Exception Request No.: 70 (Rev 1)
Section: WBR3
Town: Woodstock
Highway: US 3 (Tier 2)
Station: 1750+25; 1761+50 to 1764+50
Drawing No.: WBR3 C132-133
Survey Report Reference No.: WBR3 C128-129
Exception Type: Crossing Over Existing Drainage Structure
Alignment in Pavement

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 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. NPT has not identified a viable alternative if the requested exception for alignment in pavement is not granted.

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 1761+50 to 1764+50 of the NPT WBR3 Underground Alignment. (See Exhibit A.) Construction outside the pavement is not practicable due to limited ROW space outside the pavement caused by conflicts with drainage structures, a row of mature trees, and distribution poles. NPT does not have the necessary property rights to construct outside the NHDOT ROW.

In addition, our exception request in this area includes a crossing above a 30-inch RCP culvert with approximately 10 feet of cover. 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 proposed alignment is within the roadway due to the limited clearance that exists between the edge of pavement and ROW on the eastern side of US 3. Existing catch basins along the curb line also prevent moving the alignment closer to the edge of pavement. In addition, there are conflicts with a row of mature trees and a line of distribution poles.

Crossing over Existing Drainage Structure
The proposed alignment is set over an existing culvert (outside the pavement) 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 30" RCP culvert on US 3, Daniel Webster Highway at STA 1750+25±. There is 10 feet of cover over the culvert. The attached Exhibits A and B have been provided for this location to illustrate the constraints associated with installing the duct bank below the existing culvert.

The vertical positioning of the cable trench is constrained by the depth of the existing culvert (10 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 one to two weeks to the traffic impacts. Finally, we estimate the increase in cost associated with crossing underneath the culvert would be approximately $130,000 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.

NPT has 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 30-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 exhibits. 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 curb and existing catch basins, to avoid future conflicts with repairs or replacement. The installation of the duct bank 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 duct bank is constructed over an existing drainage structure or utility, NPT will encase the facility in a concrete duct bank 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 showing a plan and profile.

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

PRELIMINARY - NOT FOR CONSTRUCTION

N/F
JACK O'LANTERN OWNERS ASSOCIATION
32 JACK O'LANTERN DRIVE
TMP#103-1
DB PG NOT LISTED

JACK O'LANTERN DR

PROPOSED CHANGE IN ALIGNMENT OF ±320kV CABLE ROUTE, PROPOSED CABLE ROUTE TO BE MOVED OUTSIDE EDGE OF PAVEMENT

INV=608.0'

INV=600.7'

CHAIN LINK FENCE

±320kV CABLE ROUTE

BH194
TF=611.7'
INV=603.5'

TF=610.7'
INV=604.5'

EDGE OF PAVEMENT

1749+00 1750+00 1751+00 1752+00 1753+00 1754+00 1755+00 1756+00 1757+00

614.2 613.8 613.4 613.2 612.7 612.3 611.9 611.5 611.0 610.6 610.1

L65

TF=613.5'
INV=608.5'

30" RCP

EXCEPTION REQUEST
STA 1750+25±
SEE SECTION A-A, EXHIBIT B

15" CMP

15" CMP

15" RCP

US 3
(D.W. HIGHWAY)

TF=612.4'
INV(E)=600.7'
INV(S)=601.3'
INV(W)=600.9'

30" RCP

INV=601.6'

TF=611.4'
INV(E)=603.0'
INV(S)=603.2'
INV(W)=602.6'

