

Exception Request No.: 1 (Rev 2)
Section: WBR3
Town: Plymouth
Highway: US 3 (Tier 2)
Station: 2698+00 to 2701+00±
Drawing No.: WBR3 C243
Survey Report Cross Reference No.: WBR3 C239
Exception Type: Alignment in Pavement
Crossing over Existing Drainage Structure

Traffic Information

NHS: No
ADT: 2089
Traffic Control Type: Alt 1-way
Traffic Control Duration: Traffic control duration is estimated to be 6 days for the proposed installation. If the requested exceptions are not granted, NPT expects an additional 2-3 weeks of work requiring traffic control, determined as follows: (1) an additional 6 days to install the alignment outside the paved area (not including the installation of new guardrail); and (2) an additional 1-2 weeks to install the duct bank below the drainage structure.

Summary of Justification for Exception

NPT is requesting an exception from the UAM guidelines for the location of the cable trench in the pavement on US 3, Daniel Webster Highway from STA 2698+00 to 2701+00± of the NPT WBR3 Underground Alignment. (See Exhibit A.)

Due to limited ROW space outside the pavement and beyond the existing guardrail, construction outside the guardrail is not practicable because: (i) if the guardrail is not removed, NPT does not have the necessary property rights to construct outside the NHDOT ROW; (ii) if the guardrail and a portion of the roadway is temporarily removed to allow construction of the ductbank in the slope without extending past the right of way limits for benching, the traffic impacts and cost of this construction method are substantially greater than the proposed installation. 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.

In addition, our exception request in this area includes crossing above an existing 15-inch corrugated metal pipe (CMP) culvert with 11 feet of cover on US 3, Daniel Webster Highway at STA 2699+00±. The proposed alignment is set within the pavement and over the existing utility 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 exhibits have been provided for this location to illustrate the constraints associated with installing the ductbank 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 northern side of US 3 with moderate to steep slopes on the outside of the guardrails. (See Exhibit A.) Consequently, the steep slopes behind the guardrail, combined with NHDOT's requested offset of 5 feet from the existing guardrail, would result in significant constructability issues (if the guardrail were not removed), including the need for benching into the side slope to create a level and safe working area. The modified side slopes would extend beyond the right of way limits. See Exhibit B.

At the request of the DOT, we also evaluated an option to remove the guardrail and a portion of the roadway to allow NPT to construct the ductbank in the slope without extending past the right of way limits. 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 ductbank was completed. (See Exhibit C.) This option would significantly increase the time necessary in the NH DOT ROW required to construct the ductbank and would be unreasonably costly, causing a net increase of \$43,172 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.) In addition, 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.

We also evaluated placing the cable trench alignment along the south side of US 3, opposite the guardrail, but determined this was not practicable. Constraints on the south side include existing drainage outfall structures and overhead distribution utility poles located close to the ROW limits. On the south side of the ROW to the west of this location, the ability to place the alignment outside the pavement is limited by steep slopes (Station 2695+50) that would result in construction outside of the ROW, similar to the scenario in Exhibit B. Further west there is a location with steep slopes combined with a 36-inch culvert (Station 2686+50) that will require either, a deeper excavation to cross under the culvert which will extend construction impacts into the pavement due to the wider trench required or a movement further south which will extend work beyond the edge of the ROW. On the south side of the ROW to the east of this location, the ability to place the alignment outside the pavement is limited by an

existing building that extends into the ROW. As a result of the limitations on the south side of the road to the east and west of this location, a move to the south side would keep the alignment out of the pavement for only approximately 300-feet but would require two additional road crossings to do so (and DOT exception approval). The proposed location although in the pavement provides the least 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.

Note: NPT is requesting an exception for the portion of the alignment from station 2698+00 to 2701+00±, Sheet WBR3 C243. In the original permit drawings, NPT proposed an alignment within the pavement for a longer portion of the roadway in this area. In response to NHDOT comments, NPT has reduced the length of the alignment within the paved area.

Crossing Over Existing Drainage Structure

The vertical positioning of the cable trench is constrained by the depth of the existing culvert (eleven feet to the top of the culvert). (See Exhibits A and D). Crossing under the existing culvert to meet the required 2-foot minimum separation will require a greater separation of the conduits and cable to accommodate thermal design criteria for the electric cables resulting from the additional depth. 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 one to two weeks to the traffic impacts. Finally, we estimate the increase in cost associated with crossing underneath the culvert would be approximately \$200,000 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.

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 ductbank 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 ductbank is constructed over an existing drainage structure or utility, NPT will add rebar to the concrete encasing of the ductbank for a 15-foot section on each side of the crossing to form a 30-foot self-sustaining bridge that will allow for excavation under the duct bank for purposes of future maintenance of existing utilities or drainage structures. 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.

