 FT ²
Percentage of lot covered by pre-construction impervious area within 250 feet of the reference line: <i>[divide (A) by (C) x 100]</i>			(D) 19.4 %
Percentage of lot to be covered by post-construction impervious area within 250 feet of the reference line upon completion of the project: <i>[divide (B) by (C) x 100]</i>			(E) 30.6 %

³ “**Impervious surface area**” as defined in Env-Wq 1402.13 means, for purposes of the impervious surface limitation specified in RSA 483-B:9, V(g), the sum total of the footprint of each impervious surface that is located within the protected shoreland.

⁴ “**Impervious Surface**” as defined in RSA 483-B:4, VII-b means any modified surface that cannot effectively absorb or infiltrate water. Examples of impervious surfaces include, but are not limited to, roofs, and unless designed to effectively absorb or infiltrate water, decks, patios, and paved, gravel, or crushed stone driveways, parking areas, and walkways.

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Stormwater Management Requirements

THE IMPERVIOUS AREA THRESHOLDS (RSA 483-B:9, V(g))
<input type="checkbox"/> A net decrease or no net increase in impervious area is proposed (If line E is less than or equal to line D).
<input type="checkbox"/> The percentage of post-construction impervious area (line E) is less than or equal to 20%. This project does not require a stormwater management plan and does not require a plan demonstrating that each waterfront buffer grid segment at least meets the minimum required tree and sapling point score.
<input type="checkbox"/> A net increase in impervious area is proposed and the percentage of post-construction impervious area (line E) is greater than 20%, but less than 30%. This project requires a stormwater management but, does not require a plan demonstrating that each waterfront buffer grid segment at least meets the minimum required tree and sapling point score. <i>See details on the Application Checklist</i>
<input checked="" type="checkbox"/> A net increase in impervious area is proposed and the percentage of post-construction impervious area (line E) is greater than 30%. This project requires a stormwater management plan designed and certified by a professional engineer and requires plans demonstrating that each waterfront buffer grid segment meets at least the minimum required tree and sapling point score. <i>See details on the Application Checklist</i>

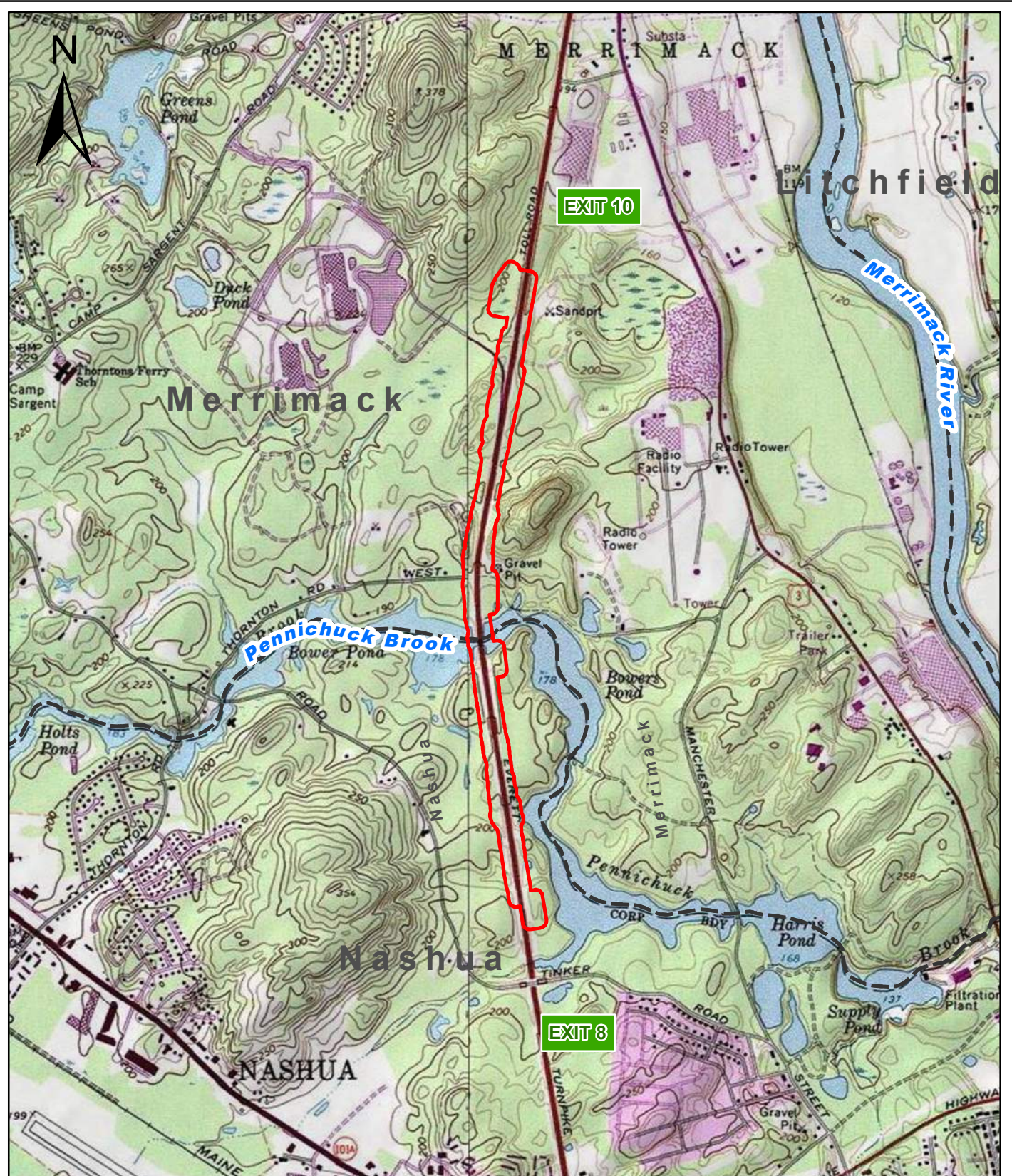
Natural Woodland Area Requirement

DETERMINING THE AREA TO REMAIN AS NATURAL WOODLAND	
Total area of the lot between 50 feet and 150 feet of the reference line within which the vegetation currently exists as natural woodland ⁵ (see definition below).	(F) 69,170 FT ²
Total area of the lot between 50 feet and 150 feet from the reference line.	(G) 211,397 FT ²
At least 25% of area (G) must remain in as natural woodland. $[0.25 \times G]$	(H) 52,849 FT ²
Place the lesser of area (F) and calculation (H) on this line. In order to remain compliant with the natural woodland area requirement , this is the minimum area that must remain as natural woodland between 50 feet and 150 feet from the reference line. This area must be represented on all plans and this area, exclusive of existing lawn, must remain in an unaltered state ⁶ .	(I) 52,849 FT ²
Name of person who prepared this worksheet: Stephen Hoffmann	
Name and date of the plan this worksheet is based upon: Shoreland Impact Plans, November 17, 2023	

⁵ **“Natural Woodland”** means a forested area consisting of various species of trees, saplings, shrubs, and ground covers in any combination and at any stage of growth (483-B:4, XI).

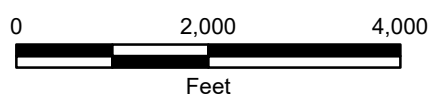
⁶ **“Unaltered State”** means native vegetation allowed to grow without cutting, limbing, trimming, pruning, mowing, or other similar activities except as needed for renewal or to maintain or improve plant health (483-B:4, XXIV-b).

Figure 1 – USGS Location Map



M:\18589.00 NHDOT Southern FEET Design\Draw\GIS\13761A\Permitting Figures\Weilands\Figure 1 - USGS Location Map 13761A.mxd

- 13761A Project Area
- Town Boundary



NHDOT 13761 F.E. EVERETT TURNPIKE WIDENING PROJECT
 13761A - SOUTHERN SEGMENT
 NASHUA-MERRIMACK, NEW HAMPSHIRE

USGS LOCATION MAP

SCALE: 1 inch = 2,000 feet	DATE: MAY 2023	FIGURE: 1
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Supplemental Project Description

SHORELAND PERMIT APPLICATION

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

NASHUA-MERRIMACK-BEDFORD

F.E. EVERETT TURNPIKE WIDENING PROJECT

13761A – SOUTHERN SEGMENT

NASHUA & MERRIMACK, NEW HAMPSHIRE

NOVEMBER 2023

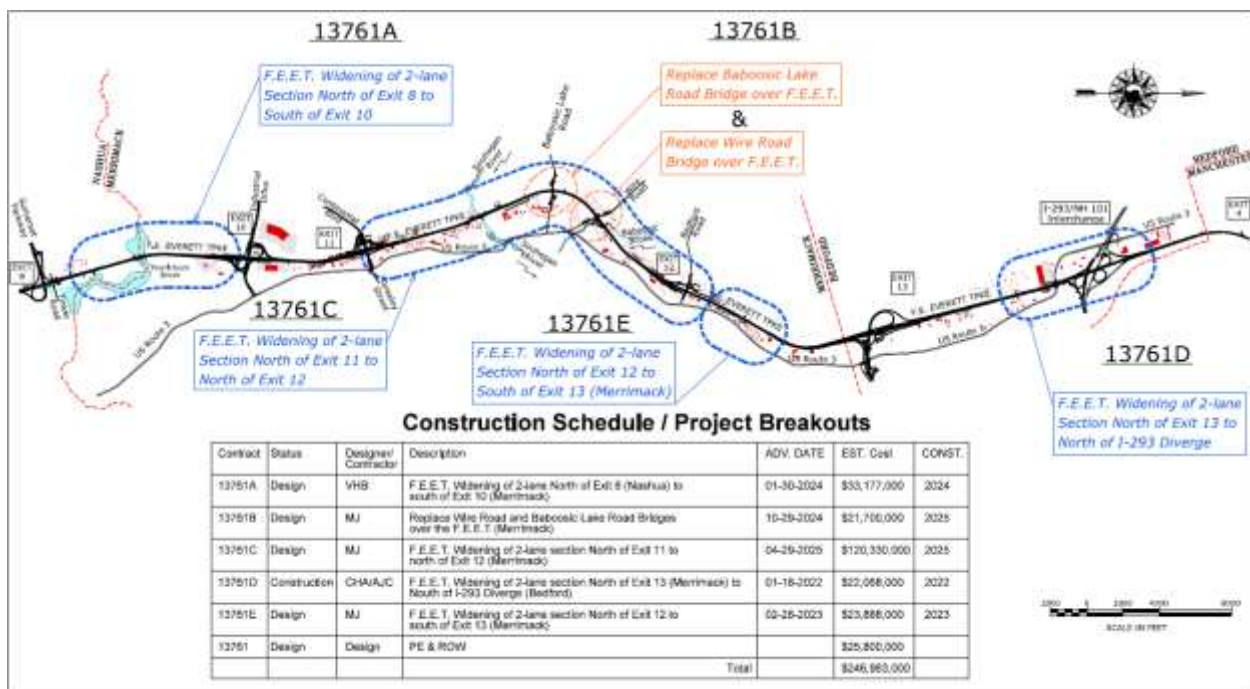
SUPPLEMENTAL NARRATIVE

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Introduction

The proposed NHDOT 13761A project is part of the larger Nashua-Merrimack-Bedford 13761 project that involves widening three (3) segments of the existing two-lane portions of the F.E. Everett Turnpike (F.E.E.T.) in Nashua, Merrimack, and Bedford, New Hampshire. The 13761 project has been divided into five (5) separate construction contracts. Based on prior discussions with NHDES and the US Army Corps of Engineers, each construction contract will be permitted separately, and cumulative impacts will be tracked for the entire project. This NHDES Shoreland Permit application is for the 13761A contract, which includes the southernmost segment located in the City of Nashua and the Town of Merrimack. The project begins just north of the Tinker Road overpass at Exit 8 in Nashua, and continues north for approximately 2.2 miles, ending approximately 400 feet north of the Industrial Drive overpass at Exit 10 in Merrimack.



Purpose & Need

The purpose of the F.E.E.T. Widening Project is to improve transportation safety and efficiency associated with turnpike congestion in Nashua, Merrimack, and Bedford for all users of the turnpike while being sensitive to the needs of local communities, residents, and natural and cultural resources.

The F.E.E.T. is a principal north-south arterial highway within the State of New Hampshire and is part of the New Hampshire Turnpike System. The F.E.E.T. begins at the New Hampshire-Massachusetts State Line, where it is a continuation of US Route 3, and continues north 39.5 miles to Exit 14 in Concord, NH. It includes portions of Interstates 93 and 293 and provides a vital link for north-south travel. The F.E.E.T. carries a mix of traffic including trucks, cars, and buses, as well as commercial traffic vital to the region's economy. The F.E.E.T. corridor serves as a regional commuting route for residents of New Hampshire and

Massachusetts as well as an important local route for the communities of Nashua, Merrimack, Bedford, and other surrounding municipalities. It also serves as an important link for New England-wide travel to population centers such as Nashua, Manchester, and Concord, as well as to tourist destinations such as the New Hampshire Lakes Region, White Mountains, and ski areas. As one of the main arterials in the New Hampshire highway system, it is important to maintain the safety and mobility of people, goods, and services through this corridor.

Project Description

The proposed 13761A project is primarily a roadway widening project involving the construction of an additional travel lane in both the northbound and southbound directions of the F.E.E.T. in Nashua and Merrimack, New Hampshire.

The proposed project also includes the complete replacement of existing bridges 107/042 and 106/042 carrying the northbound and southbound barrels of the F.E.E.T. (respectively) over Bowers Pond (Pennichuck Brook). The two existing 87' single span bridges will be replaced with a 100' single span bridge over Pennichuck Brook. The proposed bridge abutments will be constructed behind the existing abutments, and the existing abutments and piles will be removed to a minimum depth of one foot below grade. The proposed bridge structure will also provide improvements to terrestrial wildlife passage at the crossing through the inclusion of two, two-foot-wide wildlife shelves in front of the northern and southern abutments. The vegetated 2:1 slopes along the causeways will be provided to facilitate wildlife passage. The design team confirmed with NHFG that the vegetated 2:1 slope would be passable for turtles and other wildlife species.

The project also includes the construction of stormwater treatment areas and drainage upgrades and improvements to meet MS4 and AOT requirements.

In addition to the replacement of the existing bridges over Bowers Pond, portions of the proposed project are located within the Protected Shoreland (within 250 feet of the Reference Line) of Harris Pond. Harris Pond is also part of Pennichuck Brook and is the impoundment below Bowers Pond and Bowers Dam.

The project is scheduled to be advertised in January 2024, with construction anticipated to commence in spring/summer 2024.

Existing Conditions

The following sections provide a description of the existing natural and environmental resources identified in the vicinity of the proposed 13761A project.

Wetlands

The southern segment (13761A) of the F.E.E.T. Widening Project is in Nashua and Merrimack, New Hampshire. Wetlands and surface waters in the project area were originally delineated by McFarland-

Johnson, Inc. (MJ) in 2016-2017 and wetland boundaries were confirmed by an additional field review in 2022. The majority of the wetlands in the vicinity of the project consist of palustrine forested wetlands.

The following provides a summary of the delineated wetlands identified in the vicinity of the 13761A project:

W-1: Wetland W-1 is a small palustrine scrub-shrub (PSS1E) depression location adjacent to W-2. This area is located on the east side of the F.E. Everett Turnpike, north of the Tinker Road overpass. Dominant vegetation found in this wetland included red maple and white pine in the tree stratum; glossy buckthorn in the sapling/shrub stratum; and cinnamon fern, broad-leaf cattail, poison ivy, and purple loosestrife in the herbaceous stratum. Indicators of hydrology included saturation within 12 inches of the surface.

W-2: Wetland W-2 consists of a finger of the Pennichuck Brook impoundment (L1UBHh), constructed stormwater treatment areas, and a ditch/swale (PEM1Ed) along the toe-of-slope of the F.E. Everett Turnpike. These areas are all hydrologically connected, but primarily consist of constructed treatment areas designed to capture and convey stormwater runoff. Dominant vegetation occurring in this wetland included glossy buckthorn and willows along the edges of the open water areas, and soft rush, purple loosestrife, American bur-reed, and tussock sedge in the herbaceous layer. Hydrology indicators included surface water and saturation.

W-3: Wetland W-3 is a palustrine forested (PFO1E) wetland depression located on the west side of the F.E. Everett Turnpike. This wetland extends outside the study area and appears to be hydrologically connected to Pennichuck Brook according to NWI wetland mapping. This wetland is also located within the 100-year floodplain of Pennichuck Brook. Dominant vegetation includes red maple and white pine in the tree stratum. The herbaceous layer was sparse and consisted of marsh fern and small-spiked false nettle. Soils were saturated. Wetland W-3 is located within the mapped floodplain and appears to be contiguous with Pennichuck Brook based on existing wetland and floodplain mapping. Therefore, W-3 would be considered a floodplain wetland adjacent to a Tier 3 watercourse, a Priority Resource Area (PRA) type under the NHDES Wetland Rules.

W-4: Wetland W-4 is a palustrine forested (PFO1E) fringe wetland along the Pennichuck Brook impoundment located in the southwest quadrant of the bridge crossing. Dominant vegetation in this wetland included red maple and American elm in the tree stratum; winterberry and maleberry in the sapling/shrub stratum; and marsh fern, sensitive fern, awl-fruited sedge, bladder sedge, and common arrowhead in the herbaceous stratum. Indicators of hydrology included saturation at a depth of approximately 8 inches. Soils were sandy loams with a layer of mucky mineral soil at the surface. These soils met the hydric soil indicator A11: Depleted Below Dark Surface. Wetland W-4 is also a PRA located within the floodplain of Pennichuck Brook. In Nashua, the Pennichuck Brook surface water and adjacent wetlands have been designated Prime Wetlands. Therefore, W-4 is also a Prime Wetland, another PRA type.

W-5: Wetland W-5 is a palustrine forested (PFO1E) fringe wetland along the Pennichuck Brook impoundment located in the northwest quadrant of the bridge crossing. Dominant vegetation in this wetland included red maple, white pine, and green ash in the tree stratum; red oak in the sapling/shrub stratum; and cinnamon fern, hay-scented fern, and New York fern in the herbaceous stratum. This wetland

area is located within the 100-year floodplain of Pennichuck Brook and therefore, the wetland is considered a PRA. Soils were silty loams with a depleted matrix.

W-6: Wetland W-6 is a palustrine forested (PFO1E) fringe wetland along the Pennichuck Brook impoundment located in the northeast quadrant of the bridge crossing. Dominant vegetation in this wetland included red maple and white pine in the tree stratum; red maple in the sapling/shrub stratum; and cinnamon fern in the herbaceous stratum. This wetland area is also located within the 100-year floodplain of Pennichuck Brook, making this wetland a PRA.

W-7: Wetland W-7 is a small palustrine forested (PFO1E) wetland located on the west side of the F.E. Everett Turnpike near the northern terminus of the 13761A project. This area is a small ditch that drains into a culvert flowing east underneath the F.E. Everett Turnpike (the outlet was not delineated because it is located outside of the proposed project area). The wetland is separated from a small pond to the west by a berm and is hydrologically connected via a culvert through the berm. Dominant vegetation in this wetland included red maple and gray birch in the tree stratum; speckled alder in the sapling/shrub stratum; and spotted touch-me-not, small-spike false nettle, and several species of sedges in the herbaceous stratum. Indicators of hydrology included saturation and surface water. The soils were muddy sandy loams underlain by sand and met hydric soil indicator A4: Hydrogen Sulfide Odor.

Surface Waters

Bowers Pond

Bowers Pond or Pennichuck Brook is the most prominent surface water in the project area. At the location of the F.E.E.T. crossing (Bridge No.'s 107/042 and 106/042) Pennichuck Brook is an impoundment, also known as Bowers Pond, formed by a series of dams located downstream (east) of the crossing. Pennichuck Water Works owns and operates the existing dams, reservoirs, and surrounding lands. Pennichuck Brook is also a drinking water supply for the City of Nashua and surrounding municipalities. The water supply intake is located east of the project area, below a series of two dams, at the Supply Pond. Coordination with Pennichuck Water Works regarding the proposed project, impacts, stormwater treatment, and protection of water quality has been completed by VHB. Pennichuck Brook is not a Class A surface water or an Outstanding Resource Water. Based on coordination with New Hampshire Fish and Game (NHFG) Pennichuck Brook supports a warm water fishery. At the location of the F.E.E.T. crossing, Pennichuck Brook has a total watershed size of 23.9 square miles. Based on prior coordination with NHDES the crossing is considered a Tier 3 stream crossing based on the watershed size. FEMA mapped 100-year floodplain and regulatory floodway associated with Pennichuck Brook are also located within the 13761A project area.

Merrimack River

The Merrimack River is located east of the F.E.E.T. and will not be impacted by the proposed project. The segment of the Merrimack River east of the project is a part of the Lower Merrimack River, a New Hampshire Designated River. However, the proposed project is located outside the Designated River Corridor and no additional coordination with the Local River Management Advisory Committee is required.

Protected Shorelands

In New Hampshire, The Shoreland Water Quality Protection Act (RSA 483-B, SWQPA) regulates lands within 250 feet of all public waters, known as the Protected Shoreland. As defined in RSA 483-B:4 XVI. Public waters include:

- (a) All lakes, ponds, and artificial impoundments greater than 10 acres in size. Coastal waters, being all waters subject to the ebb and flow of the tide, including the Great Bay Estuary and the associated tidal rivers;
- (b) Coastal waters, being all waters subject to the ebb and flow of the tide, including the Great Bay Estuary and the associated tidal rivers; and
- (c) Rivers, meaning all year-round flowing waters of fourth order or higher and all rivers and river segments designated as protected under RSA 483:15. Stream order shall be determined using the New Hampshire hydrography dataset archived by the geographically referenced analysis and information transfer system (GRANIT) at the complex systems research center of the university of New Hampshire, and developed by GRANIT in collaboration with the department of environmental services. A listing of the streams of fourth order and higher shall be prepared and periodically updated by the GRANIT at the complex systems research center of the university of New Hampshire and delivered to the commissioner 30 days after the effective date of this subparagraph.

Bowers Pond is approximately 87 acres in size and is included on the NHDES Consolidated List of Waterbodies Subject to RSA 483-B, The Shoreland Water Quality Protections Act (SWQPA). Therefore, the portions of the project located within the Protected Shoreland of Pennichuck Brook (lands within 250 feet of the reference line, or ordinary high water) are subject to jurisdiction under the SWQPA. The surface elevation, or Reference Line of Bowers Pond has been identified on the NHDES Consolidated List as 175 feet above sea level. Pursuant to RSA 483-B:4XVII (a), "Reference Line means: For all lakes, ponds, and artificial impoundments greater than 10 acres in size, the surface elevation as listed in the Consolidated List of Water Bodies subject to the shoreland water quality protection act as maintained by the department."

Harris Pond is the next impoundment of Pennichuck Brook located downstream from Bowers Pond and below the Bowers Dam. Harris Pond is approximately 72 acres in size and is also included on the NHDES Consolidated List. According to the List, the Reference Line elevation for Harris Pond is 166 feet above sea level. Portions of the southern portion of the 13761A project are located within 250 feet of the Reference Line of Harris Pond.

Rare, Threatened, and Endangered Species / Fish and Wildlife Habitat

The US Fish and Wildlife Service Information for Planning and Consultation (IPaC) Tool Official Species List indicated that the proposed project area is within the documented range of the northern long-eared bat (NLEB). The proposed project is anticipated to require approximately 11.2 acres of tree clearing. An acoustic survey for the 13761A project was conducted between July 21 through July 28, 2021. Four detectors were deployed for a total of seven nights, three of which experienced unsuitable weather

conditions as defined by the USFWS Range-Wide Indiana Bat & Northern Long Eared Bat Summer Survey Guidelines (Survey Guidelines). Based on an analysis of the data collected during all seven nights, no acoustic files were manually identified as NLEB at any detector site. An inspection of both bridges (107/042 and 106/042) was completed on May 23, 2023, for evidence of use by bats and the Bridge/Structure Bat Assessment Form was completed. No evidence of bats (visual, audible, odor, staining, or guano) was observed. Since NLEB was not detected during the acoustic survey, it seems unlikely that NLEB would be present within the project area during the active season when tree clearing is proposed. Therefore, the project is unlikely to result in adverse effects on the NLEB. The NHDOT would implement the following measures to further minimize and avoid effects to NLEB:

- 1) The project would only clear the trees necessary to achieve project objectives and would mark all trees prior to clearing; and
- 2) The contractor would report any dead or sick bats.

Based on the information above, NHDOT is making a not likely to adversely affect determination on behalf of the Army Corps (the lead federal agency) for NLEB. The NH Natural Heritage Bureau (NHB) reviewed the project area and identified documented records of the following species in the vicinity of the proposed project area (NHB23-0523):

- Bird-Foot Violet
- Claspig Milkweed
- Long-Spined Sandbur
- Blanding's Turtle
- Eastern Hognose Snake
- Northern Black Racer

A survey for bird's foot violet and claspig milkweed was completed by MJ in September 2021. Based on coordination with NHB, surveys were not required for the long-spined sandbur. Three populations of bird-foot violet were documented in the Contract A project area in Nashua. No claspig milkweed was identified in the survey area. Impacts to the existing bird's foot violet population on the west side of the turnpike in Nashua (Population 3) could not be avoided due to the close proximity of the existing plants to the existing edge of pavement. However, impacts to Populations 1 and 2 have been avoided. Consultation with the NHB resulted in the recommendation of transplanting the impacted population on the west side of the turnpike in between Populations 1 and 2 on the east side of the turnpike. A transplanting protocol will be prepared based on NHB's recommendations, which will be included in the construction contract.

According to NHFG there are no fisheries concerns with Pennichuck Brook. This surface water is assumed to contain a warmwater fish species assemblage. In addition, aquatic organism and fish passage is blocked by a series of dams upstream and downstream from the project area. No time of year restrictions on in-water work are proposed.

Coordination with NHFG has occurred, and based on NHFG's input and recommendations, the following measures will be implemented to avoid or minimize impacts to wildlife species:

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

Shoreland Water Quality Protection Act

Lot

The term "Lot of Record" is defined in RSA 483-B:4 VIII. as, "...a legally created parcel, the plat or description of which has been recorded at the registry of deeds for the county in which it is located."

For the purpose of this Shoreland Permit application, the "Lot of Record" or "Lot" is assumed to be the total existing state-owned right-of-way (ROW) and any permanent easements located within 250 feet of the Reference Line of Bowers Pond and Harris Pond. The total area of the Lot is 574,363 SF or approximately 13.19 acres. The majority of the "Lot" is located within the existing ROW. Permanent easements are required in the northeast and southeast bridge quadrants, and near the southern limits of

the project for the construction of the proposed stormwater treatment areas. All necessary easements and property acquisitions will be obtained by the NHDOT Bureau of Right-of-Way prior to the start of construction. Easements will be required within the Pennichuck Water Works properties adjacent to Pennichuck Brook. Coordination with Pennichuck Brook is ongoing and no concerns with securing the necessary easements are anticipated.

Reference Lines

Harris Pond

According to the NHDES Consolidated List of Waterbodies, the Reference Line for Harris Pond is 166 feet above sea level. However, due to the distance of Harris Pond from the proposed 13761A project area bathymetric and topographic survey did not extend all the way to Harris Pond. Therefore, LiDAR derived two-foot contours were brought in to approximate the Reference Line location. The two-foot contours used are the most accurate and readily available data. However, the lowest elevation of the LiDAR contours in the vicinity of Harris Pond was 168 feet, suggesting that the water surface elevation at the time of the LiDAR survey was consistent with the 168-foot contour. Therefore, the 168-foot contour was used as the Reference Line elevation for the purpose of the Shoreland Impact Plans and impact areas included with this permit application. Shoreland buffer distances were based on this Reference Line.

Bowers Pond

According to the NHDES Consolidated List of Waterbodies, the Reference Line for Bowers Pond is 175 feet above sea level. A combination of topographic and bathymetric survey data, as well as LiDAR derived elevations were used to identify the 175-foot Reference Line elevation on the Shoreland Impact Plans included with this permit application.

Shoreland Impacts

The Protected Shoreland is divided into three zones:

- Waterfront Buffer (WB) – The Waterfront Buffer is the area of the Protected Shoreland located within 50 feet of the Reference Line (measured horizontally).
- Woodland Buffer (NWB) – The Woodland Buffer, or Natural Woodland Buffer is located within 150 feet of the reference line (measured horizontally) and includes the Waterfront Buffer.
- Protected Shoreland (PS) – The Protected Shoreland includes the area within 250 feet of the reference line (measured horizontally) and includes the Waterfront Buffer and Woodland Buffer.

For the purpose of calculating impacts to the Protected Shoreland, impacts have been broken out by the following locations:

- Waterfront Buffer (WB): 0 feet (REF Line) to 50 feet
- Natural Woodland Buffer (NWB): 50 feet to 150 feet
- Protected Shoreland (PS): 150 feet to 250 feet

The proposed project is anticipated to result in a total of 258,323 square feet (SF) of impacts located within the overall Protected Shoreland area (WB + NWB + PS). There are two locations where the

proposed project is located within the Protected Shoreland of Harris Pond and one location within the Protected Shoreland of Bowers Pond. The first location is associated with a proposed ditch along the western side of the turnpike near the southern limits of the project (STA 767+50 – STA 772+20). This area is primarily located within the PS and a small portion of the NWB of Harris Pond. The next location includes a narrow finger of Harris Pond that extends to the west, just east of the existing roadway embankment (STA 786+50 – STA 794). The third and final location is at the existing F.E.E.T. crossing over Bowers Pond (STA 811+50 – STA 823+50). Impacts within the Protected Shoreland are primarily associated with full depth roadway reconstruction, widening, required grading, and construction of drainage improvements and stormwater treatment areas. Impacts to the Protected Shoreland have been avoided and minimized to the maximum extent practicable. However, widening alternatives were limited due to the location of the existing infrastructure and shoreland impacts were unavoidable.

Waterfront Buffer

Impacts within the WB of Harris Pond and Bowers Pond total approximately 24 SF and 19,695 SF respectively (19,719 SF total).

STA 786+50 – STA 794

Impacts within the WB of Harris Pond at Impact Locations F, G, and H total 24 SF, and are primarily associated with the replacement of an existing 18" reinforced concrete pipe (RCP) drainage structure located at STA 790+10. Due to the steep roadway embankment at this location and the proposed widening, the proposed project includes the installation of stone fill in order to stabilize the roadway embankment and ensure the protection of the proposed roadway infrastructure. Tree clearing will be required at this location for construction access, the proposed pipe replacement, required grading, and installation of the proposed stone.

STA 811+50 – STA 823+50

Impacts within the WB of Bowers Pond at Impact Locations K and L total 11,114 SF and 8,581 SF respectively (19,695 SF total) and are primarily associated with the replacement of the two bridges over Bowers Pond, roadway widening, grading, full depth roadway reconstruction, and construction of a stone-lined swale from a proposed stormwater treatment area (BMP 814). The impacts are primarily located with the existing pavement footprint and along the constructed causeways that extend out into Bowers Pond at the northern and southern bridge approaches.

Natural Woodland Buffer

Impacts within the NWB of Harris Pond and Bowers Pond total approximately 27,264 SF and 66,214 SF respectively (93,478 SF total).

STA 771+00

Impacts within the NWB of Harris Pond at Impact Location B total 239 SF and are associated with the construction of a proposed drainage ditch. Impacts are located within a cleared portion of the existing roadway shoulder within the existing ROW.

STA 786+50 – STA 794

Impacts within the NWB of Harris Pond at Impact Location E total 27,025 SF and are primarily associated with the proposed grading required to accommodate the proposed widening, as well as full depth

roadway reconstruction. Much of the NWB impact area is located within areas that are currently within the footprint of existing pavement. Tree clearing is required within this area for the proposed widening and required grading.

STA 811+50 – STA 823+50

Impacts within the NWB at Impact Locations J and M total 40,033 SF and 26,181 SF respectively (66,214 SF total), and are primarily associated with the proposed roadway widening, grading, full depth roadway reconstruction, and construction of a stormwater treatment area (BMP 814) in the southeast bridge quadrant. Tree clearing will be required to accommodate the proposed widening and grading, as well as the construction of the stormwater treatment area.

Protected Shoreland

Impacts within the PS of Harris Pond and Bowers Pond total approximately 89,481 SF and 55,645 SF respectively (145,126 SF total).

STA 767+50 – STA 772+20

Impacts within the PS of Harris Pond at Impact Locations A and C total 4,561 SF and are associated with the construction of a proposed drainage ditch. Impacts are located within a cleared portion of the existing roadway shoulder within the existing ROW.

STA 786+50 – STA 794

Impacts within the PS at Impact Location D total 84,920 SF and are primarily associated with the proposed full depth roadway reconstruction, widening, and required grading.

STA 811+50 – STA 823+50

Impacts within the PS at Impacts Locations I, N, O, and P total 33,866 SF, 20,920 SF, 235 SF, and 624 SF respectively (55,645 SF total). Impacts at Location I are primarily associated with the proposed roadway widening, required grading, full depth roadway reconstruction, and construction of a stormwater treatment area (BMP 814). Impacts at Location N are a result of the proposed roadway widening, required grading, and full depth roadway reconstruction. Impacts at Location O and P are associated with the proposed construction of a stormwater treatment area (BMP 821) and the installation of an outlet pipe from the stormwater treatment area.

Impervious Surfaces

The proposed project will result in a net increase in impervious surface due to the proposed widening and addition of a northbound and southbound travel lane. The pre-construction impervious area within the protected shoreland or “Lot” is approximately 111,258 SF. The post-construction impervious area within the protected shoreland or “Lot” is approximately 176,024 SF, or roughly a 58.2 percent increase. The total area of the “Lot” is 574,363 SF. The percentage of the “Lot” covered by pre-construction impervious surfaces is 19.4 percent, and the post-construction percentage is 30.6 percent.

The Shoreland Protection Rules, RSA 483-B:9, V(g)(1) state that, “No more than 30 percent of the area of a lot located within the protected shoreland shall be composed of impervious surfaces, unless a stormwater management system designed and certified by a professional engineer is implemented. Such

system design shall demonstrate that the post-development volume and peak flow rate based on the 10-year, 24-hour storm event, shall not exceed the pre-development volume and peak flow rate for flow off the property within the protected shoreland.” The post construction impervious (30.6 percent) just exceeds this threshold. A waiver of this minimum standard is being requested (see Request Waiver of Minimum Standards section below).

In addition, RSA 483-B:9, V(g)(3) states that, “If the impervious surface area will exceed 30 percent and the tree, sapling, shrub, and groundcover in the waterfront buffer does not meet the point score requirement of RSA 483-B:9, V(a)(2)(D) in any segment, then such segment shall be planted, as determined by rule of the department, with trees, saplings, shrubs, or groundcover in sufficient quantity, type, and location either to meet the minimum score or to provide at least an equivalent level of protection as provided by the minimum score and shall be maintained in accordance with RSA 483-B:9, V(a).” A request of this minimum standard is also being requested.

The overall 13761A project is anticipated to result in an approximately 3.35 acre increase in impervious surface associated with the proposed widening. Four stormwater treatment areas will be constructed in the project area and will treat runoff from approximately 14.8 acres of pavement, or approximately 4.4 times the area of additional pavement. The proposed project is not anticipated to cause or contribute to surface water impairments.

Natural Woodland Buffer Area Requirements

The total area of the Lot within the NWB is 211,397 SF. The majority of the existing NWB consists of the existing pavement surfaces and cleared portions of the roadway shoulders and transportation ROW. Approximately 69,170 SF or 32.72 percent of the existing Lot currently exists as “Natural Woodland”. The post-construction condition will result in 43,070 SF or 20.37 percent of “Natural Woodland”. This area does not meet the 25 percent natural woodland area Minimum Shoreland Protection Standard outlined under RSA 483-B:9 V.(b)(2)(A). A waiver of this minimum standard is being requested (see Request Waiver of Minimum Standards section below).

Request Waiver of the Minimum Standards

The following sections correspond to the sections of the NHDES Request Waiver of the Minimum Standards Form (NHDES-W-06-031).

Section 1

MINIMUM STANDARD(S) TO BE WAIVED (Env-Wq 1409.01)

- 1) RSA 483-B:9, V, (a)(2)(C):

No natural ground cover shall be removed except as necessary for a foot path to water and access ways as provided under RSA 483-B:9, V(a)(2)(D), (viii) and (ix), for normal maintenance, to protect the waterfront buffer, cutting those portions that have grown over 3 feet in height for the purpose of providing a view, to provide access to natural areas or shoreline, or as specifically approved by the department, pursuant to RSA 482-A or RSA 483-B.

