

**Exception Request No.: 140**  
**Section: WMNF**  
**Town: Easton**  
**Highway: NH 116 (Easton Road) (Tier 3)**  
**Station: 836+75 to 840+75; 838+25±**  
**Drawing No.: WMNF C115 to C116**  
**Survey Report Cross Reference No.: WMNF C115 to C116**  
**Exception Type: Alignment in Pavement**  
**Crossing Over Existing Drainage Structure**

Traffic Information

NHS: No  
ADT: 200  
Traffic Control Type: Alt 1-way  
Traffic Control Duration: Traffic control duration for the proposed alignment in pavement is estimated to be 7 days, with an additional 6 days required if the exception request is not granted. Traffic control duration is estimated to be 6 days for the proposed installation of the duct bank over the existing drainage structure. If the requested exception to install the duct bank above the drainage structure is not granted, NPT expects an additional 2-3 weeks of traffic control.

Summary of Justification for Exception

*Alignment in Pavement*

NPT is requesting an exception from the UAM guidelines for the location of the duct bank in the pavement on NH 116 from STA 836+75 to STA 840+75 due to constraints caused by a guardrail. (See Exhibit A.) The attached Exhibits have been provided to demonstrate that construction outside the guardrail is not practicable at this location.

Construction outside the guardrail is not practicable because: (i) if the guardrail is not removed, NPT would have to work beyond the outer edge of the EIS Study Area, as defined below; (ii) if the guardrail and a portion of the roadway is temporarily removed to allow construction of the duct bank in the slope without extending beyond the edge of the EIS Study Area, the traffic impacts and cost of this construction method are substantially greater than the proposed installation. (Note: The proposed alignment is located beneath the pavement at a 5-foot offset from the guardrail consistent with NHDOT's request to avoid future conflicts with guardrail repairs or replacement, or disruption to the existing guardrail system.)

*Crossing Over Existing Drainage Structure*

NPT is also requesting an exception from the UAM guidelines for crossing above an existing 15-inch corrugated metal pipe (CMP) culvert with approximately 18 feet of cover on NH 116 (Easton Road) at approximately STA 838+25±. The proposed alignment is set inside the pavement and over the existing culvert to avoid road closures or other significant traffic impacts, unreasonable costs associated with a deeper excavation, and increased construction width that will extend the duration of construction and traffic impacts. The attached Exhibit D has been provided for this location to illustrate the constraints associated with installing the duct bank below the existing CMP culvert.

## Technical Discussion of Justification of Exception

### *Alignment in Pavement*

The roadway alignment at this location is constrained by guardrail on the east side of NH 116, with slopes on the outside of the guardrails. Consequently, the slopes behind the guardrail combined with NHDOT's requested offset of 5-feet from the existing guardrail would result in significant constructability issues, including the need for benching into the side slope to create a level and safe working area. The construction of a temporary access road and reconstruction back to its original state would extend the duration of construction and create a greater traffic impact.

NPT must plan to install any facilities and conduct any work within 20 feet of the edge of pavement, consistent with the study area for the draft Environmental Impact Statement prepared by the U.S. Department of Energy (DOE) for purposes of reviewing NPT's application to DOE for a Presidential Permit and NPT's request for a special use authorization from the United States Forest Service. Specifically, as part of NPT's Presidential Permit process and NPT's request for a special use authorization from the United States Forest Service, the federal agencies have prepared a draft Environmental Impact Statement ("draft EIS"), and are on the verge of issuing a final EIS that is necessary to support issuance of all federal permits. The draft EIS analyzed an area of impact within 20 feet from the edge of pavement on each side of the road ("the EIS Study Area"). This study area limits the design area available to NPT. The federal agencies may only issue authorizations consistent with the analysis conducted in the National Environmental Policy Act (NEPA) process (e.g., the draft and final EIS), and therefore NPT must plan to install any facilities and conduct any work within this study area.

NPT evaluated whether it could relocate the alignment outside the pavement, but has determined it could not because the modified side slopes required for construction would extend beyond the outer edge of the EIS Study Area. (See Exhibit B.)

