

**Exception Request No.: 12**  
**Section: WBR3**  
**Town: Plymouth**  
**Highway: US 3**  
**Station: 2467+75 to 2474+25**  
**Drawing No.: WBR3 C216 to 217**  
**Survey Report Cross Reference No.: WBR3 C212 to C213**  
**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 7 days for the proposed installation.

If the requested exception for alignment in pavement is not granted, NPT expects an additional 3-5 weeks of traffic control during installation of the alignment using an HDD. If the requested exception to install the duct bank above the drainage structure is not granted, NPT expects an additional 1-2 weeks of traffic control.

#### 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 2467+75 to 2474+25 of the NPT WBR3 Underground Alignment. (See Exhibit A.) Due to the bridge abutments at the I-93 underpass, NPT must be within the paved area of US 3 in order to cross under I-93. In addition, due to limited ROW space outside the pavement immediately to the south of the existing I-93 highway overpass caused by existing utilities in this area, construction outside the pavement is not practicable. The proposed alignment is located beneath the pavement at a 5-foot offset from the bridge abutments and existing sewer manhole to avoid future conflicts with repairs or replacement.

In addition, our exception request in this area includes an exception from the UAM guidelines for crossing above an existing 36-inch reinforced concrete box culvert on US 3, Daniel Webster Highway at station 2473+50±. There is 14 feet of cover over the culvert. The proposed alignment is set outside 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 would 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 two sets of bridge abutments for the I-93 highway overpass on both sides of US 3. (See Exhibit A.) In addition, on the south side of the I-93 underpass, an existing sewer manhole and sewer line constrain the ability to align the cable outside the paved area immediately to the south of the abutments. This manhole is avoided with a 5-foot offset. (See Exhibit A.) NPT's proposed design returns to the portion of the ROW outside the paved roadway at the point where these utility constraints end.

We have evaluated a trenchless option to pass under I-93 outside the bridge abutments. The trenchless installation will be unreasonably costly (a net estimated increase of \$2,069,100 for the I-93 highway crossing). (See cost estimate attached in Exhibit C). Also, significant traffic impacts would result from 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.

#### *Crossing over Existing Drainage Structure*

The vertical positioning of the cable trench is constrained by the depth of the existing culvert (14 feet to the top of the cover). (See Exhibits A and B). Crossing under the culvert 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 \$248,000. (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 to cross under the culvert). 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 at a 5-foot offset from the existing bridge abutments and existing sewer manhole to avoid future conflicts with maintenance repairs or replacement. 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