- 2) RSA 483-B:9, V, (a)(2)(D):
Starting from the northerly or easterly boundary of the property, and working along the shoreline, the waterfront buffer shall be divided into segments measuring 25 feet along the reference line and 50 feet inland. Owners of land within the waterfront buffer shall measure, calculate, and maintain the tree, sapling, shrub, and groundcover point score in each of these segments in accordance with the methods and standards described in subparagraphs (i) through (ix).
- 3) RSA 483-B:9, V, (b)(2)(A):
On a given lot, at least 25 percent of the woodland buffer area located between 50 feet and 150 feet from the reference line shall be maintained as natural woodland. The vegetation, exclusive of lawn, within the natural woodland shall be maintained in an unaltered state or improved with additional vegetation. Owners of lots legally developed or landscaped prior to July 1, 2008 that do not comply with this standard are encouraged to, but shall not be required to, increase the percentage of the woodland buffer area to be maintained as natural woodland. The percentage of the woodland buffer area maintained as natural woodland on nonconforming lots shall not be decreased. In addition, the commissioner of the department of natural and cultural resources may order vegetation on lands or properties owned by, leased to, or otherwise under the control of the department of natural and cultural resources within the protected shoreland to be cut when overgrowth of vegetation impairs law enforcement activities and endangers public safety. If such cutting will exceed that which is allowed under this subparagraph, the commissioner of the department of natural and cultural resources shall provide written notification to the department of environmental services identifying the areas to be cut and an explanation of the need for the cutting at least 2 weeks prior to the undertaking.
- 4) RSA 483-B:9, V, (d)(3):
A permit under RSA 485-A:17, I shall be required for improved, developed, or subdivided land whenever there is a contiguous disturbed area exceeding 50,000 square feet that is either partially or wholly within protected shoreland.
- 5) RSA 483-B:9, V, (g)(1):
No more than 30 percent of the area of a lot located within the protected shoreland shall be composed of impervious surfaces, unless a stormwater management system designed and certified by a professional engineer is implemented. Such system design shall demonstrate that the post-development volume and peak flow rate based on the 10-year, 24-hour storm event, shall not exceed the pre-development volume and peak flow rate for flow off the property within the protected shoreland.
- 6) RSA 483-B:9, V, (g)(3):
If the impervious surface area will exceed 30 percent and the tree, sapling, shrub, and groundcover in the waterfront buffer does not meet the point score requirement of RSA 483-B:9, V(a)(2)(D) in any segment, then such segment shall be planted, as determined by rule of the department, with

trees, saplings, shrubs, or groundcover in sufficient quantity, type, and location either to meet the minimum score or to provide at least an equivalent level of protection as provided by the minimum score and shall be maintained in accordance with RSA 483-B:9, V(a).

Section 2

EXPLAIN HOW STRICT COMPLIANCE WITH THE MINIMUM STANDARD(S) WOULD PROVIDE NO MATERIAL BENEFIT TO THE PUBLIC (Env-Wq 1409.01; RSA 483-B:9, V, (i))

1) RSA 483-B:9, V, (a)(2)(C):

Strict compliance with RSA 483-B:9, V, (a)(2)(C) would not provide a material benefit to the public. The proposed project involves roadway reconstruction and widening, bridge replacements and associated drainage and stormwater improvements that require disturbance to ground cover within the waterfront buffer. The Lot consists of a linear transportation right-of-way and the purpose of the overall project is to increase safety and improve the capacity of the existing roadway. The existing and proposed structures are critical to the integrity of the roadway and due to the locations of the existing infrastructure, disturbance within the waterfront buffer is required for their replacement and reconstruction.

2) RSA 483-B:9, V, (a)(2)(D):

The WB within the Lot was not divided up into grid segments and tree, sapling, shrub, and groundcover point scores were not calculated for the proposed project. The majority of the WB impacts are located along the existing causeways at the northern and southern bridge approaches. These areas were constructed as part of the original highway construction in the 1950s. Since the original construction of the causeways, small trees and shrubs have colonized the edges of the causeways adjacent to Bowers Pond. The proposed project will require the removal of this vegetation to accommodate the proposed widening and bridge replacements. The existing causeways consist of stone and earthen fill that has been artificially constructed and is considered part of the existing crossing structure. The vegetation along the existing causeways provides limited shading, slope stabilization, stormwater filtration, and other functions typically provided by naturally vegetated banks and shorelines. The existing vegetation needs to be removed in order to construct the proposed project. Due to maintenance and safety concerns, trees or shrubs cannot be planted along the causeway. The causeway slopes will be vegetated with an herbaceous seed mix. Therefore, it is not possible for the project to meet the required point scores. Disturbed areas will be restored and seeded following construction.

3) RSA 483-B:9, V, (b)(2)(A):

Impacts to the NWB have been avoided and minimized to the maximum extent practicable, however, impacts are required to accommodate the proposed widening, required grading, bridge replacements, and the construction of stormwater treatment areas. Currently, 69,170 SF or 32.72 percent of the existing Lot exists as "Natural Woodland". Following completion of the proposed project, approximately 43,070 SF or 20.37 percent of the Lot will remain "Natural Woodland".

20.37 percent falls just short of the 25 percent requirement by approximately 9,779 SF. Therefore, the proposed project is unable to fully comply with this Minimum Standard.

4) RSA 483-B:9, V, (d)(3):

Per a Permit Exemption signed by NHDES and NHDOT in 2011, NHDOT projects are not required to obtain an Alteration of Terrain (AOT) Permit but must still comply with AOT regulations. Therefore, a permit under RSA 485-A:17 is not required.

5) RSA 483-B:9, V, (g)(1):

The proposed project would result in 30.6 percent of the entire Lot being composed of impervious surfaces, or an increase of 11.2 percent, from 19.4 percent existing impervious surface. The threshold of this Minimum Standard is exceeded by 0.6 percent. A standalone Stormwater Management Plan has not been prepared for the proposed NHDOT project. However, the proposed project includes the construction of four stormwater treatment areas that have been designed to meet or exceed MS4 and AOT requirements. The proposed stormwater BMPs would treat runoff from approximately 14.8 acres of pavement, approximately 4.4 times the area of additional pavement. Stormwater BMPs will be maintained in accordance with NHDOT's existing maintenance policies.

6) RSA 483-B:9, V(g)(3):

As aforementioned in numbers 2 and 5 above, the proposed project will exceed the 30 percent threshold by a nominal amount (0.6 percent) and tree, sapling, shrub, and groundcover scores in the WB have not been tabulated. No additional tree, sapling, or shrub plantings are proposed. Disturbed areas will be stabilized and seeded with a seed mix to help restore vegetation.

Section 3

EXPLAIN HOW GRANTING A WAIVER OF THE MINIMUM STANDARDS WOULD HAVE NO MATERIAL ADVERSE EFFECT ON THE ENVIRONMENT OR NATURAL RESOURCES OF THE STATE (Env-Wq 1409.01; RSA 483-B:9, V, (i))

A thorough alternatives analysis was completed and impacts to jurisdictional wetlands and Protected Shorelands have been avoided and minimized to the maximum extent practicable. A total of four proposed stormwater treatment areas will be provided to treat runoff from the existing and proposed impervious surfaces in the project area in order to help protect and maintain existing water quality. Portions of the linear transportation project do not meet the minimum standards outlined in RSA 483-B:9, V. However, these impacts are required in order to improve the safety and capacity of the F.E.E.T. and to address the purpose and need of the overall project. The majority of the land surrounding Bowers Pond and Harris Pond is owned by the Pennichuck Water Works and consists of undeveloped, forested lands, protected from future development. The impacts to the Protected Shoreland from the proposed project are relatively minor in size compared to the rest of the undeveloped Protected Shoreland surrounding these two surface waters. For these reasons, a waiver of the minimum standards requested herein is not anticipated to have a material adverse effect on the environment or natural resources of the state.

Request Waiver of the Minimum Standards Form



**REQUEST WAIVER OF THE
MINIMUM STANDARDS FORM**
Water Division/ Land Resources Management
Shoreland Program
[Check the Status of your Application](#)



RSA/ Rule: RSA 483-B, V, (i)/ Env-Wq 1409

This form may be used to request a waiver of the Minimum Standards of RSA 483-B:9, V of the Shoreland Water Quality Protection Act (SWQPA). Waivers may only be granted if strict compliance with the minimum standards will provide no material benefit to the public and have no material adverse effect on the environment or the natural resources of the state. To be eligible for a waiver of the minimum standards, applicants must clearly demonstrate how these criteria are satisfied (complete Sections 1, 2, and 3). Alternatively, a waiver may be requested to accommodate the reasonable needs of persons with disabilities (complete Sections 1 and 4).

SECTION 1 - MINIMUM STANDARD(S) REQUESTED TO BE WAIVED (Env-Wq 1409.01)
RSA 483-B, V, (a)(2)(C); (a)(2)(D); (b)(2)(A); (d)(3); (g)(1); (g)(3)
SECTION 2 - EXPLAIN HOW STRICT COMPLIANCE WITH THE MINIMUM STANDARD(S) WOULD PROVIDE NO MATERIAL BENEFIT TO THE PUBLIC (Env-Wq 1409.01; RSA 483-B:9, V, (i))
See the Request Waiver of the Minimum Standards Section of the Supplemental Narrative included with this permit application submittal.
SECTION 3 - EXPLAIN HOW GRANTING A WAIVER OF THE MINIMUM STANDARDS WOULD HAVE NO MATERIAL ADVERSE EFFECT ON THE ENVIRONMENT OR NATURAL RESOURCES OF THE STATE (Env-Wq 1409.01; RSA 483-B:9, V, (i))
See the Request Waiver of the Minimum Standards Section of the Supplemental Narrative included with this permit application submittal.

shoreland@des.nh.gov or (603) 271-2147
NHDES Shoreland Program, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095
<http://www.des.nh.gov>

SECTION 4 - PERSONS WITH DISABILITIES (Env-Wq 1409.01; Env-Wq 1409.02(b); RSA 483-B:9, V, (i))

Please provide an explanation of how the proposal is adequate to ensure that the intent of RSA 483-B is met and explain why granting the waiver is necessary to accommodate the individual's disability. **Please note, medical details are not being requested. Please only describe the limitations faced by the individuals for whom the waiver is being requested.**

NOT APPLICABLE

Please also submit a statement signed by the physician who is attending the individual for the disability or disabilities certifying that the impacts or structures for which the waiver is being requested are necessary to accommodate the individual's disability or disabilities. **Please note, details specific to the nature of the disability are not requested. Only specify that the project is necessary to meet the needs specific to the individual for whom the waiver is being requested.**

Statement submitted.

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

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

<http://www.des.nh.gov>

Photo Log



Photo 1: Impact Location A (PS) West Side of FEET at Exit 8 SB Offramp



Photo 2: Impact Location B (NWB) West Side of FEET



Photo 3: Impact Location C (PS) West Side of FEET



Photo 4: Impact Location D (PS)



Photo 5: Impact Location E (NWB)



Photo 6: Impact Locations F, G, and H (WB) Drainage Outlet at Harris Pond



Photo 7: Impact Locations F, G, and H (WB) Drainage Outlet at Harris Pond



Photo 8: Impact Location I (PS) East Side of FEET South of Pennichuck Brook Crossing



Photo 9: Impact Location I (PS) West Side of FEET South of Pennichuck Brook Crossing



Photo 10: Impact Location J (NWB) East Side of FEET South of Pennichuck Brook Crossing



Photo 11: Impact Location J (NWB) West Side of FEET South of Pennichuck Brook Crossing



Photo 12: Impact Locations J (NWB) and K (WB) South of Pennichuck Brook Crossing



Photo 13: Impact Location L (WB) and M (NWB) North of Pennichuck Brook Crossing



Photo 14: Impact Location M (NWB) North of Pennichuck Brook Crossing



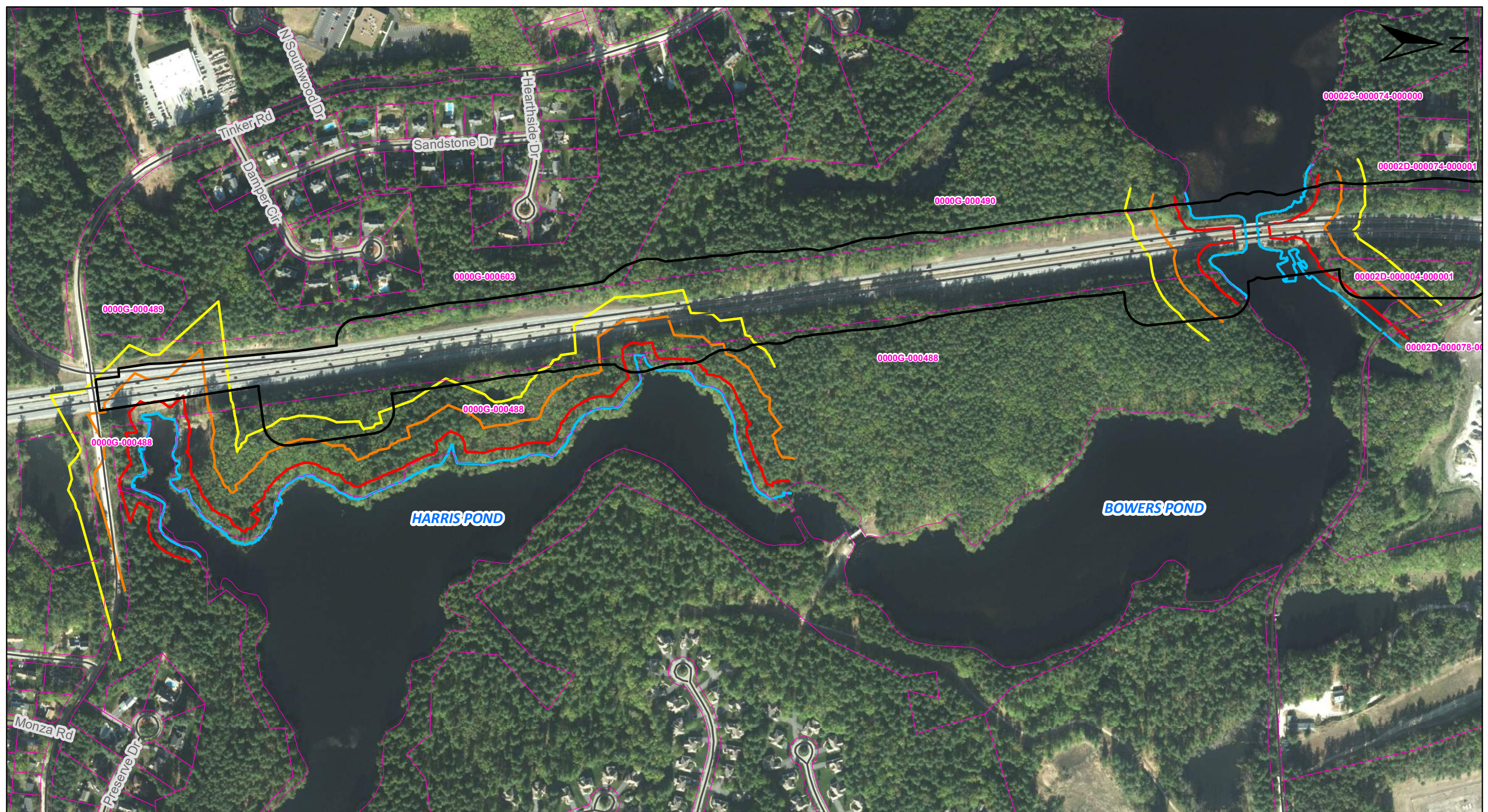
Photo 15: Impact Location N (PS) North of Pennichuck Brook Crossing










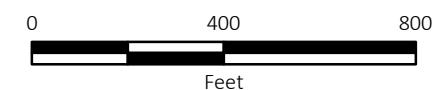
Photo 16: Impact Locations O and P (PS) North of Pennichuck Brook Crossing

Figure 2 – Tax Map

M:\18589.00 NHDOT Southern FEET Design\Draw\GIS\13761A\Permitting Figures\Shoreland\Figure 2 - Tax Map.mxd



- | | |
|---|---|
|  13761A Project Area | 13761A SWQPA Buffers |
|  Tax Parcels |  Reference Line |
|  Roads |  Waterfront Buffer (0' to 50') |
| |  Natural Woodland Buffer (50' to 150') |
| |  Protected Shoreland (150' to 250') |



NHDOT 13761 F.E. EVERETT TURNPIKE WIDENING PROJECT
 13761A - SOUTHERN SEGMENT
 NASHUA-MERRIMACK, NEW HAMPSHIRE

TAX MAP

SCALE : 1" = 400'	DATE : November 2023	FIGURE : 2
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NHB DataCheck Results Letter

Memo

NH Natural Heritage Bureau
NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

To: Stephen Hoffmann
53 Regional Drive
Concord, NH 03301

From: NHB Review, NH Natural Heritage Bureau

Date: 2/24/2023 (valid until 02/24/2024)

Re: Review by NH Natural Heritage Bureau

Permits: NHDES - Shoreland Standard Permit, NHDES - Wetland Standard Dredge & Fill - Major, USACE - General Permit, USEPA - Stormwater Pollution Prevention

NHB ID: NHB23-0523

Town: Nashua

Location: F.E. Everett Turnpike

Description: The NHDOT 13761A project includes the southernmost segment of the overall 13761 F.E. Everett Widening Project. The 13761A project begins in Nashua, just north of Exit 8 and the Tinker Road overpass, and continues north for approximately two miles, just south of Exit 10. Previous NHB reviews that included the southern segment included, NHB21-1748, NHB18-0238, and NHB16-2791. The proposed project involves widening the F.E. Everett Turnpike from two lanes to three lanes in both the northbound and southbound directions and associated roadway improvements including, replacement of the existing bridges carrying the Turnpike over Pennichuck Brook/Bowers Pond, drainage improvements, and construction of stormwater treatment BMPs.

cc: NHFG Review

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

Comments **NHB: Please provide NHB with representative photos during the growing season of any proposed impact areas and proposed plans.**
F&G: Please refer to NHFG consultation requirements below.

Plant species	State ¹	Federal	Notes
bird-foot violet (<i>Viola pedata</i> var. <i>pedata</i>)	T	--	
clasping milkweed (<i>Asclepias amplexicaulis</i>)*	T	--	This species grows in sandplains and disturbed openings, and is sensitive to disturbances that eliminate its habitat.
long-spined sandbur (<i>Cenchrus longispinus</i>)*	E	--	This species grows in sandplains and disturbed openings, and is sensitive to disturbances that eliminate its habitat.

Memo

NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

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

Vertebrate species	State ¹	Federal	Notes
Blanding's Turtle (<i>Emydoidea blandingii</i>)	E	--	Contact the NH Fish & Game Dept (see below).
Eastern Hognose Snake (<i>Heterodon platirhinos</i>)	E	--	Contact the NH Fish & Game Dept (see below).
Northern Black Racer (<i>Coluber constrictor constrictor</i>)	T	--	Contact the NH Fish & Game Dept (see below).

¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

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

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

IMPORTANT: NHFG Consultation

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

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

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

Memo

NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.
Maps and NHB record pages are confidential and should be redacted from public documents.

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

NHFG Coordination

Stephen Hoffmann

From: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Sent: Tuesday, July 6, 2021 2:11 PM
To: Stephen Hoffmann
Subject: RE: NHB review: NHB21-1748

Hello Steve,

If protected mussel species aren't listed on the NHB for this phase of the project, then no mussel survey is required.

Thanks,

Kim Tuttle
Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Stephen Hoffmann <shoffmann@mjinc.com>
Sent: Tuesday, July 6, 2021 12:43 PM
To: Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>
Cc: DNCR: NHB Review <nhbreview@dnrc.nh.gov>; Christine J. Perron <CPerron@mjinc.com>
Subject: RE: NHB review: NHB21-1748

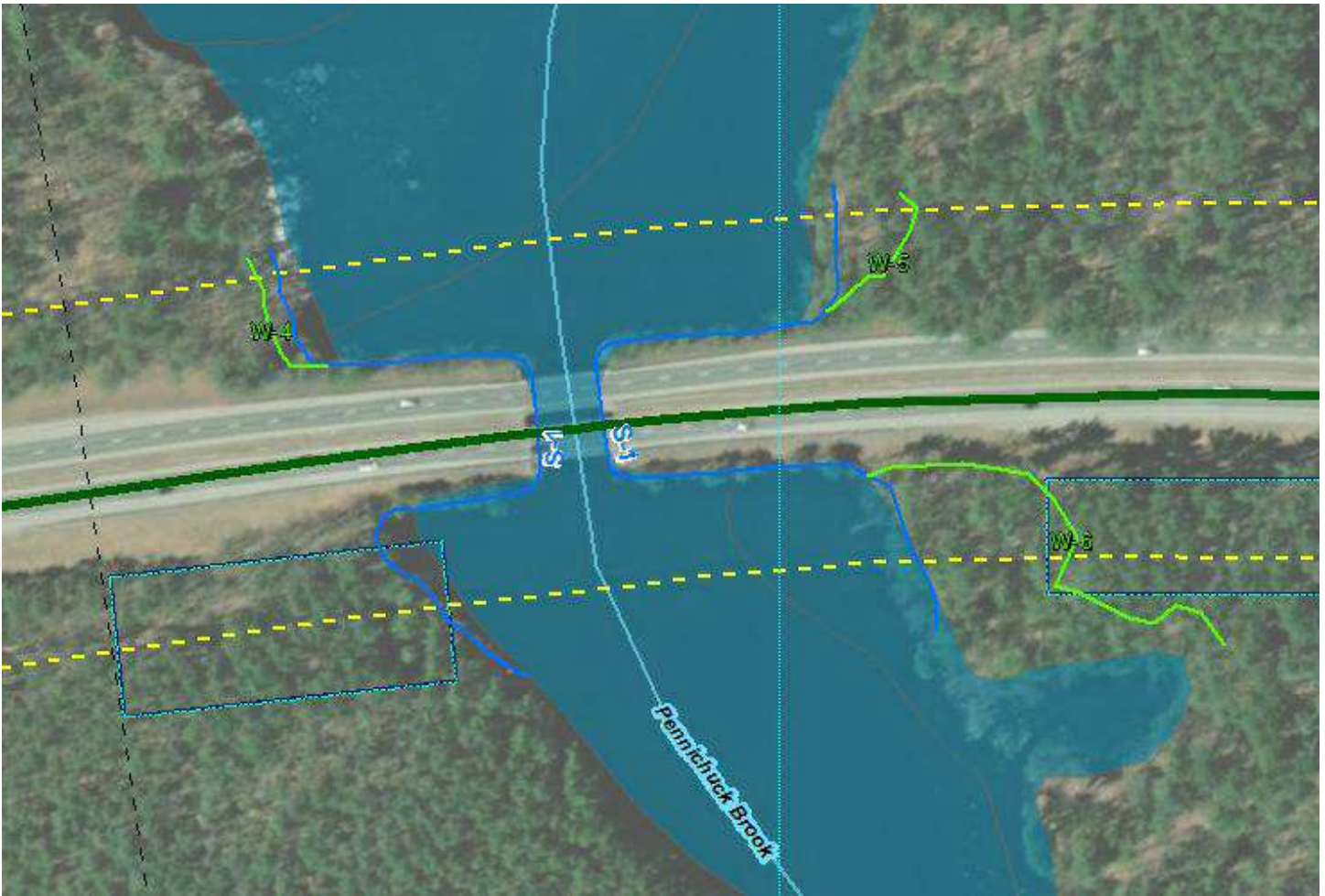
EXTERNAL: Do not open attachments or click on links unless you recognize and trust the sender.

Hi Kim,

Have you or anyone else at NHFG had an opportunity to review the proposed project area for the potential presence of state listed mussels and/or the need for mussel surveys in any of the surface waters found in the project area? In order to keep the project on schedule, we hope to coordinate and complete any required surveys this summer. The two locations below are a priority based on the current project schedule. I've also reattached photos of the existing surface water resources and overall map of the project and surface water locations. Could you please provide guidance/recommendations on whether mussel surveys are required?

Thanks,
Steve

- 1.) Pennichuck Brook (Bower's Pond Impoundment)



- 2.) Baboosic Brook (S-7)
- Unnamed Intermittent Tributary of Baboosic Brook (S-6)
- Unnamed Intermittent Tributary to the Unnamed Intermittent Tributary of Baboosic Brook (S-5)



From: Stephen Hoffmann
Sent: Wednesday, June 23, 2021 9:59 AM
To: 'Tuttle, Kim' <Kim.A.Tuttle@wildlife.nh.gov>
Cc: 'DNCR: NHB Review' <nhbreview@dnrc.nh.gov>; Christine J. Perron <CPerron@mjinc.com>
Subject: RE: NHB review: NHB21-1748

Good Morning Kim,

I am following up on my email from a few weeks ago regarding the potential need for mussel surveys in tributaries of the Merrimack River located within the NHDOT F.E. Everett Turnpike widening project in Nashua and Merrimack, NH. Please let me know if you have any questions or if you require any additional information to make this determination.

Thanks,
Steve

From: Stephen Hoffmann
Sent: Tuesday, June 8, 2021 8:29 AM

To: 'Tuttle, Kim' <Kim.A.Tuttle@wildlife.nh.gov>

Cc: DNCR: NHB Review <nhbreview@dncr.nh.gov>; Christine J. Perron <CPerron@mjinc.com>

Subject: RE: NHB review: NHB21-1748

Hi Kim,

I am reaching out regarding the subject NHB DataCheck Results Letter for the NHDOT F.E. Everett Turnpike widening project. The current review (NHB21-1748) is for the southern and middle segments of the overall 13761 project. You were involved in the coordination for the northern segment of the project last fall.

My first question is whether NHFG recommends or requires mussel surveys in any of the surface waters that are anticipated to be impacted by the proposed project? No mussel species were identified in the latest NHB Results Letter. However, in previous NHB reviews that included the northern segment, the project was identified as being located within an area flagged for possible impacts to the state-listed brook floater mussel (Merrimack River and tributaries). In preliminary project coordination, NHFG recommended surveying streams with suitable mussel habitat prior to construction so any rare mussels can be relocated. I have prepared the attached table summarizing the surface waters located within the southern and middle segments and the proposed work. Exact impact areas have not been determined at this time, but the majority of impacts to surface waters are associated with bridge and culvert replacements. I've also included a PDF with photographs of these areas as well as a figure showing the overall project and surface water locations to assist with your review/assessment. Please let me know if you have any questions or require any additional information. Again, the goal of this early coordination is to determine whether any mussel surveys will be required prior to construction.

Please let me know if you have any additional concerns or recommendations regarding any of the other species listed on the NHB Results Letter.

Thanks,
Steve

From: DNCR: NHB Review <nhbreview@dncr.nh.gov>

Sent: Friday, June 4, 2021 3:47 PM

To: Stephen Hoffmann <shoffmann@mjinc.com>

Cc: Tuttle, Kim <Kim.Tuttle@wildlife.nh.gov>

Subject: NHB review: NHB21-1748

Attached, please find the review we have completed. If your review memo includes potential impacts to plants or natural communities please contact me for further information. If your project had potential impacts to wildlife, please contact NH Fish and Game at the phone number listed on the review.

Best,
Jessica

Jessica Bouchard
Environmental Reviewer / Ecological Information Specialist

NH Natural Heritage Bureau
DNCR - Forests & Lands
172 Pembroke Rd
Concord, NH 03301
603-271-2834

Stephen Hoffmann

From: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>
Sent: Friday, June 2, 2023 10:26 AM
To: Stephen Hoffmann
Cc: Winters, Melissa; FGC: NHFG review; Christine J. Perron; Evans, Jonathan; Martin, Rebecca
Subject: RE: Turtle Design Guidance NHB23-0523

Hi Steve,

Thanks for your questions. Some responses below:

1. The Pennichuck brook crossing is not identified by the NHFG Nongame and Endangered Species program as a hotspot for road mortalities for rare wildlife. However, the crossing may be a more important element for more common wildlife species, as animals tend to use river edges as travel corridors throughout the landscape.
2. Blanding's turtles predominately use wetland habitats with permanent shallow water and emergent vegetation such as marshes, swamps, bogs, and ponds. They will use vernal pools extensively in spring and will utilize upland areas during nesting season. They may use slow rivers and streams as mechanisms for dispersal between wetlands. Based on our records and the fragmentation of habitat in the area, improvements to terrestrial wildlife passage associated with the bridge replacement will likely have minimal positive impacts for Blanding's turtle. Rare snakes and amphibians may use crossings if designed correctly (allow for open light and designed to encourage use; e.g. funneling them through an area or tied to specific and preferred habitat features). However, at this location, small mammals would probably stand to benefit the most from the proposed improvements.
3. Vegetated 2:1 slopes would be navigable for turtles (and other species). Surface and vegetation should represent natural surroundings. Rip rap, if used, should not be large or angular and finer materials such as seeded soil, should be used to fill any voids.
4. Other comments for this project would include standard F & G recommendations:
 - a. All manufactured erosion and sediment control products, with the exception of turf reinforcement mats, utilized for, but not limited to, slope protection, runoff diversion, slope interruption, perimeter control, inlet protection, check dams, and sediment traps shall not contain plastic, or multifilament or monofilament polypropylene netting or mesh with an opening size of greater than 1/8 inches.
 - b. All observations of threatened or endangered species on the project site shall be reported to the NHFG nongame and endangered wildlife environmental review program by phone at 603-271-2461 and by email at NHFGreview@wildlife.nh.gov, with the email subject line containing the NHB DataCheck tool results letter assigned number, the project name, and the term Wildlife Species Observation.
 - c. Photographs of the observed species and nearby elements of habitat or areas of land disturbance shall be provided to NHFG in digital format at the above email address for verification, as feasible.
 - d. In the event a threatened or endangered species is observed on the project site during the term of the permit, the species shall not be disturbed, handled, or harmed in any way prior to consultation with NHFG and implementation of corrective actions recommended by NHFG.
 - e. Site operators shall be allowed to relocate wildlife encountered if discovered within the active work zone if in direct harm from project activities. Wildlife shall be relocated in close proximity to the capture location but outside of the work zone and in the direction the individual was heading. NHFG shall be contacted immediately if this action occurs.
 - f. NHFG, including its employees and authorized agents, shall have access to the property during the term of the permit.

Thanks, and let me know if you have any additional questions.

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

From: Stephen Hoffmann <SHoffmann@mjinc.com>

Sent: Tuesday, May 30, 2023 2:52 PM

To: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>

Cc: Winters, Melissa <Melissa.J.Winters@wildlife.nh.gov>; FGC: NHFG review <NHFGreview@wildlife.nh.gov>; Christine J. Perron <CPerron@mjinc.com>; Evans, Jonathan <Jonathan.A.Evans@dot.nh.gov>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>

Subject: RE: Turtle Design Guidance NHB23-0523

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

Hi Kevin,

Thank you for the additional information. The question regarding the NHFG/UNH research on turtle passage design came up at the NHDOT Natural Resource Agency Meeting on Wednesday May 17, specifically for the Pennichuck Brook crossing located within the 13761A F.E. Everett Turnpike project you referenced below. Mary Ann Tilton with NHDES recommended that we reach out to Sandi and Tom for input regarding specific details of the crossing such as side slopes of the causeways, surface materials, etc. in order to demonstrate the effectiveness of the proposed crossing and improvements over the existing conditions.

The design and details of the wildlife shelves are still being finalized, but we are currently anticipating an approximately two-foot-wide shelf in front of both abutments with approximately three feet of clearance under the proposed bridge structure (see snip below with this area circled). The wildlife shelves would be limited to areas of proposed riprap and would tie in to the vegetated 2:1 slopes along the existing causeways. We briefly evaluated extending the shelves along the entire length of the causeways but this would result in additional wetland and surface water impacts, and while not ideal, we assumed that most species can navigate the vegetated 2:1 slopes (see attached photos). The surface of the wildlife shelves will be a uniform, fine material, that fills the larger voids in the proposed riprap required for scour protection. As you can see in the attached photos, the potential for wildlife crossing currently exists, however, the rocky, uneven material in front of the existing abutments is not the most conducive for smaller reptile and amphibian passage.

- Additional wildlife species identified by NHB included northern black racer (I believe this population is considered extirpated/impacted by the Merrimack outlet development) and eastern hognose snake.
- 3) Does NHFG concur with the proposed design described above?
- Shelves limited to areas of riprap;
 - Vegetated 2:1 slopes are passable for most species;
 - 2' wide x 3' high shelves on both sides;
 - Tread will be finer materials to fill larger voids in riprap.
- 4) Any additional RTE species or other fish and wildlife concerns?

Thanks,
Steve



Stephen Hoffmann | Environmental Analyst

802-862-9381

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From: Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>
Sent: Friday, May 19, 2023 10:34 AM
To: Stephen Hoffmann <SHoffmann@mjinc.com>
Cc: Winters, Melissa <Melissa.J.Winters@wildlife.nh.gov>; FGC: NHFG review <NHFGreview@wildlife.nh.gov>
Subject: RE: Turtle Design Guidance NHB23-0523

Hi Steve,

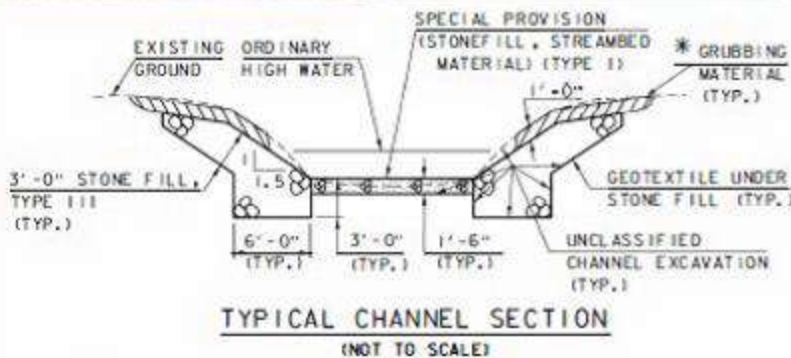
In general, NHFG Nongame program recommends matching proposed crossings to the existing stream/river as closely as possible as to mimic natural conditions. In the case of larger bridges, inclusion of dry wildlife passage can provide opportunities for turtles (and other wildlife) to safely cross over land and avoid trying to cross over the highway.

A good example of this is the Minnesota/Vermont transportation guidance. It is a relatively low cost but efficient standard.



Grubbing material has low costs and

To provide a passage
 Transportation speci
 riprap under all bridge
 ordinary high water a
 of this work is estima
 machine and operati
 along with a photo c
 existing bridge on Int



*GRUBBING MATERIAL SHALL BE PLACED ON THE STONE FILL IN THE AREA UNDER THE BRIDGE. WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.

Of course, different projects have different parameter and constrains. But in general, providing some level of dry wildlife passage should be a net benefit for wildlife.

In the case of the NHDOT13761A FE Everett Turnpike project (NHB23-0523), incorporating dry wildlife passage under the bridge may result in some minimal benefits to T&E species and would most likely benefit other common wildlife such as raccoons, fox, and small mammals.

Kevin

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

From: Stephen Hoffmann <SHoffmann@mjinc.com>

Sent: Wednesday, May 17, 2023 2:14 PM

To: Houghton, Sandra <Sandra.D.Houghton@wildlife.nh.gov>; 'Tom.Ballestero@unh.edu' <Tom.Ballestero@unh.edu>;
 Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>

Cc: Christine J. Perron <CPerron@mjinc.com>

Subject: RE: Turtle Design Guidance

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Thank you Sandi, I will coordinate with Kevin directly.

Thanks,
Steve



Stephen Hoffmann | Environmental Analyst

802-862-9381

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From: Houghton, Sandra <Sandra.D.Houghton@wildlife.nh.gov>

Sent: Wednesday, May 17, 2023 12:23 PM

To: Stephen Hoffmann <SHoffmann@mjinc.com>; 'Tom.Ballestero@unh.edu' <Tom.Ballestero@unh.edu>; Newton, Kevin <Kevin.M.Newton@wildlife.nh.gov>

Cc: Christine J. Perron <CPerron@mjinc.com>

Subject: RE: Turtle Design Guidance

Hello Stephen,

Thank you for reaching out. I've copied Kevin Newton here as he works on all NHDOT proposed projects for Nongame environmental review and can reply.

*Thank you,
Sandi*

Sandra Houghton
Wildlife Diversity Biologist
Nongame and Endangered Wildlife Program
NH Fish and Game Department

From: Stephen Hoffmann <SHoffmann@mjinc.com>

Sent: Wednesday, May 17, 2023 11:17 AM

To: 'Tom.Ballestero@unh.edu' <Tom.Ballestero@unh.edu>; Houghton, Sandra <Sandra.D.Houghton@wildlife.nh.gov>

Cc: Christine J. Perron <CPerron@mjinc.com>

Subject: Turtle Design Guidance

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

Good Morning Sandi and Tom,

Mary Ann Tilton with NHDES recommended that I reach out to you regarding the design of wildlife crossings, specifically wildlife shelves associated with a bridge replacement project. Mary Ann mentioned that you are currently working on an EPA grant looking at turtle crossings and preparing a guidance document for the design of turtle crossings. It sounded like you are still working on finalizing this document, but if you are able to provide any additional information at that this time that we could use to aid in our design it would be greatly appreciated.

Thanks,
Steve



Stephen Hoffmann | Environmental Analyst

802-862-9381

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Stephen Hoffmann

From: Magee, John <john.a.magee@wildlife.nh.gov>
Sent: Monday, June 12, 2023 11:52 AM
To: Stephen Hoffmann
Cc: Evans, Jonathan; Martin, Rebecca; Christine J. Perron; Dionne, Michael
Subject: RE: 13761A NHDOT F.E. Everett Turnpike - Pennichuck Brook Crossing

Hi Steve, you are correct about the fish relative to this project. I do not have additional concerns. I have cc'd Mike Dionne on this email.