NPT also evaluated an option to remove the guardrail and a portion of the roadway to allow NPT to construct the duct bank in the slope without having to conduct work beyond the outer edge of the EIS study area. Although this option would allow NPT to restrict its work to the ROW, this alternative is not practical for several reasons. First, considerable amounts of materials would have to be removed and transported to another site for temporary storage in order to bench into the slope. These materials would then have to be transported back to the site to restore the site after the duct bank was completed. (See Exhibit C.) Second, this option would significantly increase the time necessary in the NHDOT ROW required to construct the duct bank and would be unreasonably costly, causing a net increase of \$53,452, including the cost of material transport and new guardrail installation. (See Exhibit E.) (Note: This marginal cost estimate does not factor in the potential that native materials cannot be used during reburial because more expensive, select materials may be needed to address cable thermal issues.) Finally, traffic impacts would be significantly greater for this option (as compared to the proposed installation) due to the additional work for the benching activities.

Additionally, NPT has liability concerns regarding DOT's request that NPT install new guardrails after completion of its work. Unlike NHDOT, if NPT were to install new guardrails, NPT would not have the benefit of immunity protections afforded to NHDOT under New Hampshire law. See N.H. R.S.A. § 230:80. Therefore, even in cases where NPT deemed the cost of the "guardrail replacement option" to be a reasonable project cost for a particular location, NPT could not agree to have any role in work to replace the guardrails unless NHDOT were willing to agree to defend, indemnify, and hold harmless NPT against any and all claims related in any manner to, or arising out of, the installation of the new

guardrails. If NHDOT were not willing to provide such protection to NPT, then NPT would be willing, in the alternative, to reimburse NHDOT for the cost NHDOT and/or its contractors incur to replace any guardrails removed during our work, but NPT could not have any role in such work. However, NPT is not requesting the “guardrail replacement option” at this location, where it deems the additional traffic impacts and cost of this work to be prohibitive.

NPT also evaluated placing the cable trench alignment along the west side of the road, opposite the guardrail. A move to the west side of the road would require two additional road crossings with approximately 100 feet of pavement impacts and significant traffic impacts. The proposed location, although in the pavement, involves a relatively short section of pavement impact and the least impact to traffic during construction.

Excavation limits and work areas are shown on the attached drawings. During construction, one lane will remain open to traffic at all times.

#### *Crossing Over Existing Drainage Structure*

The vertical positioning of the cable trench is constrained by the depth of the existing culvert (18 feet to the top of the culvert). (See Exhibits A and D.) Crossing under the existing culvert and meeting the required 2-foot minimum separation will require a wider trench as the thermal design criteria require a greater separation of the electrical cables as depth increases. This trench width and additional offsets necessary for construction would likely require either complete road closures or result in significant traffic impacts, including extended duration of construction within roadway to allow for sheeting installation and removal and extensive excavation due to the depth and width of the trench. We estimate that these construction alternatives will add 2-3 weeks to the traffic impacts. Finally, we estimate the increase in cost associated with crossing underneath the culvert would be approximately \$248,000 for this 200 foot section. (See Exhibit E.) Road closures are not needed for the proposed installation, which thereby minimizes traffic impacts and attendant safety issues.

We have also evaluated a trenchless option to pass under the culvert. The trenchless installation will be unreasonably costly (a net estimated increase of \$2,069,100 for the 15-inch culvert crossing section). (See cost estimate attached in Exhibit E). Also, traffic impacts would be increased for a trenchless installation due to the addition of trenchless work areas and the extended duration of installation.

Excavation limits and work areas are shown on the attached drawings. During construction, one lane will remain open to traffic at all times.

#### Impacts

##### *Alignment in Pavement*

The design, as proposed, will not adversely affect the design, construction, stability, traffic, safety, environmental commitments, maintenance, or operation of the highway. The alignment has been located 5-feet off the edge of the guardrail, to avoid future conflicts with guardrail repairs or replacement or disruption to the existing guardrail system. The installation of the duct bank and pavement restoration will be designed and constructed in accordance with conditions outlined in the NHDOT’s April 3, 2017 letter to the New Hampshire Site Evaluation Committee. The installation’s proposed depth meets NHDOT’s criteria relating to the structural box to minimize any potential conflicts with maintenance and future highway projects. A traffic control plan has been submitted to the NHDOT for this design and complies with the Manual on Uniform Traffic Control Devices.