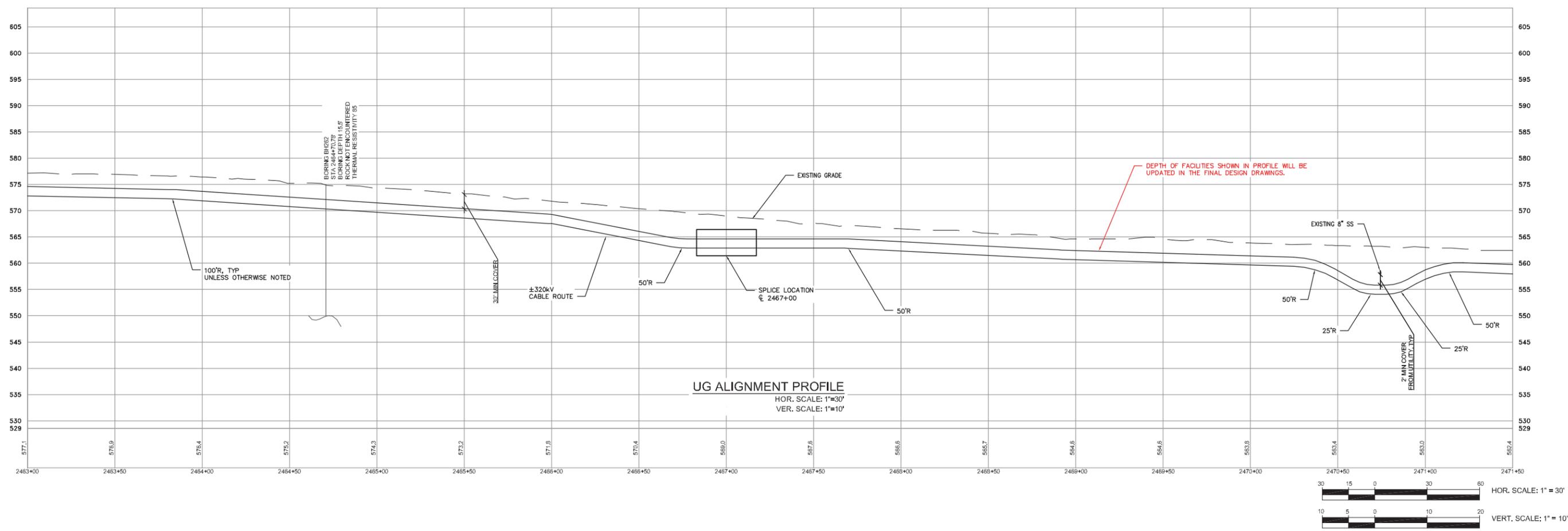
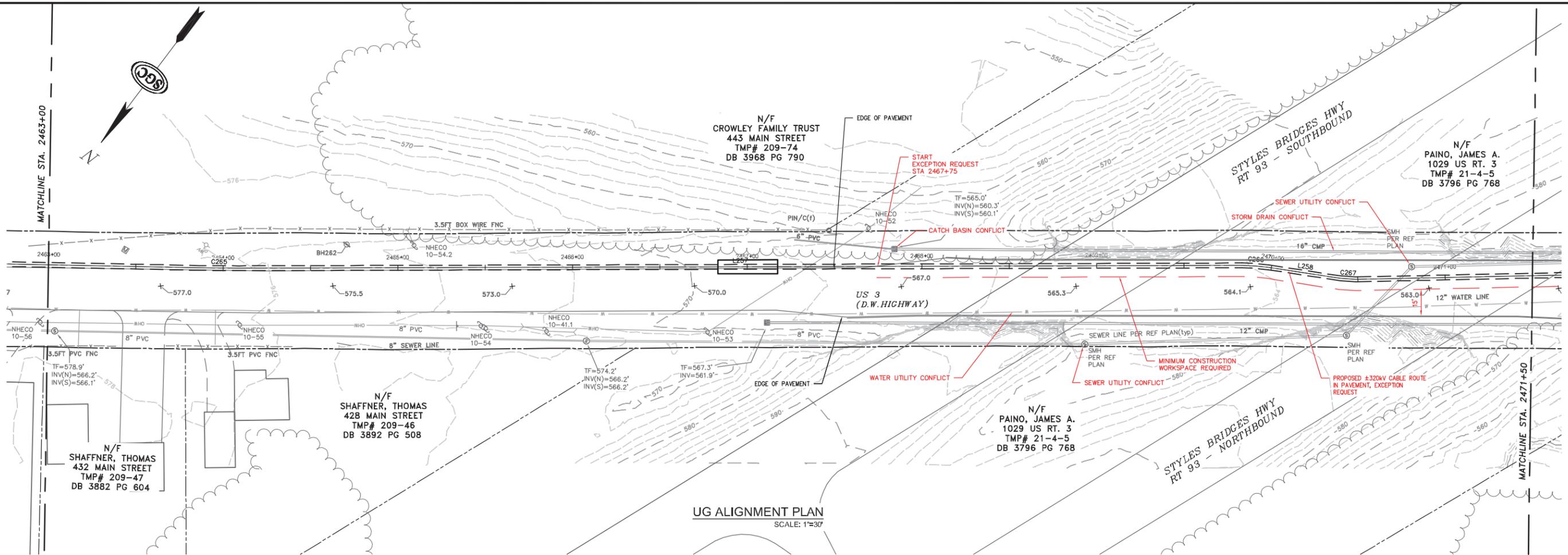
*Alignment in Pavement*

See attached Exhibit A showing a plan and profile view of the proposed installation.

*Crossing Over Utilities/Drainage*

See attached Exhibit B showing section view and cost estimates in Exhibit C.