John

John Magee (he/him/his)
M.S., Certified Fisheries Professional
Fisheries Habitat Research and Management Programs Coordinator
New Hampshire Fish and Game Department
11 Hazen Drive, Concord, NH 03301
Phone 603-271-2744
Fax 603-271-5829

Did you know? New Hampshire Fish and Game protects, conserves and manages more than 500 species of wildlife, including 63 mammals, 18 reptiles, 22 amphibians, 313 birds and 122 kinds of fish as well as thousands of invertebrates!

From: Stephen Hoffmann <SHoffmann@mjinc.com>
Sent: Monday, June 12, 2023 11:03 AM
To: Magee, John <john.a.magee@wildlife.nh.gov>
Cc: Evans, Jonathan <Jonathan.A.Evans@dot.nh.gov>; Martin, Rebecca <Rebecca.A.Martin@dot.nh.gov>; Christine J. Perron <CPerron@mjinc.com>
Subject: 13761A NHDOT F.E. Everett Turnpike - Pennichuck Brook Crossing

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

Hi John,

I am reaching out regarding the subject NHDOT project involving the widening of a section of the F.E. Everett Turnpike in Nashua and Merrimack, New Hampshire. This is the southernmost segment of the overall widening project and involves the replacement of the existing bridges spanning Pennichuck Brook (aka Bowers Pond). I've attached a USGS location map depicting the project location.

Pennichuck Brook has a series of four dams along its length including one (Holt Pond Dam) located upstream or west of the Turnpike, and a series of three (Bowers Dam, Harris Pond Dam, and Supply Pond Dam) located downstream or east of the Turnpike. I am assuming that aquatic organism/fish passage from downstream (i.e., the Merrimack River) is impeded by these three dams.

No rare, threatened, or endangered species were identified by NHB that are specifically associated with Pennichuck Brook (see attached DataCheck Results Letter). According to the NHDES WPPT and the 2020 NH WAP mapping, Pennichuck Brook is not identified as a cold water fishery or predicted cold water fishery, eastern brook trout water, or a water containing threatened, endangered species or species of conservation concern.

The project is moving into the final design/permitting phase, and I just wanted to confirm with you that there are no additional concerns regarding fisheries. Thank you for your time and consideration of this request. Let me know if you have any questions or need any additional information.

Thanks,
Steve



Stephen Hoffmann | Environmental Analyst

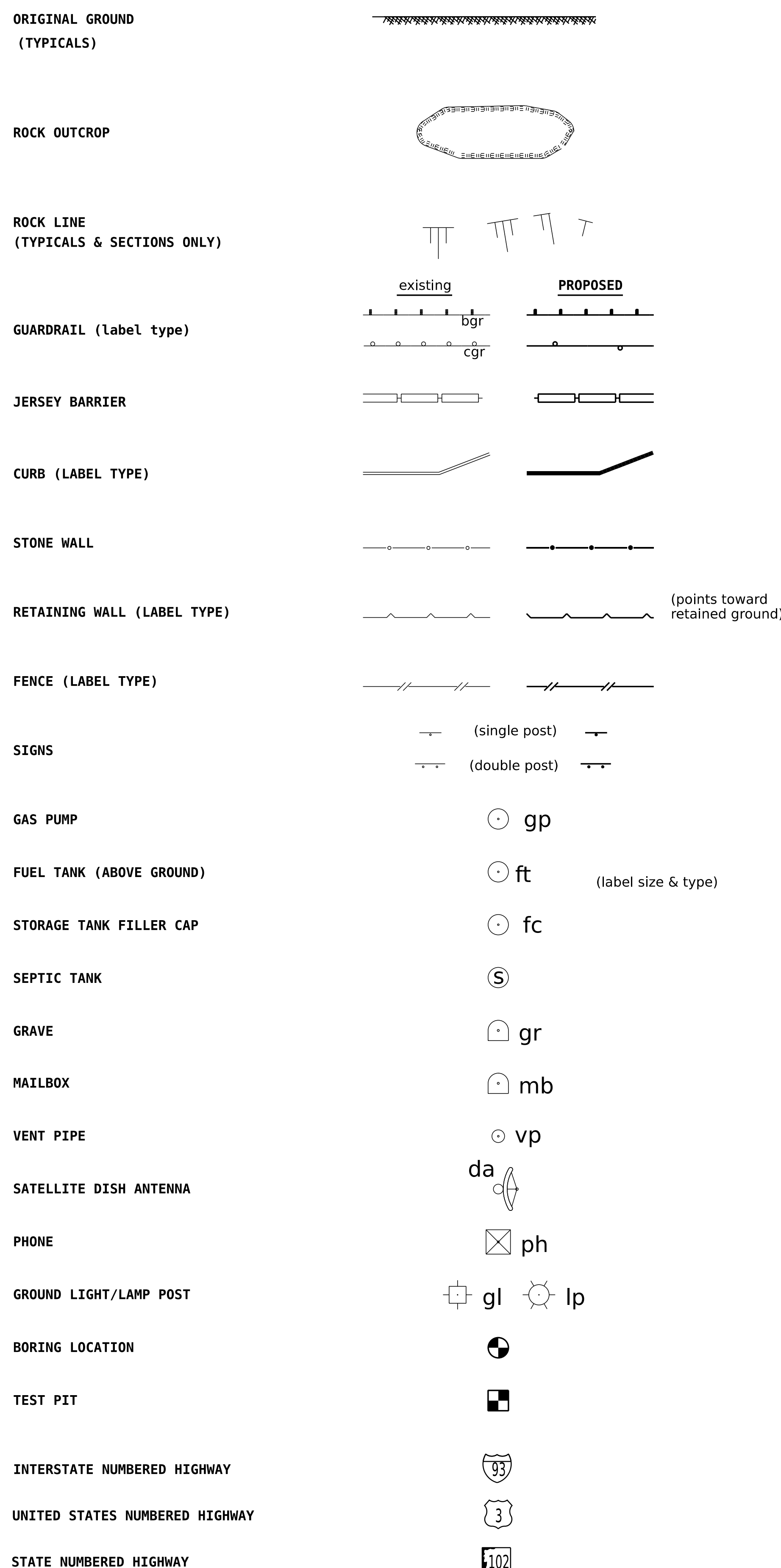
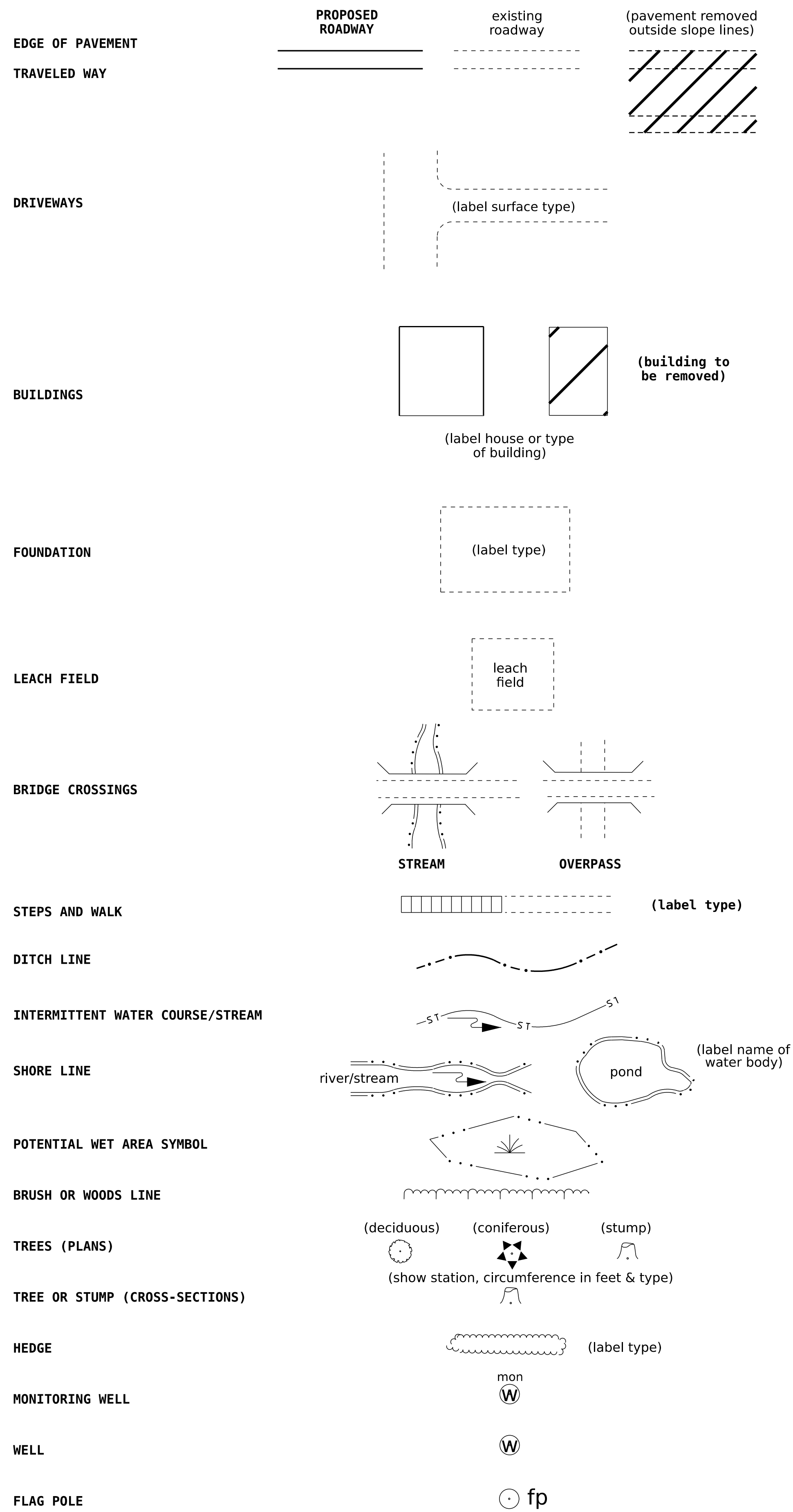
☎ 802-862-9381

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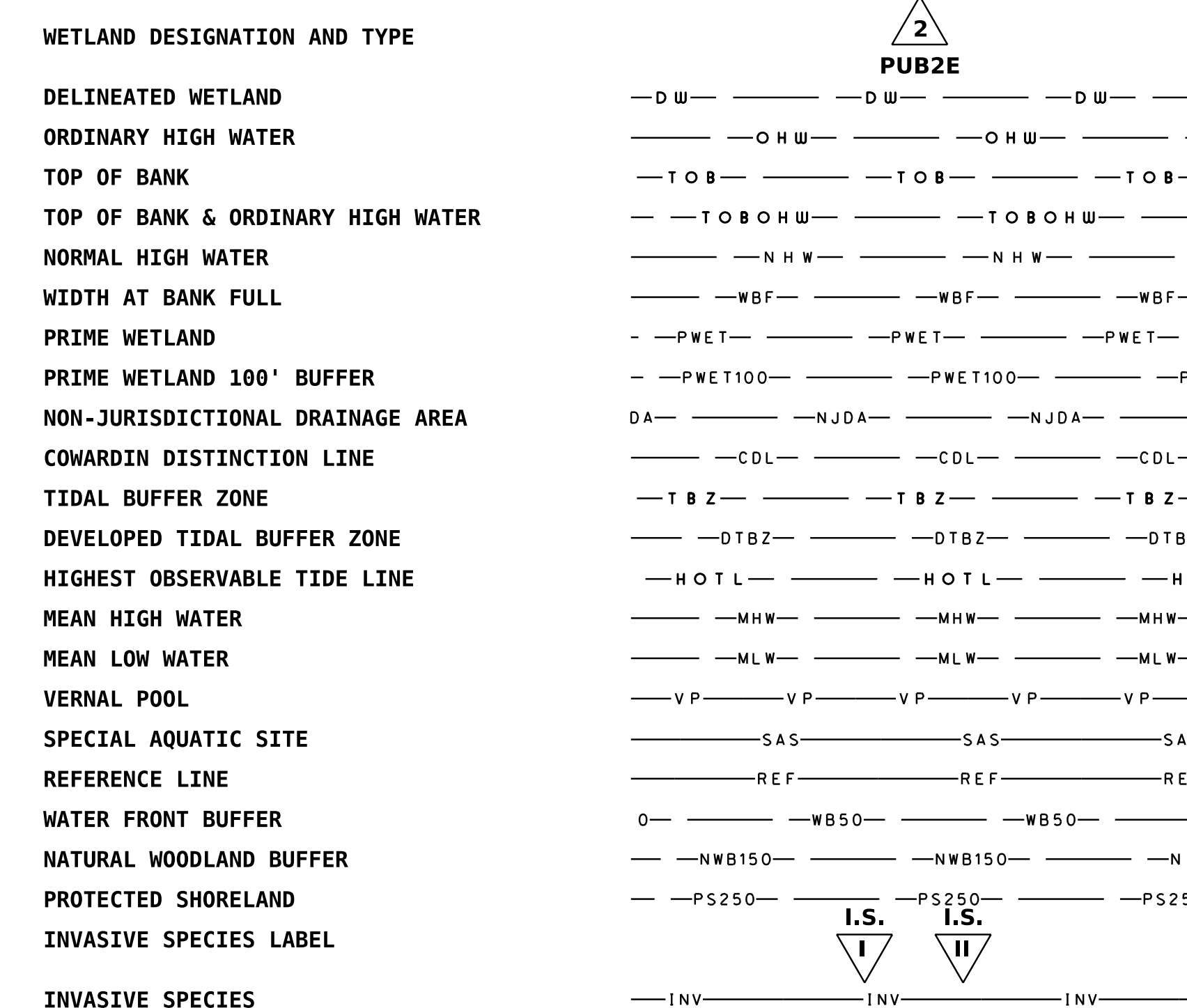


Shoreland Impact Plans

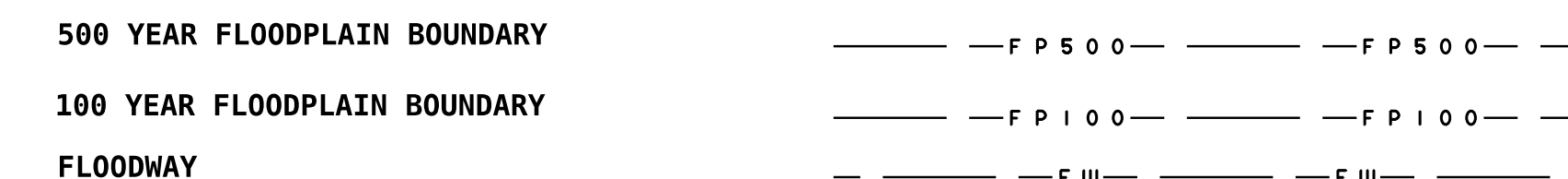
GENERAL



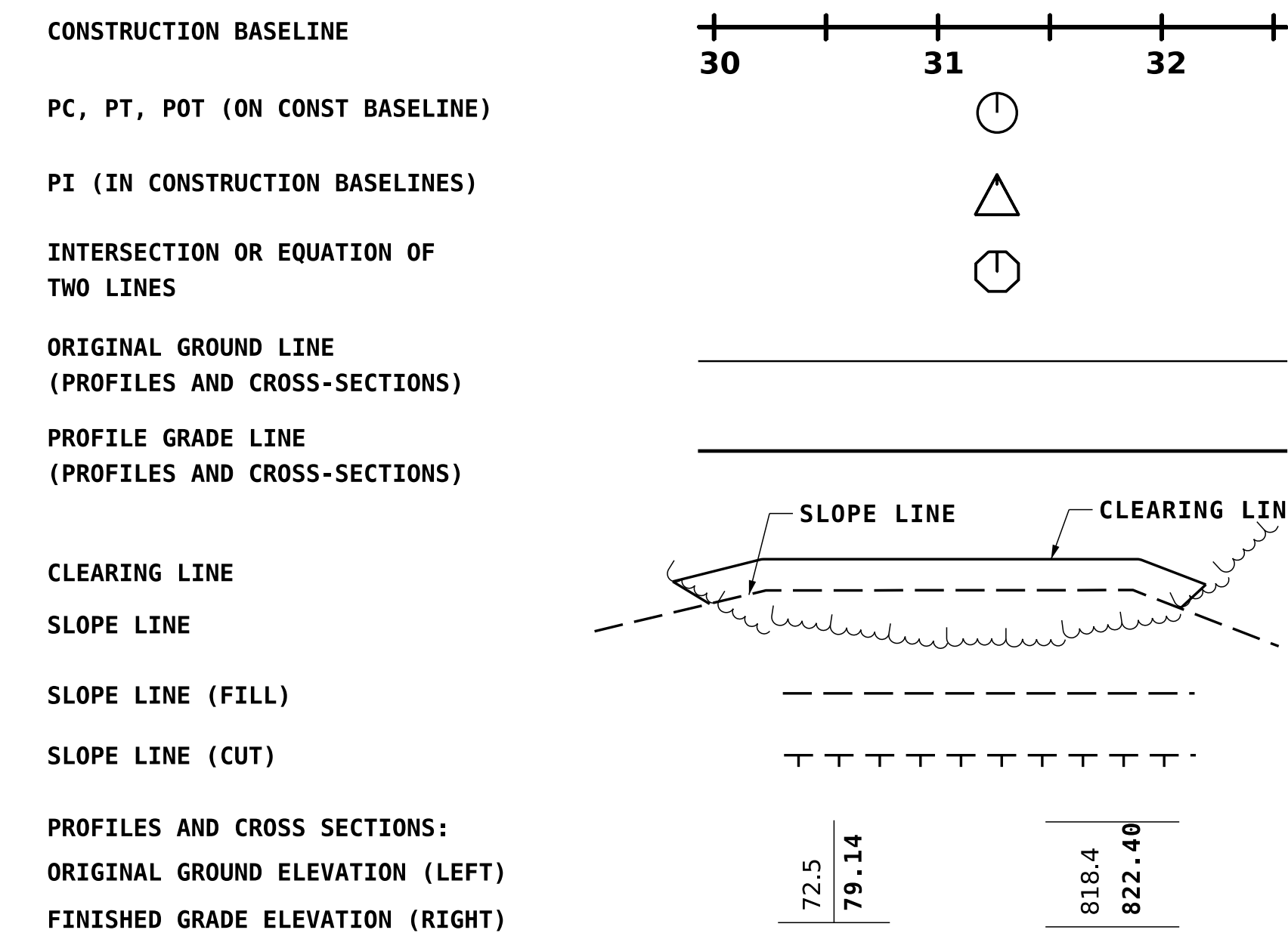
SHORELAND - WETLAND



FLOODPLAIN / FLOODWAY



ENGINEERING

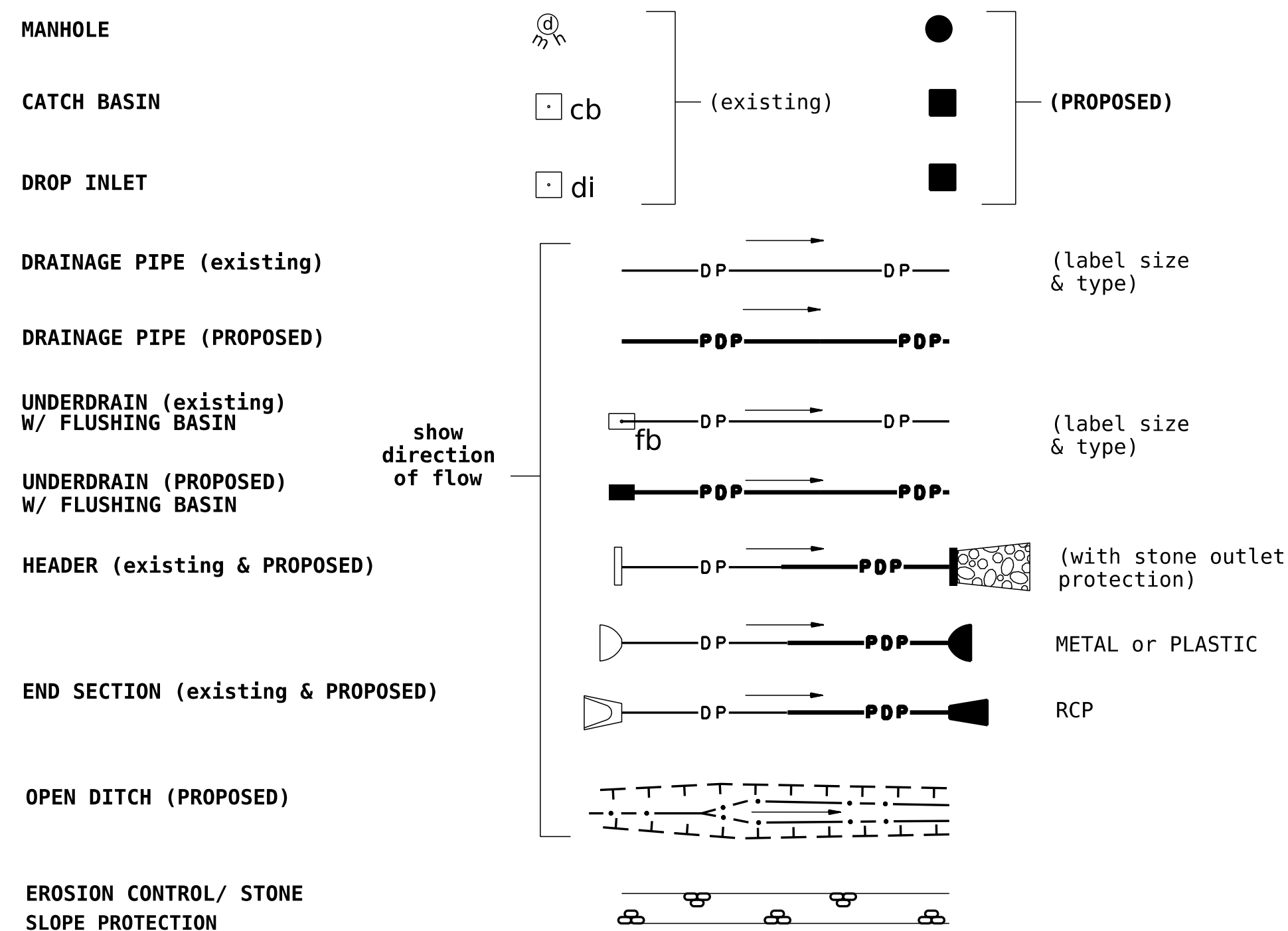


STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

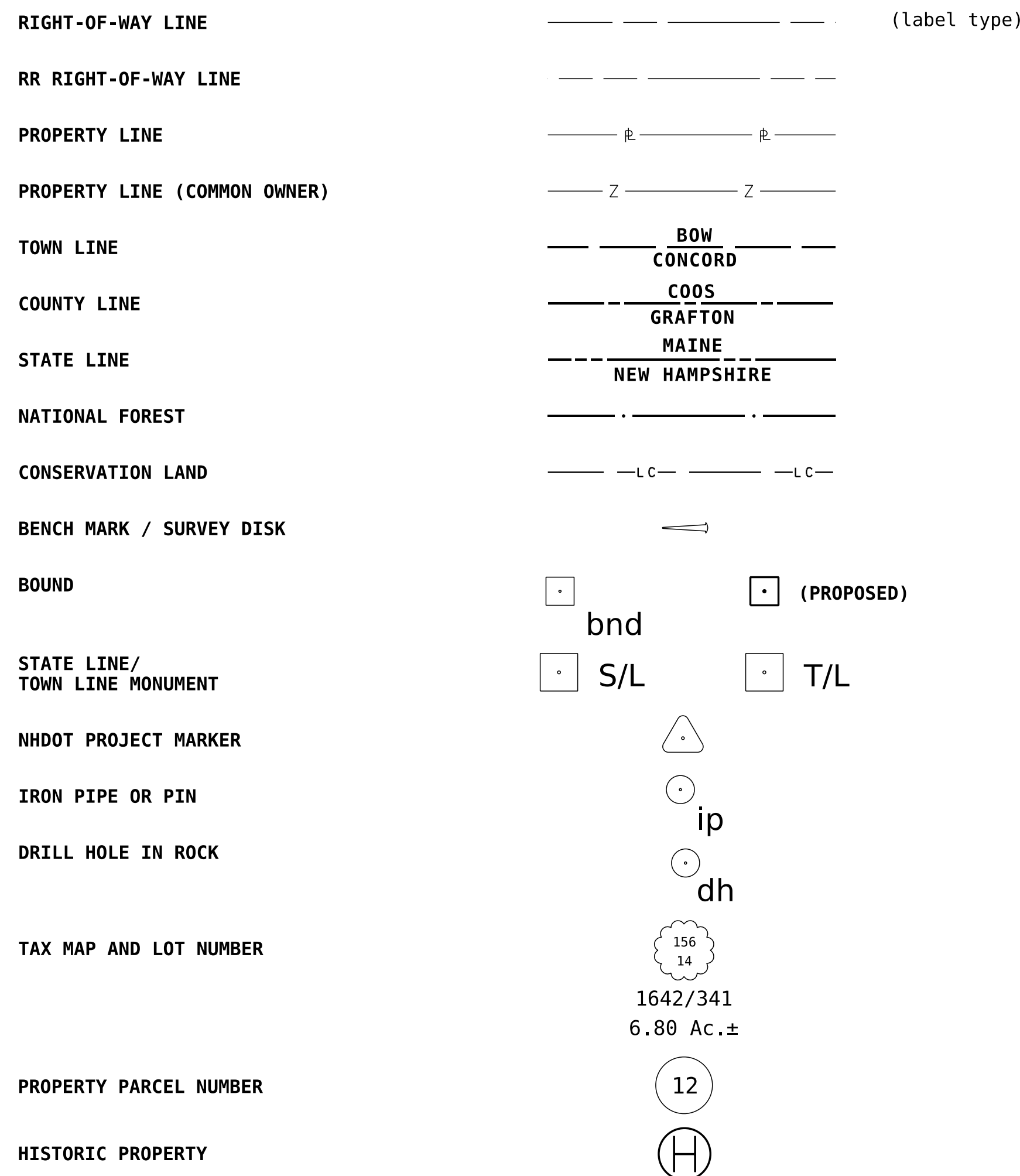
STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
07-31-2023	13761A_Symb	13761A	2	44

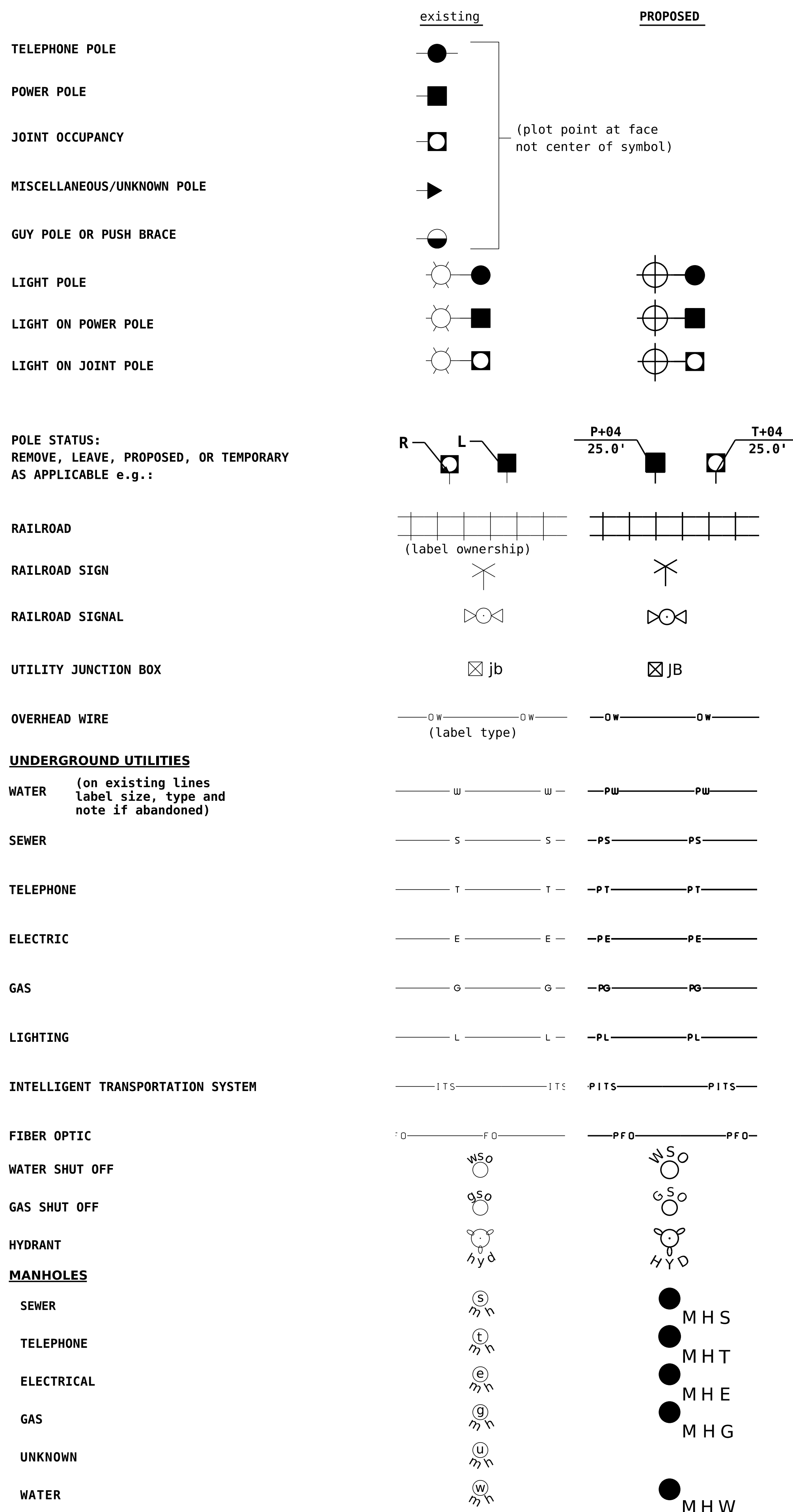
DRAINAGE



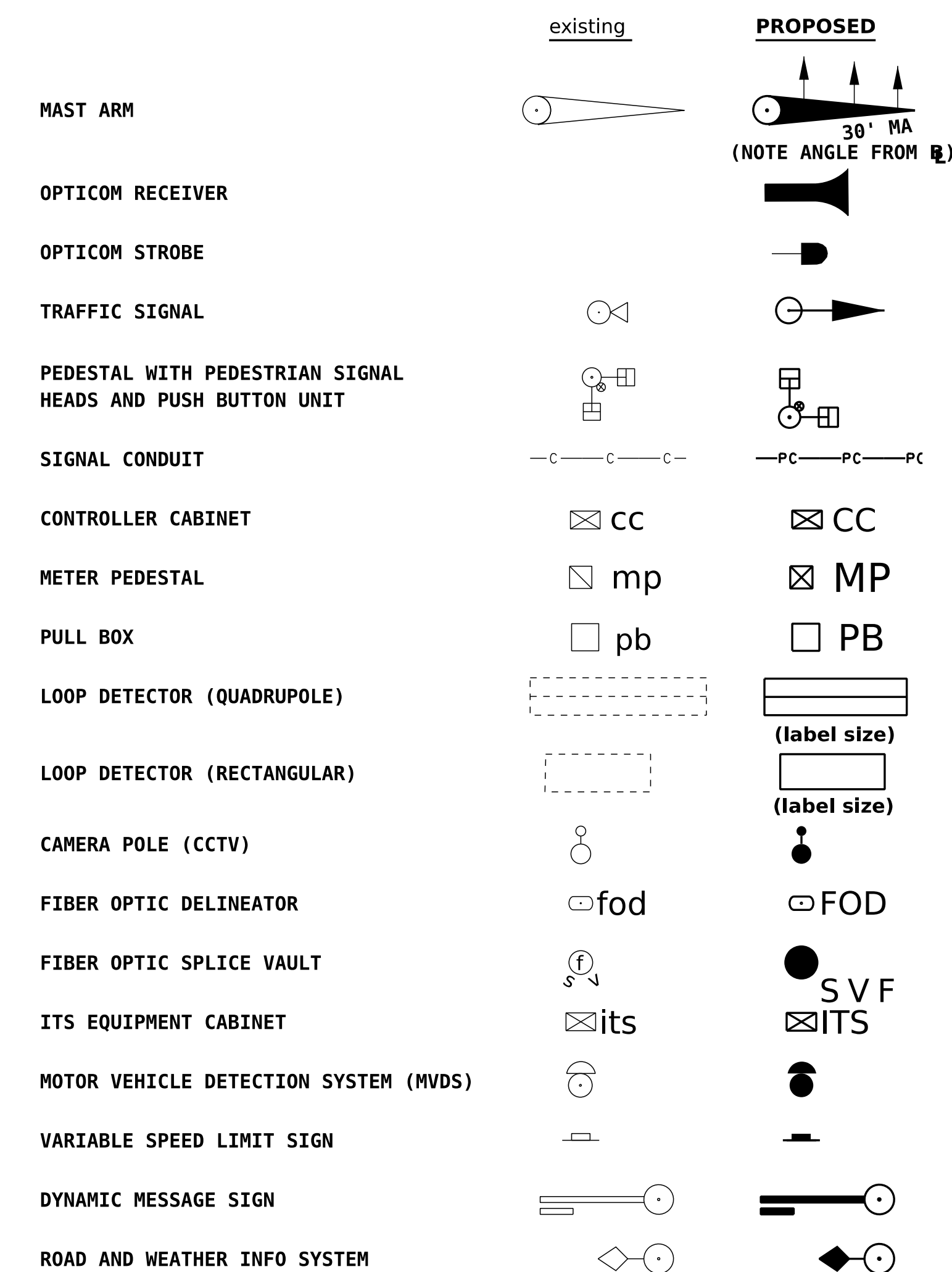
BOUNDARIES / RIGHT-OF-WAY



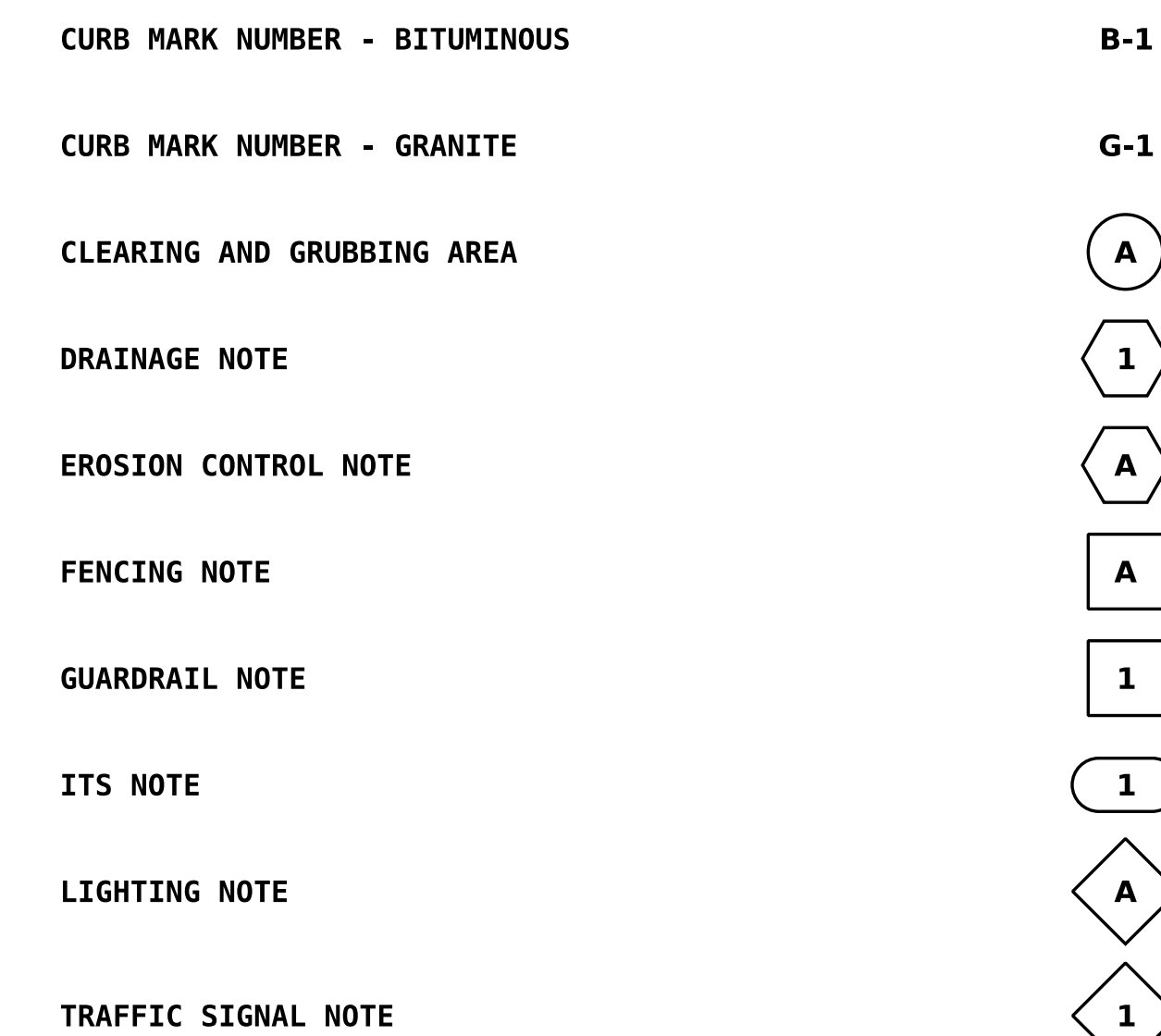
UTILITIES



TRAFFIC SIGNALS / ITS



CONSTRUCTION NOTES



STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
07-31-2023	13761A_Symb	13761A	3	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