#### *Crossing Over Existing Drainage Structure*

At all locations where the new duct bank is constructed over an existing drainage structure or utility, NPT will encase the facility in a concrete duct bank reinforced with rebar for a length to exceed a 2:1 slope from the bottom/center of the drainage structure (or utility) to the surface. At a minimum, this will involve a 20-foot reinforced section on each side of the crossing to form a self-sustaining bridge that will allow for excavation under the duct bank for purposes of future maintenance of existing utilities or drainage structures. This reinforced concrete duct bank shall be designed by a Professional Engineer licensed in the State of New Hampshire. In connection with future maintenance activities, especially related to the culvert, NPT will provide any and all required support, including but not limited to, providing crews to assist while work is being conducted in the vicinity of the culvert.

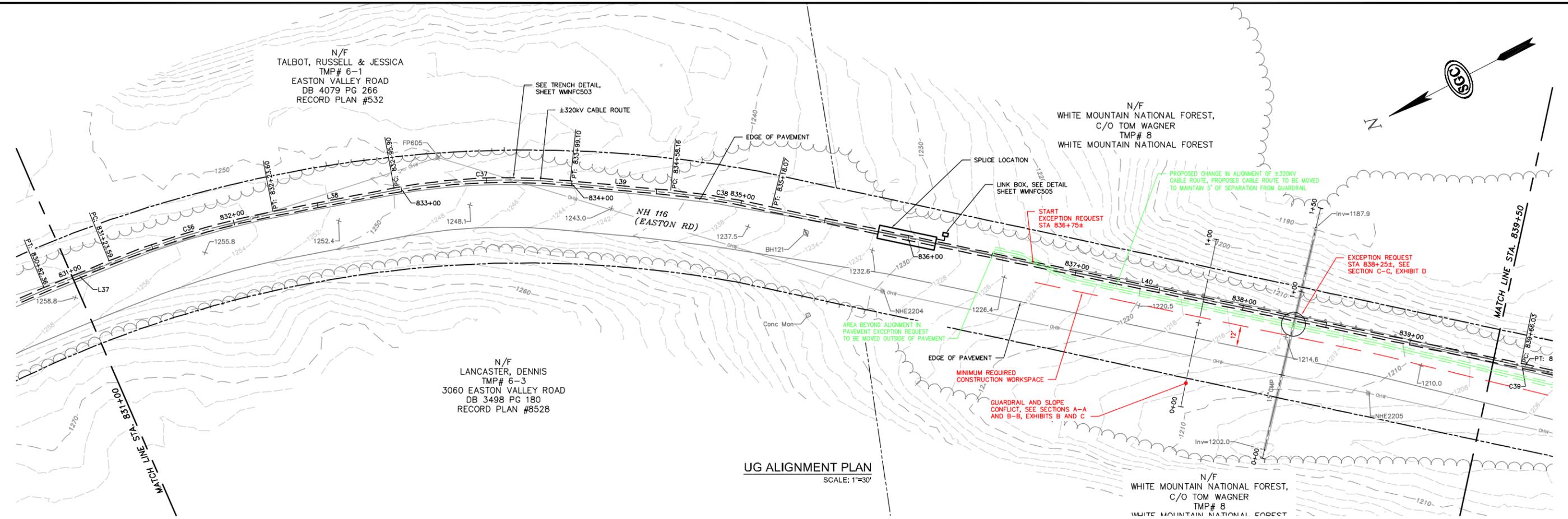
#### Supporting Documentation

##### *Alignment in Pavement*

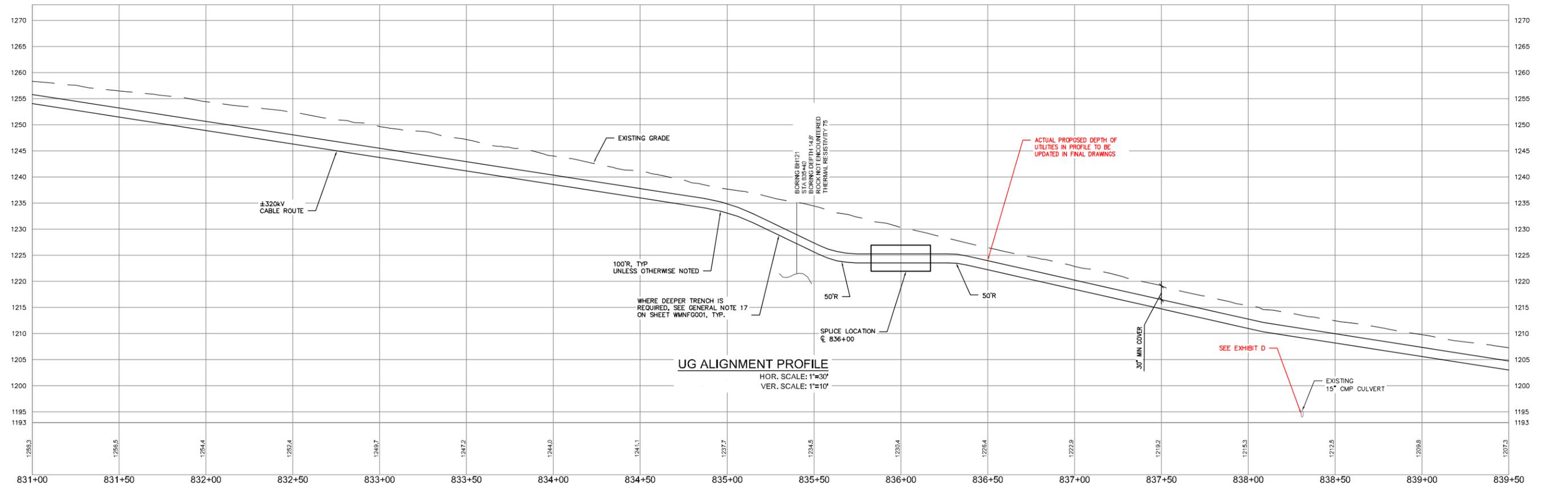
See attached Exhibits A, B, and C showing a plan, profile, and sections for the proposed installation. See Exhibit E for cost estimates.

##### *Crossing Over Existing Drainage Structure*

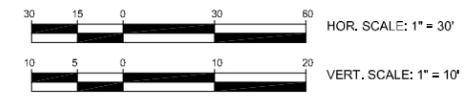
See Exhibit D for sections for the proposed installation. See Exhibit E for cost estimates.



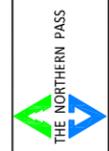
**UG ALIGNMENT PLAN**  
SCALE: 1"=30'



