

Exception Request No.: 47
Section: WBR3
Town: Thornton
Highway: US 3 (Tier 2)
Station: 2000+50±
Drawing No.: WBR3 C161
Survey Report Cross Reference No.: WBR3 C157
Exception Type: Crossing Over Existing Drainage Structure

Traffic Information

NHS: No
ADT: 955
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 is not granted, NPT expects an additional 2-3 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 crossing above an existing 48--inch RCP culvert on US 3, Daniel Webster Highway at station 2000+50±. There is 12 feet of cover over the culvert. The proposed alignment will be set outside the pavement and over the existing culvert to avoid significant traffic impacts, unreasonable costs associated with a deeper excavation, and increased construction width which 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 culvert.

Technical Discussion of Justification of Exception

The vertical positioning of the cable trench is constrained by the depth of the existing culvert (twelve feet to the top of the culvert). (See Exhibits A and B). 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 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 \$200,000 for this 200-foot section. (See Exhibit C.) 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 48-inch culvert crossing section). (See cost estimate attached in Exhibit C). 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 exhibit. During construction, one lane will remain open to traffic at all times.

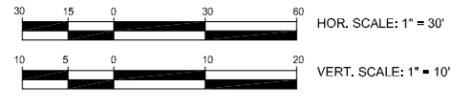
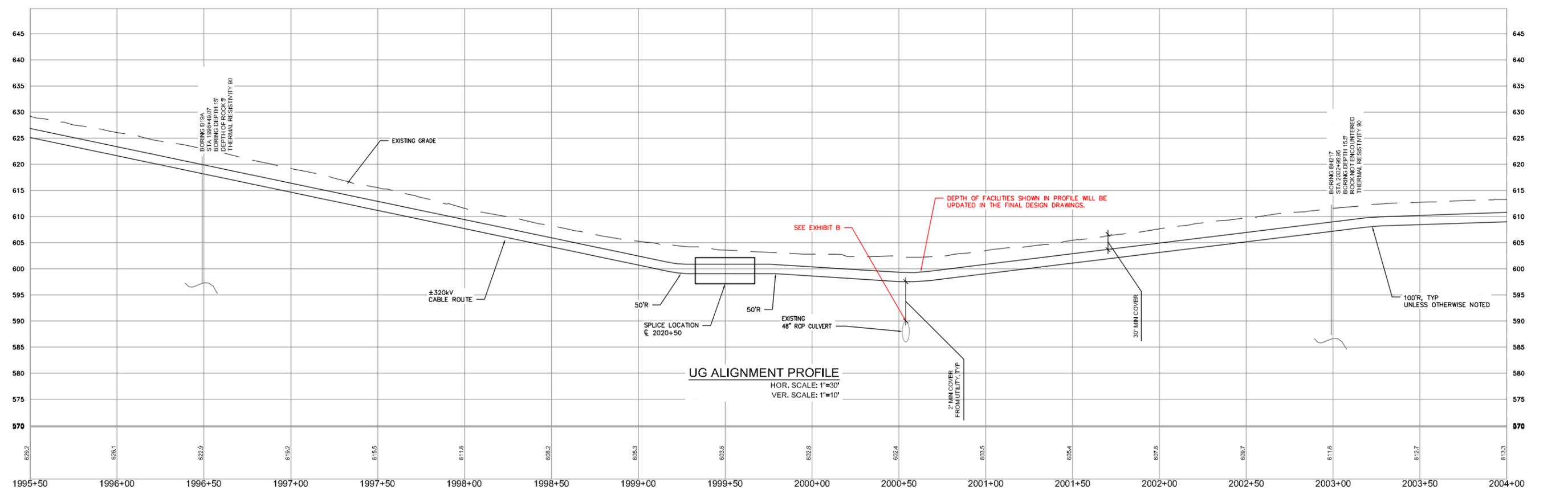
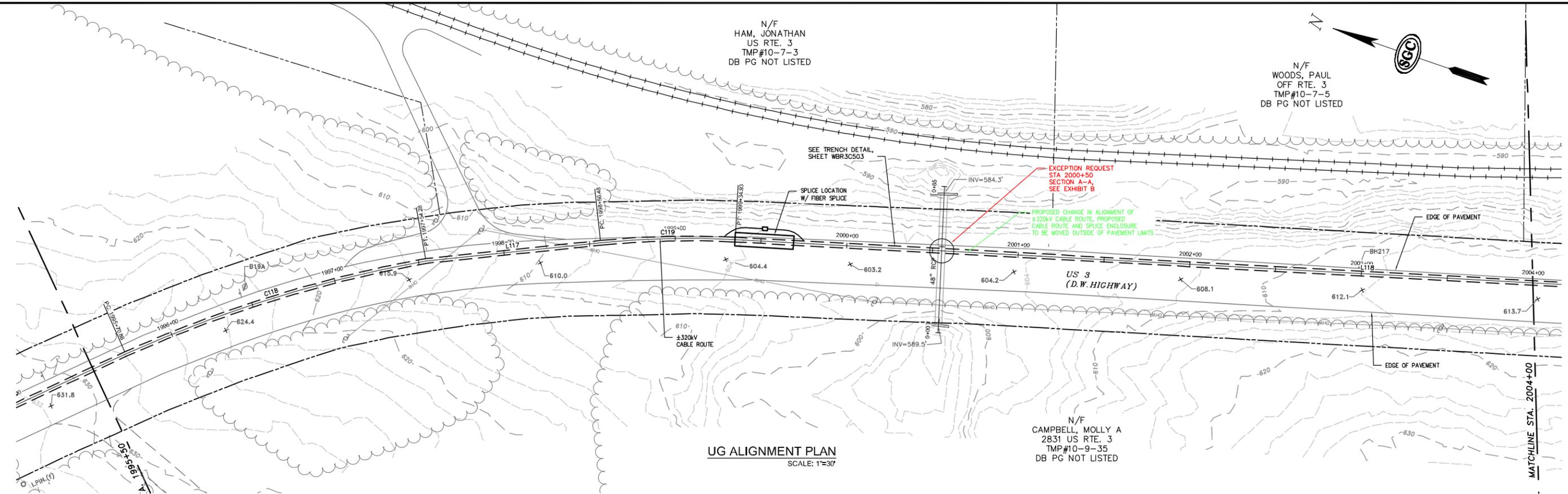
Note: On Exhibit A, the alignment of the ductbank in the area of this exception is shown in the roadway. NPT intends to move the alignment out of the roadway in this area, which will be reflected in the final plan drawings.

Impacts

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

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



NO.	REVISION	DATE	BY	CHKD	APPRV.
0	EXCEPTION REQUEST	05/17/17	TDD	DOWN	CHD



Transmission Business

EXCEPTION 47-CROSSING OVER EXISTING UTILITY/DRAINAGE:
NPT WBR3-UNDERGROUND ALIGNMENT
WBR3 SECTION-STA. 2000+50
DATE: 05/20/17

DES: MRR CHK: TDD
DRW: MRR APR: TMT
TOWN: THORNTON

TRANSMISSION LINE:
WBR3

Exhibit C - Exception 47 Cost Estimates

Additional Cost for Trenching Under Culvert

Length	200'			
Max Depth	19.69'			
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 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.