Exception Request No.: 22 (Rev 1)
Section: WBR3
Town: Campton
Highway: US 3 (Tier 2)
Station: 2327+00 to 2329+10
Drawing No.: WBR3 C200
Survey Report Cross Reference No.: WBR3 C196
Exception Type: Alignment in Pavement
Crossing Over Existing Drainage Structure

Traffic Information

NHS: No
ADT: 1300
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 exception to cross over the drainage structure is not granted, NPT expects an additional 1-2 weeks of work requiring traffic control 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 station 2327+00 to 2329+10 of the NPT WBR3 Underground Alignment. (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 more than 20 feet from the edge of pavement, which NPT cannot propose because of design criteria limitations arising out of the federal permitting process for this project; (ii) if the guardrail and a portion of the roadway is temporarily removed to allow construction of the ductbank in the slope without extending more than 20 feet from the edge of pavement, 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.)

In addition, NPT's exception request in this area includes a crossing above an existing 60-inch Corrugated Metal Pipe (CMP) culvert with approximately 8.5 feet of cover at station 2327+75. (See Exhibit A and D). The proposed alignment is set within 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 which will extend the duration of construction and traffic impacts.

Technical Discussion of Justification of Exception

Alignment in Pavement

The roadway alignment at this location is constrained by guardrail on the east side of US 3 with moderate to steep 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 evaluated whether it could relocate the alignment outside the pavement, but has determined it could not. The modified side slopes required for construction would extend beyond the 20' area of impact studied for federal permitting purposes. (See Exhibit B) 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. 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 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 having to conduct work more than 20 feet from the edge of pavement. Although this option would allow NPT to restrict its work to within 20 feet of the edge of pavement, 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 ductbank was completed. (See Exhibit C.) Second, 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 $29,961 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 US 3, opposite the guardrail. Additional constraints existing on the west side include steep slopes and utility pole guy wire conflicts. A move to the west side of the road would keep the alignment out of the pavement for approximately 200 feet, but would require two additional road crossings with approximately 100 feet of pavement and significant traffic impacts. 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 2327+00 to 2329+10. (See Exhibit A.) 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. The revised alignment will be reflected in revised drawings to be submitted at a later date.

Crossing Over Existing Drainage Structures
The proposed alignment is set within the pavement and over an existing culvert to avoid road closures, unreasonable costs associated with a deeper excavation and increased construction width which will extend the duration of construction and traffic impacts, as further described below.

NPT's exception request includes crossing above an existing 60" CMP culvert on US 3, Daniel Webster Highway at STA 2327+75±. There is approximately 8.5 feet of cover over the culvert. The attached Exhibits A and D have been provided for this location to illustrate the constraints associated with installing the ductbank below the existing culvert.

The vertical positioning of the cable trench is constrained by the 8.5 foot depth of cover for the existing culvert. Crossing under the existing 60" culvert to meet the required 2-foot minimum separation will require a wider trench to maintain the greater separation of the conduits and cable to accommodate the thermal design criteria for the electric cables resulting from the additional depth. (See Exhibit D). This trench width and additional offsets necessary for construction would likely require either complete road closures or result in significant traffic impacts, including an extended duration of construction within the 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 60" CMP would be approximately $248,000 for this section. (See Exhibit E.) In contrast, total road closures are not needed for the proposed installation going over the existing 60" CMP, 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 to cross under the culvert). (See 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