**UG ALIGNMENT PROFILE**  
HOR. SCALE: 1"=30'  
VER. SCALE: 1"=10'



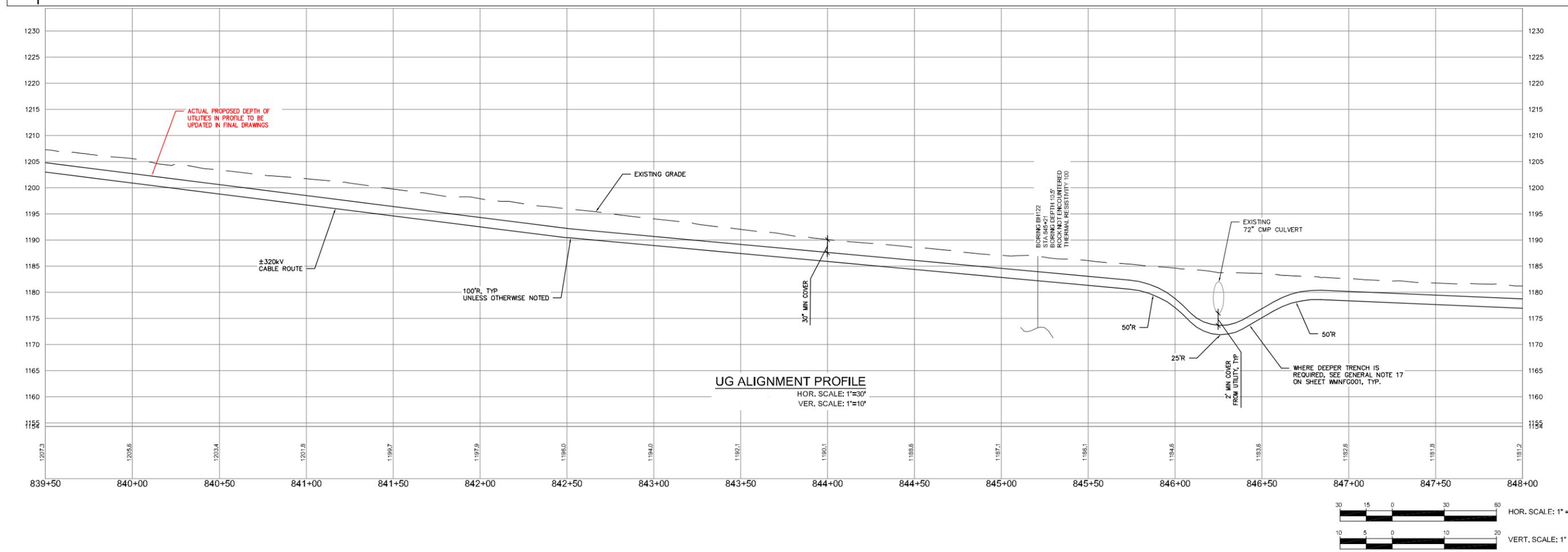
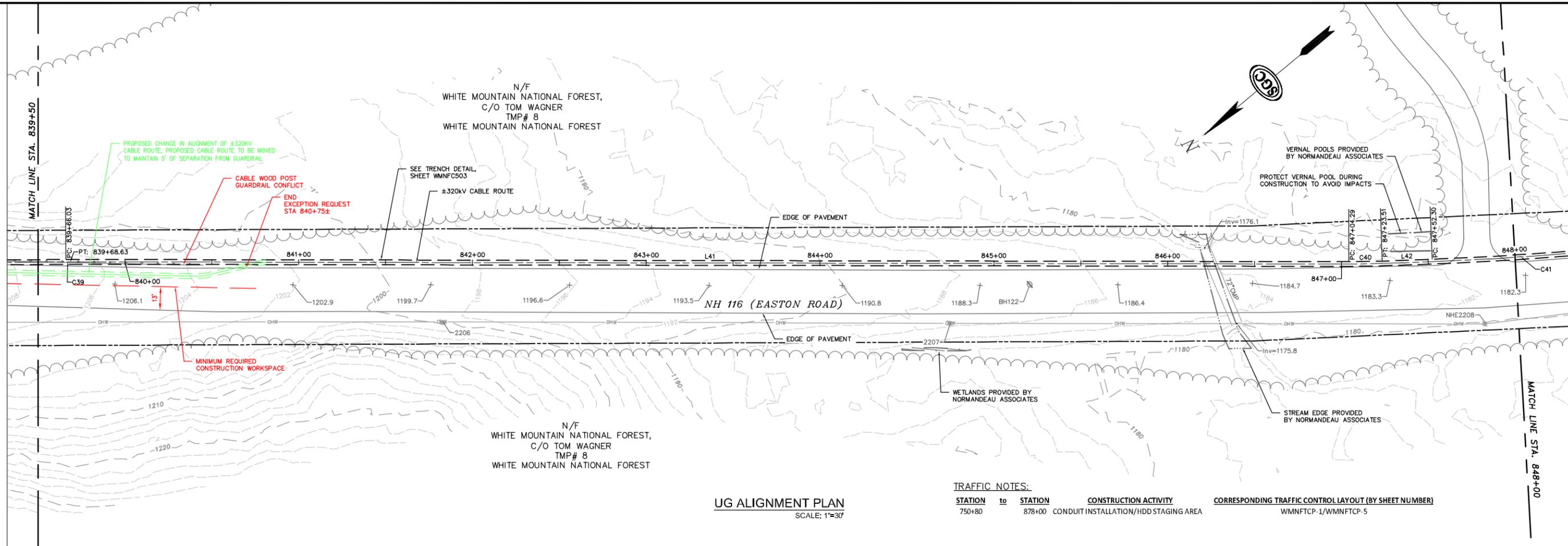
NO.	REVISION	DATE	BY	CHKD	APPROV.
0	EXCEPTION REQUEST	07/25/17	DD	MRR	TMH



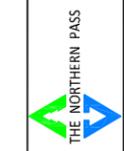
Transmission Business

EXCEPTION 140-ALIGNMENT IN PAVEMENT AND CROSSING OVER EXISTING UTILITY/DRAINAGE: NPT WMNF-UNDERGROUND ALIGNMENT WMNF SECTION-STA. 836+75 TO STA. 840+75±  
SCALE: H. 1"=30', V. 1"=10'  
DATE: 05/20/17