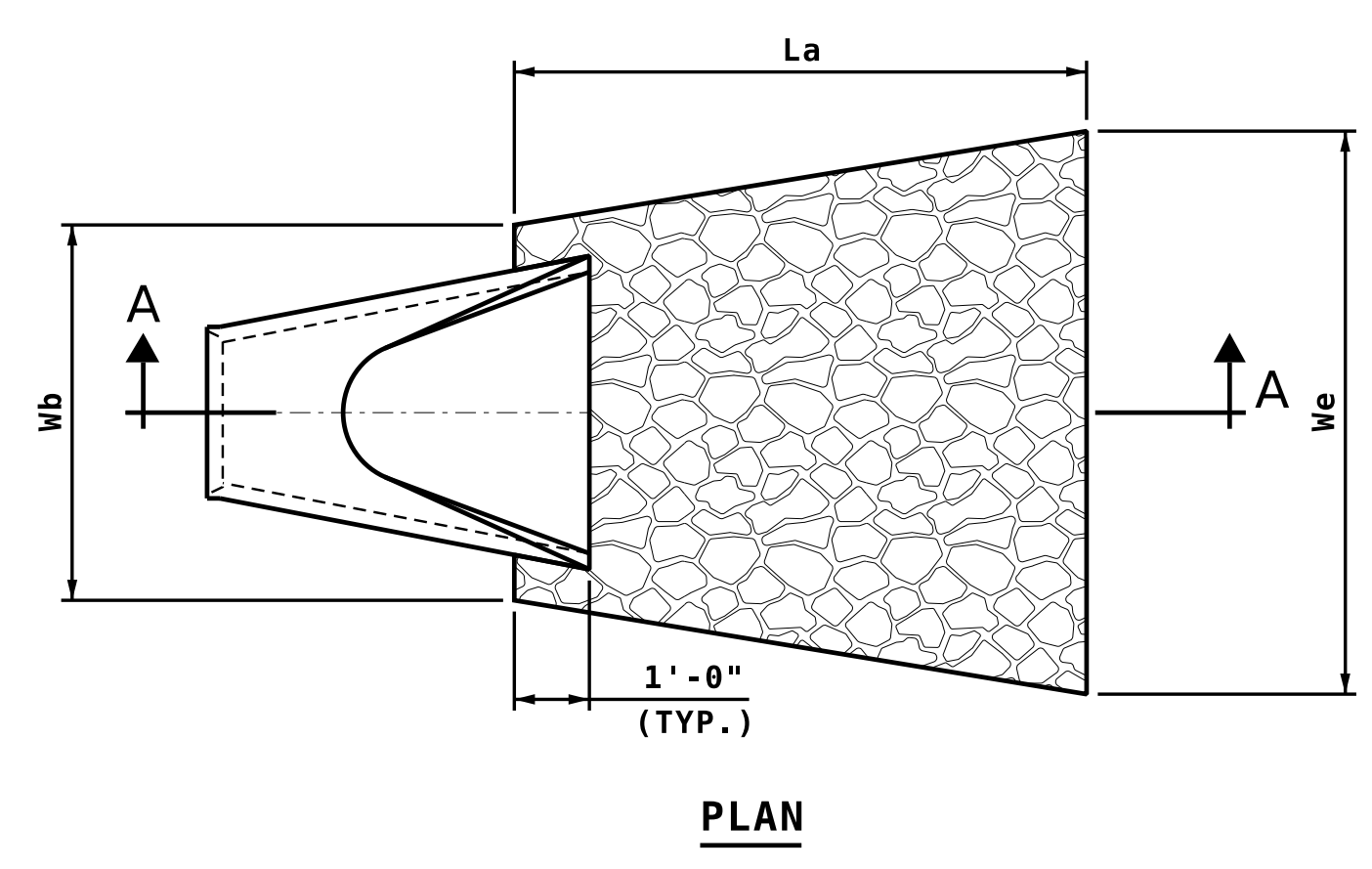
REVISIONS AFTER PROPOSAL

STATION

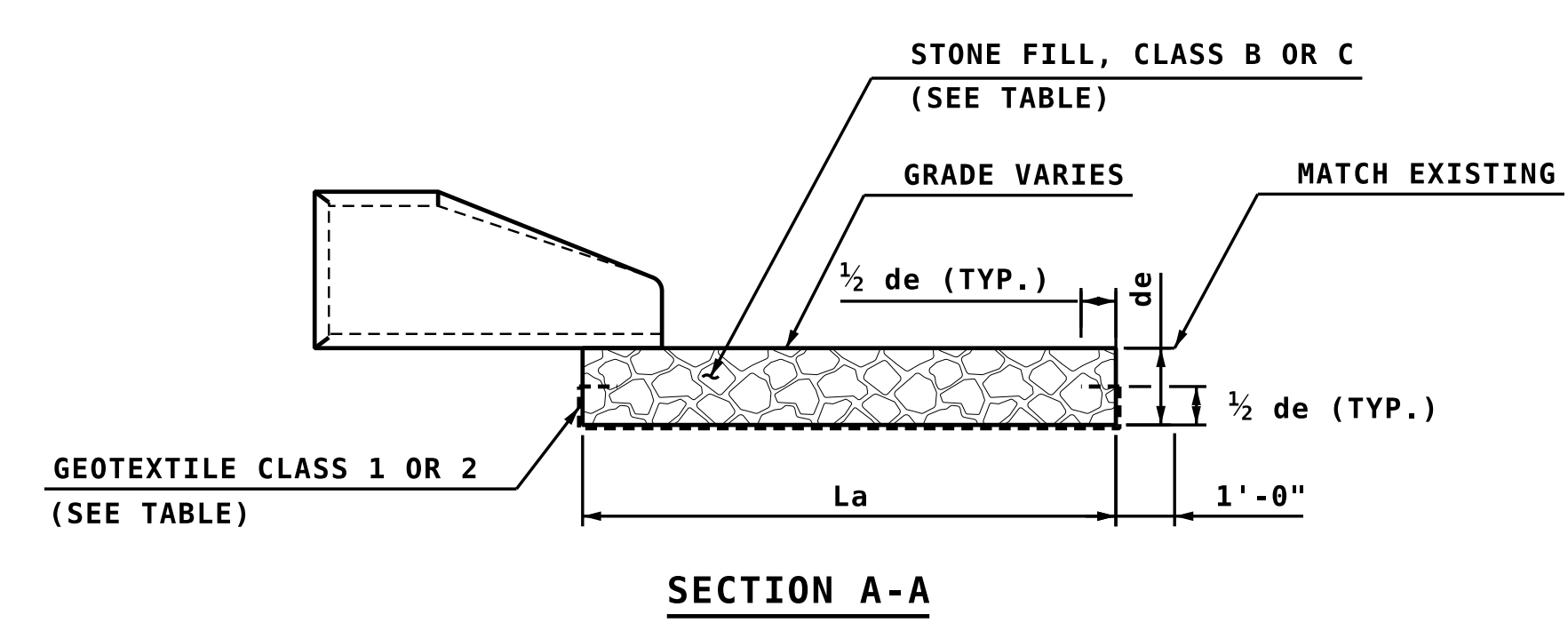
STATION

DATE

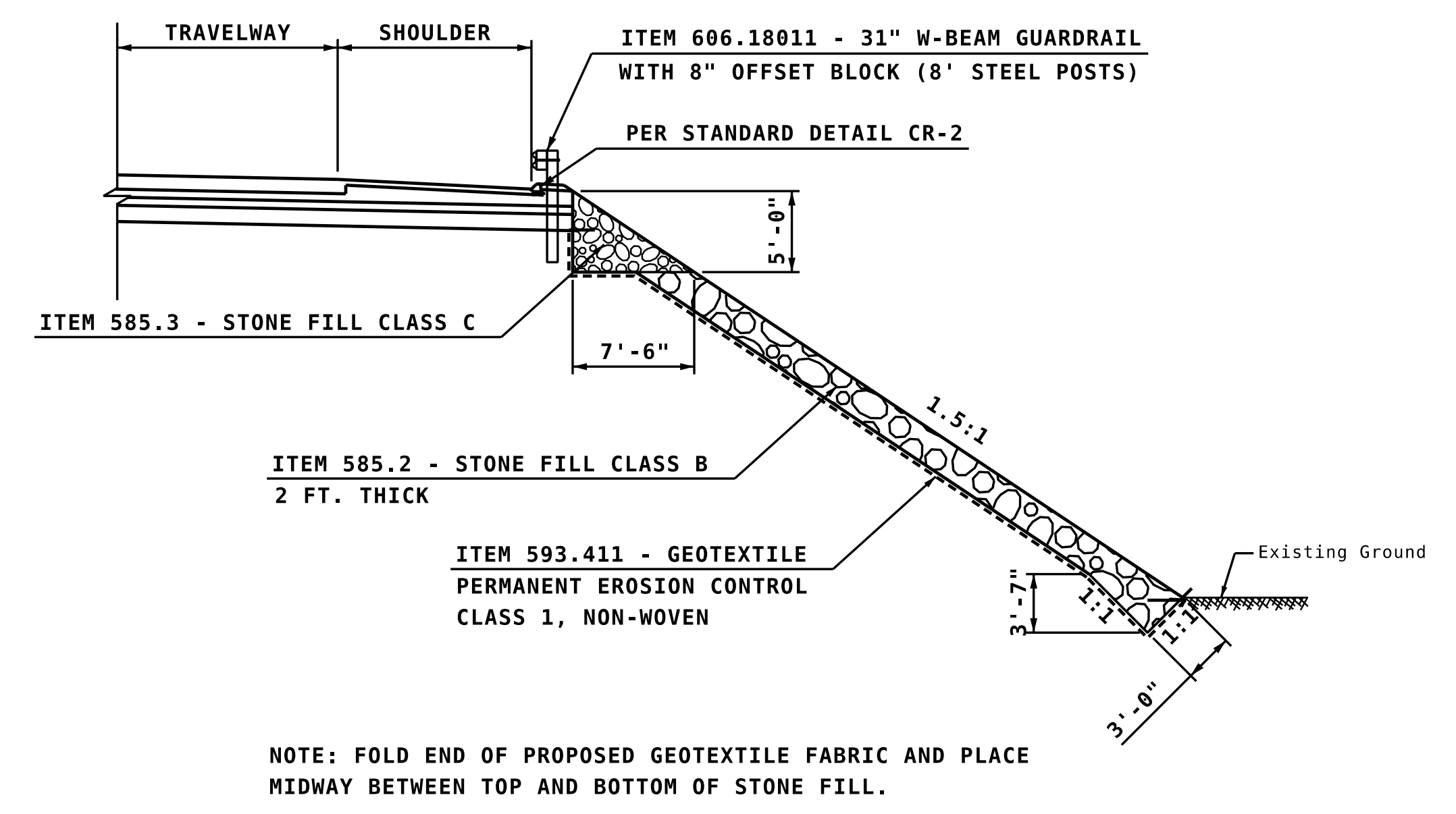
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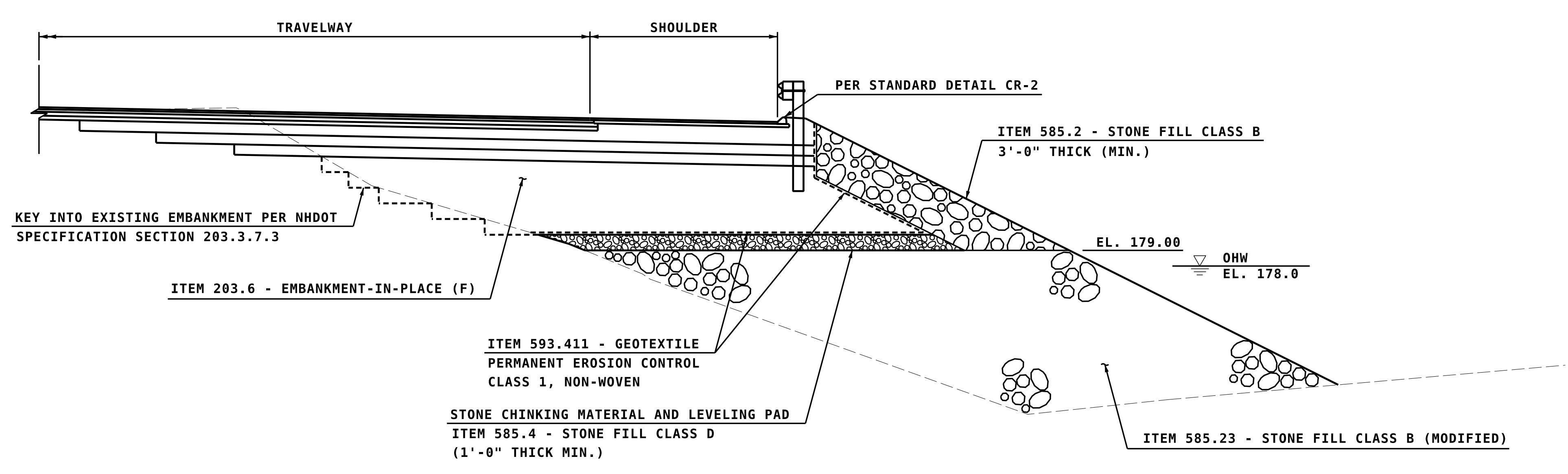
**DRAINAGE PIPE
OUTLET PROTECTION**
NOT TO SCALE



*EXCAVATION FOR STONE FILL TO BE PAID FOR UNDER ITEM 206.1 - COMMON STRUCTURE EXCAVATION



NOTE: FOLD END OF PROPOSED GEOTEXTILE FABRIC AND PLACE MIDWAY BETWEEN TOP AND BOTTOM OF STONE FILL.



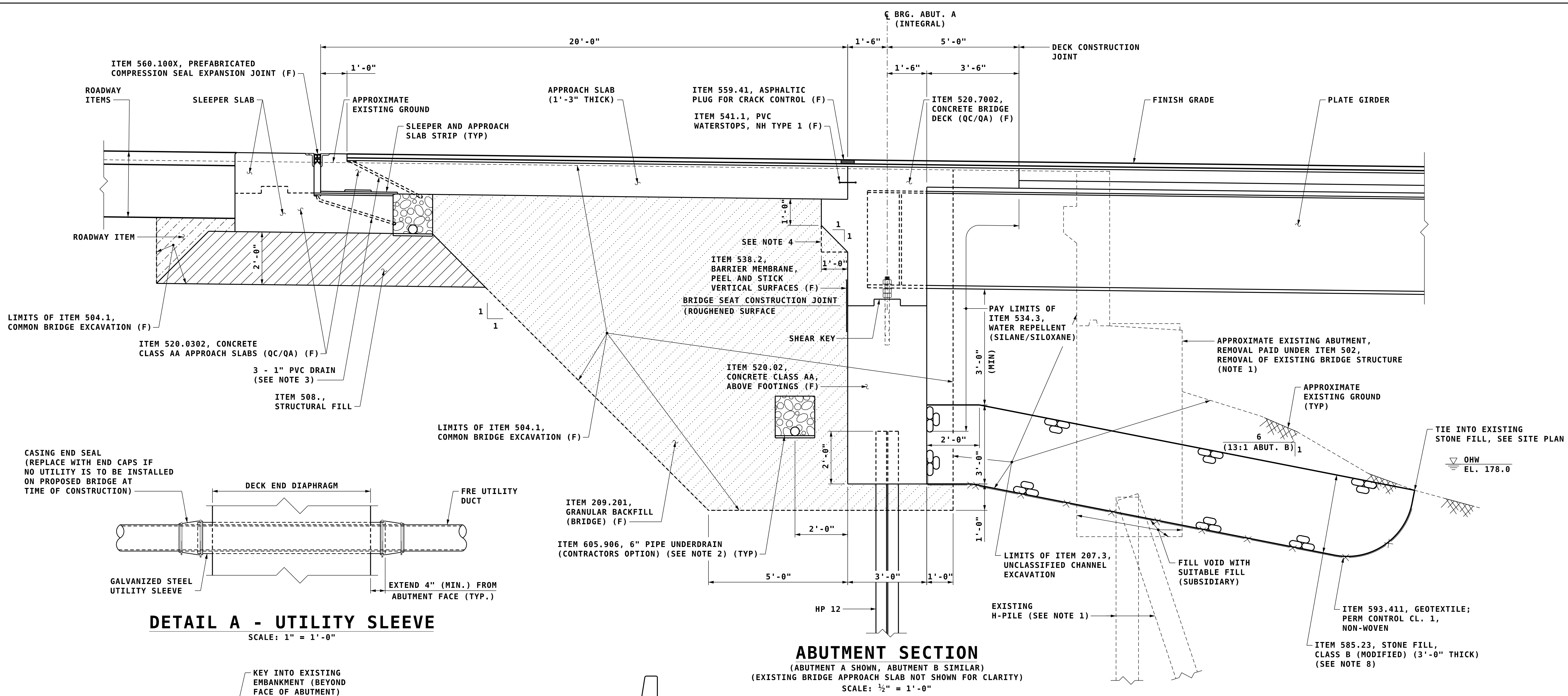
SEE BRIDGE PLANS FOR ADDITIONAL INFORMATION.



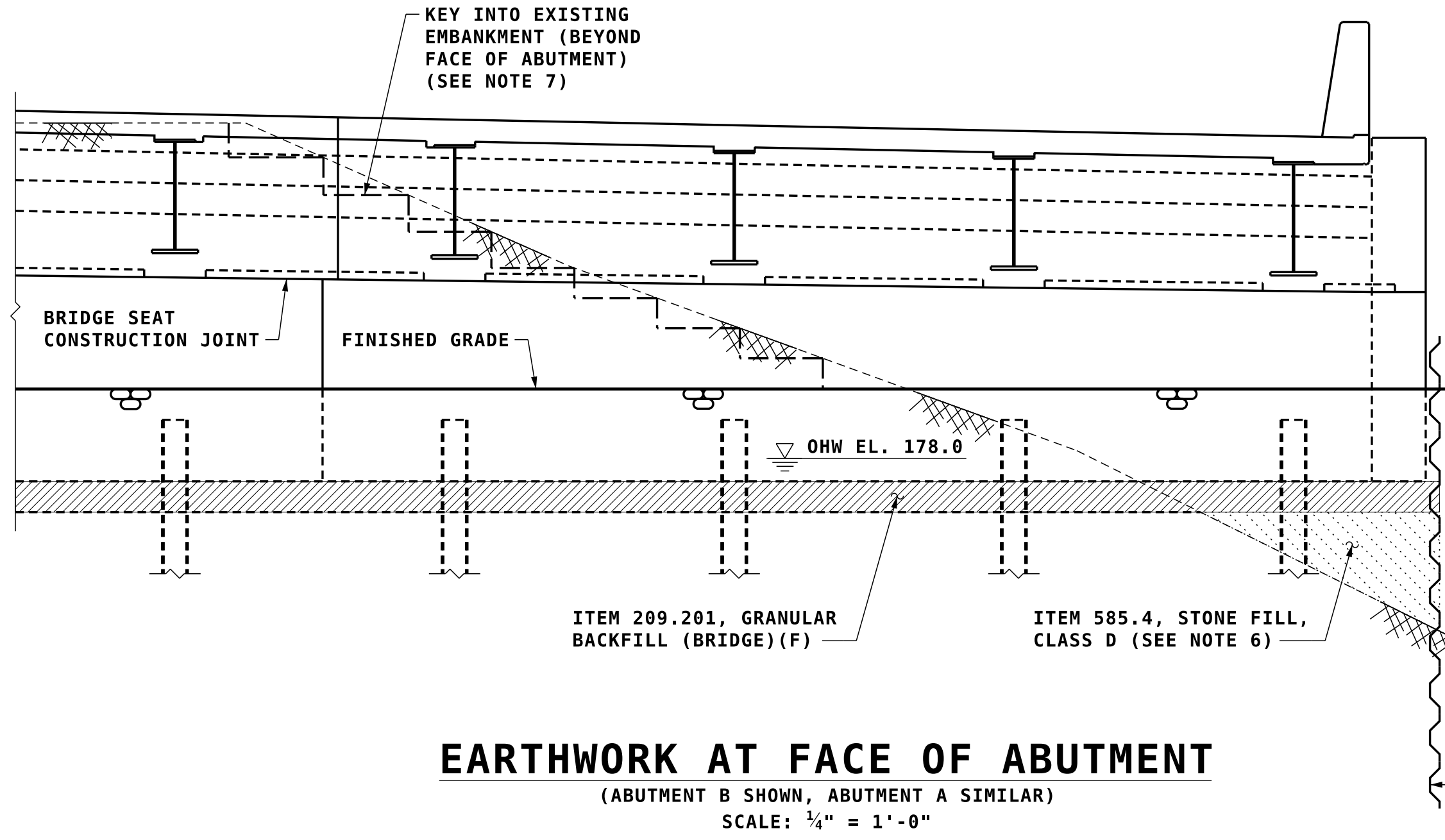
STATE OF NEW HAMPSHIRE NASHUA & MERRIMACK					
DEPARTMENT OF TRANSPORTATION		BUREAU OF HIGHWAY DESIGN			
MISCELLANEOUS DETAILS					
DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11/17/2023	52775.00	13761A_Shr_Det_01	13761A	4	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	DESCRIPTION
STATION	
STATION	
DATE	
NUMBER	



DETAIL A - UTILITY SLEEVE
SCALE: 1" = 1'-0"



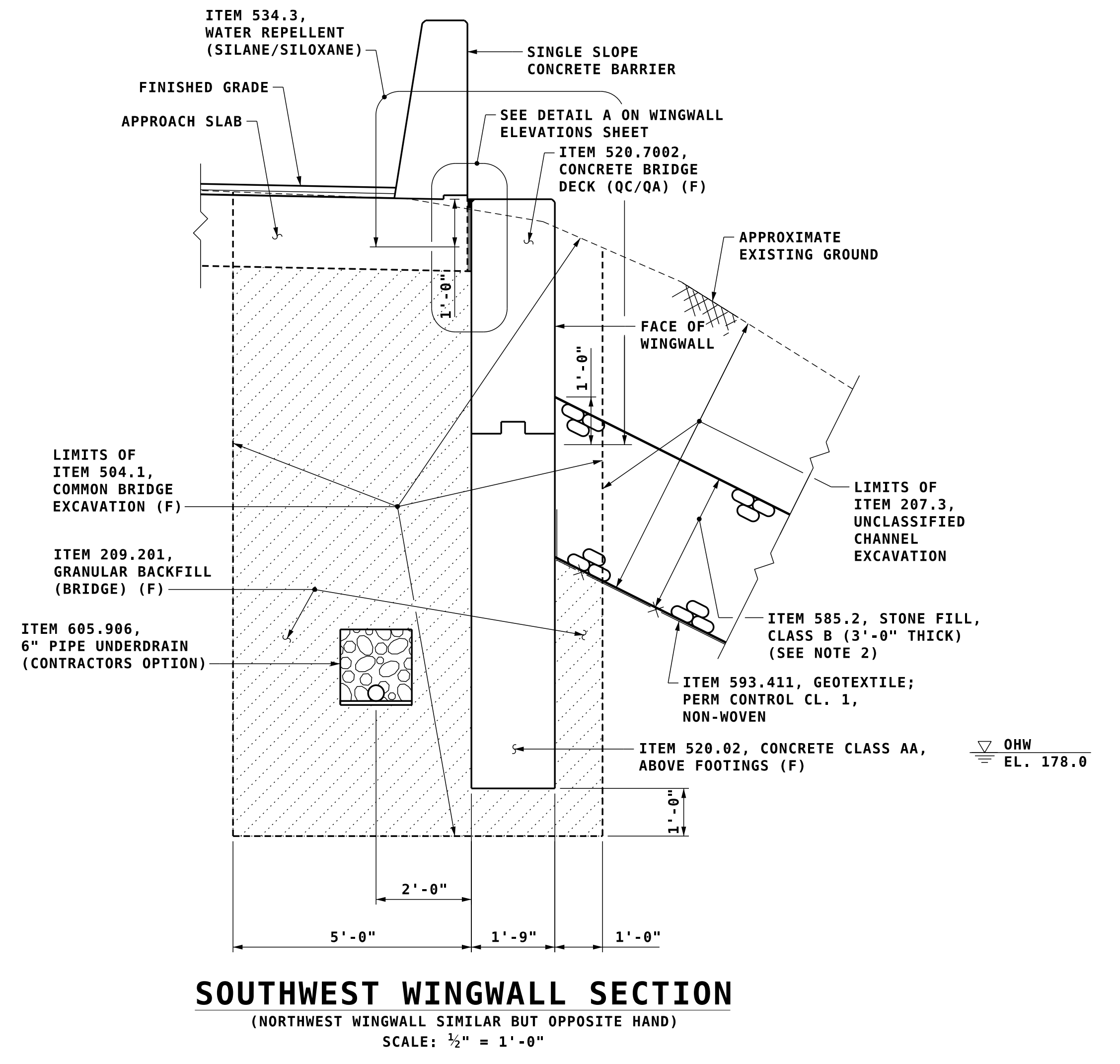
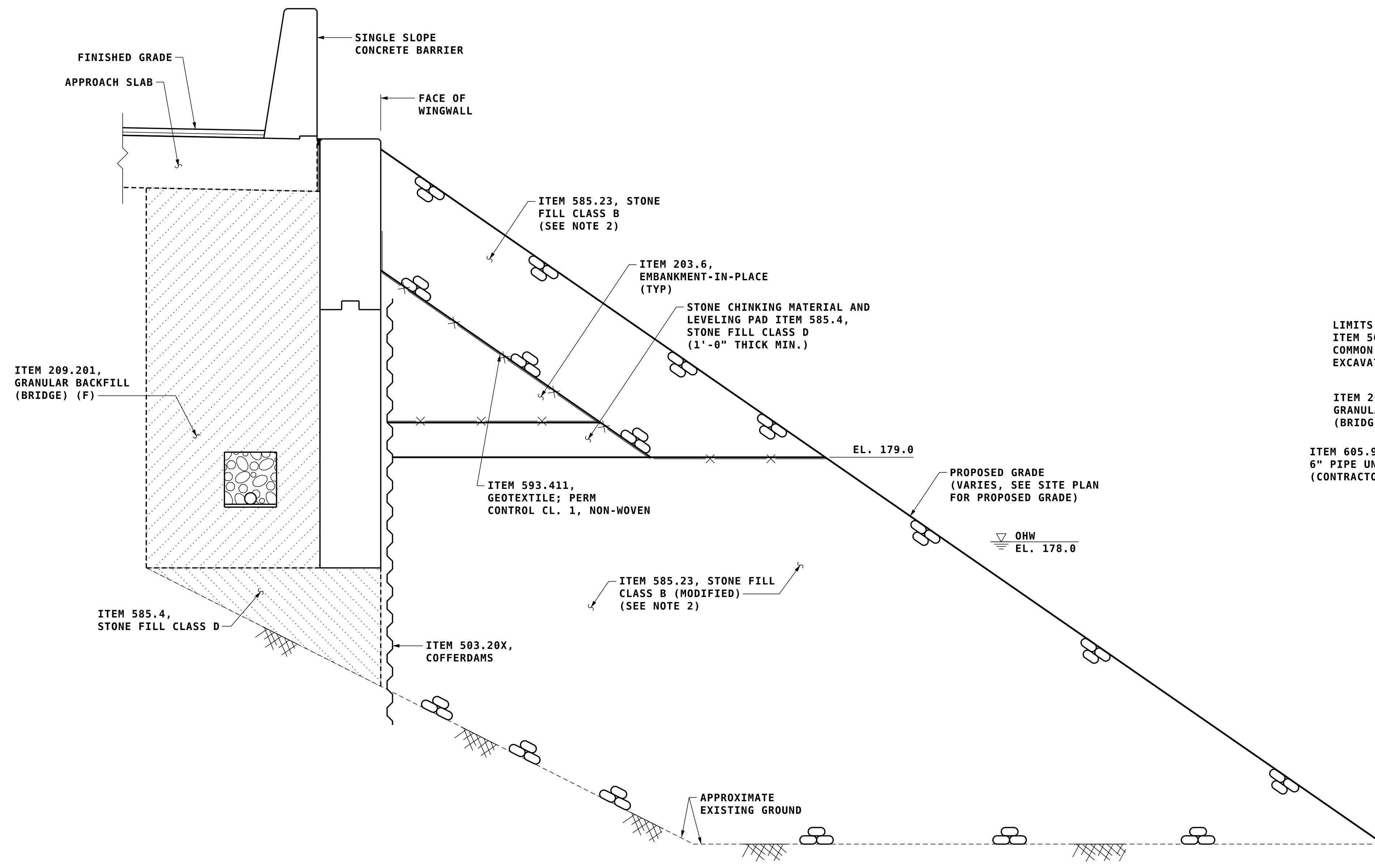
EARTHWORK AT FACE OF ABUTMENT
(ABUTMENT B SHOWN, ABUTMENT A SIMILAR)
SCALE: 1/4" = 1'-0"

- NOTES:**
- EXISTING BRIDGE ABUTMENTS AND WINGWALLS SHALL BE REMOVED IN THEIR ENTIRETY. EXISTING PILES SHALL BE REMOVED TO A MINIMUM OF 1 FOOT BELOW STONE FILL. SEE PROJECT NOTES AND QUANTITIES SHEETS FOR BRIDGE REMOVAL NOTES.
 - PIPE UNDERDRAIN BEHIND ABUTMENT IS PROVIDED AT BOTH ABUTMENT A AND B. PIPE UNDERDRAIN AT SLEEPER SLAB IS ONLY PROVIDED AT ABUTMENT B. SEE ABUTMENT AND WINGWALL NOTES ON PROJECT NOTES SHEET FOR ADDITIONAL UNDERDRAIN NOTES.
 - PVC DRAINS IN THE BOTTOM OF THE EXPANSION JOINT TROUGH TO BE PROVIDED AT ALL LOW POINTS (MEDIANS AND SHOULDERS) AT BOTH ABUTMENTS. PVC DRAINS BELOW THE PAVEMENT AT THE END OF APPROACH SLAB ARE ONLY PROVIDED AT ABUTMENT B.
 - NEGATE CHAMFER IN APPROACH SLAB SEAT IN THE VICINITY OF THE UTILITIES TO ACCOMMODATE UTILITY SLEEVE.
 - COFFERDAMS FOR DEWATERING AND EXCAVATION TO FACILITATE ABUTMENT CONSTRUCTION. FINAL DESIGN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
 - STONE FILL CLASS D TO BE USED IN PLACE OF CLASS B IN AREAS PILES ARE TO BE DRIVEN.
 - BENCHING OR TERRACING OF SLOPES STEEPER THAN 3:1 (HORIZONTAL TO VERTICAL) SHALL BE PERFORMED IN CONJUNCTION WITH THE PLACING OF EMBANKMENTS ABUTTING SUCH SLOPES.
 - STONE FILL, CLASS B (MODIFIED), ITEM 585.23 IS TO BE USED UP TO EL. 179.00, SEE SITE PLAN FOR GRADING LIMITS. STONE FILL, CLASS B, ITEM 585.2 IS TO BE USED ABOVE EL. 179.00.

STATE OF NEW HAMPSHIRE NASHUA & MERRIMACK					
DEPARTMENT OF TRANSPORTATION			BUREAU OF HIGHWAY DESIGN		
MISCELLANEOUS DETAILS					
DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11/17/2023	52775.00	13761A_Shr_Det_02	13761A	5	44



REVISIONS AFTER PROPOSAL		DESCRIPTION
STATION		
STATION		
DATE		
NUMBER		
DATE	7/2021	
DATE	11/17/2023	
DATE		
DATE		
SDR PROCESSED	NHDOT	
NEW DESIGN	VHB TEAM	
SHEET CHECKED		
AS BUILT DETAILS		

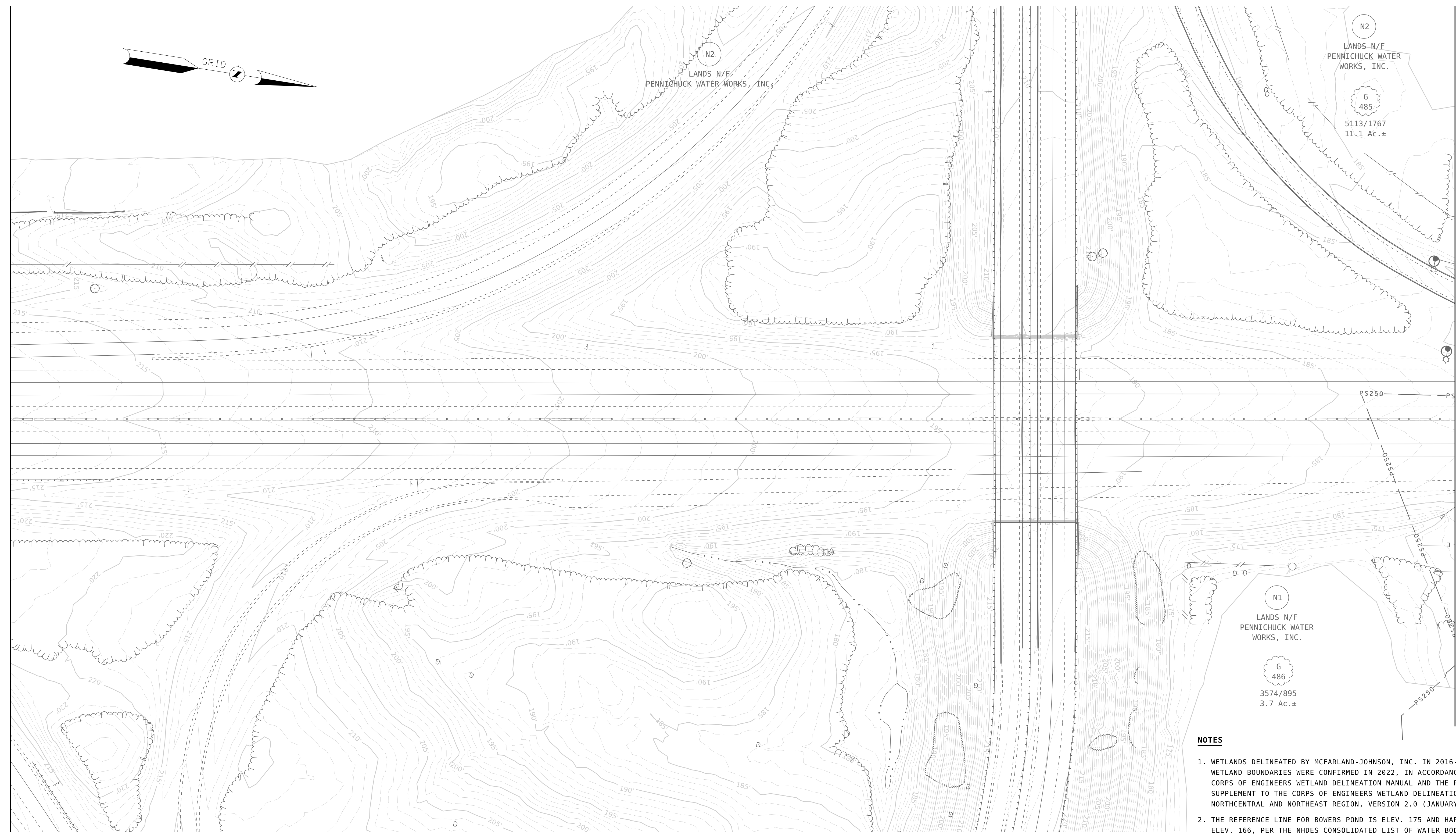


- NOTES:**
1. SINGLE SLOPED CONCRETE BARRIER ON BRIDGE AND APPROACH SLAB FASCIA NOT SHOWN FOR CLARITY.
 2. STONE FILL CLASS B, ITEM 585.2 IS TO BE USED ABOVE ELEVATION 179.00 AND STONE FILL CLASS B (MODIFIED), ITEM 585.23 TO BE USED BELOW EL. 179.00, SEE SITE PLAN FOR GRADING LIMITS.