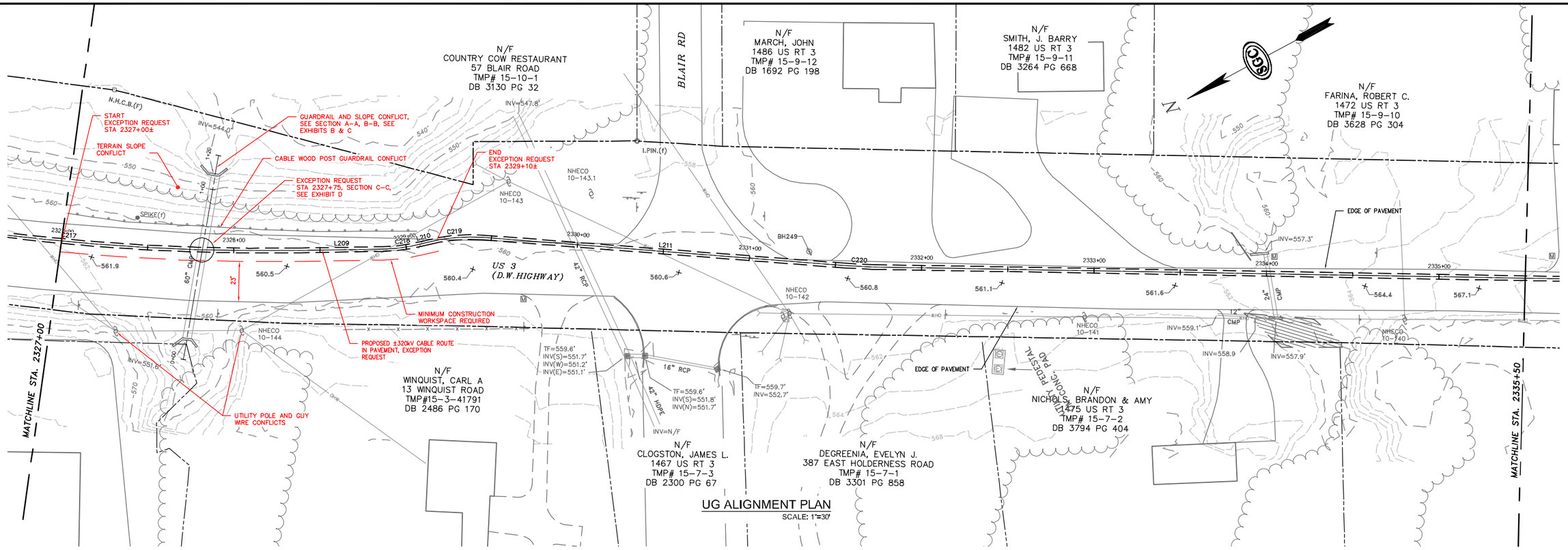
Alignment in Pavement
The design, as proposed, will not adversely affect the design, construction, stability, traffic, safety, environmental commitments, maintenance, or operation of the highway. The alignment has been located 5-feet off the edge of the guardrail, to avoid future conflicts with guardrail 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.

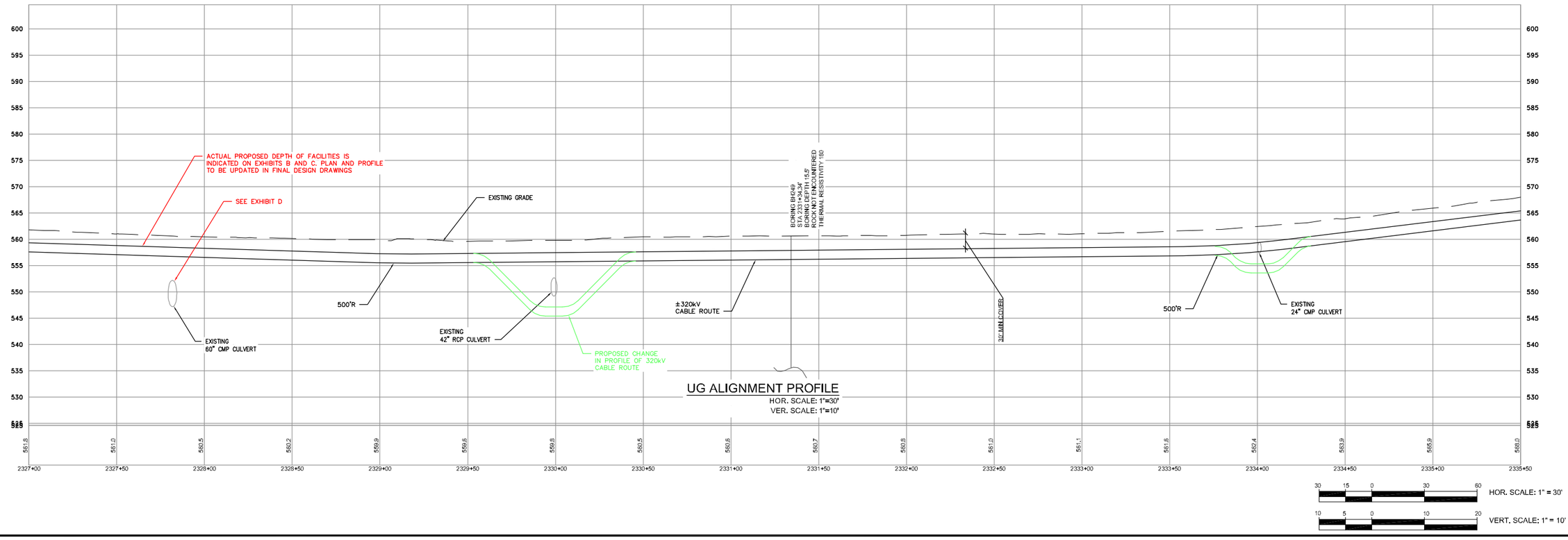
Crossing Over Existing Utility/Drainage
At all locations where the new ductbank is constructed over an existing drainage structure or utility, NPT will encase the facility in a concrete ductbank reinforced with rebar for a length to exceed a 2:1 slope from the bottom/center of the drainage structure (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 Exhibit A, B, and C showing plan, profile and sections for the proposed installation. See cost estimates in Exhibit E.