TRANSMISSION LINE: WMNF

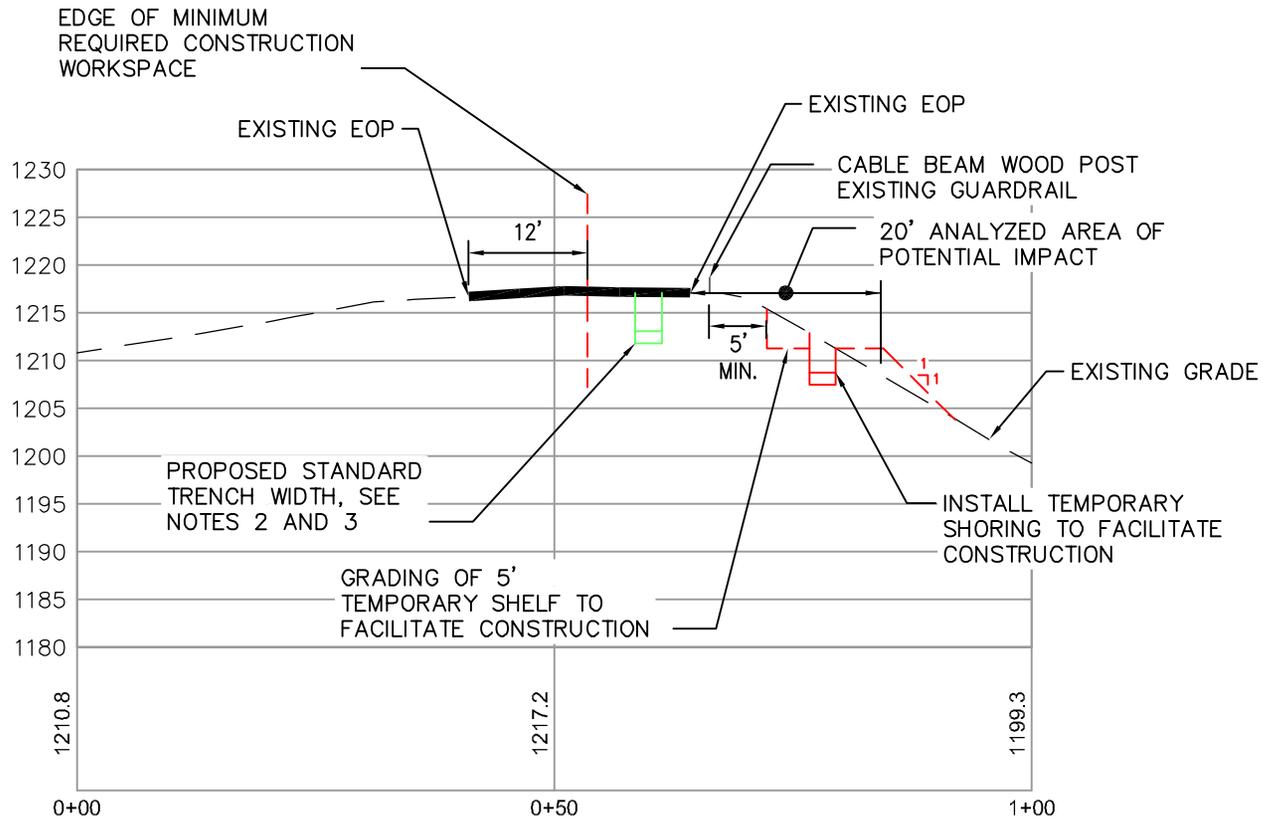


NO.	REVISION	DATE	BY	CHKD	APPRV.
0	EXCEPTION REQUEST	07/25/17	MMR	MMR	TMH



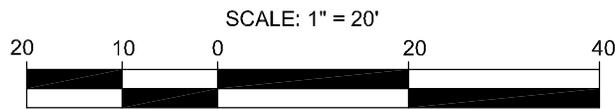
Transmission Business

EXCEPTION 140-ALIGNMENT IN PAVEMENT AND CROSSING OVER EXISTING UTILITY/DRAINAGE: NPT WMNF-UNDERGROUND ALIGNMENT WMNF SECTION-S1A 836+75 TO STA 840+75±  
SCALE: H. 1"=30', V. 1"=10'  
DATE: 05/20/17



## SECTION A-A

SCALE: 1"=20'



**NOTES:**

1. THE TRENCH LOCATION SHOWN IN RED IS NOT PROPOSED AND IS INTENDED TO DEMONSTRATE CONSTRUCTABILITY ISSUES.
2. TRENCH WIDTH SHOWN TO BE MAINTAINED USING TRENCH JACKS AND SHEETING.
3. PROPOSED CABLE ROUTE TO BE MOVED TO MAINTAIN 5 FEET OF SEPARATION FROM THE GUARDRAIL. A MINIMUM 12-FOOT WIDE TRAVEL LANE WILL REMAIN TO MAINTAIN A SINGLE LANE OF TRAFFIC.