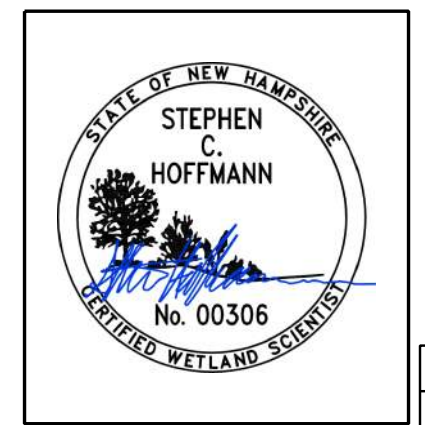


STATE OF NEW HAMPSHIRE NASHUA & MERRIMACK					
DEPARTMENT OF TRANSPORTATION		BUREAU OF HIGHWAY DESIGN			
MISCELLANEOUS DETAILS					
DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11/17/2023	52775.00	13761A_Shr_Det_03	13761A	6	44

SDR PROCESSED	NHDOT	DATE	7/2021
	VHB TEAM	DATE	11/17/2023
NEW DESIGN	STATION	DATE	
	DESCRIPTION	DATE	
SHEET CHECKED	NUMBER	DATE	
	DATE	DATE	
AS BUILT DETAILS			
DATE	DATE	DATE	DATE



WETLAND CLASSIFICATION CODES	
PSS1E	PALUSTRINE, SCRUB-SHRUB, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PEM1Eh	PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED/SATURATED, DIKED/IMPOUNDED
PF01E	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
VP	VERNAL POOL
L1UBHh	LACUSTRINE, LIMNETIC, UNCONSOLIDATED BOTTOM, PERMANENTLY FLOODED, DIKED/IMPOUNDED



- NOTES**
1. WETLANDS DELINEATED BY MCFARLAND-JOHNSON, INC. IN 2016-2017 AND WETLAND BOUNDARIES WERE CONFIRMED IN 2022, IN ACCORDANCE WITH THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0 (JANUARY 2012).
 2. THE REFERENCE LINE FOR BOWERS POND IS ELEV. 175 AND HARRIS POND IS ELEV. 166, PER THE NHDES CONSOLIDATED LIST OF WATER BODIES SUBJECT TO RSA 483-B, THE SHORELAND WATER QUALITY PROTECTION ACT (SWQPA). THE HARRIS POND REFERENCE LINE HAS BEEN DEPICTED BASED ON LIDAR CONTOUR 168. THE REFERENCE LINES ARE DEPICTED ON THIS EXISTING CONDITIONS PLAN, AS WELL AS THE FIELD DELINEATED ORDINARY HIGH WATER LINE.

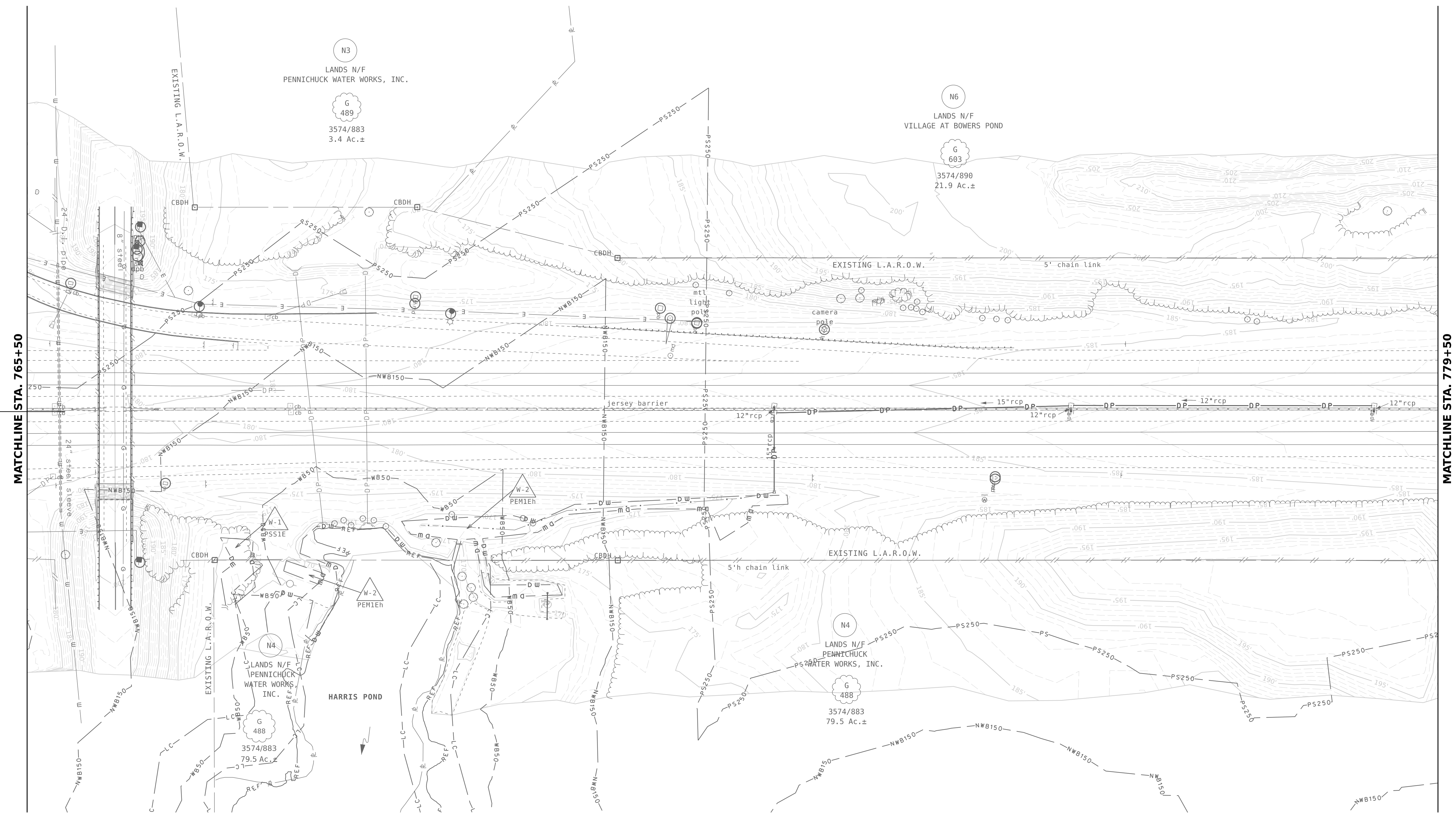
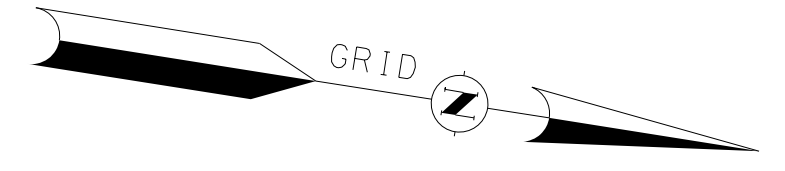
STATE OF NEW HAMPSHIRE NASHUA & MERRIMACK						
DEPARTMENT OF TRANSPORTATION			BUREAU OF HIGHWAY DESIGN			
EXISTING CONDITIONS PLAN 01						
MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_01	11/17/2023	52775.00	13761A_Ex_Cond	13761A	7	44

REVISIONS AFTER PROPOSAL

MATCHLINE STA. 765+50

SDR PROCESSED	NHDOT	DATE	7/2021
	VHB TEAM	DATE	11/17/2023
NEW DESIGN	VHB TEAM	DATE	
		DATE	
SHEET CHECKED			
AS BUILT DETAILS			

REVISIONS AFTER PROPOSAL	STATION	DATE	DESCRIPTION



MATCHLINE STA. 765+50

MATCHLINE STA. 779+50

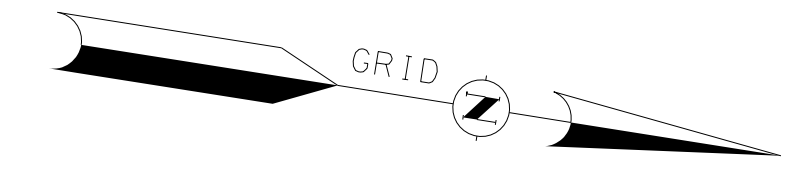
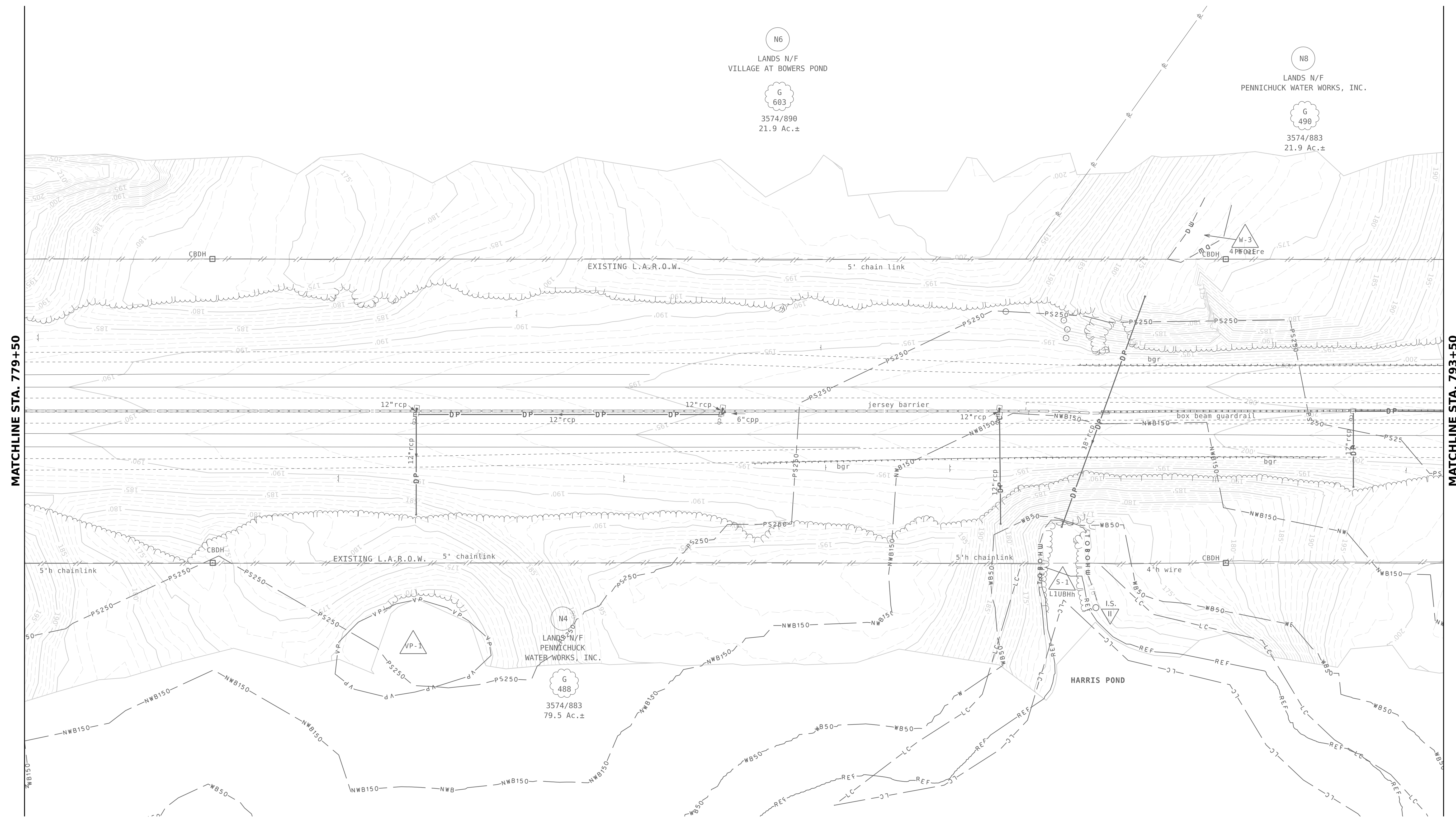


STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 02

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_02	11/17/2023	52775.00	13761A_Ex_Cond	13761A	8	44

SDR PROCESSED	NHDOT	DATE	7/2021
	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
		DATE	
AS BUILT DETAILS			
REVISIONS AFTER PROPOSAL			
NUMBER	DATE	STATION	DESCRIPTION



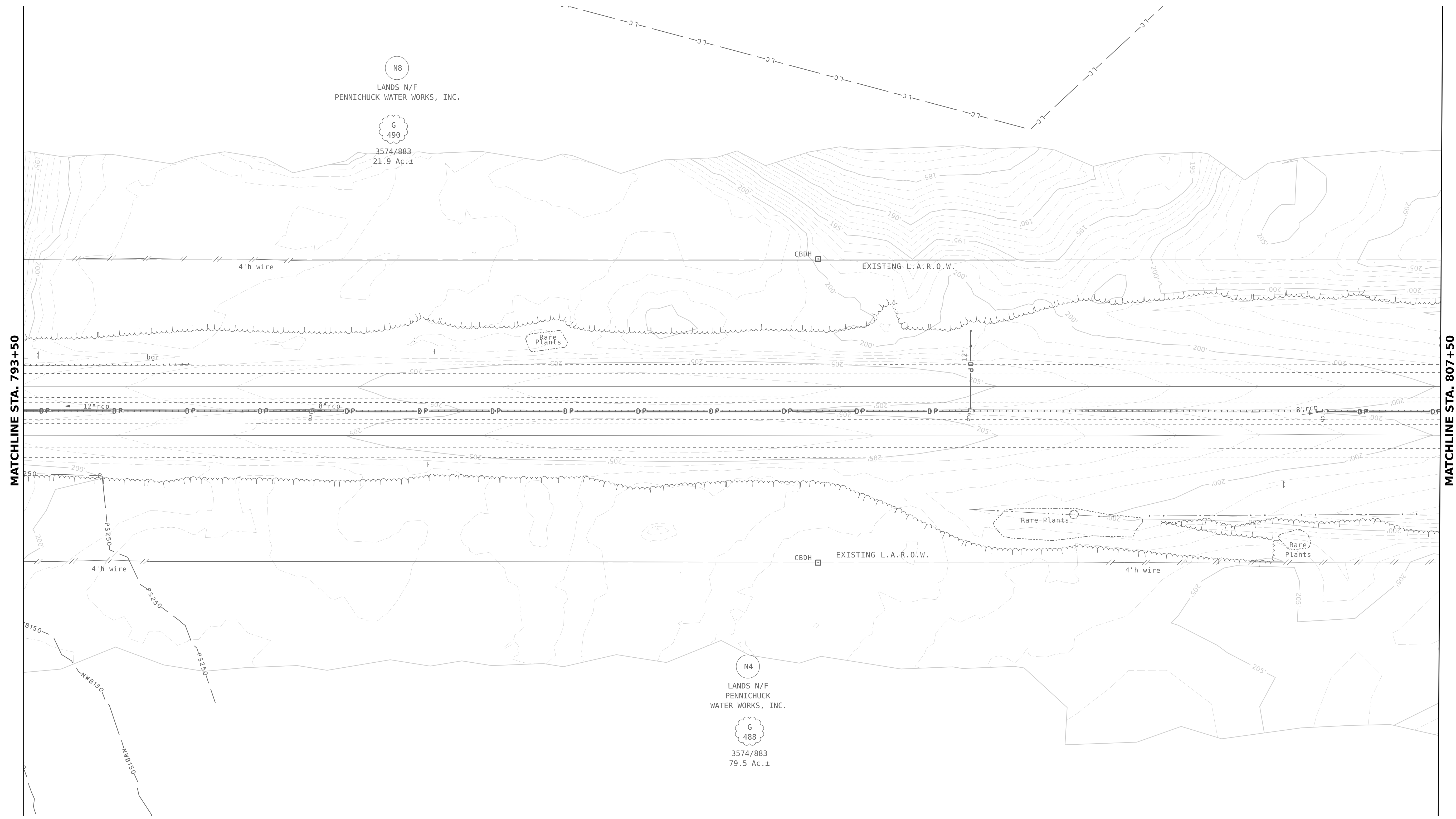
STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 03

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_03	11/17/2023	52775.00	13761A_Ex_Cond	13761A	9	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



MATCHLINE STA. 793+50

MATCHLINE STA. 807+50



STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 04

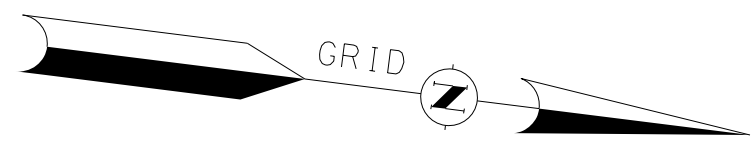
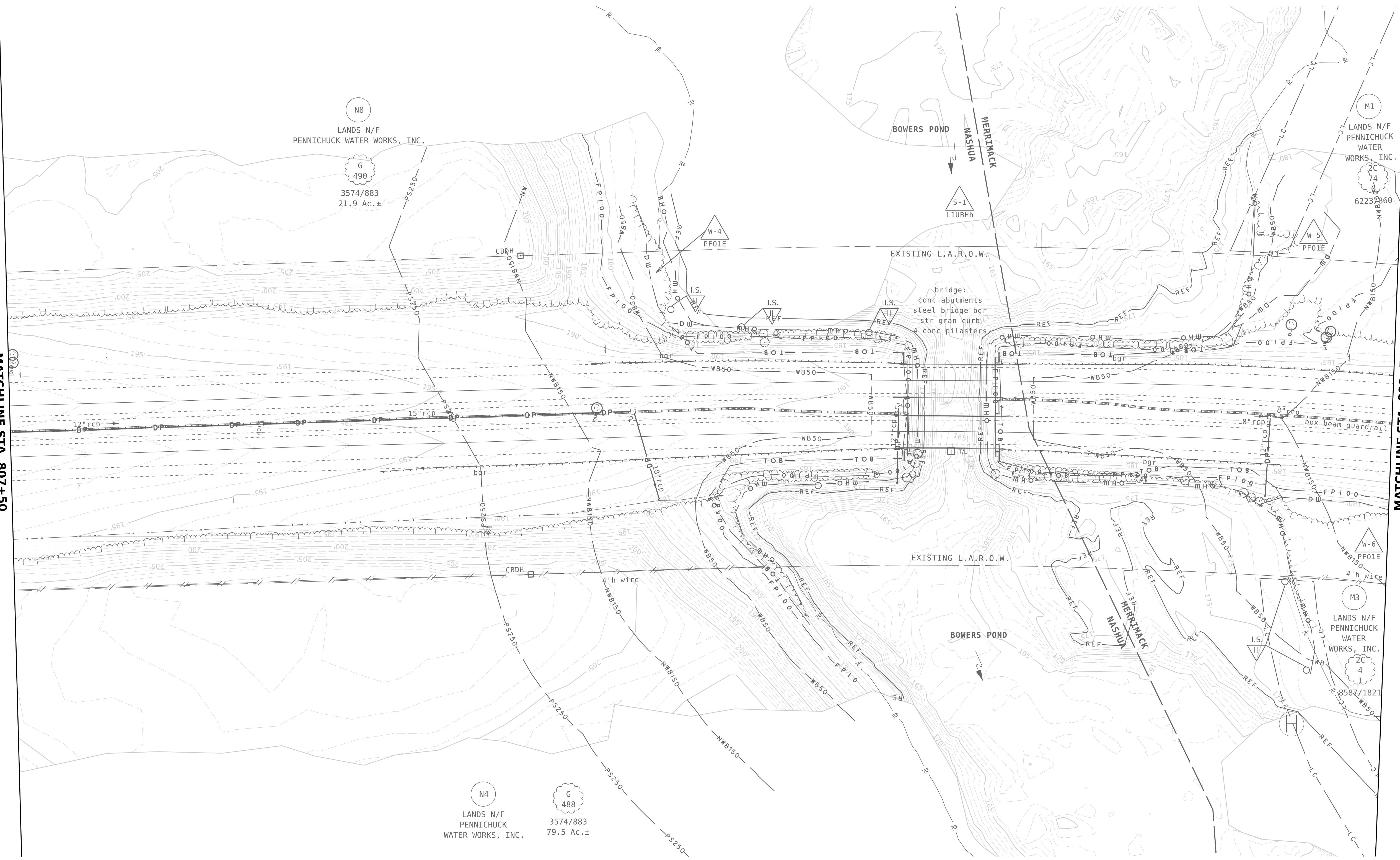
MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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SDR PROCESSED	NHDOT	DATE	7/2021
	NEW DESIGN	DATE	11/17/2023
SHEET CHECKED	VHB TEAM	DATE	
		DATE	
AS BUILT DETAILS			

REVISIONS AFTER PROPOSAL	DESCRIPTION
STATION	
DATE	
NUMBER	

MATCHLINE STA. 807 +50

MATCHLINE STA. 820 +50



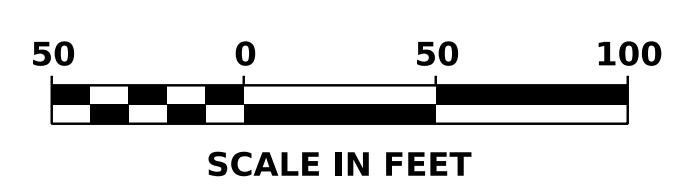
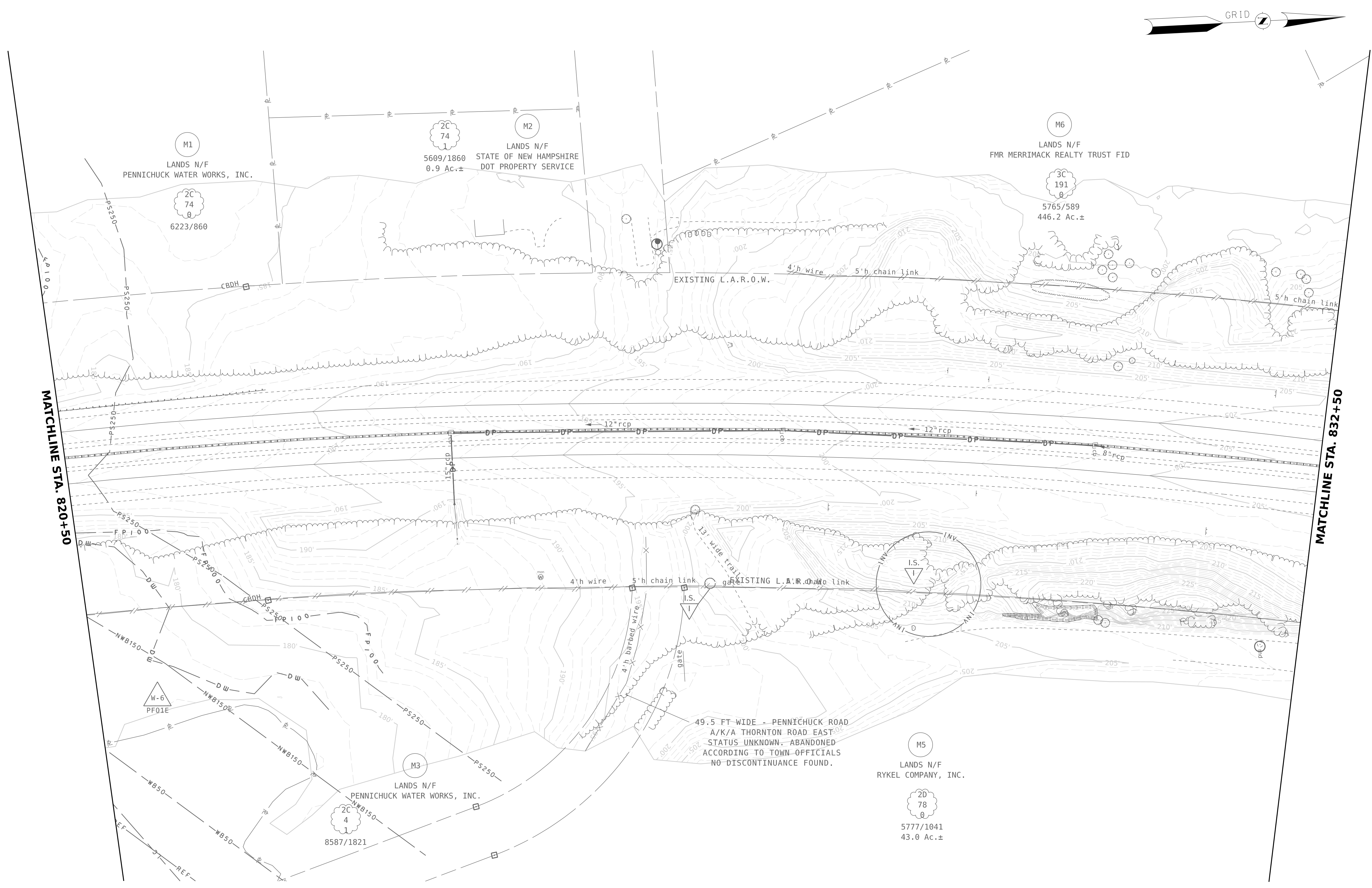
STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 05

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_05	11/17/2023	52775.00	13761A_Ex_Cond	13761A	11	44

SDR PROCESSED	NHDOT	DATE	7/2021
	NEW DESIGN	VHB TEAM	DATE
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DATE	DESCRIPTION



STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 06

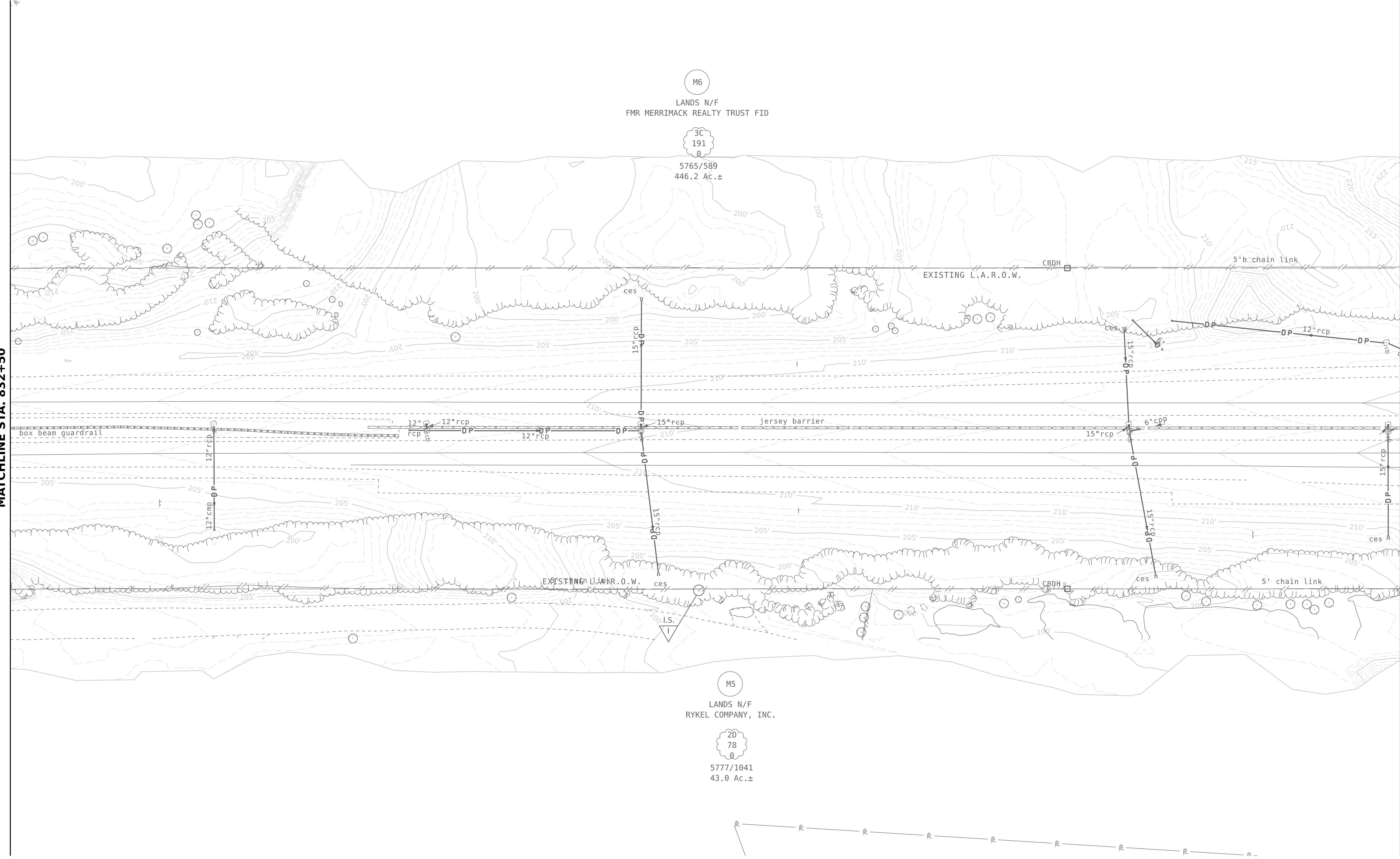
MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_06	11/17/2023	52775.00	13761A_Ex_Cond	13761A	12	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION

MATCHLINE STA. 832+50

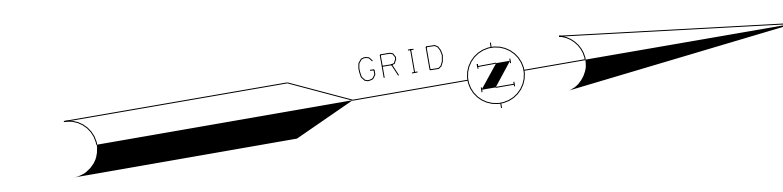
MATCHLINE STA. 845+50



STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

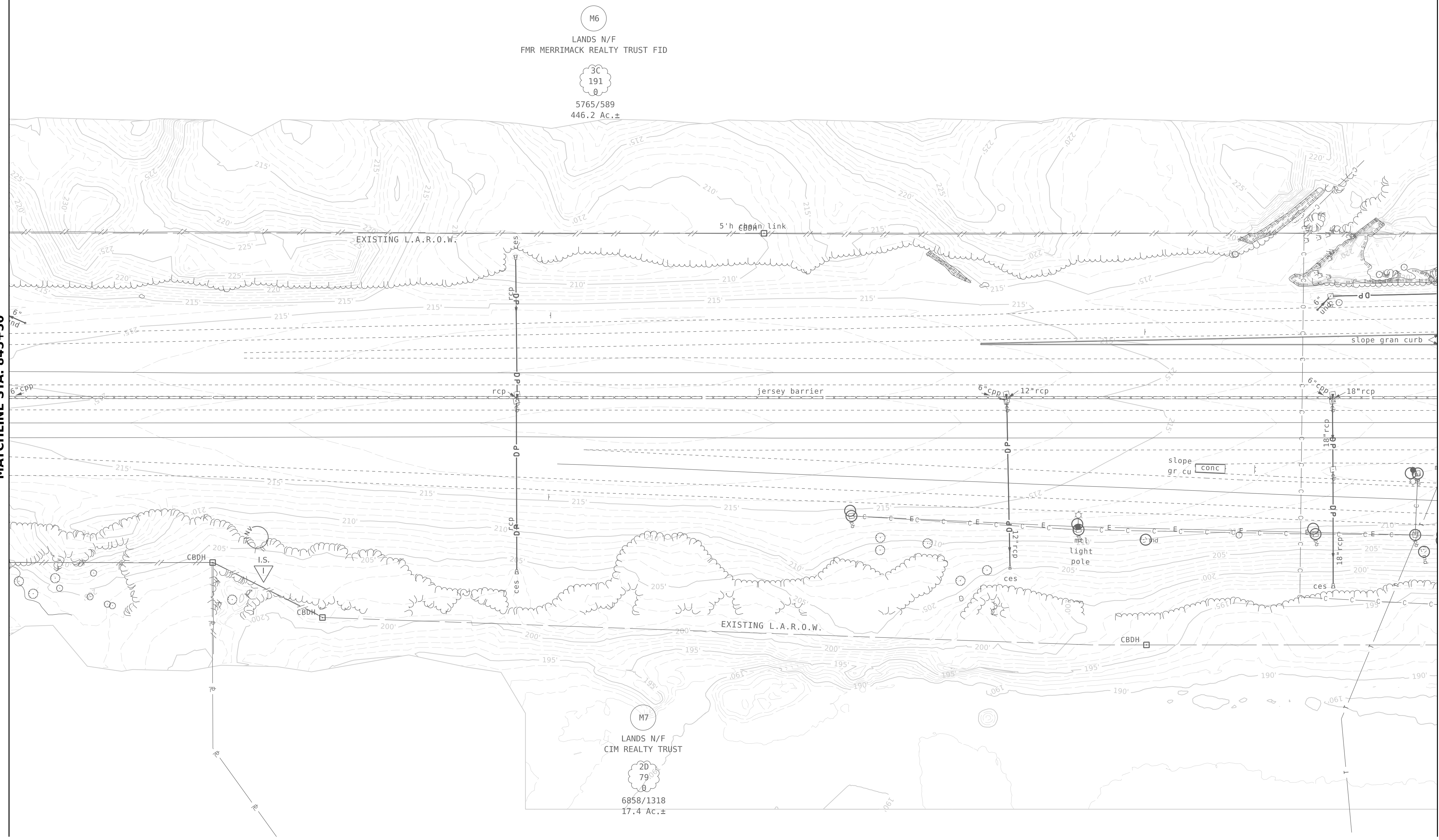
EXISTING CONDITIONS PLAN 07

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_07	11/17/2023	52775.00	13761A_Ex_Cond	13761A	13	44



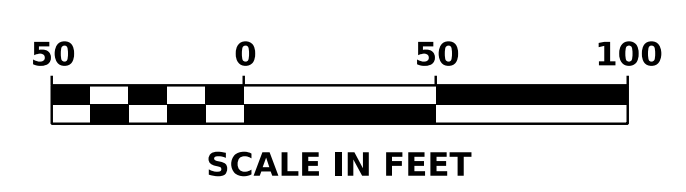
MATCHLINE STA. 845+50

MATCHLINE STA. 858+50



SDR PROCESSED	NHDOT	DATE	7/2021
	VHB TEAM	DATE	11/17/2023
NEW DESIGN	VHB TEAM	DATE	
		DATE	
SHEET CHECKED		DATE	
		DATE	
AS BUILT DETAILS		DATE	
		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION

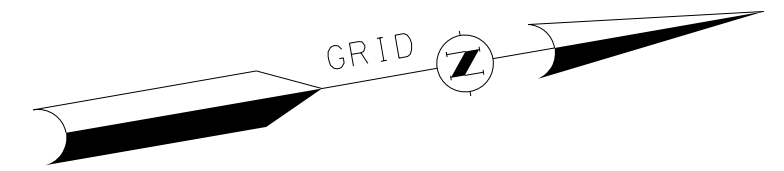


STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 08

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_08	11/17/2023	52775.00	13761A_Ex_Cond	13761A	14	44

SDR PROCESSED	NHDOT	DATE	7/2021		
	NEW DESIGN	DATE	11/17/2023		
SHEET CHECKED	VHB TEAM	DATE			
	AS BUILT DETAILS	DATE			
REVISIONS AFTER PROPOSAL		NUMBER	DATE	STATION	DESCRIPTION



MATCHLINE STA. 858+50

MATCHLINE STA. 871+75

MATCHLINE STA. 52+75

M7
LANDS N/F
CIM REALTY TRUST
6858/1318
17.4 Ac.±

M8
LANDS N/F
FAA DTFANE-06-U-00002
5831/1027
29.5 Ac.±

3C
191
0
5765/589
446.2 Ac.±
LANDS N/F
FMR MERRIMACK REALTY TRUST FID

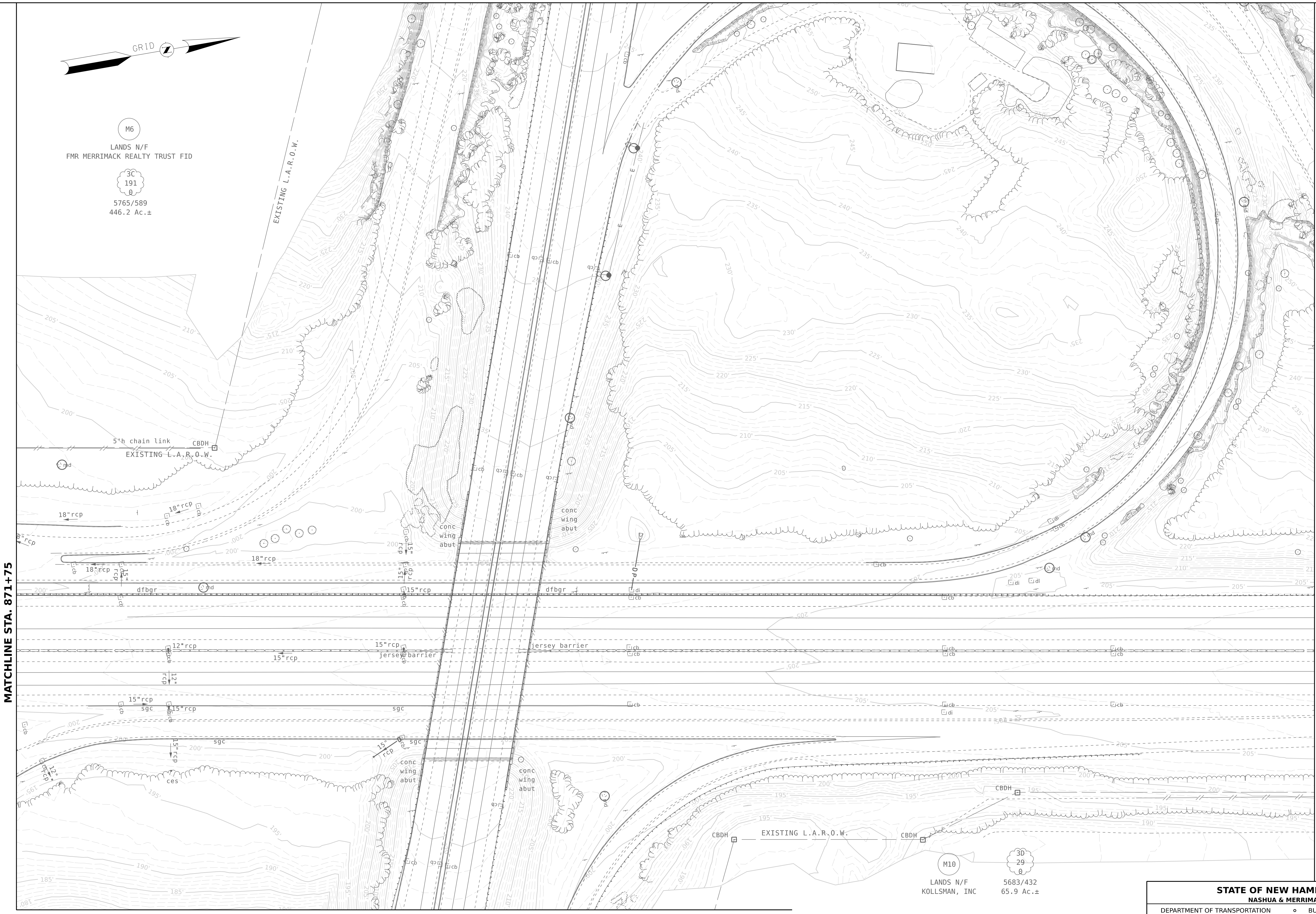


STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 09

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_09	11/17/2023	52775.00	13761A_Ex_Cond	13761A	15	44