Crossing Over Utilities/Drainage
See attached Exhibits A and D showing plan, profile, and sections for the proposed installation, and cost estimates in Exhibit E.





PRELIMINARY - NOT FOR CONSTRUCTION

NO.	REVISION	DATE	DRWN	CHKD	APPRV.
0	EXCEPTION REQUEST	06/20/17	TDD	TDD	TMH
1	UPDATED EXCEPTION REQUEST	09/07/17	TDD	TDD	TMH

SGC Engineering, LLC
a Lloyd's Register Company

PAR ELECTRICAL CONTRACTORS, INC.

THE NORTHERN PASS
Transmission Business

EXCEPTION 22-ALIGNMENT IN PAVEMENT & CROSSING OVER EXISTING UTILITY/DRAINAGE: MPT WBR3-UNDERGROUND ALIGNMENT
WBR3 SECTION-STA 2327+00 TO 2329+101

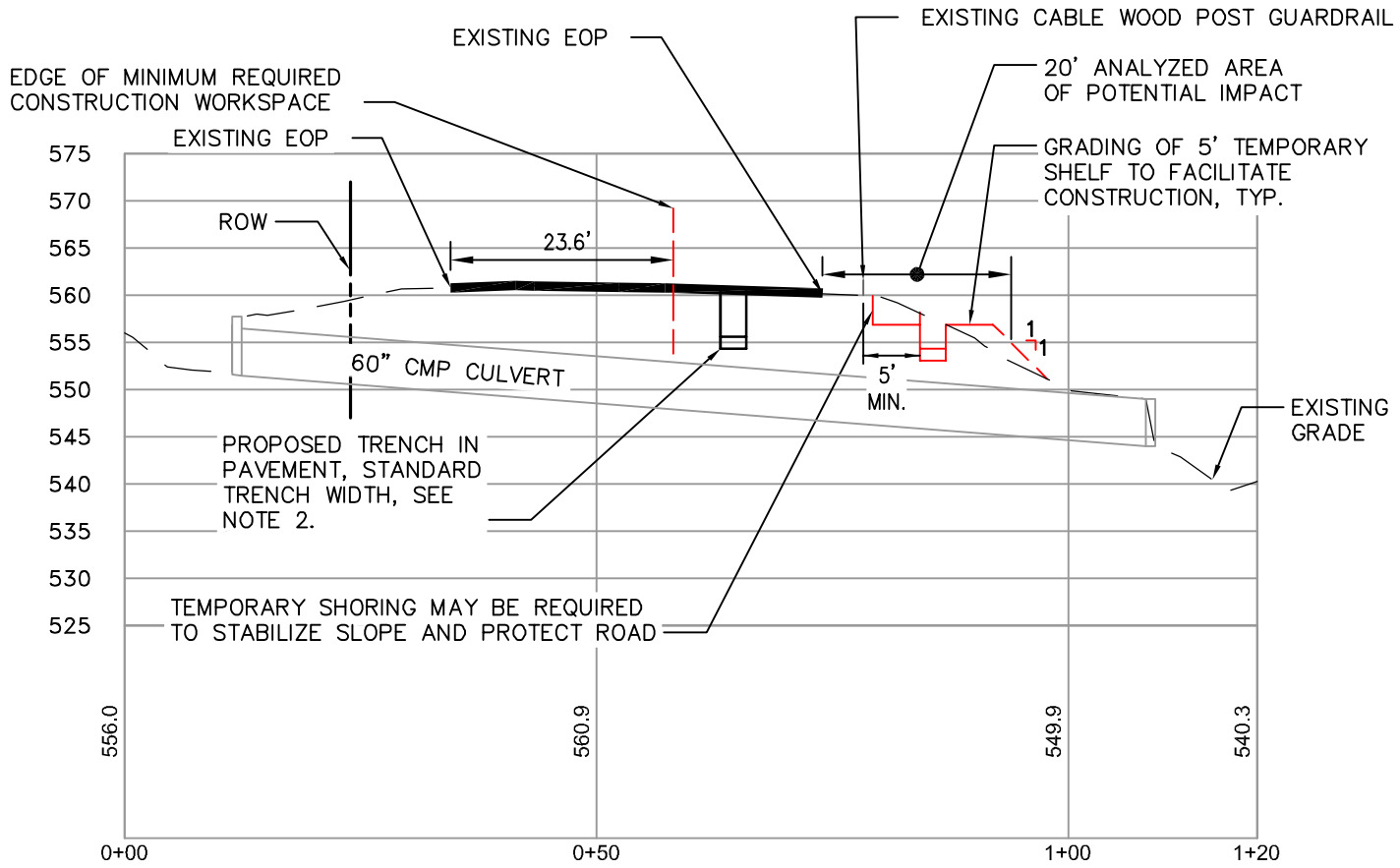
DATE: 05/2017
SCALE:

DES: MRR | CHK: TDD
DRW: MRR | APR: TMH

TOWN: CAMPTON

TRANSMISSION LINE: WBR3

EXHIBIT A



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 AS SHOWN TO BE MAINTAINED USING TRENCH JACKS AND SHEETING.

SCALE: 1" = 20'

20 10 0 20 40

JOB NO.: 1384001

TITLE:

EXCEPTION 22-ALIGNMENT IN PAVEMENT & CROSSING OVER EXISTING UTILITY/DRAINAGE
NPT-WBR3 UNDERGROUND ALIGNMENT
WBR3 SECTION-STA 2327+00 TO STA 2329+10±
TOWN: CAMPTON

PREPARED FOR:

NH DOT
7 HAZEN DRIVE
CONCORD, NH

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

REVISIONS:

NO.	DATE	
0	05/15/2017	EXCEPTION REQUEST
1	06/19/2017	UPDATED EXCEPTION REQUEST

SGC ENGINEERING, LLC
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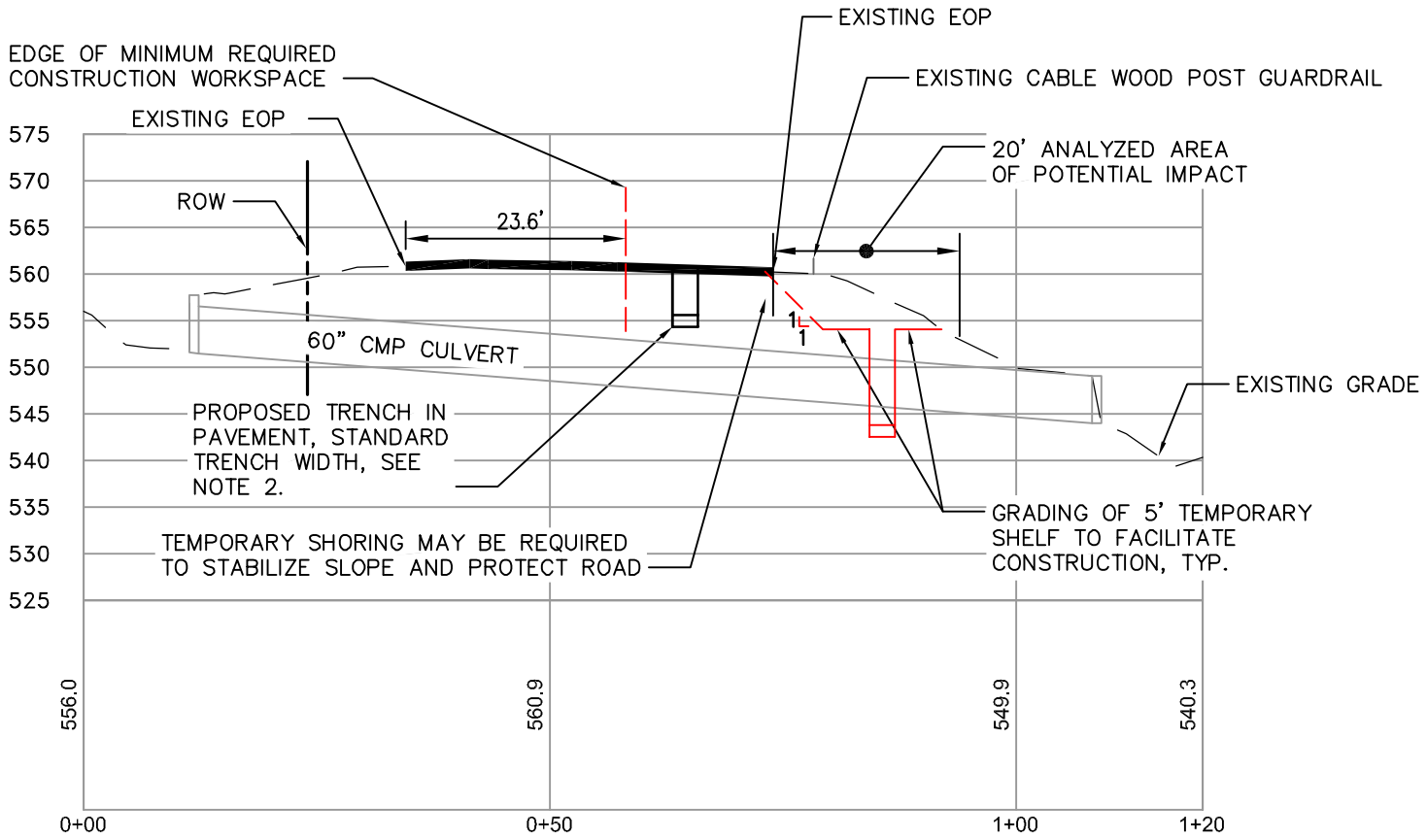
14 School Street, Suite 203-5, Bristol, VT 05443, Tel: 802-735-0258
Galleria Tower 1, Suite 2478, 2700 Post Oak Boulevard, Houston, TX 77056



GUARDRAIL SECTIONS

START STATION	END STATION	LENGTH (FT)
2327+00	2329+10	210

ALTERNATE LOCATION CUT VOLUME EVALUATION:

1. GUARDRAIL LENGTH: 210 FT
2. APPROX. CUT AREA: 60 SF
3. APPROX. CUT VOLUME: 12,600 CF (465 CY)

SCALE: 1" = 20'

20 10 0 20 40

SECTION B-B

SCALE: 1"=20'

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EXCEPTION 22-ALIGNMENT IN PAVEMENT & CROSSING OVER EXISTING UTILITY/DRAINAGE
NPT-WBR3 UNDERGROUND ALIGNMENT
WBR3 SECTION-STA 2327+00 TO STA 2329+10±
TOWN: CAMPTON

PREPARED FOR:

NH DOT
7 HAZEN DRIVE
CONCORD, NH

REVISIONS:

NO.	DATE	
0	05/15/2017	EXCEPTION REQUEST
1	06/19/2017	UPDATED EXCEPTION REQUEST

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

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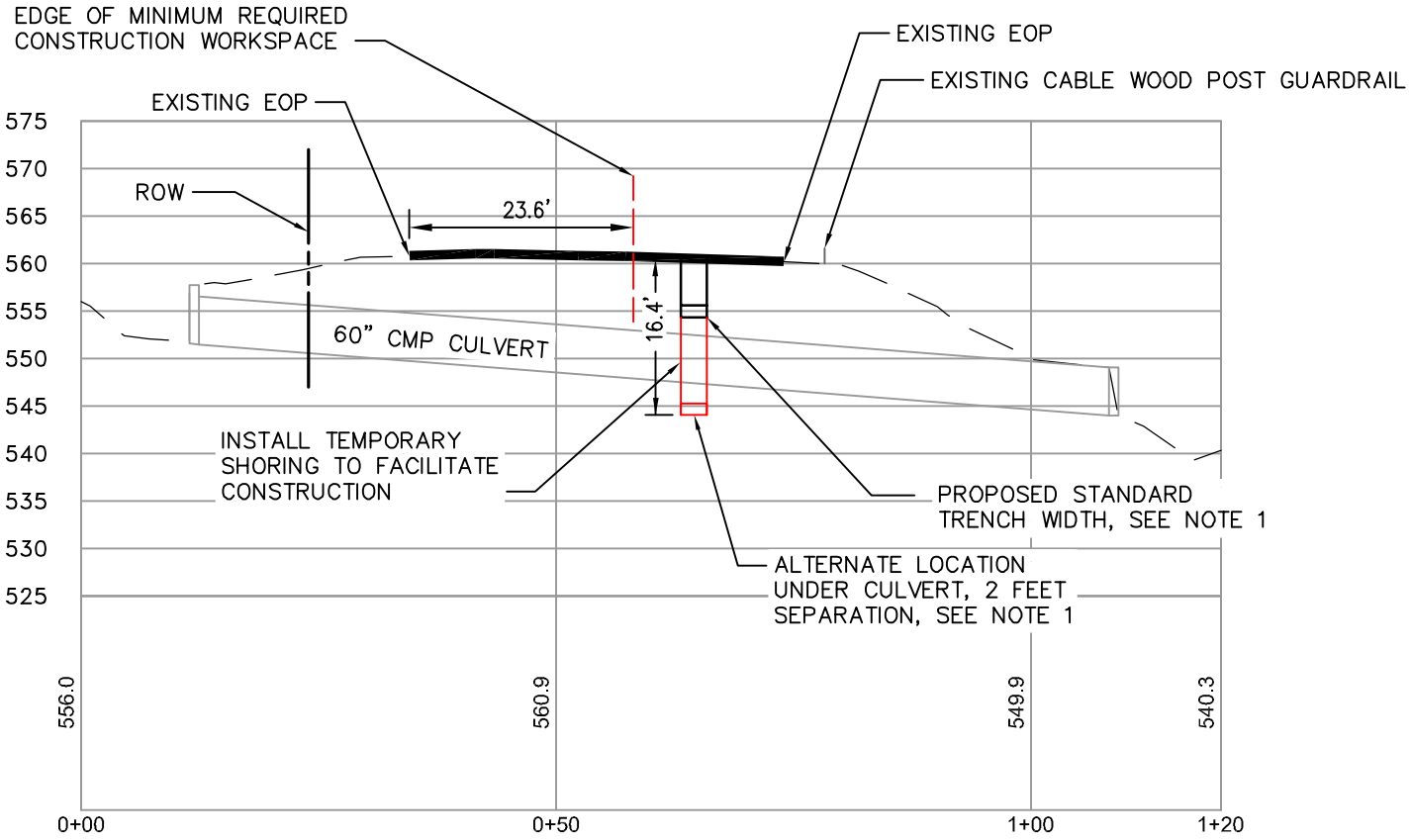

NOTES:
1. TRENCH WIDTH AS SHOWN TO BE MAINTAINED USING TRENCH JACKS AND SHEETING.

SECTION C-C

SCALE: 1"=20'

SCALE: 1" = 20'

20 10 0 20 40

JOB NO.: 1384001

TITLE:

EXCEPTION 22-ALIGNMENT IN PAVEMENT & CROSSING OVER EXISTING UTILITY/DRAINAGE
NPT-WBR3 UNDERGROUND ALIGNMENT
WBR3 SECTION-STA 2327+00 TO STA 2329+10±
TOWN: CAMPTON

PREPARED FOR:

NH DOT
7 HAZEN DRIVE
CONCORD, NH

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

REVISIONS:

NO.	DATE	
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Exhibit E - Exception 22 Cost Estimates

Additional Cost for the Trenching Under the 60" CMP Culvert

Length	200'			
Max Depth	19.96			
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	($30,000.00)
Net Additional Cost for each trench				$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 Removing Guardrail and Benching into slope

Length	210'			
Cut Volume	465 cy			
	Quantity	Units	Unit Price	Total
Material Removal, Hauling & Replacement	465	cy	$42.19	$19,618.35
Guardrail	210	LF	$49.25	$10,342.50
Net Additional Cost				$29,960.85

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

Additional Cost for Installing HDD Under the 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	($135,000.00)
Deduct for Surface Restoration	900	LF	$41.00	($36,900.00)
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.