JOB NO.: 1384001

**TITLE:**  
 EXCEPTION 140  
 ALIGNMENT IN PAVEMENT  
 NPT-WMNF UNDERGROUND ALIGNMENT  
 WMNF SECTION-STA 836+75 TO STA 840+75±  
 TOWN: EASTON

**PREPARED FOR:**  
 NH DOT  
 7 HAZEN DRIVE  
 CONCORD, NH

**REVISIONS:**

NO.	DATE	EXCEPTION REQUEST
0	07/07/2017	



**SGC ENGINEERING, LLC**  
 • Civil Design & Survey Engineering  
 • Environmental & Regulatory Permitting  
 • Electrical Power Systems Engineering

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14 School Street, Suite 203-A  
 Bristol, VT 05443  
 Tel: 802-256-9296

Galinda Tower 1, Suite 2478  
 2700 Post Oak Boulevard  
 Houston, TX 77056

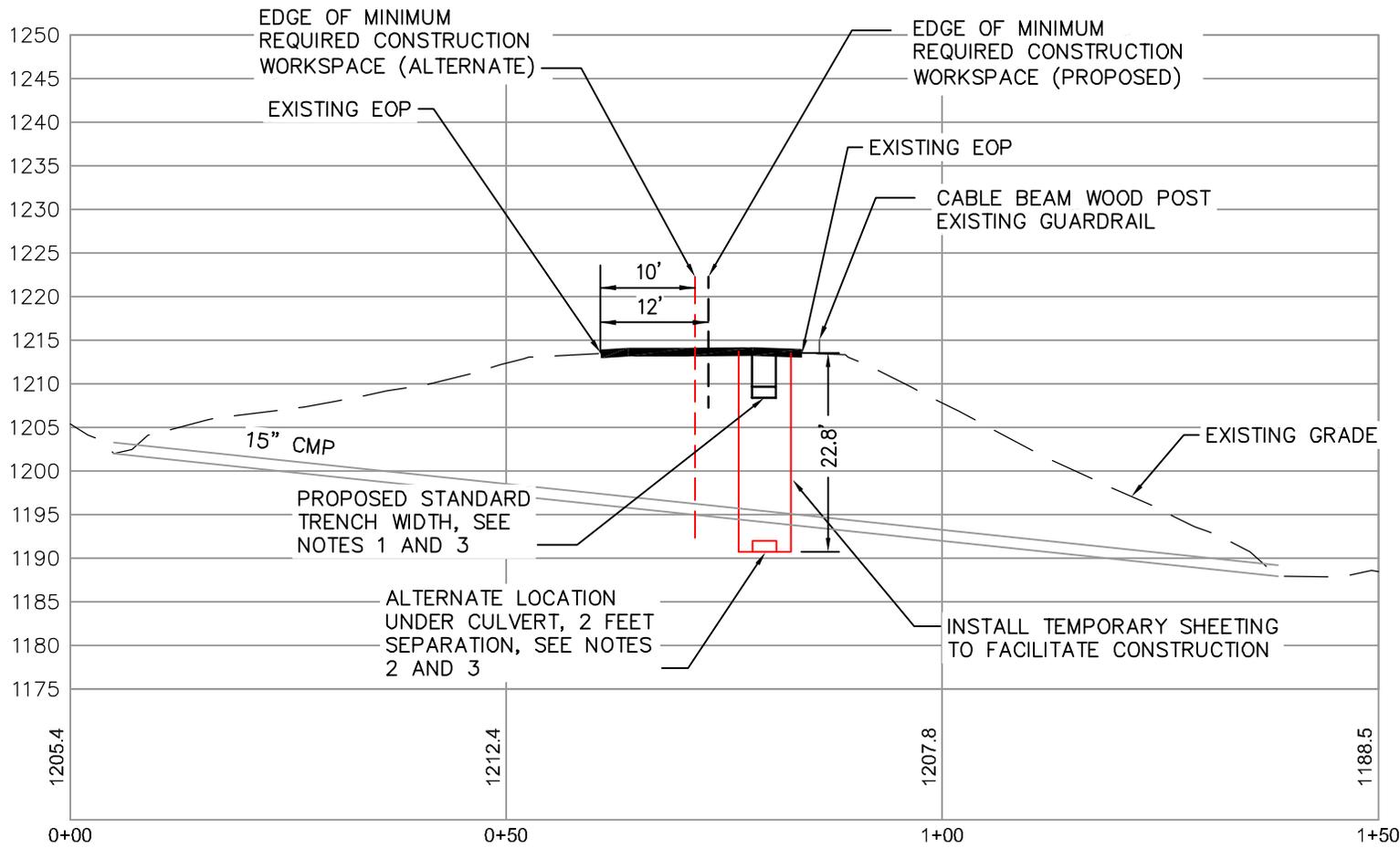
EXHIBIT NO.: B

DATE: 07/2017

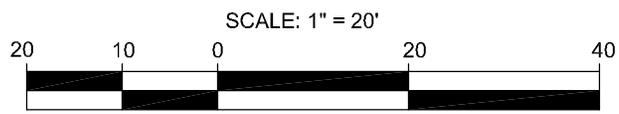
DRAWN: MRR

SCALE: 1" = 20'





**SECTION C-C**  
SCALE: 1"=20'



- NOTES:
1. THE TRENCH WIDTH SHOWN TO BE MAINTAINED USING TRENCH JACKS AND SHEETING.
  2. TRENCH WIDTH SHOWN TO BE MAINTAINED USING TRENCH BOXES.
  3. PROPOSED CABLE ROUTE TO BE MOVED TO MAINTAIN 5 FEET OF SEPARATION FROM THE GUARDRAIL. CHANGE IN ALIGNMENT WILL PROVIDE ADDITIONAL ROOM FOR WORKSPACE AND MAINTENANCE OF TRAFFIC.

JOB NO.: 1384001

TITLE:  
EXCEPTION 140  
CROSSING OVER EXISTING UTILITY/DRAINAGE  
NPT-WMNF UNDERGROUND ALIGNMENT  
WMNF SECTION-STA 838+25±  
TOWN: EASTON

PREPARED FOR:  
NH DOT  
7 HAZEN DRIVE  
CONCORD, NH

REVISIONS:		
NO.	DATE	EXCEPTION REQUEST
0	07/07/2017	

**SGC ENGINEERING, LLC**

- Civil Design & Survey Engineering
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**Exhibit E - Exception 140 Cost Estimates**