SDR PROCESSED	NHDOT	DATE	7/2021	REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION
	NEW DESIGN	VHB TEAM	DATE			
SHEET CHECKED		DATE		NUMBER	DATE	STATION
AS BUILT DETAILS		DATE				



MATCH TO SHEET EXCOND_12



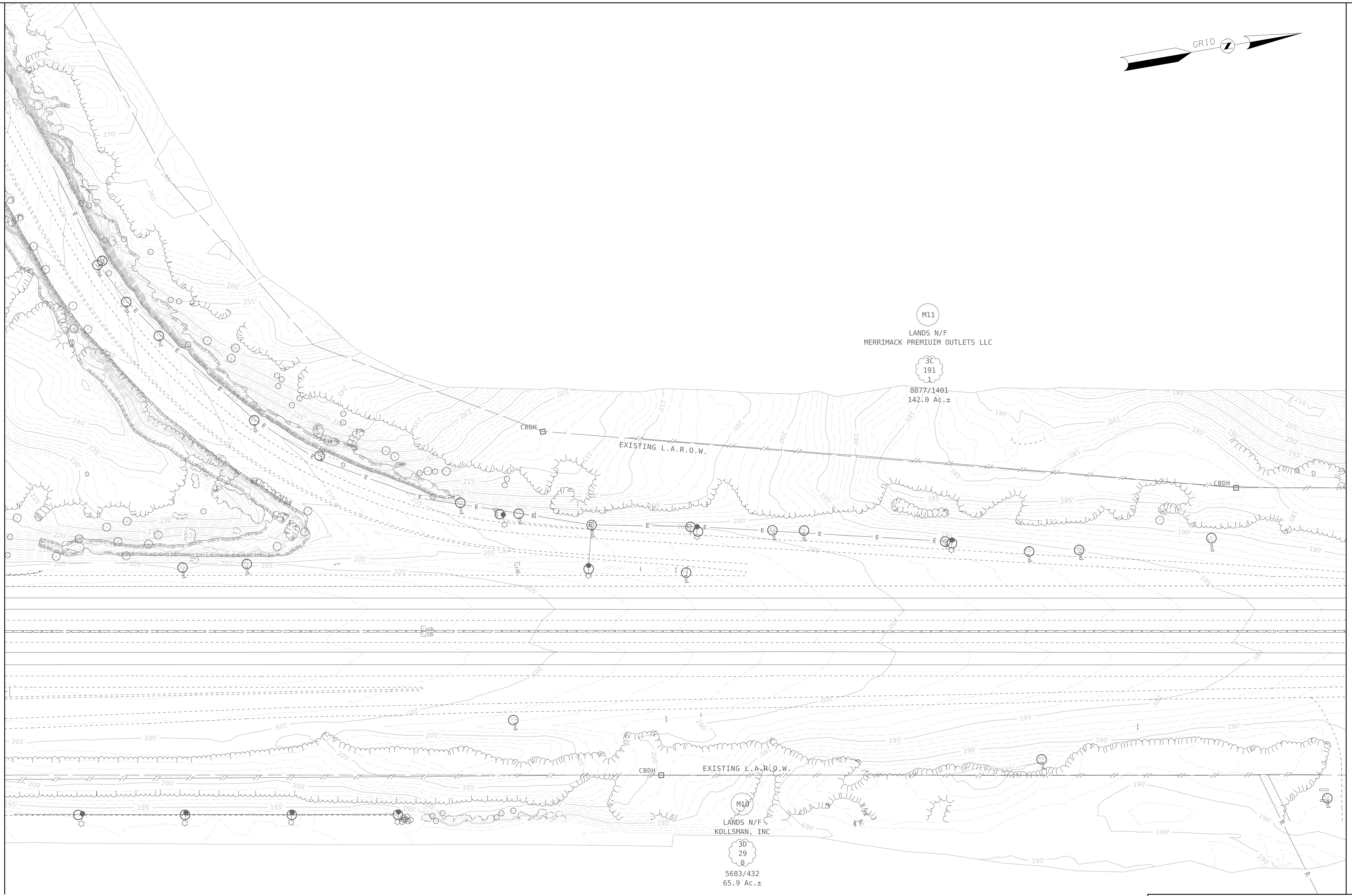
STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 10

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_10	11/17/2023	52775.00	13761A_Ex_Cond	13761A	16	44

SDR PROCESSED	NHDOT	DATE	7/2021		
	NEW DESIGN	DATE	11/17/2023		
SHEET CHECKED	VHB TEAM	DATE			
	AS BUILT DETAILS	DATE			
REVISIONS AFTER PROPOSAL		NUMBER	DATE	STATION	DESCRIPTION

MATCHLINE STA. 885+50



STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EXISTING CONDITIONS PLAN 11

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ExCond_11	11/17/2023	52775.00	13761A_Ex_Cond	13761A	17	44

SDR PROCESSED	NHDOT	DATE	7/2021	NUMBER	STATION	DESCRIPTION
NEW DESIGN	VHB TEAM	DATE	11/17/2023	DATE	STATION	DESCRIPTION
SHEET CHECKED		DATE		DATE	STATION	DESCRIPTION
AS BUILT DETAILS		DATE		DATE	STATION	DESCRIPTION

WETLAND CLASSIFICATION CODES	
PSS1E	PALUSTRINE, SCRUB-SHRUB, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
PEM1Eh	PALUSTRINE, EMERGENT, PERSISTENT, SEASONALLY FLOODED/SATURATED, DIKED/IMPOUNDED
PF01E	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDUOUS, SEASONALLY FLOODED/SATURATED
VP	VERNAL POOL
L1UBHh	LACUSTRINE, LIMNETIC, UNCONSOLIDATED BOTTOM, PERMANENTLY FLOODED, DIKED/IMPOUNDED

SHORELAND IMPACT SUMMARY			
LOCATION	AREAS (SF)		
	REF TO WB50	WB50 TO NWB150	NWB150 TO PS250
A			3,558
B		239	
C			1,003
D			84,920
E		27,025	
F	22		
G	1		
H	1		
I			33,866
J		40,033	
K	11,114		
L	8,581		
M		26,181	
N			20,920
O			235
P			624

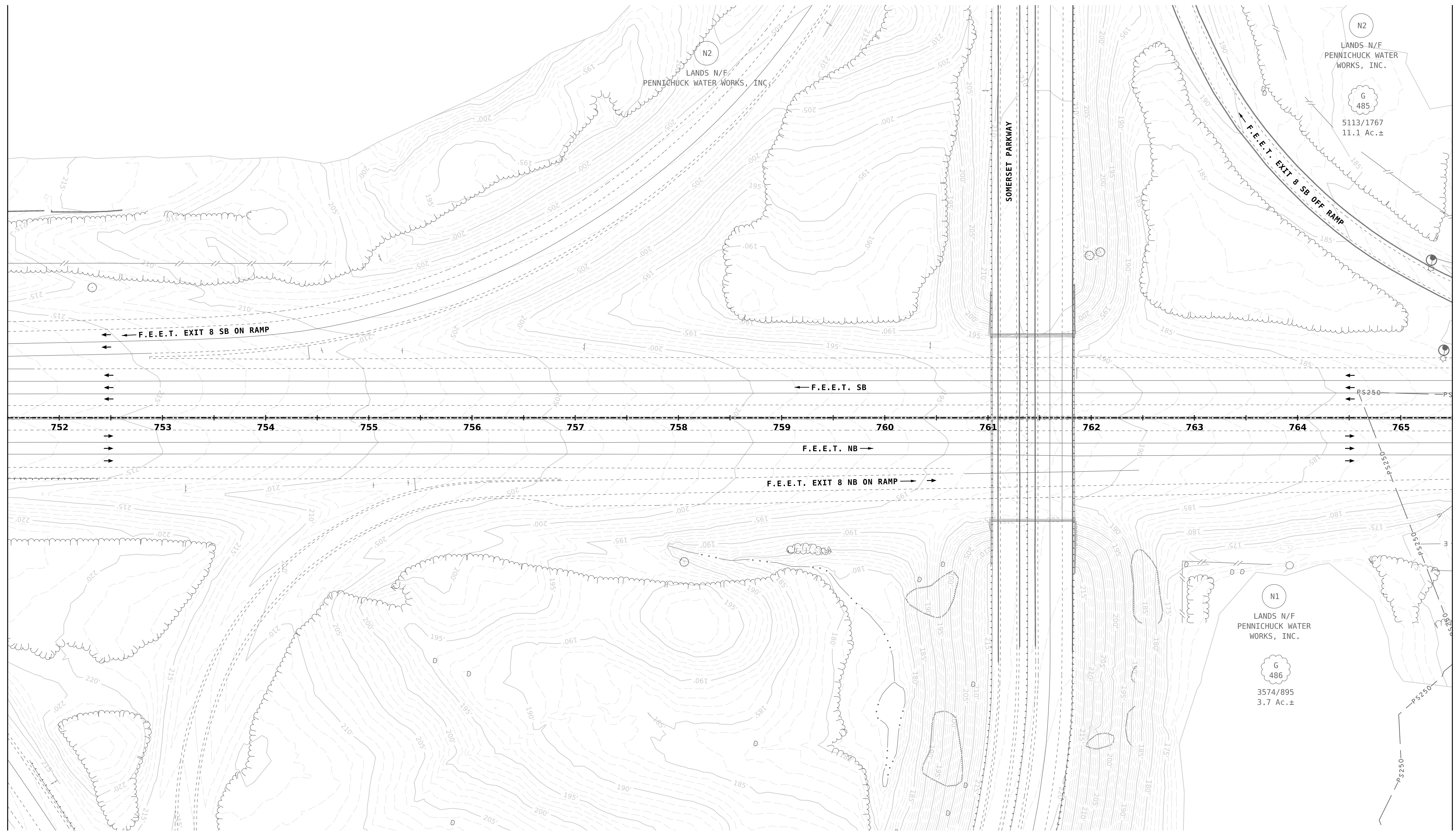
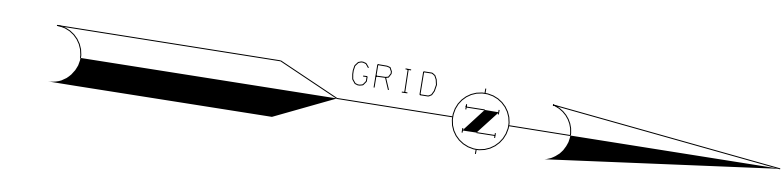
TOTAL REF TO WB50 = 19,719 SF
TOTAL WB50 TO NWB150 = 93,478 SF
TOTAL NWB150 TO PS250 = 145,126 SF

TOTAL IMPACTS REF TO PS250 = 258,323 SF

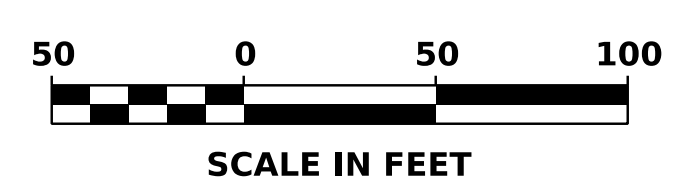


STATE OF NEW HAMPSHIRE NASHUA & MERRIMACK					
DEPARTMENT OF TRANSPORTATION		BUREAU OF HIGHWAY DESIGN			
SHORELAND IMPACT SUMMARY					
DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11/17/2023	52775.00	13761A_Shr_Summary	13761A	19	44

SDR PROCESSED	NHDOT	DATE	7/2021
	NEW DESIGN	DATE	11/17/2023
SHEET CHECKED	VHB TEAM	DATE	
	AS BUILT DETAILS	DATE	
REVISIONS AFTER PROPOSAL		STATION	DESCRIPTION



MATCHLINE STA. 765+50



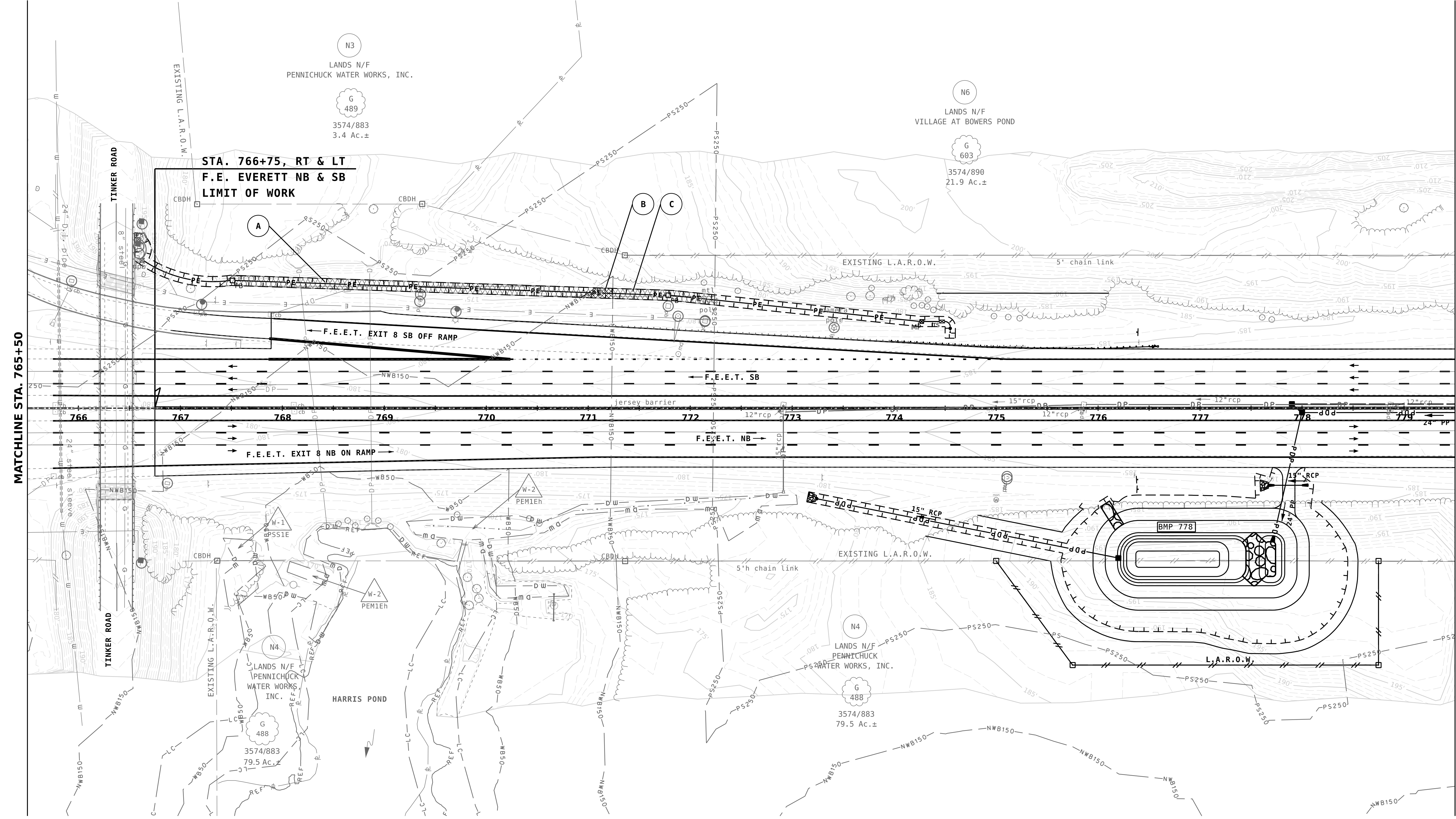
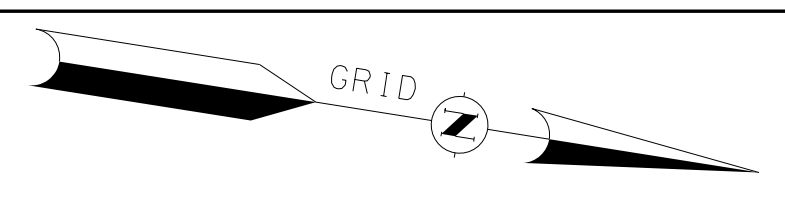
STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

SHORELAND IMPACT PLAN 01

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR01	11/17/2023	52775.00	13761A_Shore_Plans	13761A	20	44

SDR PROCESSED	DATE	7/2021	STATION	
	NEW DESIGN	DATE	11/17/2023	
SHEET CHECKED	DATE			
	DATE			
AS BUILT DETAILS				

REVISIONS AFTER PROPOSAL	DESCRIPTION



LEGEND

SHORELAND IMPACT LOCATION

TYPE OF SHORELAND IMPACT	SHADING/HATCHING	TYPE OF SHORELAND IMPACT	SHADING/HATCHING
REF TO WB50		NWB150 TO PS250	
WB50 TO NWB150		JURISDICTIONAL WETLAND IMPACTS	



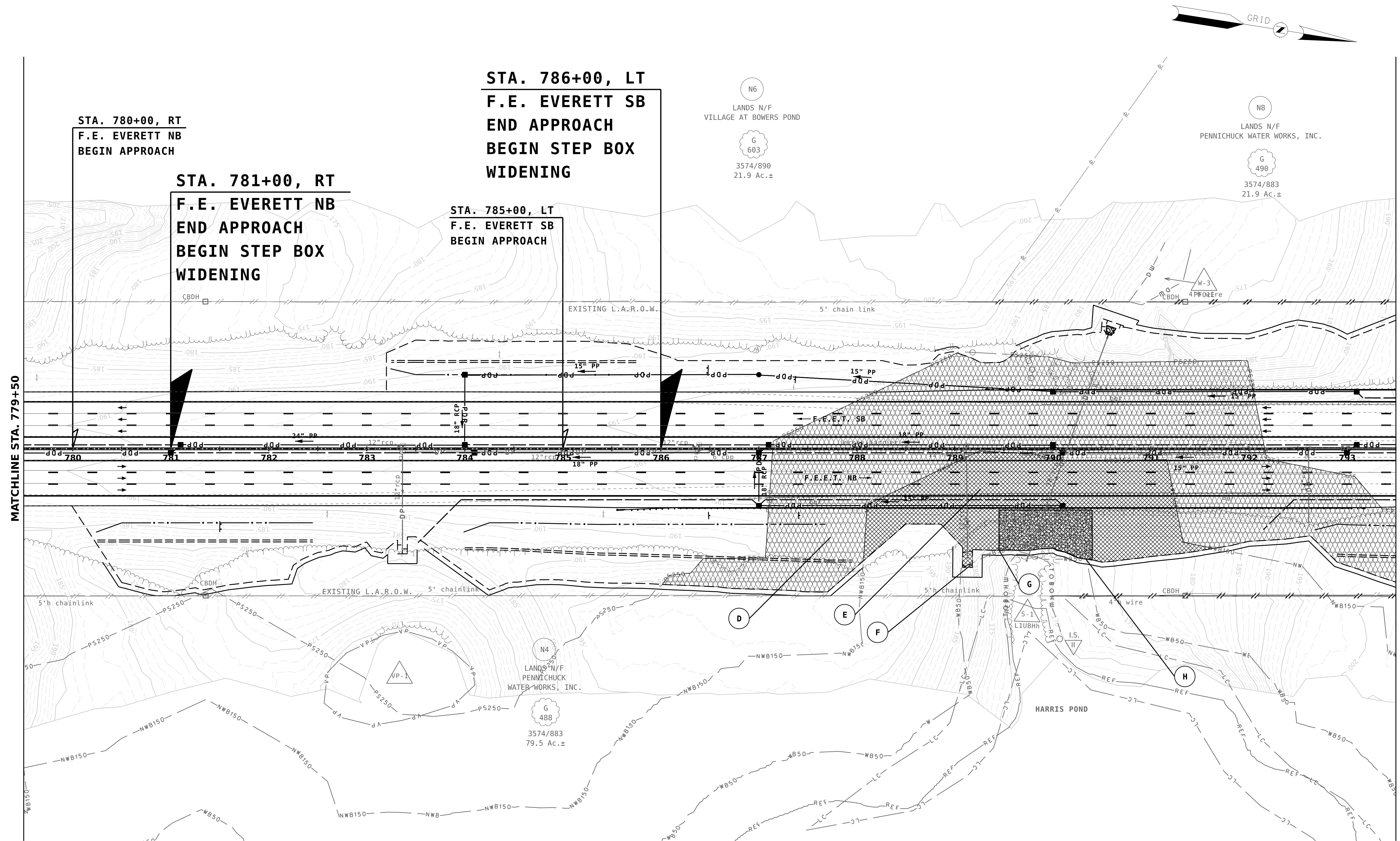
STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

SHORELAND IMPACT PLAN 02

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR02	11/17/2023	52775.00	13761A_Shore_Plans	13761A	21	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	DESCRIPTION
STATION	
DATE	
NUMBER	



STA. 780+00, RT
F.E. EVERETT NB
BEGIN APPROACH

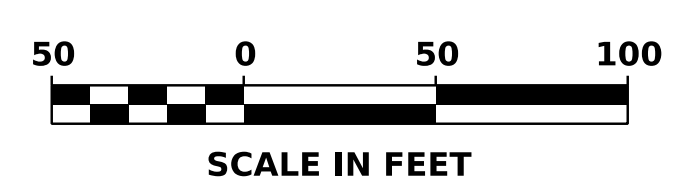
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F.E. EVERETT NB
END APPROACH
BEGIN STEP BOX
WIDENING

STA. 785+00, LT
F.E. EVERETT SB
BEGIN APPROACH

STA. 786+00, LT
F.E. EVERETT SB
END APPROACH
BEGIN STEP BOX
WIDENING

LEGEND

#	SHORELAND IMPACT LOCATION	TYPE OF SHORELAND IMPACT	SHADING/HATCHING
	REF TO WB50	NWB150 TO PS250	
	WB50 TO NWB150	JURISDICTIONAL WETLAND IMPACTS	



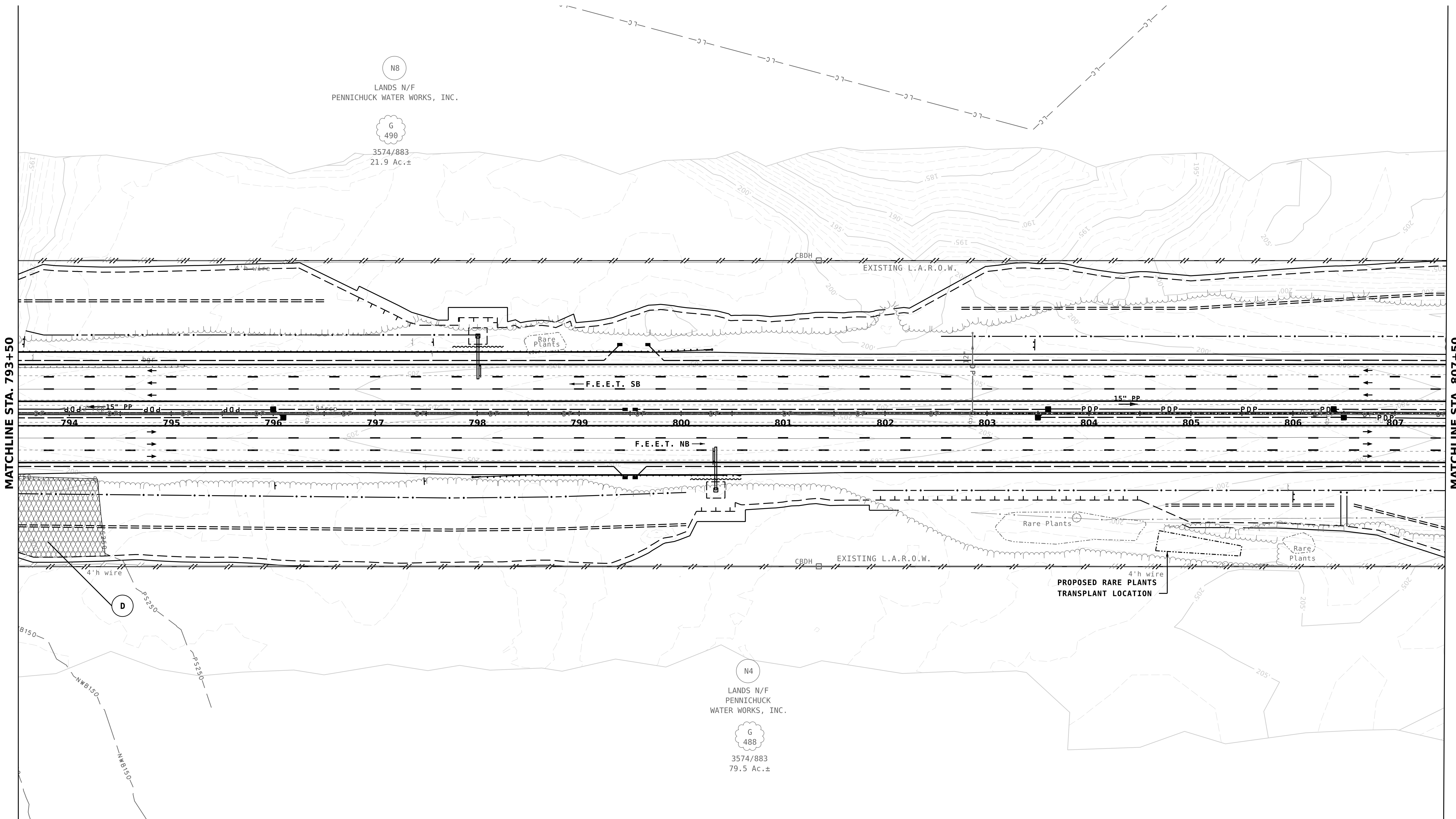
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SHORELAND IMPACT PLAN 03

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR03	11/17/2023	52775.00	13761A_Shore_Plans	13761A	22	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DATE	NUMBER	DESCRIPTION



LEGEND

SHORELAND IMPACT LOCATION

TYPE OF SHORELAND IMPACT	SHADING/HATCHING	TYPE OF SHORELAND IMPACT	SHADING/HATCHING
REF TO WB50		NWB150 TO PS250	
WB50 TO NWB150		JURISDICTIONAL WETLAND IMPACTS	

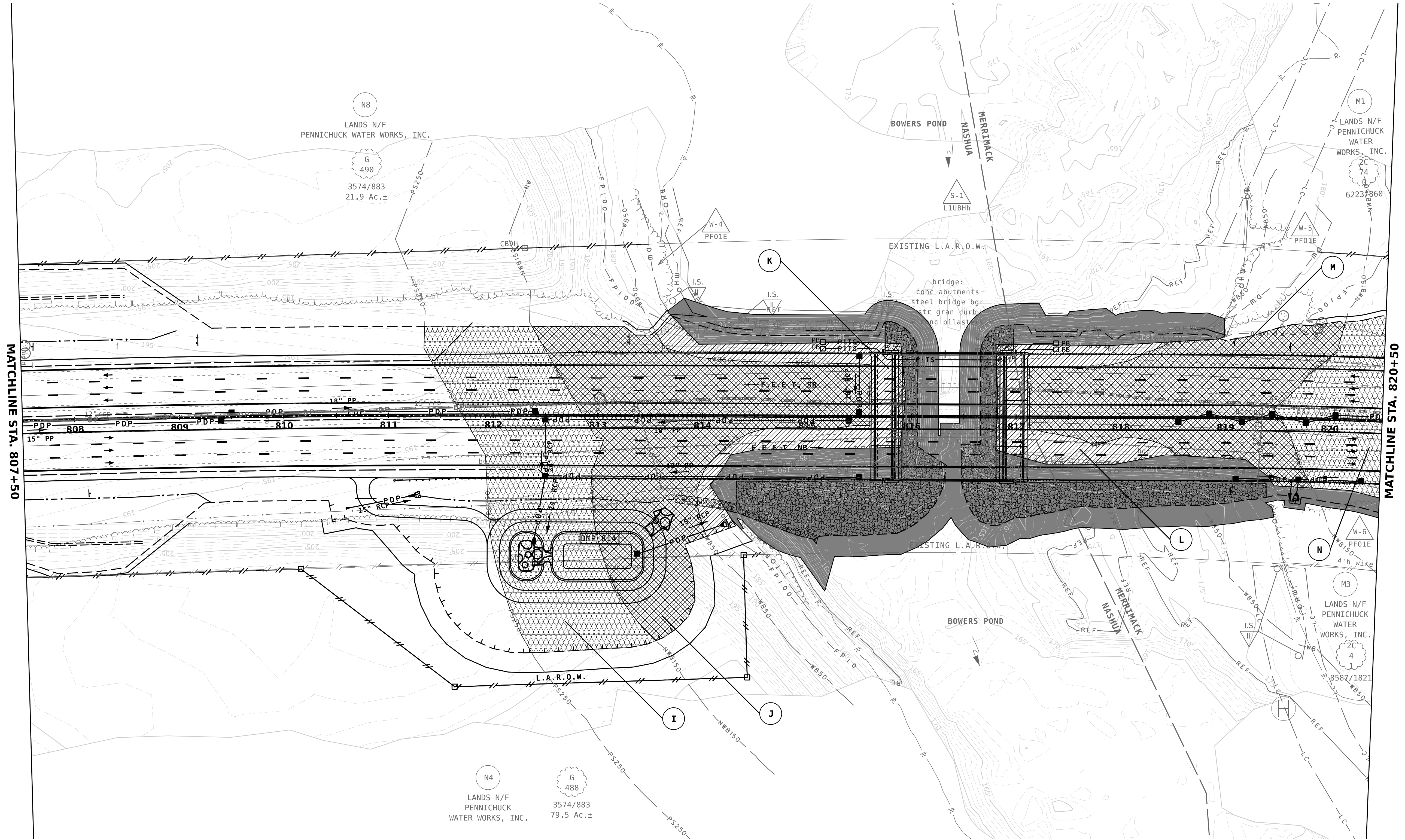


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SHORELAND IMPACT PLAN 04

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR04	11/17/2023	52775.00	13761A_Shore_Plans	13761A	23	44

SDR PROCESSED	DATE	7/2021	REVISIONS AFTER PROPOSAL
	NEW DESIGN	DATE	11/17/2023
SHEET CHECKED	DATE		STATION
	DATE		
AS BUILT DETAILS	DATE		NUMBER
	DATE		DATE



LEGEND

SHORELAND IMPACT LOCATION

TYPE OF SHORELAND IMPACT	SHADING/HATCHING	TYPE OF SHORELAND IMPACT	SHADING/HATCHING
REF TO WB50		NWB150 TO PS250	
WB50 TO NWB150		JURISDICTIONAL WETLAND IMPACTS	



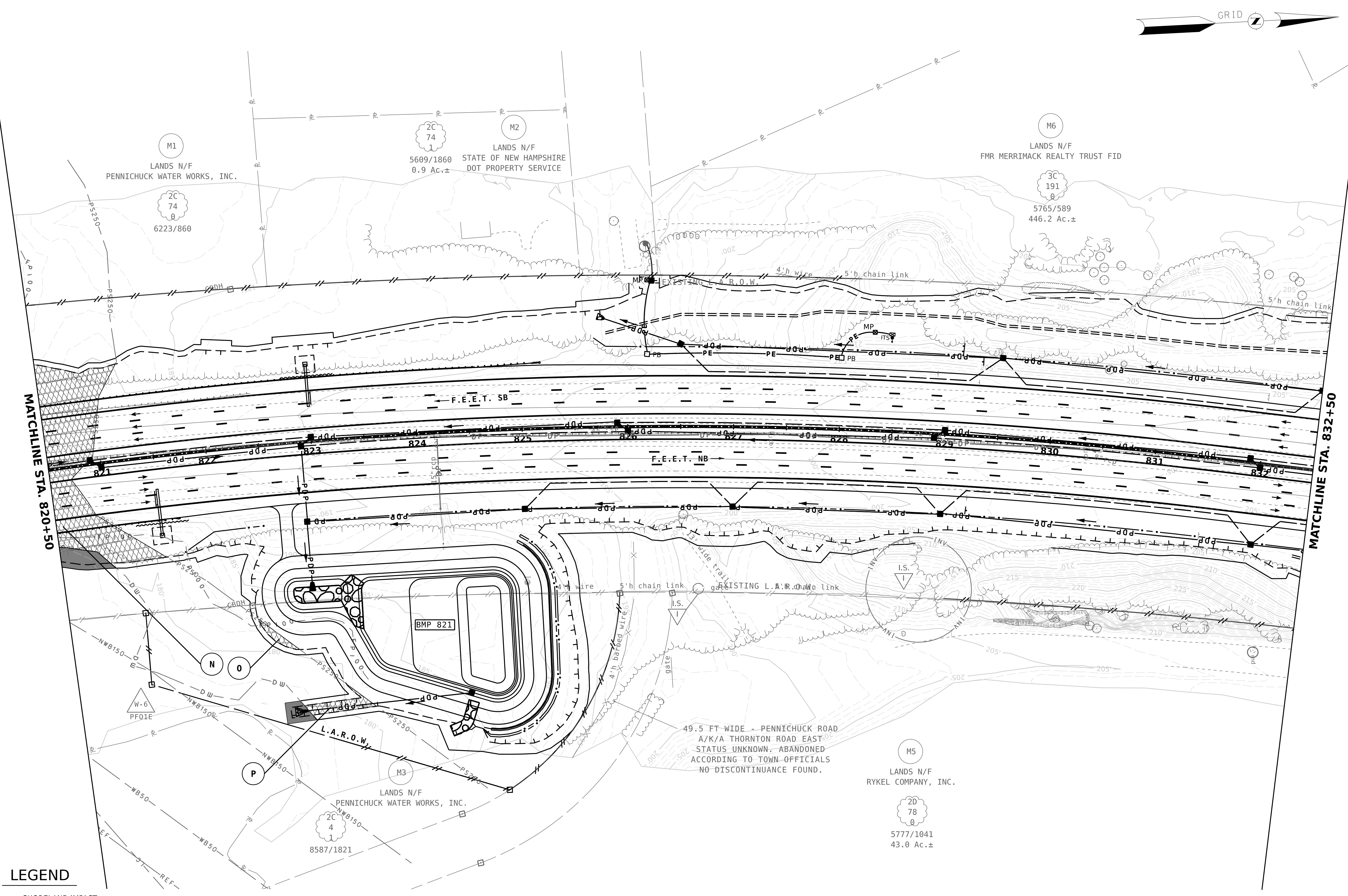
STATE OF NEW HAMPSHIRE
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SHORELAND IMPACT PLAN 05

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR05	11/17/2023	52775.00	13761A_Shore_Plans	13761A	24	44

SDR PROCESSED	NHDOT	DATE	7/2021
	NEW DESIGN	DATE	11/17/2023
SHEET CHECKED	VHB TEAM	DATE	
		DATE	
AS BUILT DETAILS			

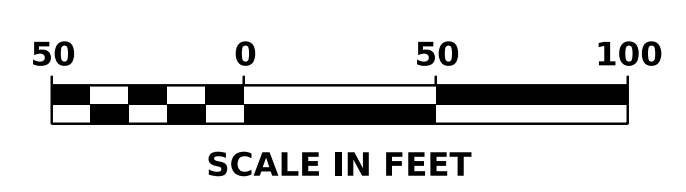
REVISIONS AFTER PROPOSAL	DESCRIPTION
STATION	
STATION	
DATE	
NUMBER	



LEGEND

SHORELAND IMPACT LOCATION

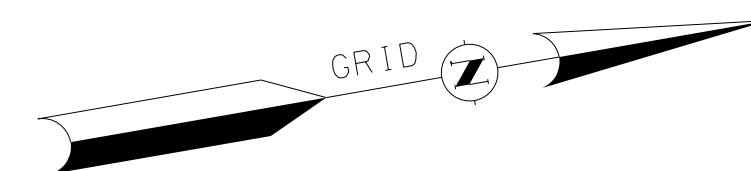
TYPE OF SHORELAND IMPACT	SHADING/HATCHING	TYPE OF SHORELAND IMPACT	SHADING/HATCHING
REF TO WB50		NWB150 TO PS250	
WB50 TO NWB150		JURISDICTIONAL WETLAND IMPACTS	