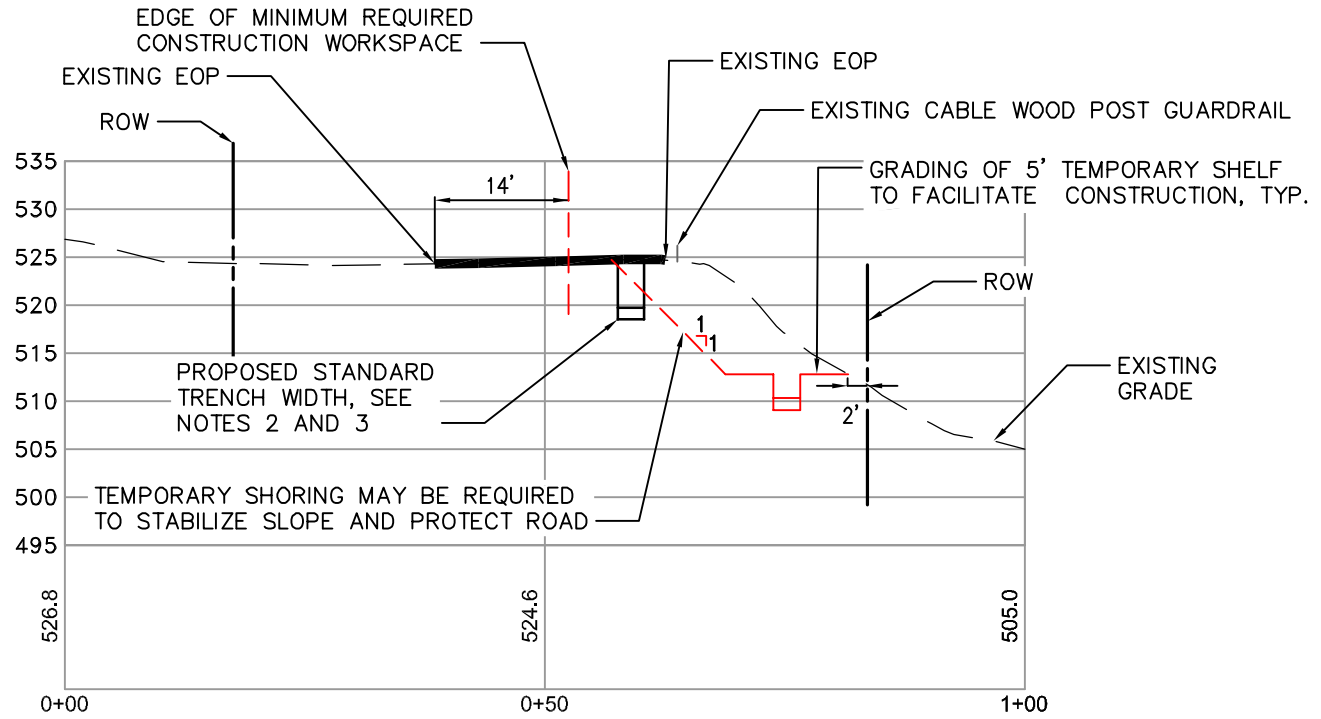
Supporting Documentation

Alignment in Pavement

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

Crossing Over Existing Drainage Structure

See attached Exhibits A and D showing a plan, profile, and section for the proposed installation. See Exhibit E for cost estimates.



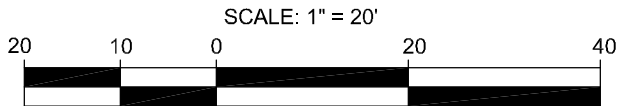
GUARDRAIL SECTIONS

START STATION	END STATION	LENGTH (FT)
2698+40	2700+15	175

ALTERNATE LOCATION CUT VOLUME EVALUATION:

1. GUARDRAIL LENGTH: 175 FT
2. APPROX. CUT AREA: 126 SF
3. APPROX. CUT VOLUME: 22,050 CF (817 CY)

SECTION B-B
SCALE: 1"=20'



NOTE:

1. TRENCH LOCATION SHOWN IN RED IS NOT PROPOSED AND ONLY 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 GUARDRAIL.

JOB NO.: 1384001

TITLE:
EXCEPTION 1-ALIGNMENT IN PAVEMENT & CROSSING OVER EXISTING UTILITY/DRAINAGE NPT-WBR3 UNDERGROUND ALIGNMENT WBR3 SECTION-STA 2698+00 TO 2701+00± TOWN: PLYMOUTH

PREPARED FOR:
NH DOT
7 HAZEN DRIVE
CONCORD, NH

REVISIONS:

NO.	DATE	UPDATED EXCEPTION REQUEST
0	05/12/2017	



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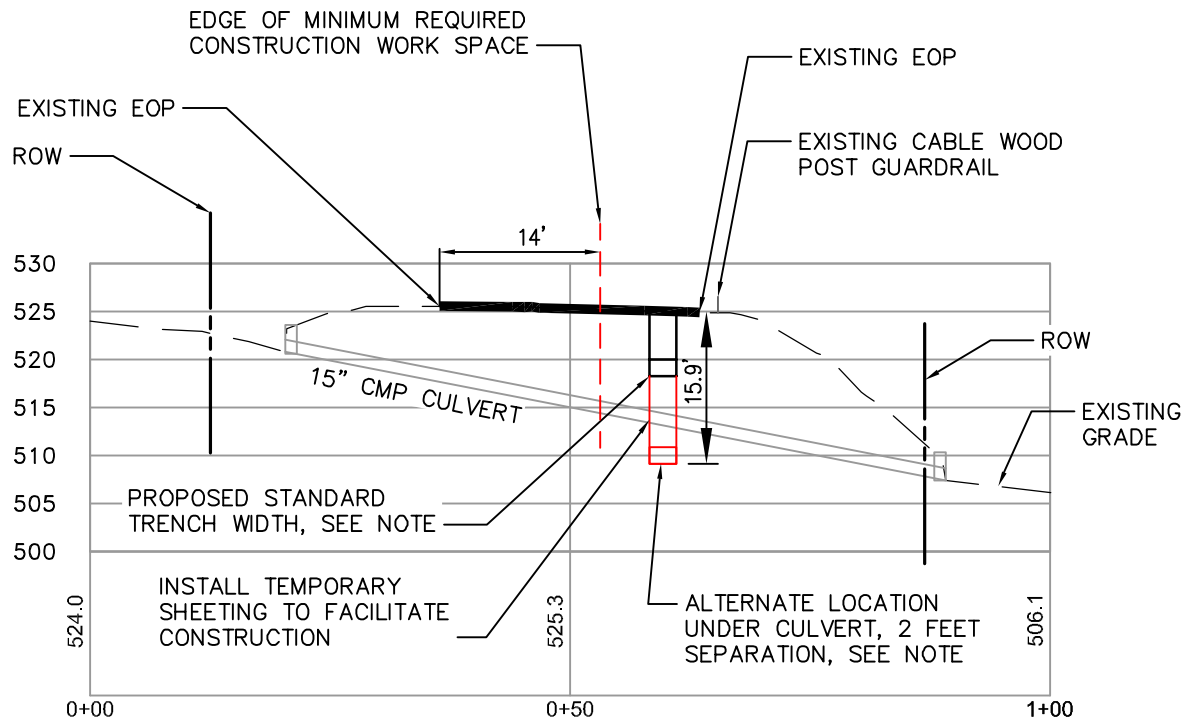
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14 School Street, Suite 203-A Bristol, VT 05443 Tel: 802-259-9298
Galena Tower 1, Suite 2478 2700 Post Oak Boulevard Houston, TX 77056

EXHIBIT NO.: C

DATE: 05/2017

DRAWN: MRR

SCALE: 1" = 20'

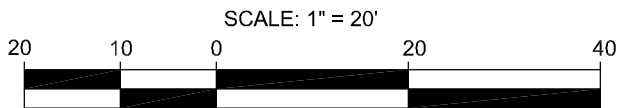


NOTE:

TRENCH WIDTH SHOWN TO BE MAINTAINED USING TRENCH JACKS AND TEMPORARY SHEETING

SECTION C-C

SCALE: 1"=20'



JOB NO.: 1384001

TITLE:
 EXCEPTION 1-ALIGNMENT IN PAVEMENT &
 CROSSING OVER EXISTING UTILITY/DRAINAGE
 NPT-WBR3 UNDERGROUND ALIGNMENT
 WBR3 SECTION-STA 2698+00 TO 2701+00±
 TOWN: PLYMOUTH

PREPARED FOR:
 NH DOT
 7 HAZEN DRIVE
 CONCORD, NH

REVISIONS:

NO.	DATE	EXCEPTION REQUEST
0	05/03/2017	
1	05/12/2017	UPDATED EXCEPTION REQUEST



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EXHIBIT NO.: D DATE: 05/2017 DRAWN: MRR SCALE: 1" = 20'

Exhibit E - Exception 1 Cost Estimates

Additional Cost for Trenching Under Culvert

Length	200'			
Max Depth	15.9			
Min Depth	6.7'			
	Quantity	Units	Unit Price	Total
Trench Cost for Deeper Trench	200	LF	\$1,150.00	\$230,000.00
Deduct for Base Trench Cost	200	LF	\$150.00	(<u>\$30,000.00</u>)
Net Additional Cost				\$200,000.00

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 Removing Guardrail and Benching into slope

Length	175			
Cut Volume	819 cy			
	Quantity	Units	Unit Price	Total
Material Removal, Hauling & Replacement	819	cy	\$42.19	\$34,553.61
Guardrail	175	LF	\$49.25	<u>\$8,618.75</u>
Net Additional Cost				\$43,172.36

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

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.