**Additional Cost for Removing Guardrail and Benching into slope**

Length	400			
Cut Volume	800			
	Quantity	Units	Unit Price	Total
Material Removal, Hauling & Replacement	800	CY	\$42.19	\$33,752.00
Guardrail	400	LF	\$49.25	<u>\$19,700.00</u>
Net Additional Cost				\$53,452.00

1. Cost assumes rock excavation not required.
2. Cost assumes off site storage available within 20 miles

**Additional Cost for Trenching Under Culvert**

Length	200'			
Max Depth	22.8'			
Min Depth	6.7'			
	Quantity	Units	Unit Price	Total
Trench Cost for Deeper Trench	200	LF	\$1,390.00	\$278,000.00
Deduct for Base Trench Cost	200	LF	\$150.00	<u>(\$30,000.00)</u>
Net Additional Cost				\$248,000.00

1. Cost assumes rock excavation not required.
2. Costs based on contractual unit pricing for the project.
3. 200 foot minimum length required for the trenching installation is required to accommodate the gradual slope necessary to accommodate the minimum bend.

**Additional Cost for Installing HDD Under Culvert**

Length	900'			
Max Depth	27.5'			
Min Depth	6.7'			
	Quantity	Units	Unit Price	Total
HDD (2-8" Bores)	900	LF	\$2,490.00	\$2,241,000.00
Deduct for Base Trench Cost	900	LF	\$150.00	<u>(\$135,000.00)</u>
Deduct for Surface Restoration	900	LF	\$41.00	<u>(\$36,900.00)</u>
Net Additional Cost				\$2,069,100.00

1. Cost assumes rock excavation not required.
2. Costs based on contractual unit pricing for the project.
3. 900 foot minimum length required for HDD installation to accommodate minimum bending requirements.