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SHORELAND IMPACT PLAN 06

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
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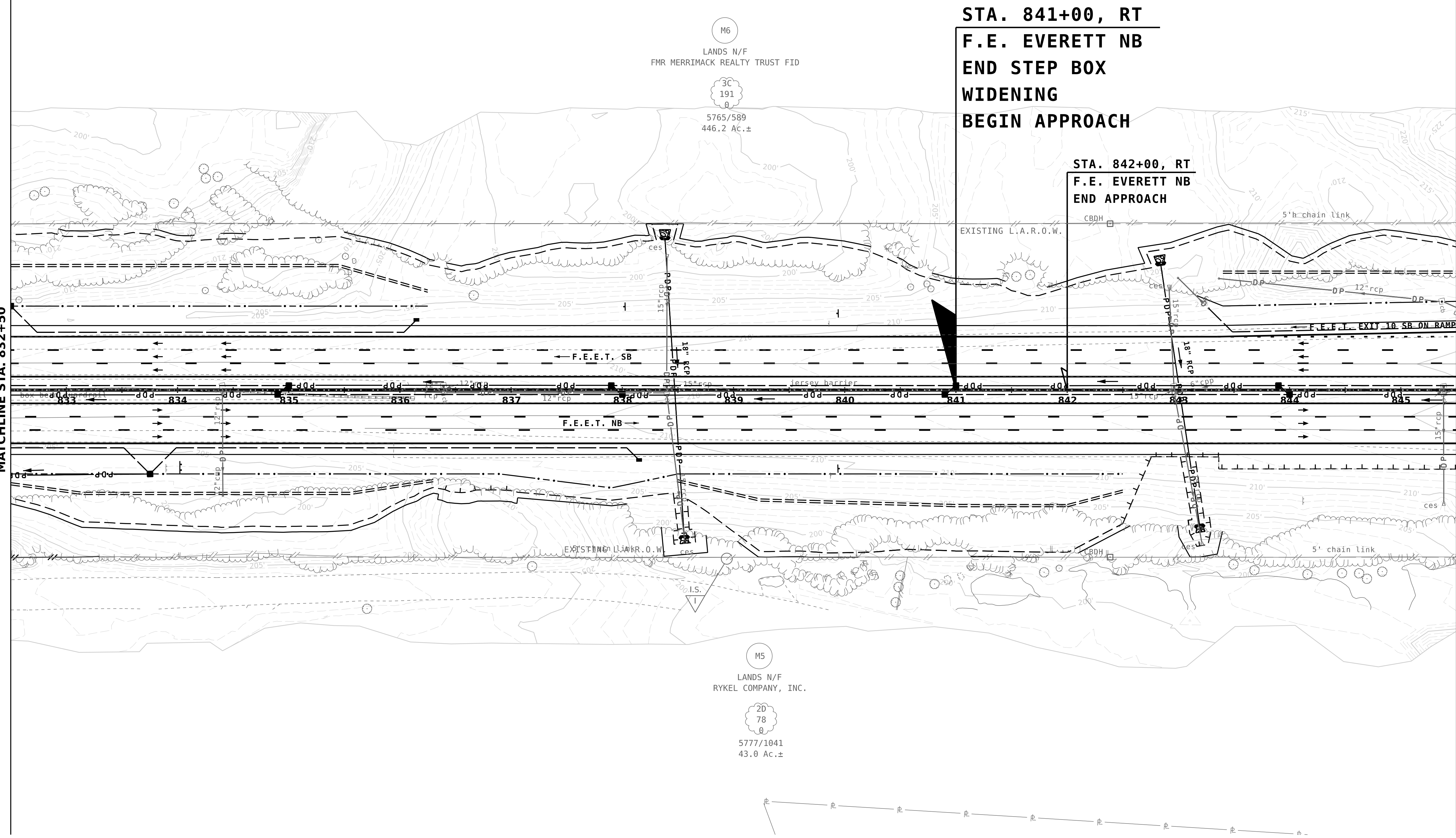


SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION

MATCHLINE STA. 832+50

MATCHLINE STA. 845+50



STA. 841+00, RT
F.E. EVERETT NB
END STEP BOX
WIDENING
BEGIN APPROACH

STA. 842+00, RT
F.E. EVERETT NB
END APPROACH

M6
 LANDS N/F
 FMR MERRIMACK REALTY TRUST FID
 5765/589
 446.2 Ac.±

M5
 LANDS N/F
 RYKEL COMPANY, INC.
 5777/1041
 43.0 Ac.±



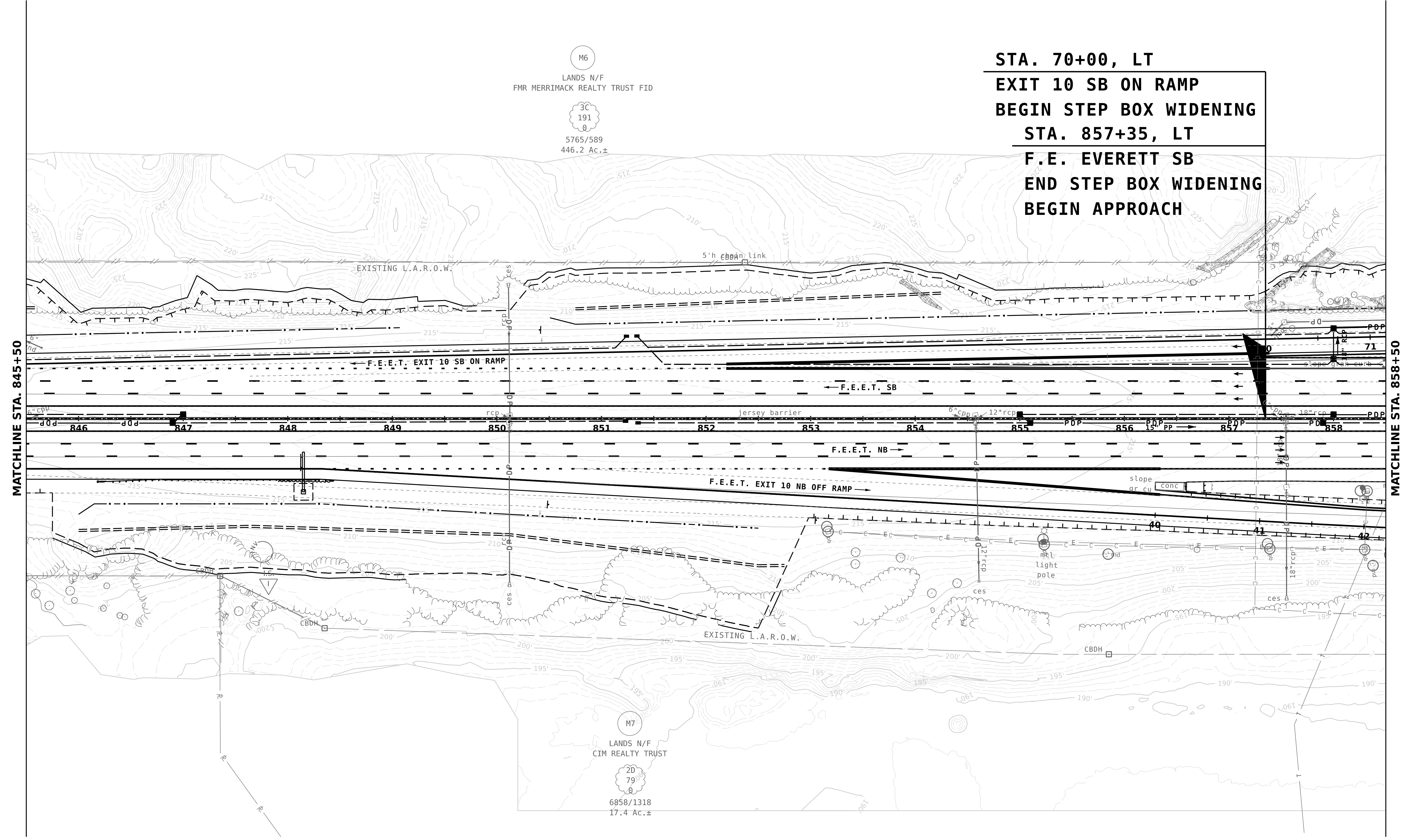
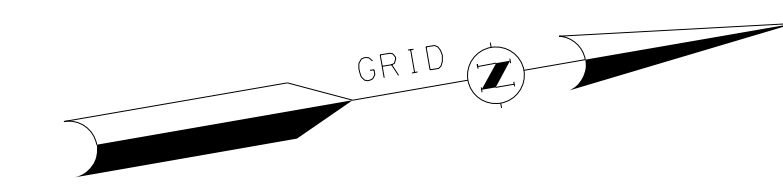
STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

SHORELAND IMPACT PLAN 07

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR07	11/17/2023	52775.00	13761A_Shore_Plans	13761A	26	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

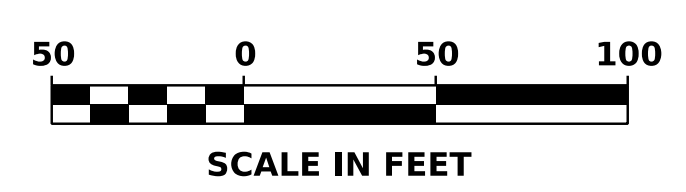
REVISIONS AFTER PROPOSAL	STATION	DATE	DESCRIPTION



STA. 70+00, LT
EXIT 10 SB ON RAMP
BEGIN STEP BOX WIDENING
STA. 857+35, LT
F.E. EVERETT SB
END STEP BOX WIDENING
BEGIN APPROACH

M6
 LANDS N/F
 FMR MERRIMACK REALTY TRUST FID
 3C
 191
 0
 5765/589
 446.2 Ac.±

M7
 LANDS N/F
 CIM REALTY TRUST
 2D
 79
 0
 6858/1318
 17.4 Ac.±



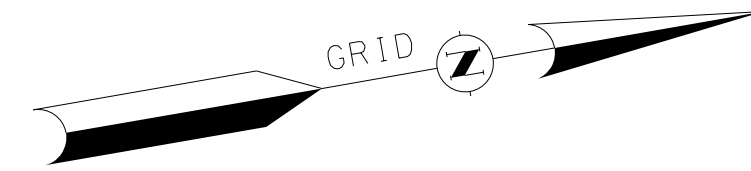
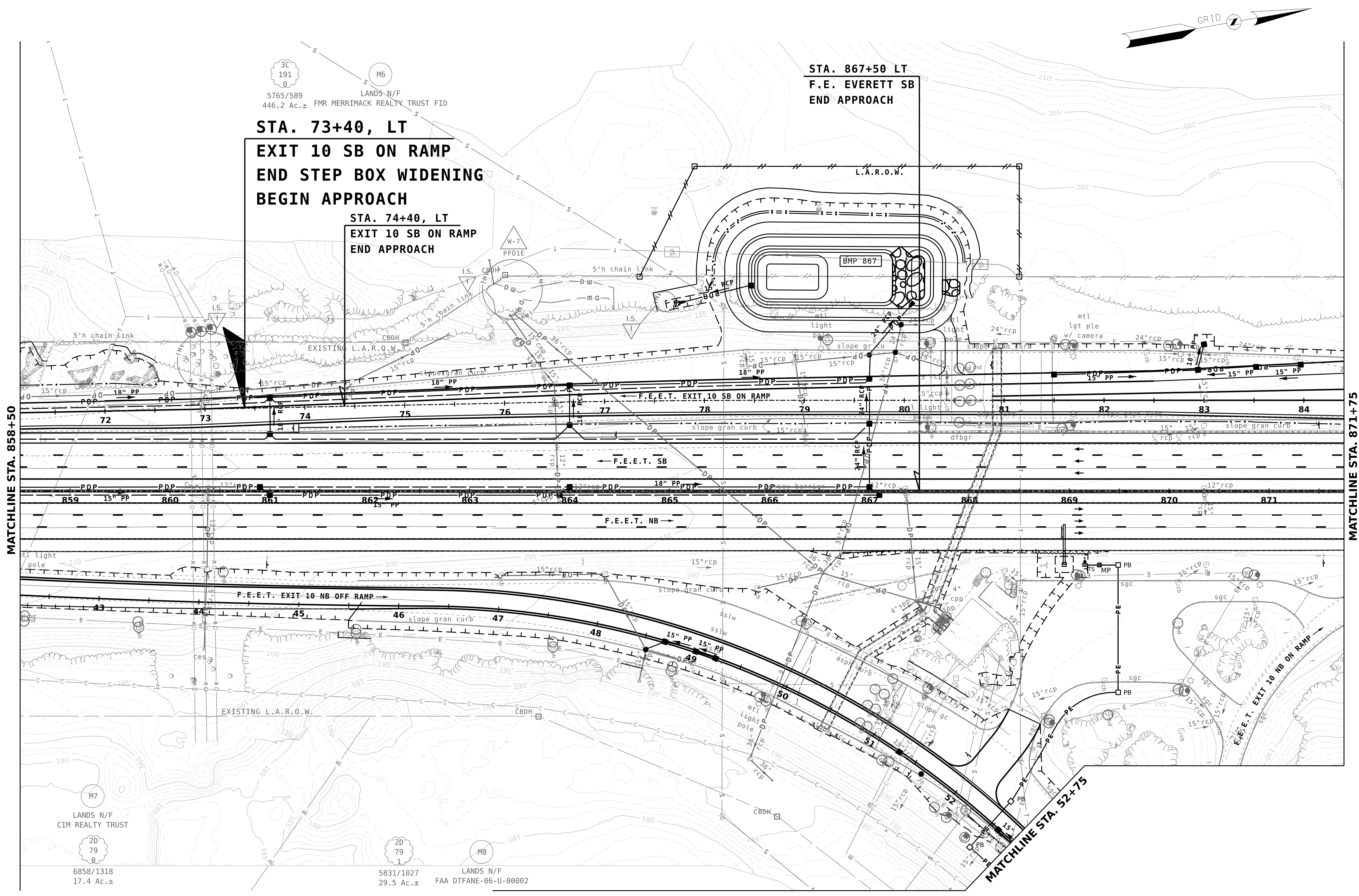
STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

SHORELAND IMPACT PLAN 08

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR08	11/17/2023	52775.00	13761A_Shore_Plans	13761A	27	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION

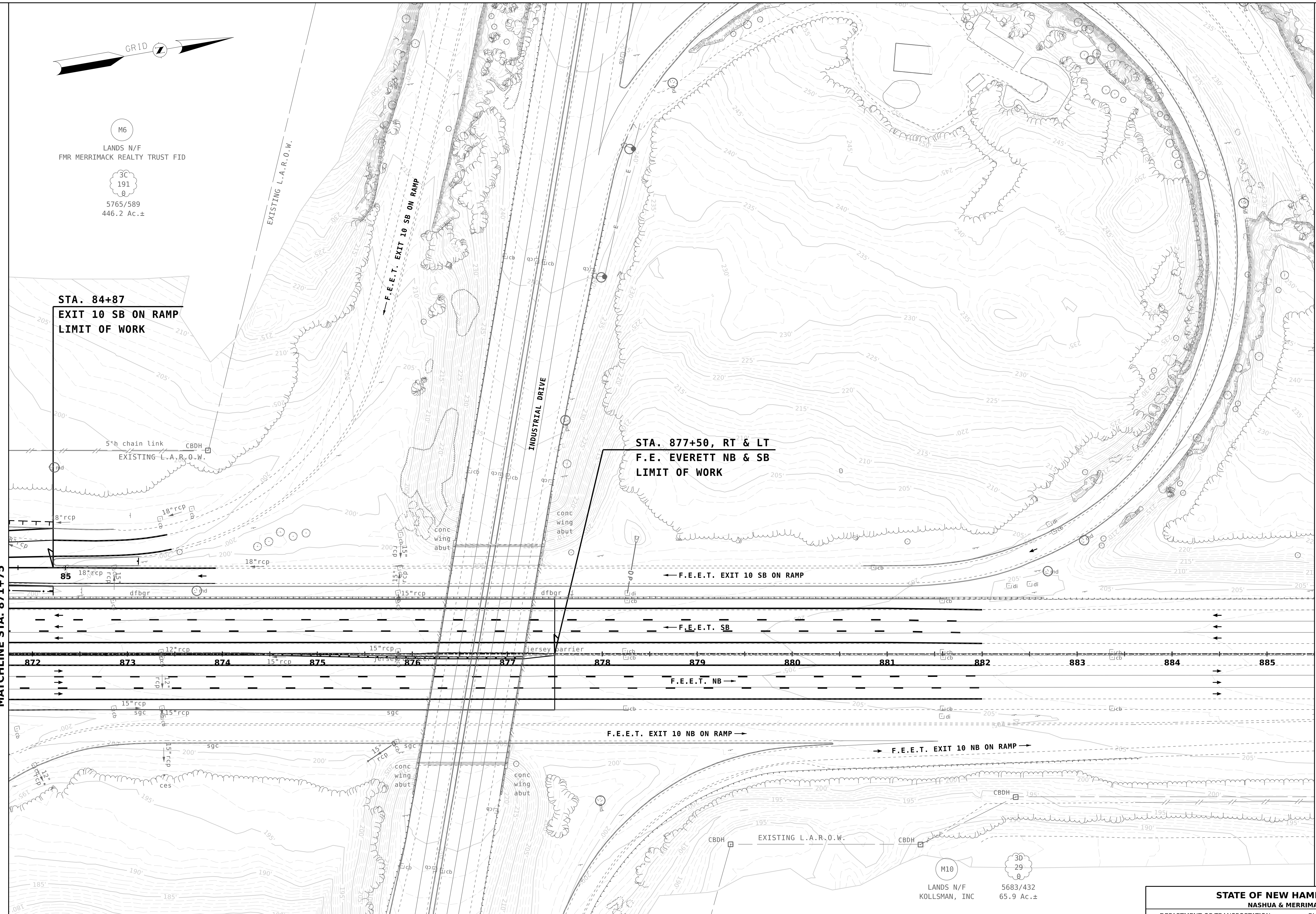


STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
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SHORELAND IMPACT PLAN 09

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR09	11/17/2023	52775.00	13761A_Shore_Plans	13761A	28	44

SDR PROCESSED	NHDOT	DATE	7/2021
	NEW DESIGN	DATE	11/17/2023
SHEET CHECKED	VHB TEAM	DATE	
	AS BUILT DETAILS	DATE	
REVISIONS AFTER PROPOSAL		STATION	DESCRIPTION
NUMBER	DATE	STATION	



STA. 84+87
EXIT 10 SB ON RAMP
LIMIT OF WORK

STA. 877+50, RT & LT
F.E. EVERETT NB & SB
LIMIT OF WORK

MATCHLINE STA. 871+75

MATCHLINE STA. 885+50

MATCH TO SHEET SHR12



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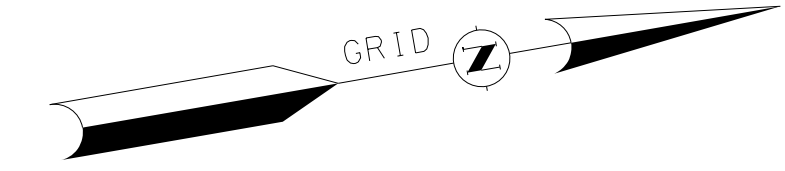
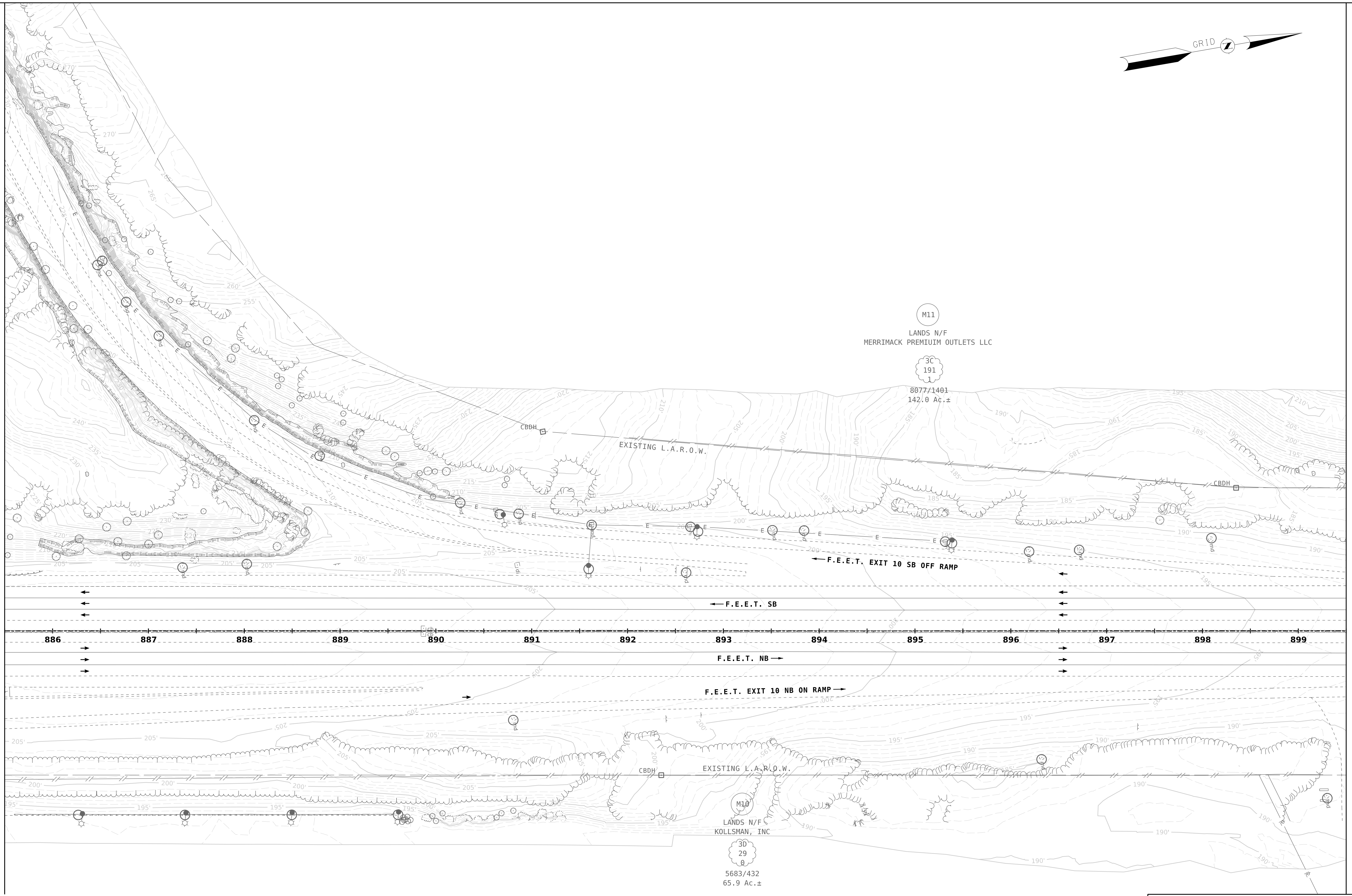
SHORELAND IMPACT PLAN 10

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR10	11/17/2023	52775.00	13761A_Shore_Plans	13761A	29	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED		DATE	
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	DESCRIPTION
STATION	
DATE	
NUMBER	

MATCHLINE STA. 885+50



STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
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SHORELAND IMPACT PLAN 11

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
SHR11	11/17/2023	52775.00	13761A_Shore_Plans	13761A	30	44

EROSION CONTROL NOTES AND STRATEGIES

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

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

GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES
TABLE 1

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

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

NOTES:

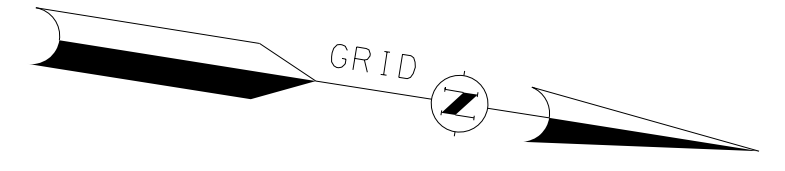
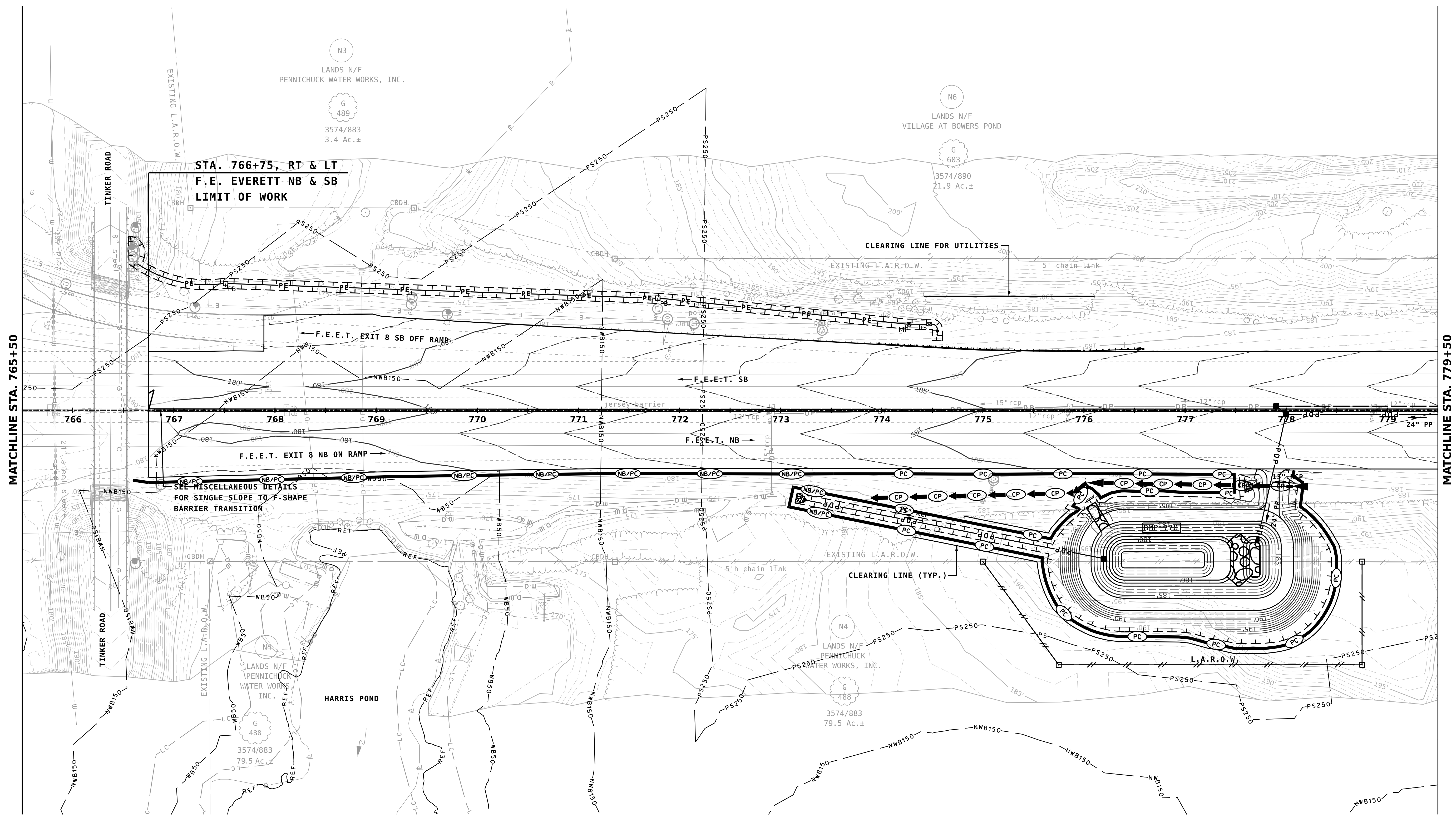
1. All slope stabilization options assume a slope length ≤ 10 times the horizontal distance component of the slope, in feet.
2. Do not apply products containing polyacrylamide (PAM) directly to, or within 100 feet of any surface water without NHDES approval.
3. Install all methods in Table 1 per the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

STATE OF NEW HAMPSHIRE	
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EROSION CONTROL	
NOTES AND STRATEGIES	

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
erosstrat-ce 07-31-2023	13761A_weterostrat	13761A	32	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



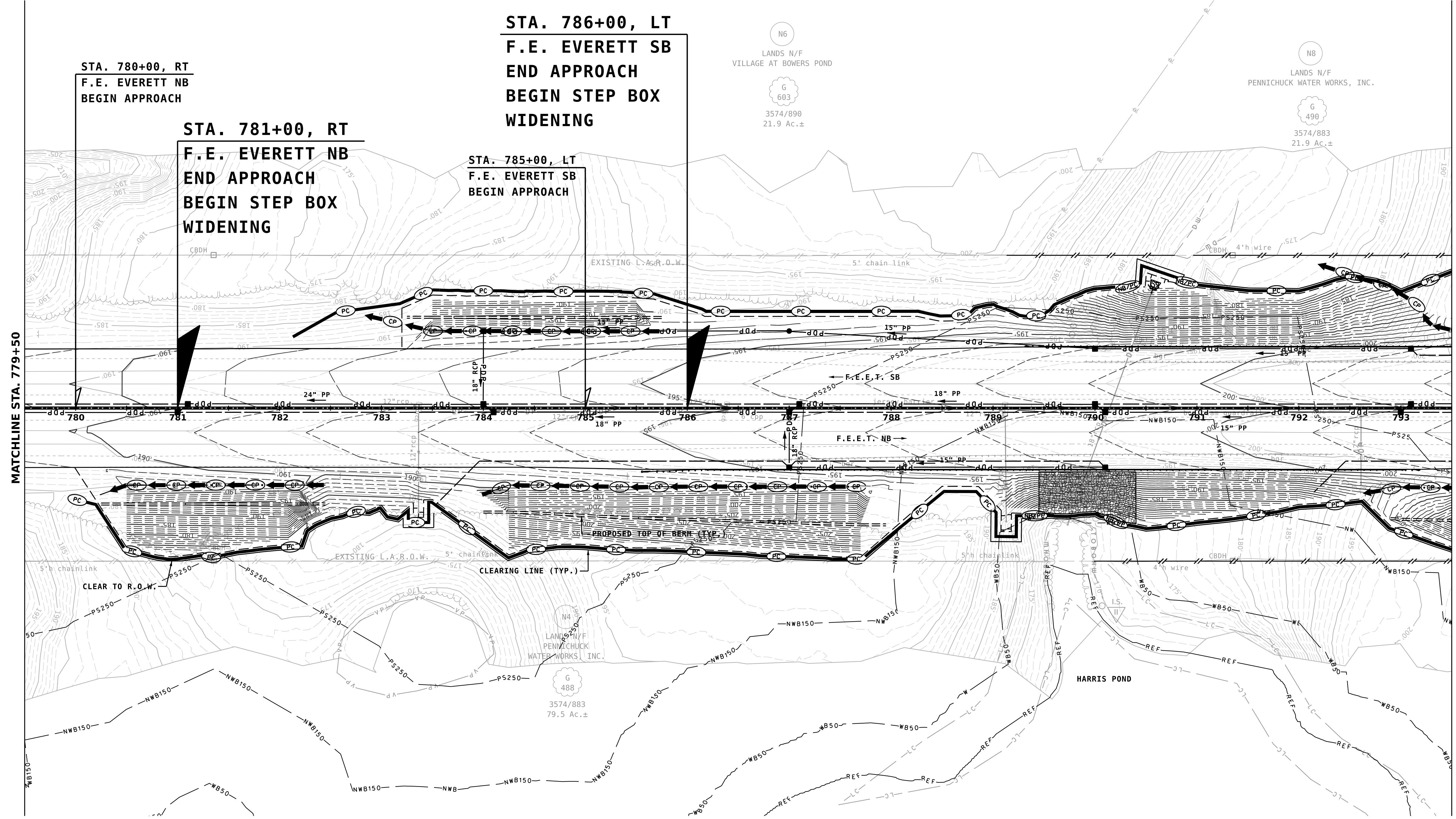
STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 02

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_02	11/17/2023	52775.00	13761A_Ero_Plans	13761A	34	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION

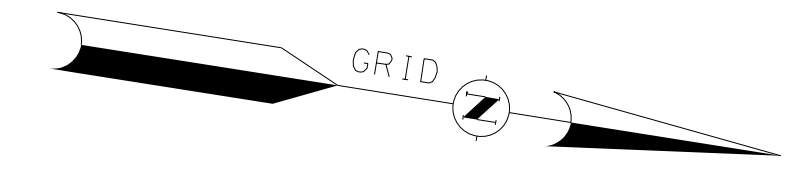


**STA. 786+00, LT
F.E. EVERETT SB
END APPROACH
BEGIN STEP BOX
WIDENING**

**STA. 780+00, RT
F.E. EVERETT NB
BEGIN APPROACH**

**STA. 781+00, RT
F.E. EVERETT NB
END APPROACH
BEGIN STEP BOX
WIDENING**

**STA. 785+00, LT
F.E. EVERETT SB
BEGIN APPROACH**



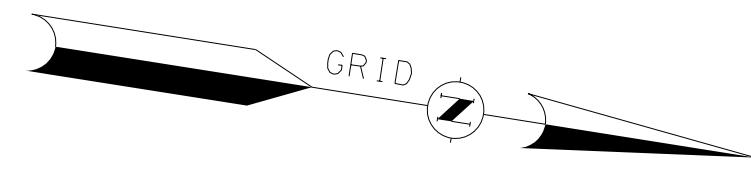
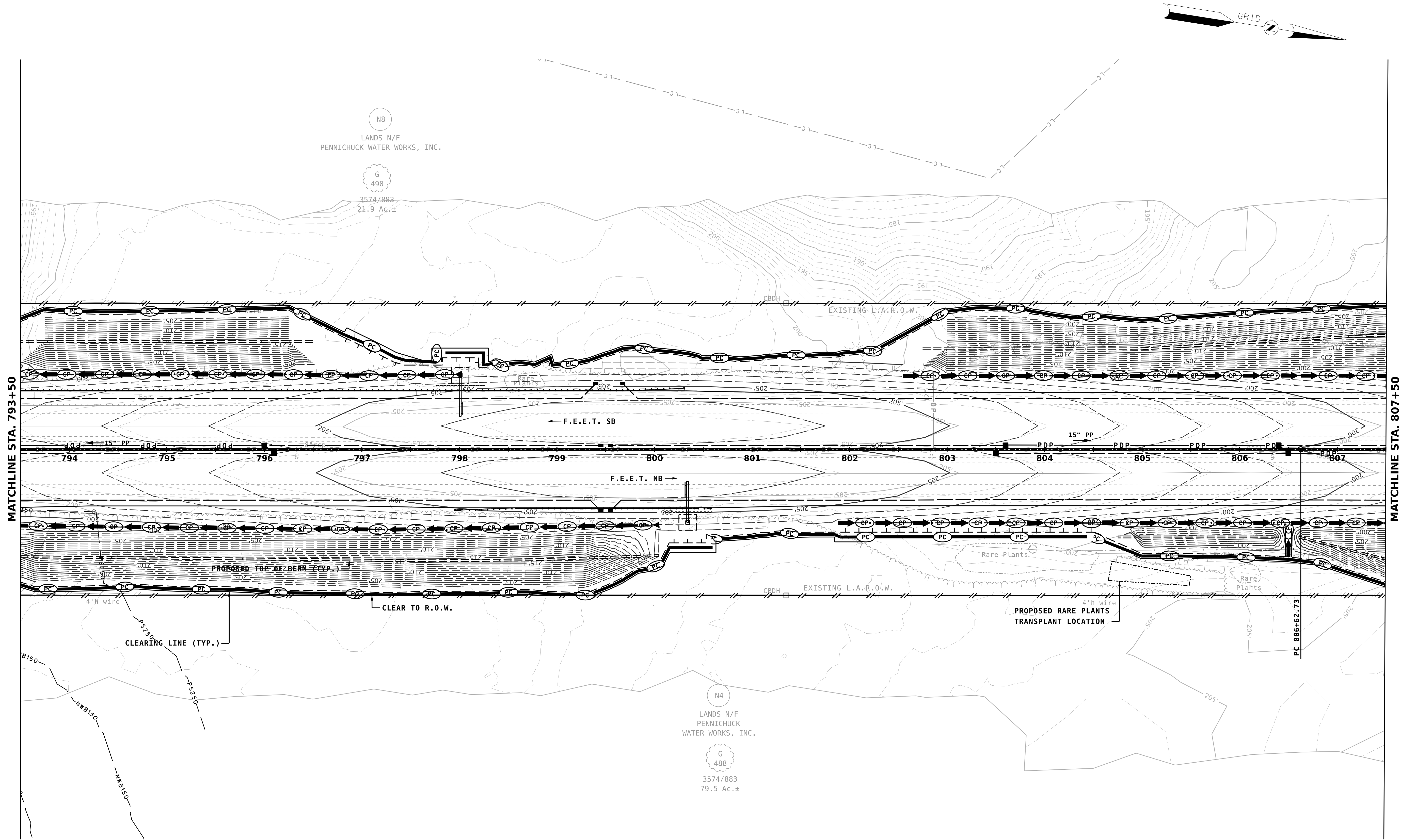
**STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK**
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 03

