

Exception Request No.: 56 (Rev 1)
Section: WBR3
Town: Thornton
Highway: US 3 (Tier 2)
Station: 1885+70 to 1898+00±
Drawing No.: WBR3 C148 to C149
Survey Report Cross Reference No.: WBR3 C143 to C145
Exception Type: Alignment in Pavement
Crossing over Existing Drainage Structure

Traffic Information

NHS: No

ADT: 955

Traffic Control Type: Alt 1-way

Traffic Control Duration: Traffic control duration for the proposed alignment is expected to be 9 days. If the requested exception for the culvert crossing is not granted, NPT expects an additional 2-3 weeks of work requiring traffic control at the crossing location. If the requested exception for the alignment in pavement is not granted, NPT has not identified a viable alternative at this location.

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 1885+70 to 1898+00± of the NPT WBR3 Underground Alignment. Due to limited ROW space outside the pavement and beyond the existing guardrail, and conflicts with existing overhead utility lines and buildings encroaching in the ROW, construction outside the pavement is not practical because NPT does not have the necessary property rights to construct outside the NHDOT ROW on private property. 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 a 12-inch CMP culvert. The proposed alignment is set 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 steep slopes and guardrail on the eastern side of US 3. In addition, existing buildings and an overhead utility line encroach upon the ROW on the east side. (See Exhibit A.) Consequently, the buildings impinging the ROW, steep slopes, guardrail and utility line, 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 modified side slopes would extend beyond the ROW limits and impact the buildings. (See Exhibit B.) These constraints prevent construction outside the paved area even if the guardrail were removed during construction. (See Exhibit C.)

NPT also evaluated placing the cable trench alignment on the western side of the road in this area; however, there are construction constraints on the western side of the road, including, a sidewalk, a drainage line and headwall, guardrail, steep embankments, and the need to relocate a distribution utility pole, which would require acquisition of additional easement rights on private property for modified distribution pole guying. (See Exhibit A) In addition, moving the alignment to the western side of the road would require two additional highway crossings. These road crossings would involve disturbance to approximately 100 feet of paved roadway each. NPT submits that any benefits of moving to the opposite side of the road are negated by the additional traffic impacts and additional delays associated with the construction of the road crossings.

Crossing over Existing Drainage Structure

NPT's exception request includes crossing above an existing 12-inch CMP culvert on US 3, Daniel Webster Highway at STA 1894+75±. There is 17 feet of cover over the culvert. The attached Exhibits A and C 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 depth of the existing culvert (17 feet to the top of the culvert). (See Exhibit 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 shoring and 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 two to three weeks to the traffic impacts. Finally, we estimate the increase in cost associated with crossing underneath the culvert would be approximately \$248,000. (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 to cross under the culvert). (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. See Exhibits A, B, C, and D. 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 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 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.