**PRELIMINARY - NOT FOR CONSTRUCTION**



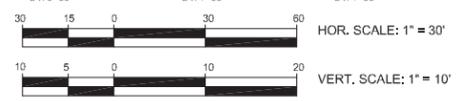
NO.	REVISION	DATE	BY	CHK	APPV.
0	EXCEPTION REQUEST	05/15/17	TDD	DOWN	CHD



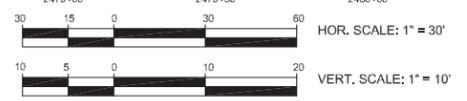
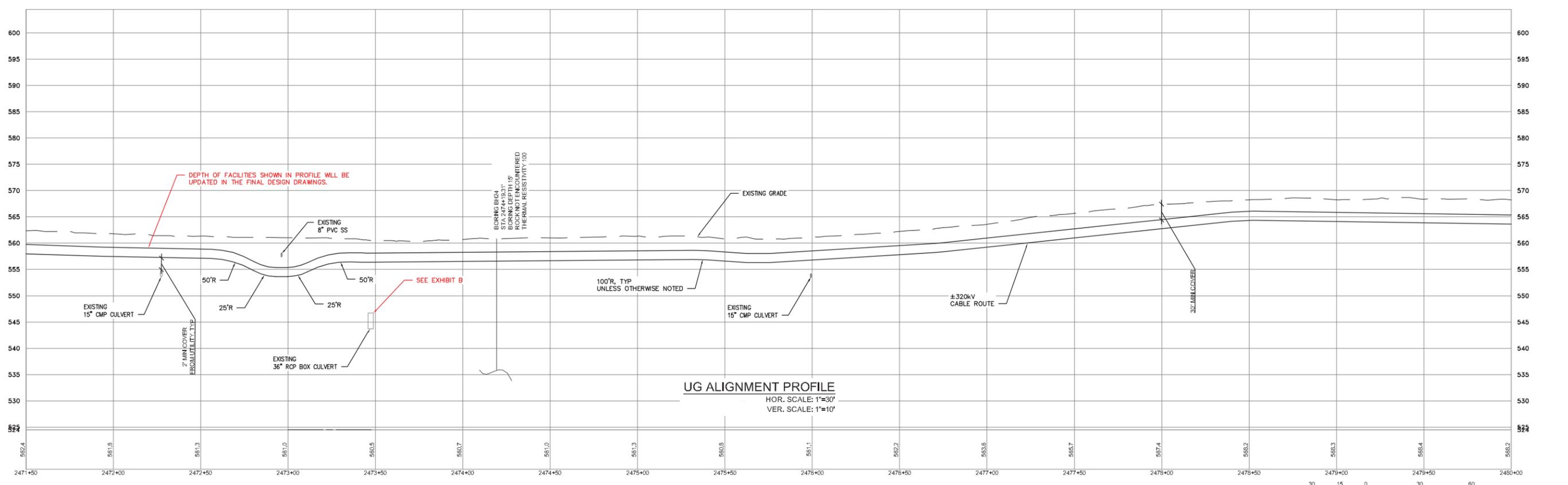
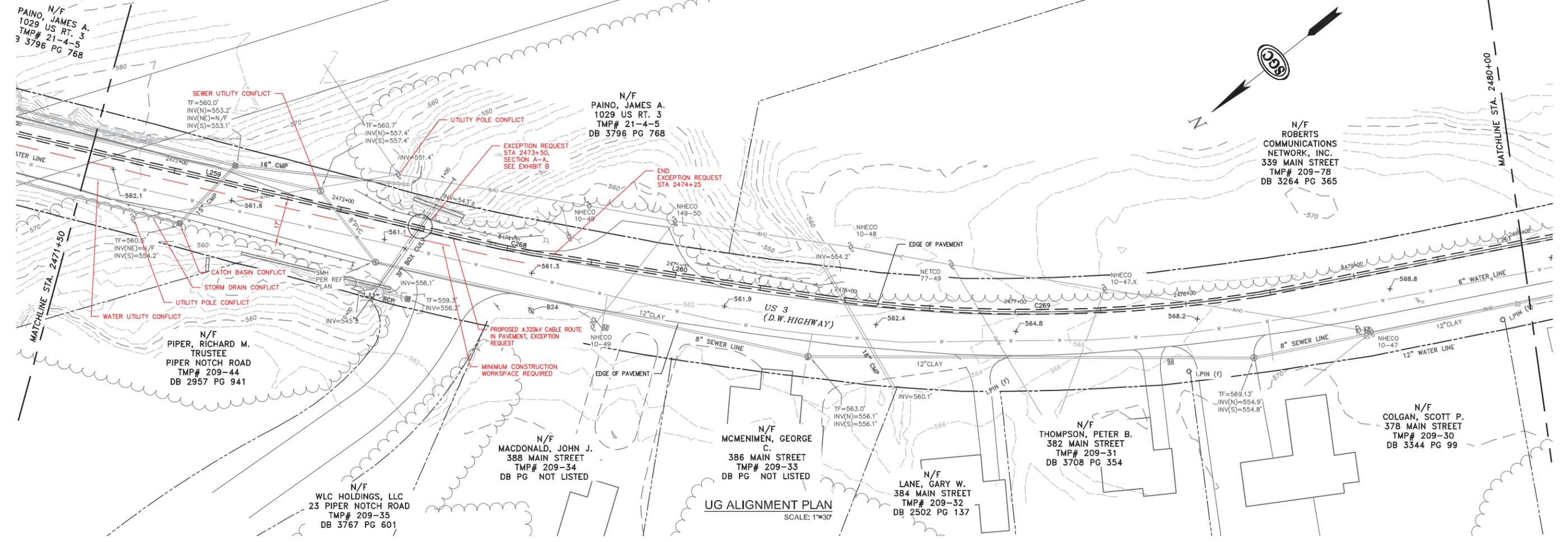
Transmission Business