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_03	11/17/2023	52775.00	13761A_Ero_Plans	13761A	35	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

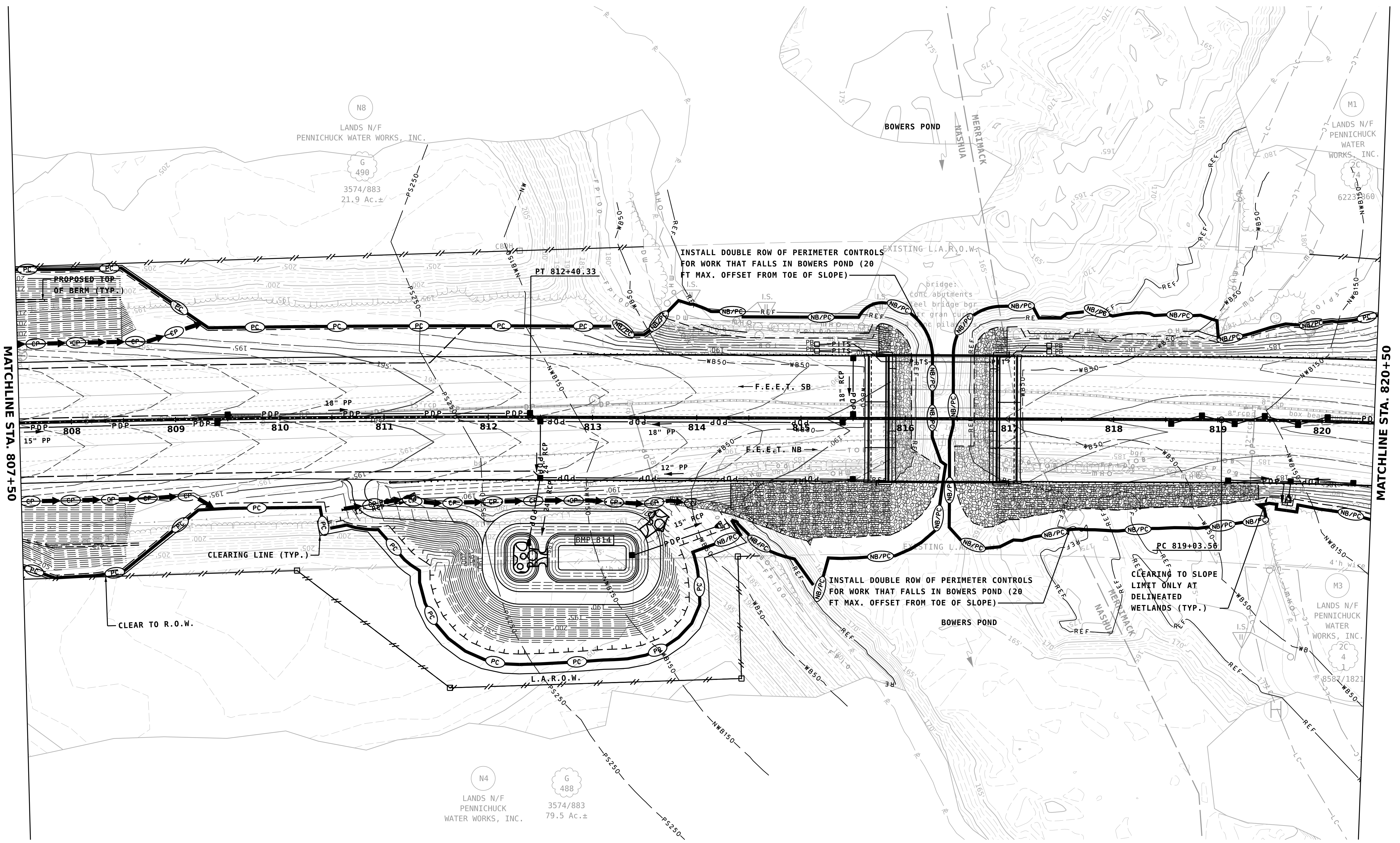
REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



STATE OF NEW HAMPSHIRE NASHUA & MERRIMACK						
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN						
EROSION CONTROL PLAN 04						
MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_04	11/17/2023	52775.00	13761A_Ero_Plans	13761A	36	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



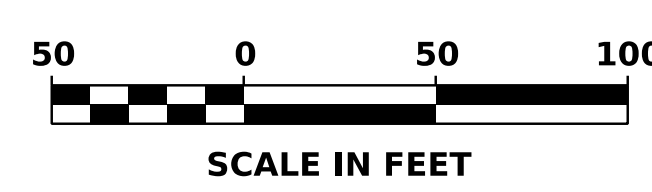
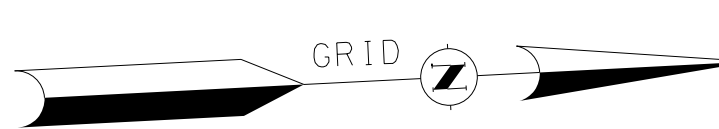
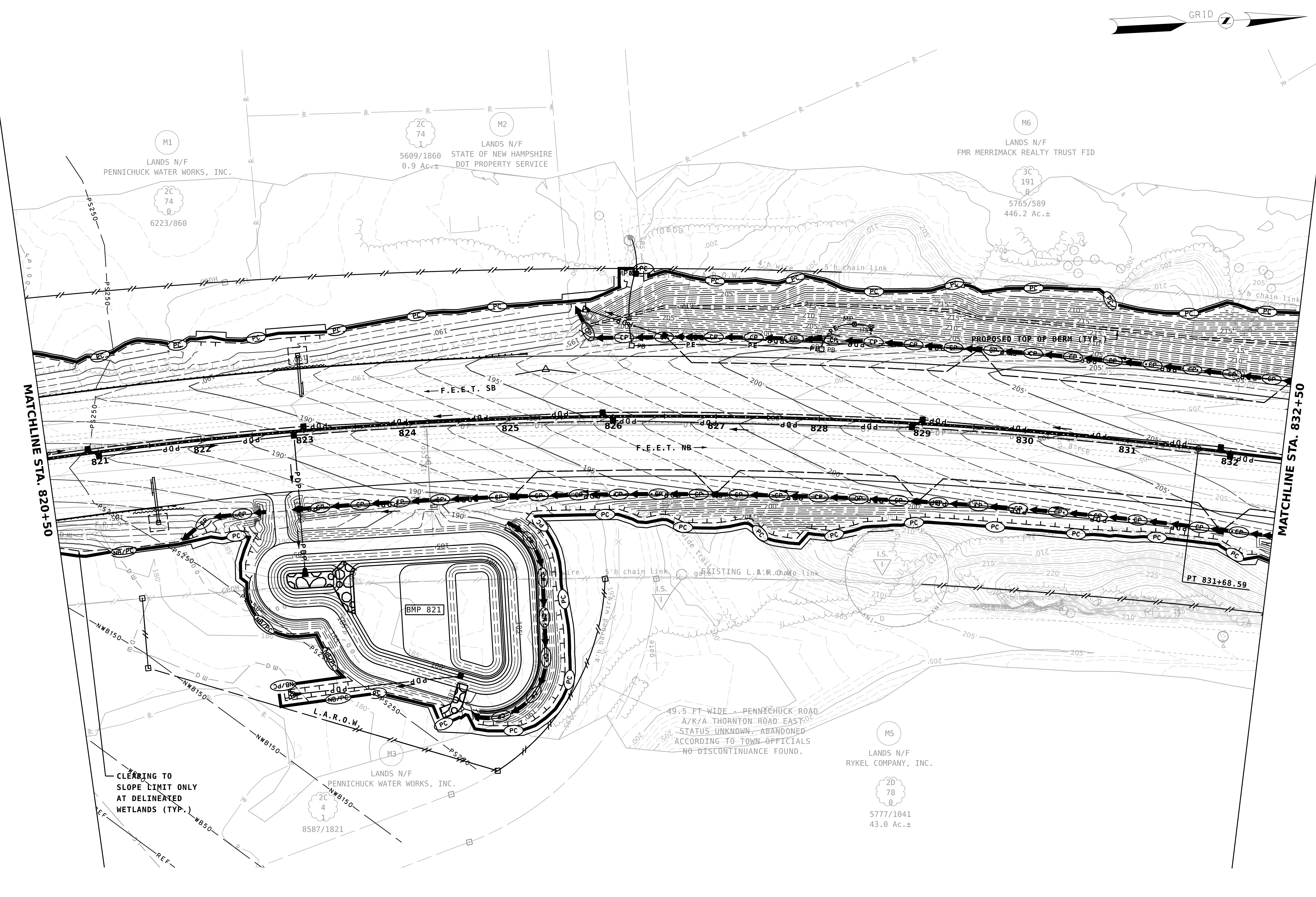
STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 05

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_05	11/17/2023	52775.00	13761A_Ero_Plans	13761A	37	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



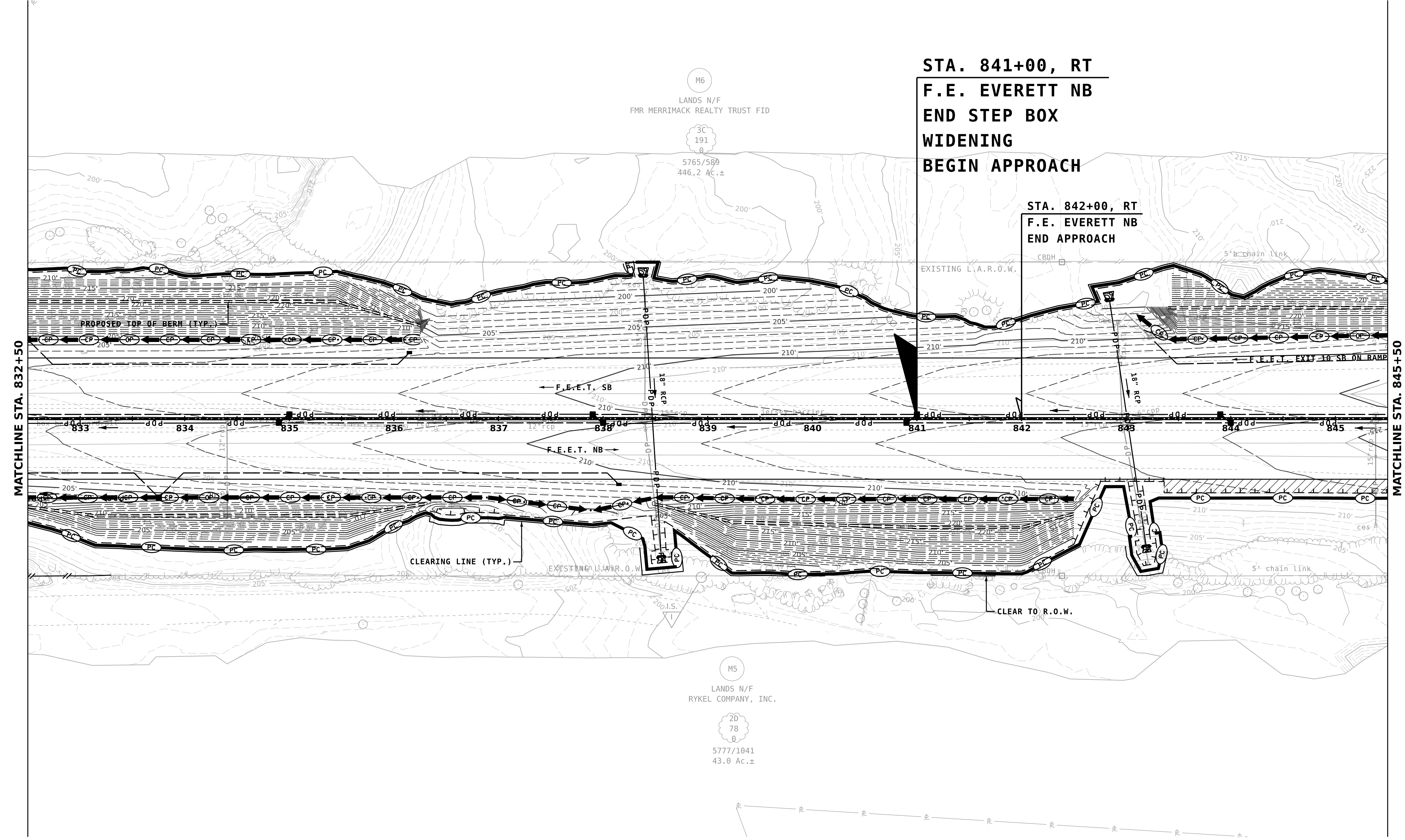
STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 06

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_06	11/17/2023	52775.00	13761A_Ero_Plans	13761A	38	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

NUMBER	DATE	STATION	STATION	DESCRIPTION



STA. 841+00, RT
 F.E. EVERETT NB
 END STEP BOX
 WIDENING
 BEGIN APPROACH

STA. 842+00, RT
 F.E. EVERETT NB
 END APPROACH

MATCHLINE STA. 832+50

MATCHLINE STA. 845+50



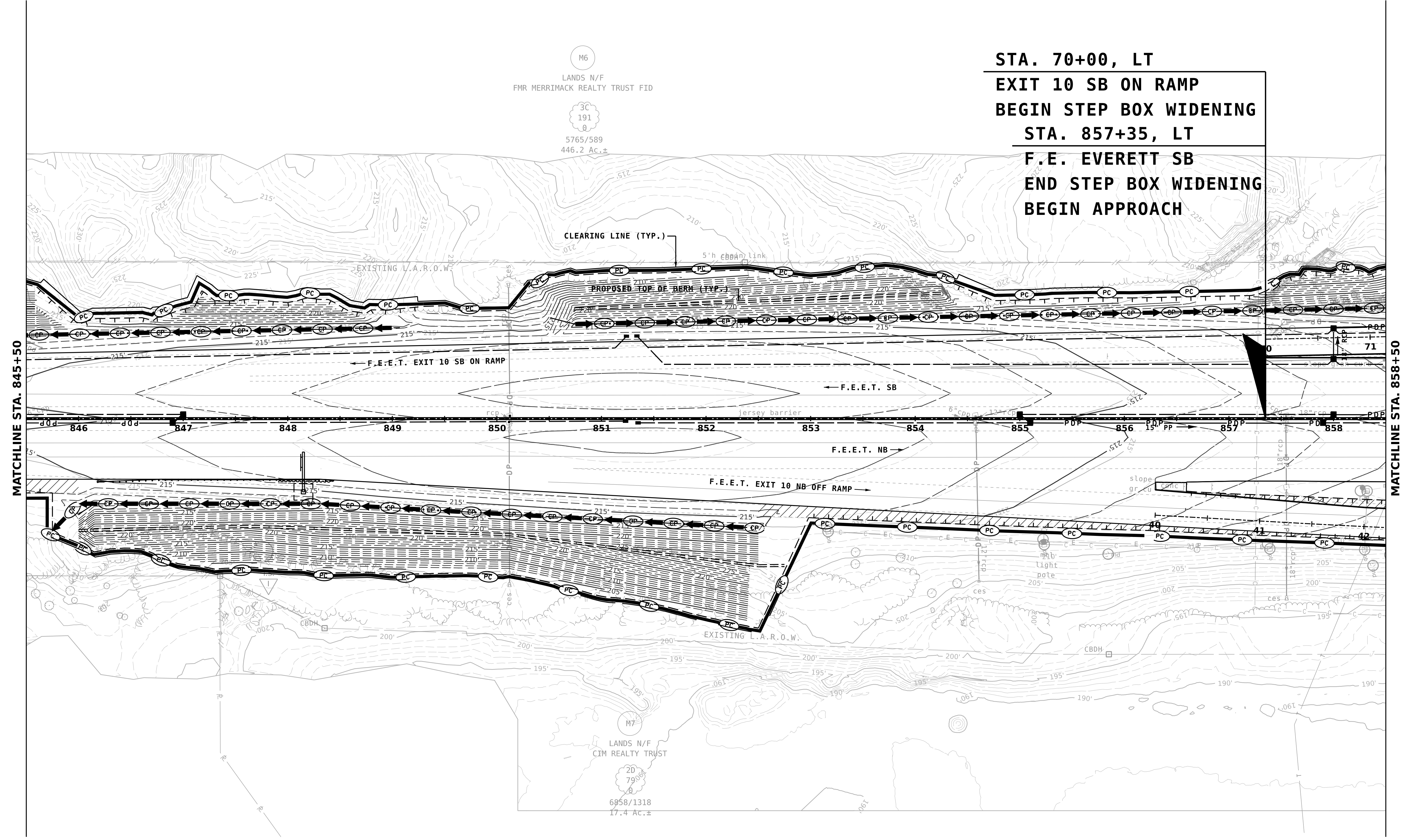
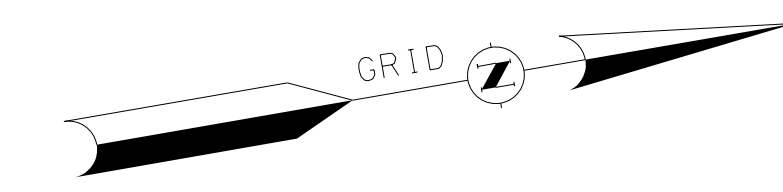
STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 07

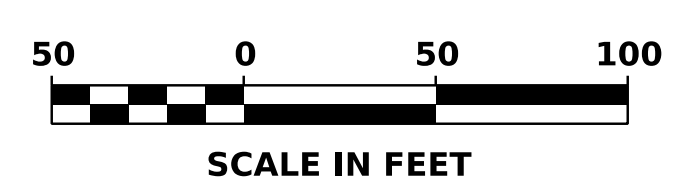
MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_07	11/17/2023	52775.00	13761A_Ero_Plans	13761A	39	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DATE	DESCRIPTION



STA. 70+00, LT
EXIT 10 SB ON RAMP
BEGIN STEP BOX WIDENING
STA. 857+35, LT
F.E. EVERETT SB
END STEP BOX WIDENING
BEGIN APPROACH



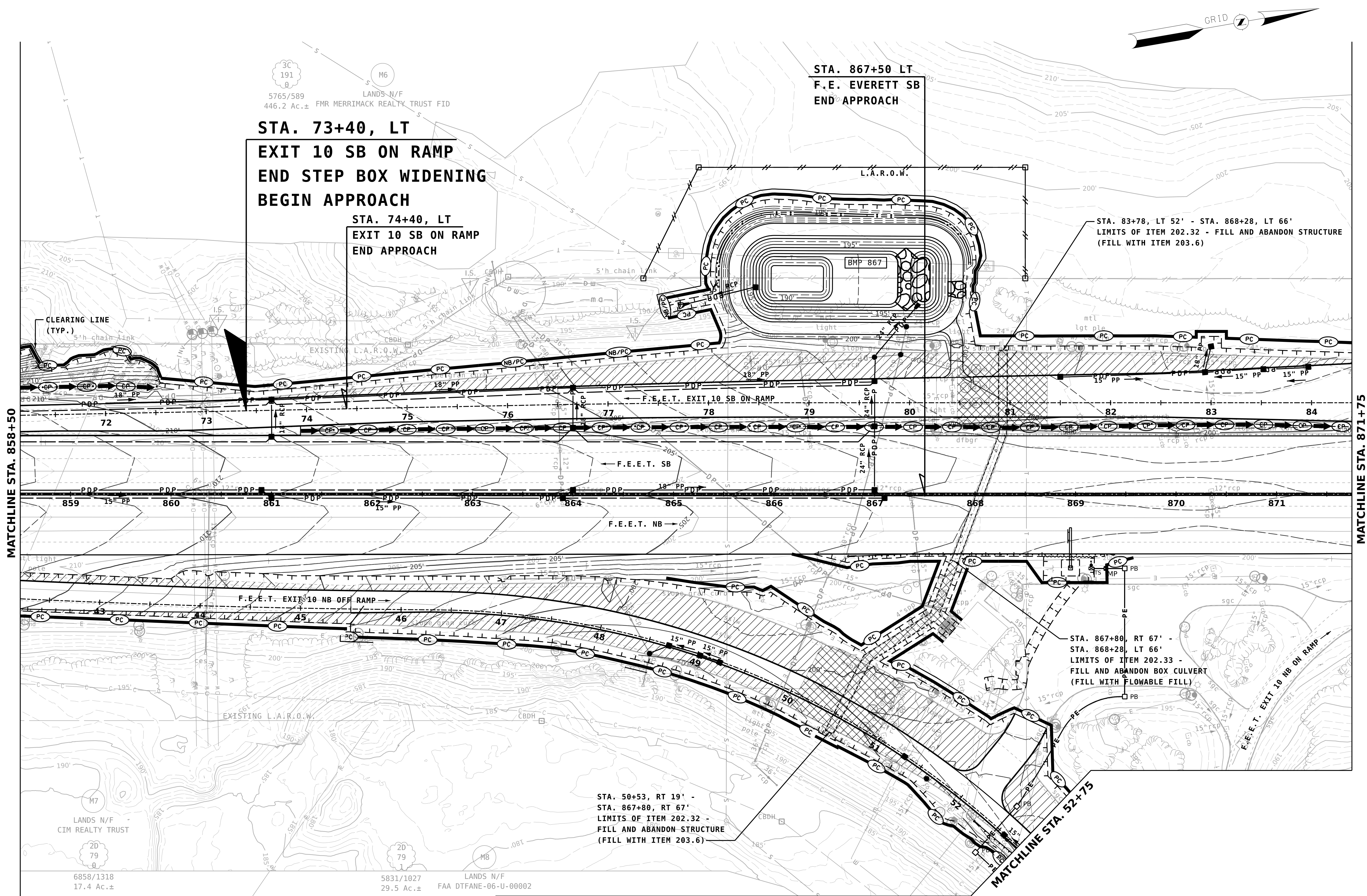
STATE OF NEW HAMPSHIRE
 NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 08

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_08	11/17/2023	52775.00	13761A_Ero_Plans	13761A	40	44

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



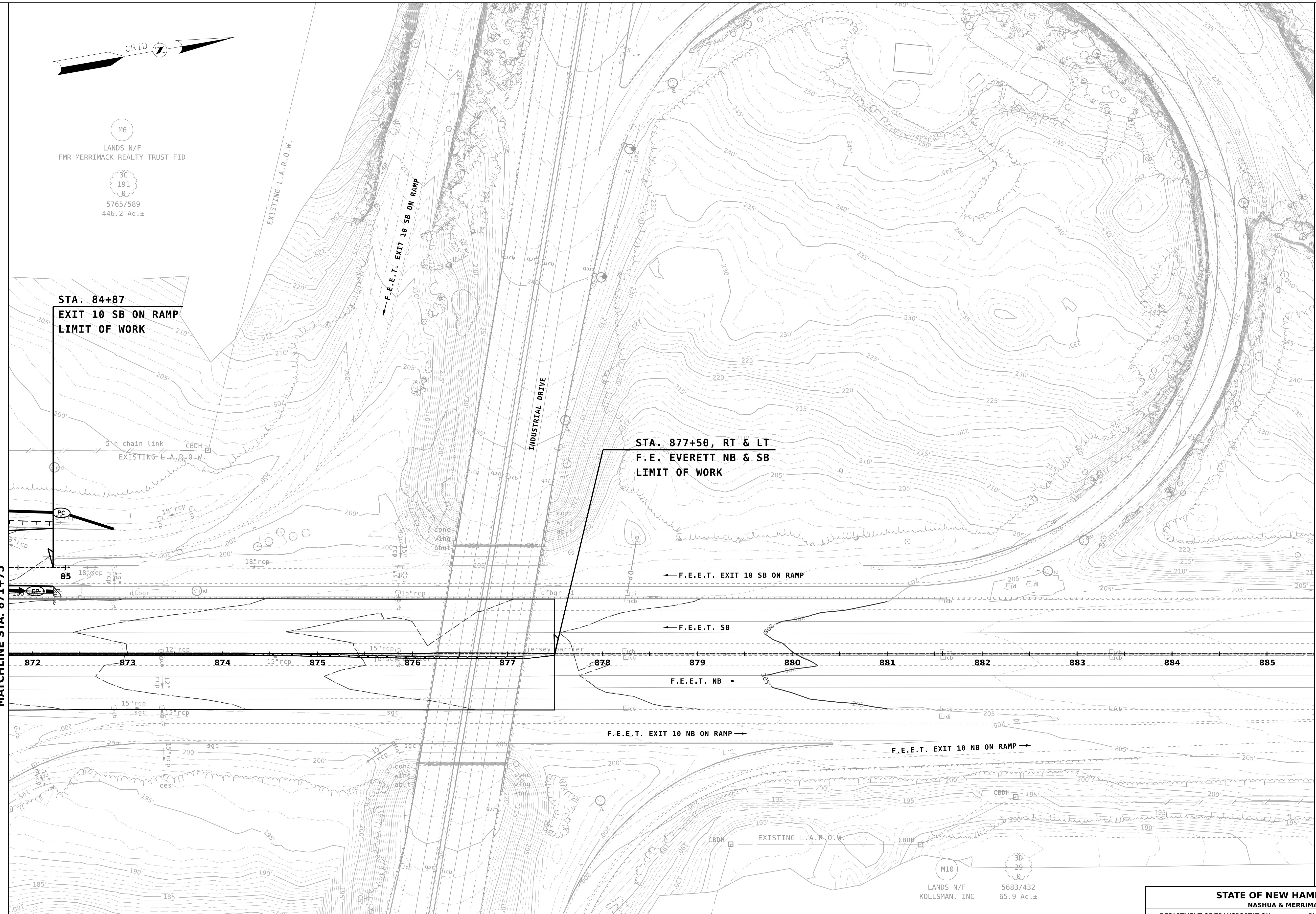
STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 09

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_09	11/17/2023	52775.00	13761A_Ero_Plans	13761A	41	44

SDR PROCESSED	NHDOT	DATE	7/2021
	NEW DESIGN	DATE	11/17/2023
SHEET CHECKED	VHB TEAM	DATE	11/17/2023
	B. ARCIERI	DATE	
AS BUILT DETAILS			

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION
	NUMBER	DATE



M6
LANDS N/F
FMR MERRIMACK REALTY TRUST FID
3C
191
0
5765/589
446.2 Ac.±

STA. 84+87
EXIT 10 SB ON RAMP
LIMIT OF WORK

STA. 877+50, RT & LT
F.E. EVERETT NB & SB
LIMIT OF WORK

MATCHLINE STA. 871+75

MATCHLINE STA. 885+50

MATCH TO SHEET GEN12



M10
LANDS N/F
KOLLSMAN, INC
5683/432
65.9 Ac.±



STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

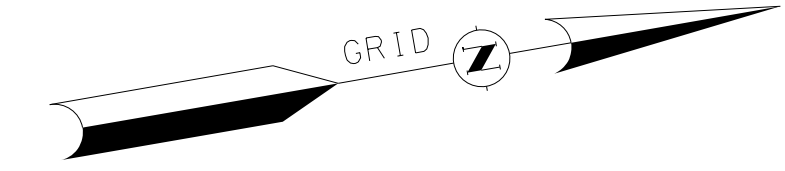
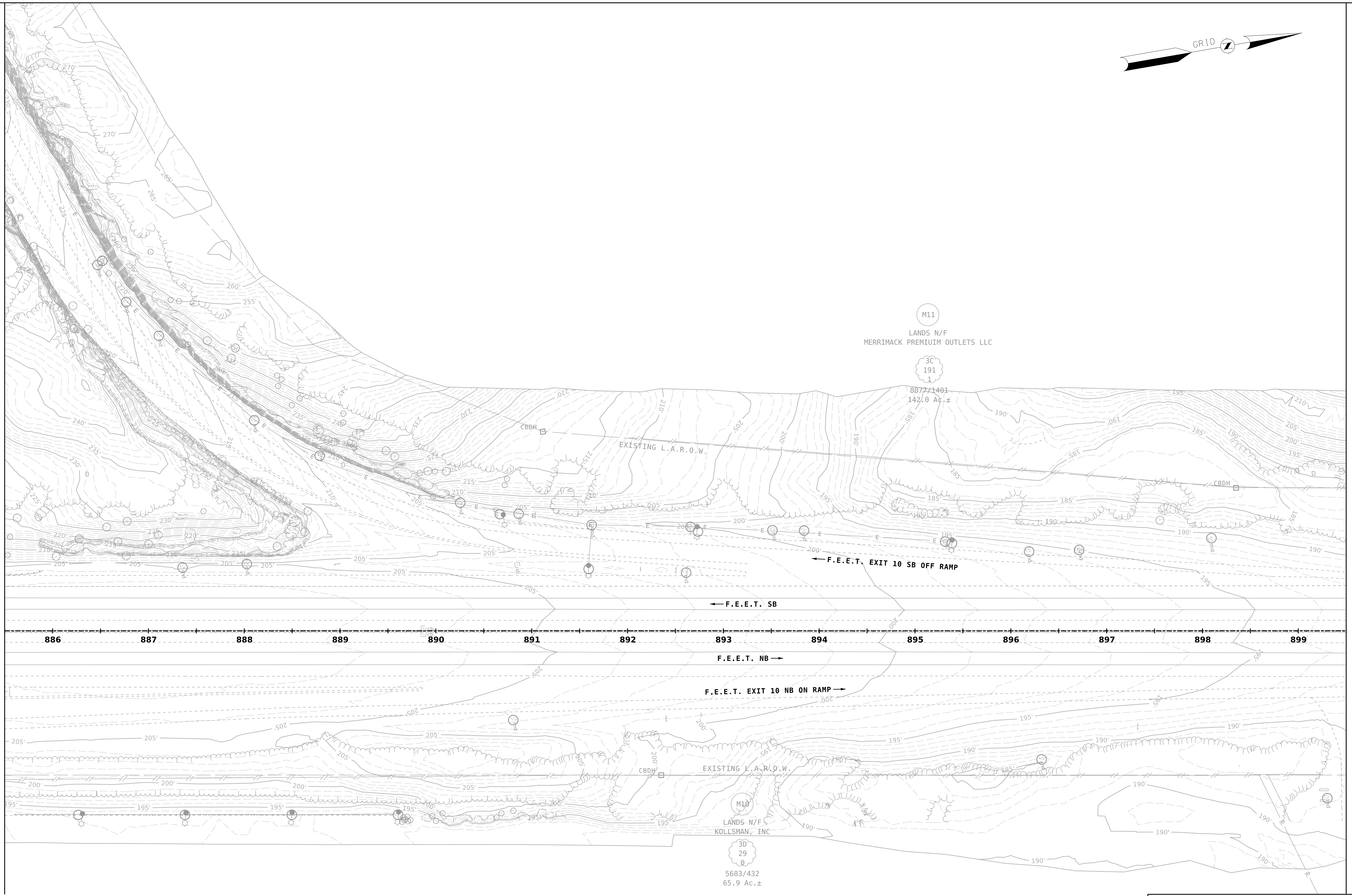
EROSION CONTROL PLAN 10

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_10	11/17/2023	52775.00	13761A_Ero_Plans	13761A	42	44

SDR PROCESSED		NHDOT	DATE	7/2021
NEW DESIGN		VHB TEAM	DATE	11/17/2023
SHEET CHECKED		B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS			DATE	

REVISIONS AFTER PROPOSAL		STATION	DESCRIPTION
NUMBER	DATE	STATION	DESCRIPTION

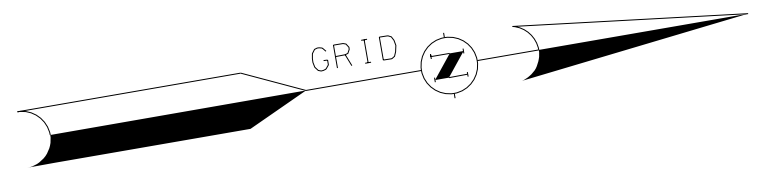
MATCHLINE STA. 885+50



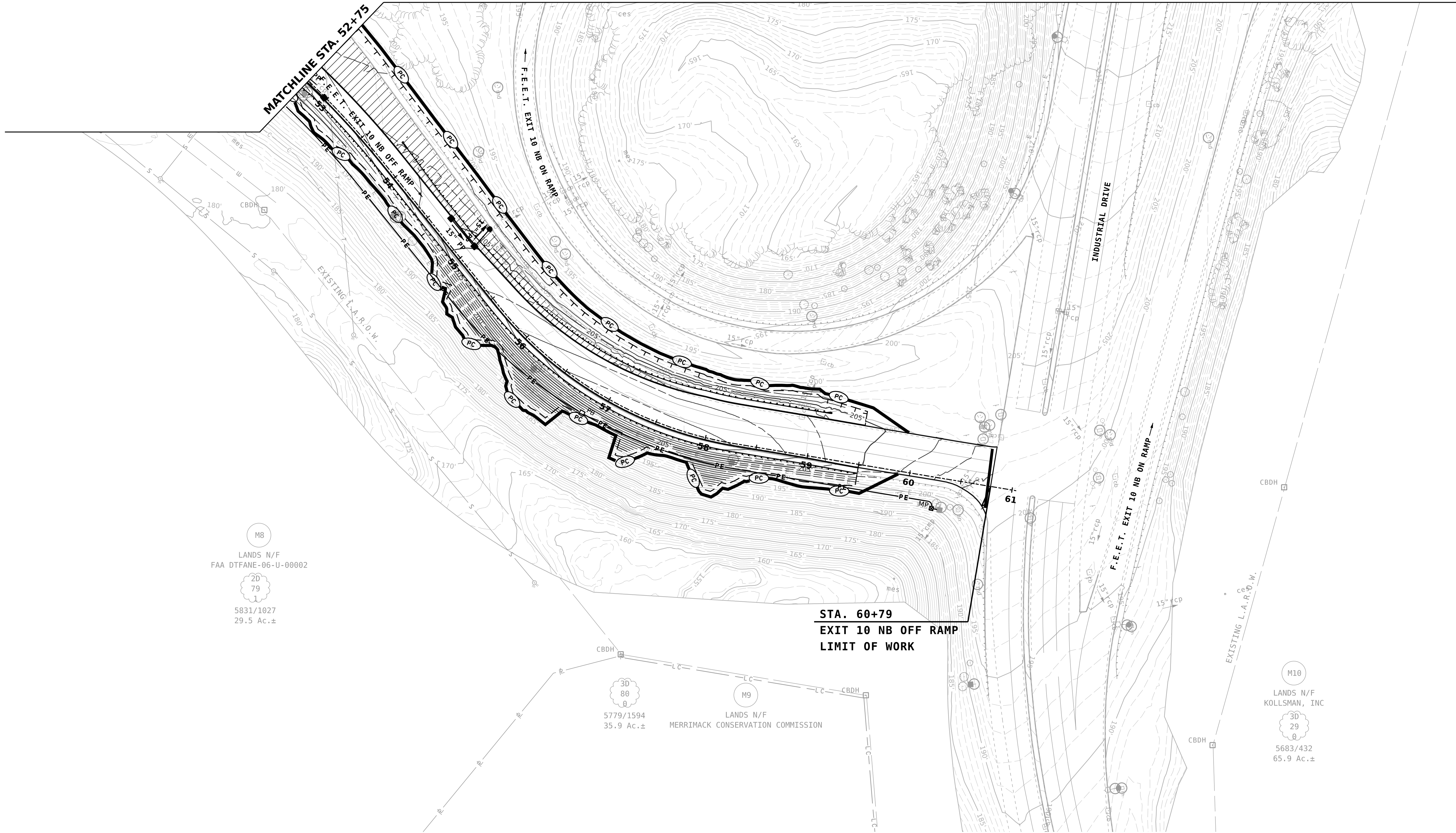
STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
 DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 11

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_11	11/17/2023	52775.00	13761A_Ero_Plans	13761A	43	44



MATCH TO SHEET GEN10



M8
LANDS N/F
FAA DTFANE-06-U-00002
20
79
5831/1027
29.5 Ac.±

3D
80
0
5779/1594
35.9 Ac.±

M9
LANDS N/F
MERRIMACK CONSERVATION COMMISSION

M10
LANDS N/F
KOLLSMAN, INC
3D
29
0
5683/432
65.9 Ac.±

STA. 60+79
EXIT 10 NB OFF RAMP
LIMIT OF WORK



STATE OF NEW HAMPSHIRE
NASHUA & MERRIMACK
DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 12

REVISIONS AFTER PROPOSAL		STATION	DESCRIPTION
NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	NHDOT	DATE	7/2021
NEW DESIGN	VHB TEAM	DATE	11/17/2023
SHEET CHECKED	B. ARCIERI	DATE	11/17/2023
AS BUILT DETAILS		DATE	

MODEL	DATE PLOTTED	VHB PROJECT NO.	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
ERO_12	11/17/2023	52775.00	13761A_Ero_Plans	13761A	44	44