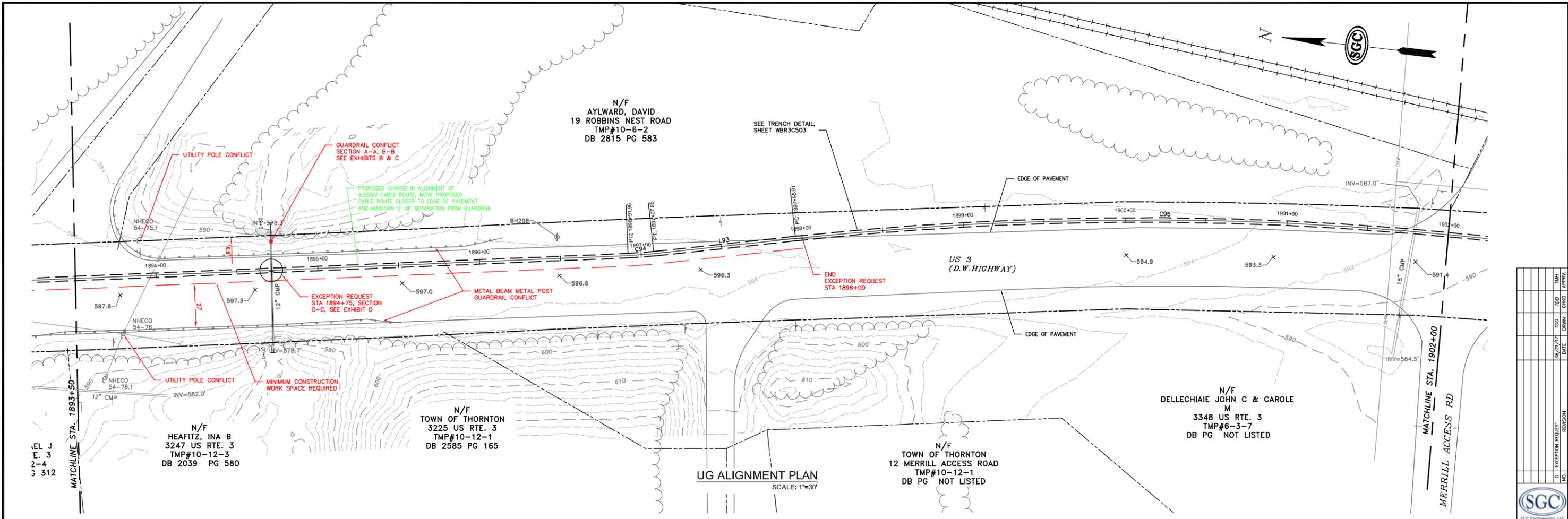
Supporting Documentation

Alignment in Pavement

See attached Exhibits A, B, and C showing plan, profile, and section views.

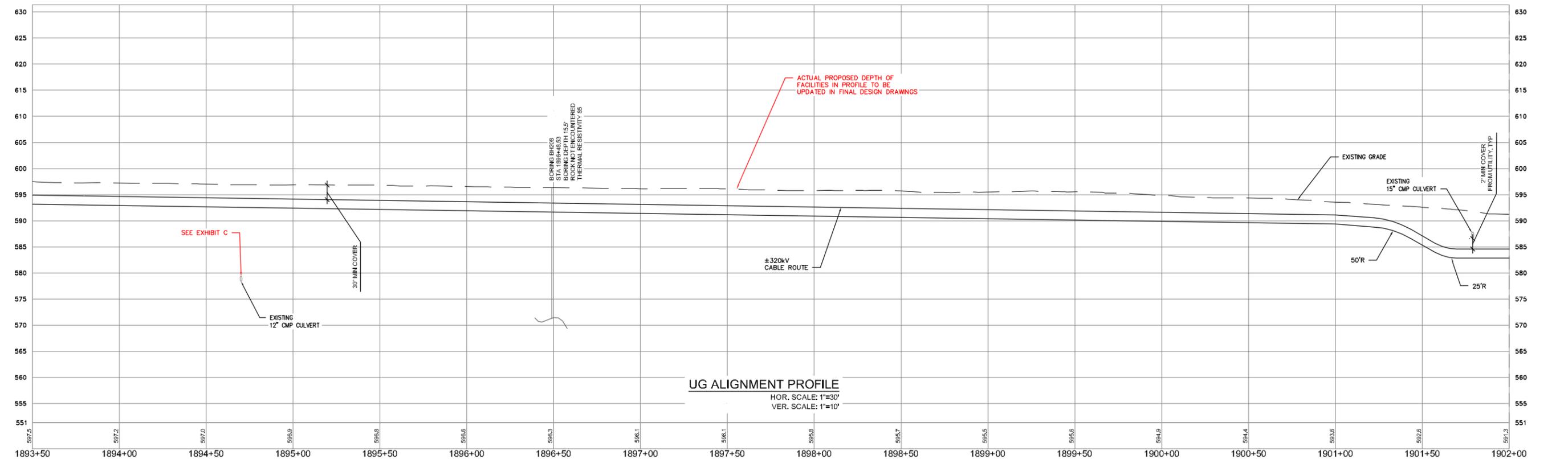
Crossing Over Utilities/Drainage

See attached Exhibit D showing section views. See cost estimates in Exhibit E.

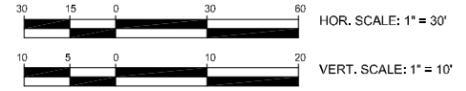


REL J
E. 3
2-4
3 312

UG ALIGNMENT PLAN
SCALE: 1"=30'



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



NO.	DATE	REVISION	BY	CHKD	APPRV.
0	06/27/17	EXCEPTION REQUEST			



Transmission Business

EXCEPTION 56 - ALIGNMENT IN PAVEMENT & CROSSING OVER EXISTING UTILITY/DRAINAGE: IPT WBR3-UNDERGROUND ALIGNMENT WBR3 SECTION-STA. 1895+70 TO STA. 1899+00 SCALE: DATE: 06/20/17

TRANSMISSION LINE:
WBR3

EXHIBIT A.2

Exhibit E - Exception 56 Cost Estimates

Additional Cost for Trenching Under 12" CMP Culvert

Length	200			
Max Depth	21.54			
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.