EXCEPTION 12-ALIGNMENT IN PAVEMENT & CROSSING OVER EXISTING UTILITY/DRAINAGE: IPT WBR3-UNDERGROUND ALIGNMENT WBR3 SECTION-STA. 2467+75 TO STA. 2474+25  
SCALE: DATE: 05/20/17

DES: MRR CHK: TDD  
DRW: MRR APR: TMH  
TOWN: PLYMOUTH  
TRANSMISSION LINE: WBR3  
EXHIBIT A.1



**PRELIMINARY - NOT FOR CONSTRUCTION**



NO.	DATE	BY	CHKD	APPV.
0	05/15/17	TDD	DOWN	CHAD
		DATE	REVISION	



Transmission Business

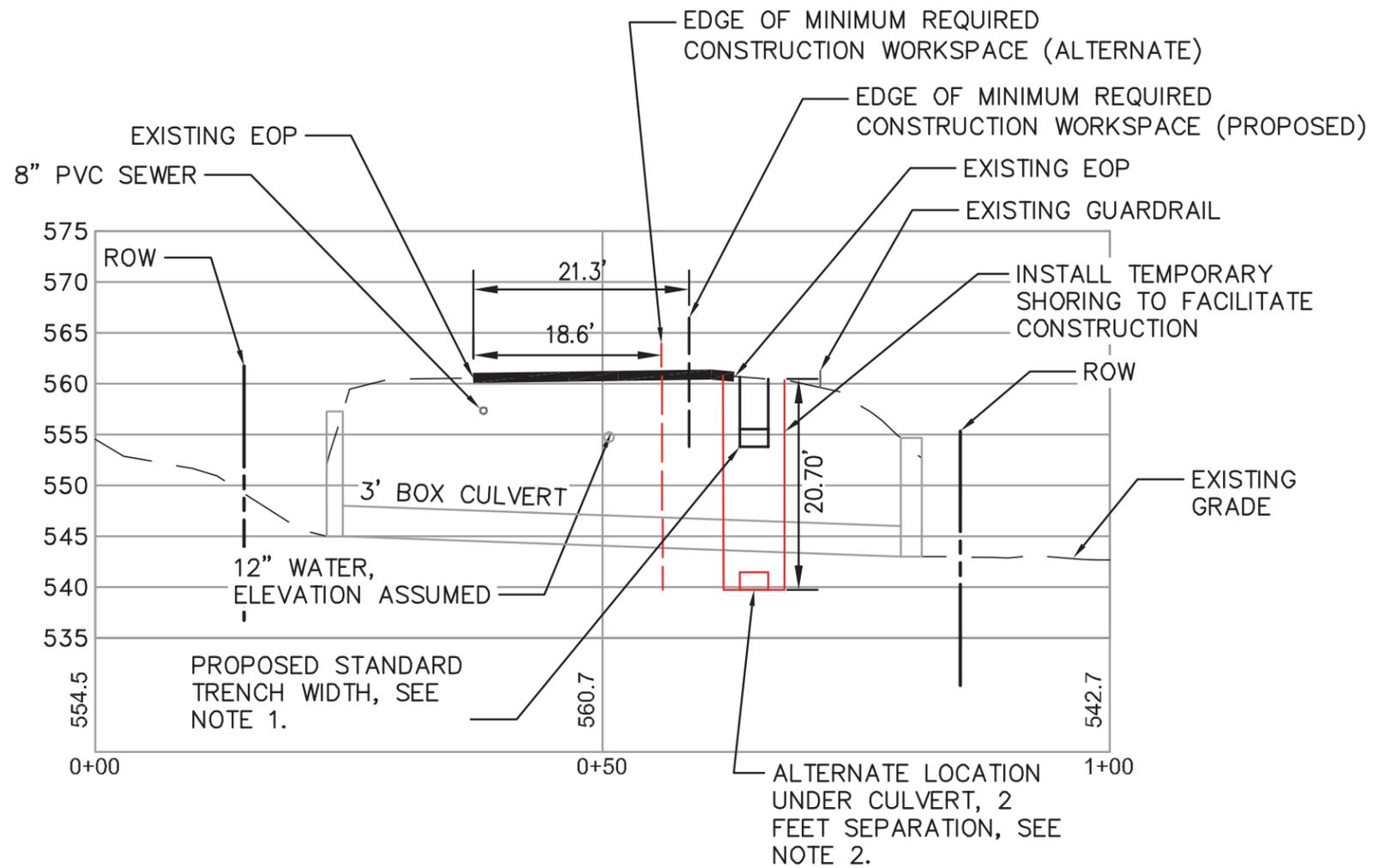
EXCEPTION 12-ALIGNMENT IN PAVEMENT & CROSSING OVER EXISTING UTILITY/DRAINAGE: WPT WBR3-UNDERGROUND ALIGNMENT WBR3 SECTION-STA. 2467+75 TO STA. 2474+25

DES: MRR CHK: TDD  
DRW: MRR APR: TMH  
TOWN: PLYMOUTH

DATE: 05/2017

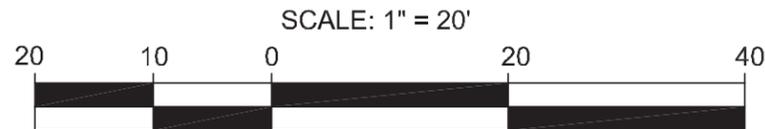
TRANSMISSION LINE:  
**WBR3**

EXHIBIT A.2



- NOTES:
- TRENCH WIDTH SHOWN TO BE MAINTAINED USING TRENCH JACKS AND TEMPORARY SHEETING.
  - TRENCH WIDTH SHOWN TO BE MAINTAINED WITH BOXES.

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



JOB NO.: 1384001

**TITLE:**  
EXCEPTION 12-ALIGNMENT IN PAVEMENT &  
CROSSING OVER EXISTING UTILITY/DRAINAGE  
NPT-WBR3 UNDERGROUND ALIGNMENT  
WBR3 SECTION-STA 2467+75 TO 2474+25±  
TOWN: PLYMOUTH

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

**REVISIONS:**

NO.	DATE	EXCEPTION REQUEST
0	05/15/21017	



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

SERVING OUR CLIENTS IN THE U.S.A. & CANADA

501 County Road Westbrook, Maine 04092 Tel: 207-347-8100 Fax: 207-347-8101  
 40 Harlow Street, Suite 2 Bangor, Maine 04401 Tel: 207-217-6769 Fax: 207-217-6018  
 14 School Street, Suite 203-5 Bristol, VT 05443 Tel: 802-735-0258  
 Galleria Tower 1, Suite 2475 2700 Post Oak Boulevard Houston, TX 77056

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

**Exhibit C - Exception 12 Cost Estimates**

**Additional Cost for Trenching Under Culvert**

Length	200'			
Max Depth	20.7'			
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.