INV=N/F

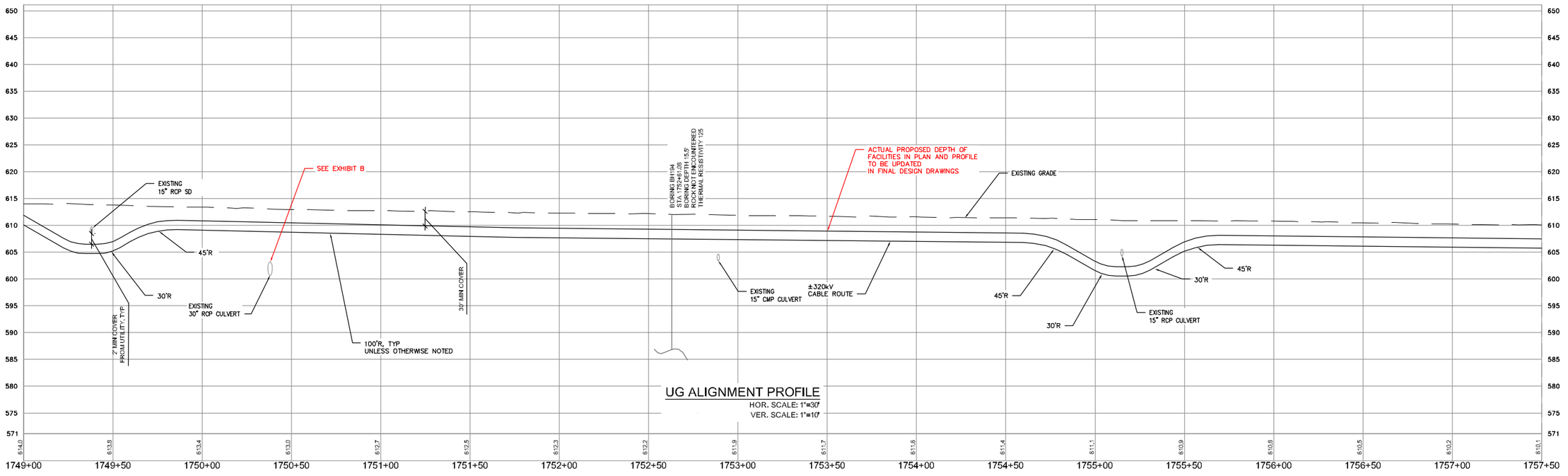
INV=N/F

EDGE OF PAVEMENT

MATCHLINE STA. 1749+00

MATCHLINE STA. 1757+50

UG ALIGNMENT PLAN
SCALE: 1"=30'



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

30 15 0 30 60 HOR. SCALE: 1" = 30'

10 5 0 10 20 VERT. SCALE: 1" = 10'

NO.	REVISION	DATE	DRWN	CHKD	APPRV.
0	EXCEPTION REQUEST	05/26/17	TDD	TDD	TMH

SGC Engineering, LLC
a Lloyd's Register Company

PAR Electrical Contractors, Inc.

THE NORTHERN PASS
Transmission Business

EXCEPTION 70-ALIGNMENT IN PAVEMENT AND CROSSING OVER EXISTING UTILITY/DRAINAGE - NPT WBR3-UNDERGROUND ALIGNMENT
WBR3 SECTION-FROM STA 1750+25 TO 1764+50±

DATE: 05/2017
SCALE:

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

TOWN: WOODSTOCK

TRANSMISSION LINE: WBR3

EXHIBIT A.1

PRELIMINARY - NOT FOR CONSTRUCTION

PROPOSED CHANGE IN ALIGNMENT OF ±320kV CABLE ROUTE, PROPOSED CABLE ROUTE TO BE MOVED OUTSIDE EDGE OF PAVEMENT

CHAIN LINK FENCE

MATCHLINE STA. 1757+50

US 3 (D.W. HIGHWAY)

JACK O'LANTERN DR

N/F
JACK O'LANTERN OWNERS ASSOCIATION
32 JACK O'LANTERN DRIVE
TMP#103-1
DB PG NOT LISTED

TF=605.2'
INV=601.8'

UP CONFLICT

BH195

#1-102A

CATCH BASIN CONFLICT

NHECO
#5406-5

UP CONFLICT

INV=600.8±'

INV=599.3±'

EDGE OF PAVEMENT

MATURE TREES CONFLICT

AREA BEYOND ALIGNMENT IN PAVEMENT EXCEPTION REQUEST TO BE MOVED OUTSIDE OF PAVEMENT

END EXCEPTION REQUEST STA 1764+50±

MATCHLINE STA. 1766+00

ALIGNMENT IN PAVEMENT EXCEPTION REQUEST START STA 1761+50±

15" RCP

TF=606.0'
INV=603.0'

48" RCP

48" RCP

EDGE OF PAVEMENT

MINIMUM REQUIRED CONSTRUCTION WORKSPACE

N/F
JACK O'LANTERN, INC.
DANIEL WEBSTER HIGHWAY
TMP#103-8
DB PG NOT LISTED

INV=602.9'

INV=602.3'

UG ALIGNMENT PLAN
SCALE: 1"=30'

ACTUAL PROPOSED DEPTH OF FACILITIES IN PLAN AND PROFILE TO BE UPDATED IN FINAL DESIGN DRAWINGS

EXISTING GRADE

100'R, TYP
UNLESS OTHERWISE NOTED

30' MIN COVER

±320kV
CABLE ROUTE

45'R

30'R

BORING BH195
STA 1761+94.14
BORING DEPTH 15.5'
SOIL RESISTIVITY MEASURED
THERMAL RESISTIVITY 90

EXISTING
15" RCP CULVERT

30'R

7' MIN COVER
FROM UTILITY, TYP

45'R

45'R

30'R

EXISTING 48" RCP
CULVERTS

45'R

30'R

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

30 15 0 30 60 HOR. SCALE: 1" = 30'

10 5 0 10 20 VERT. SCALE: 1" = 10'

NO.	REVISION	DATE	DRWN	CHKD	APPRV.
0	EXCEPTION REQUEST	06/21/17	TDD	TDD	TMH

SGC Engineering, LLC
a Lloyd's Register Company

PAR
PAR ELECTRICAL CONTRACTORS, INC.

THE NORTHERN PASS
Transmission Business

EXCEPTION 70-ALIGNMENT IN PAVEMENT AND CROSSING OVER EXISTING UTILITY/DRAINAGE: NPT WBR3-UNDERGROUND ALIGNMENT
WBR3 SECTION-FROM STA 1750+25 TO 1764+50±

DATE: 05/2017

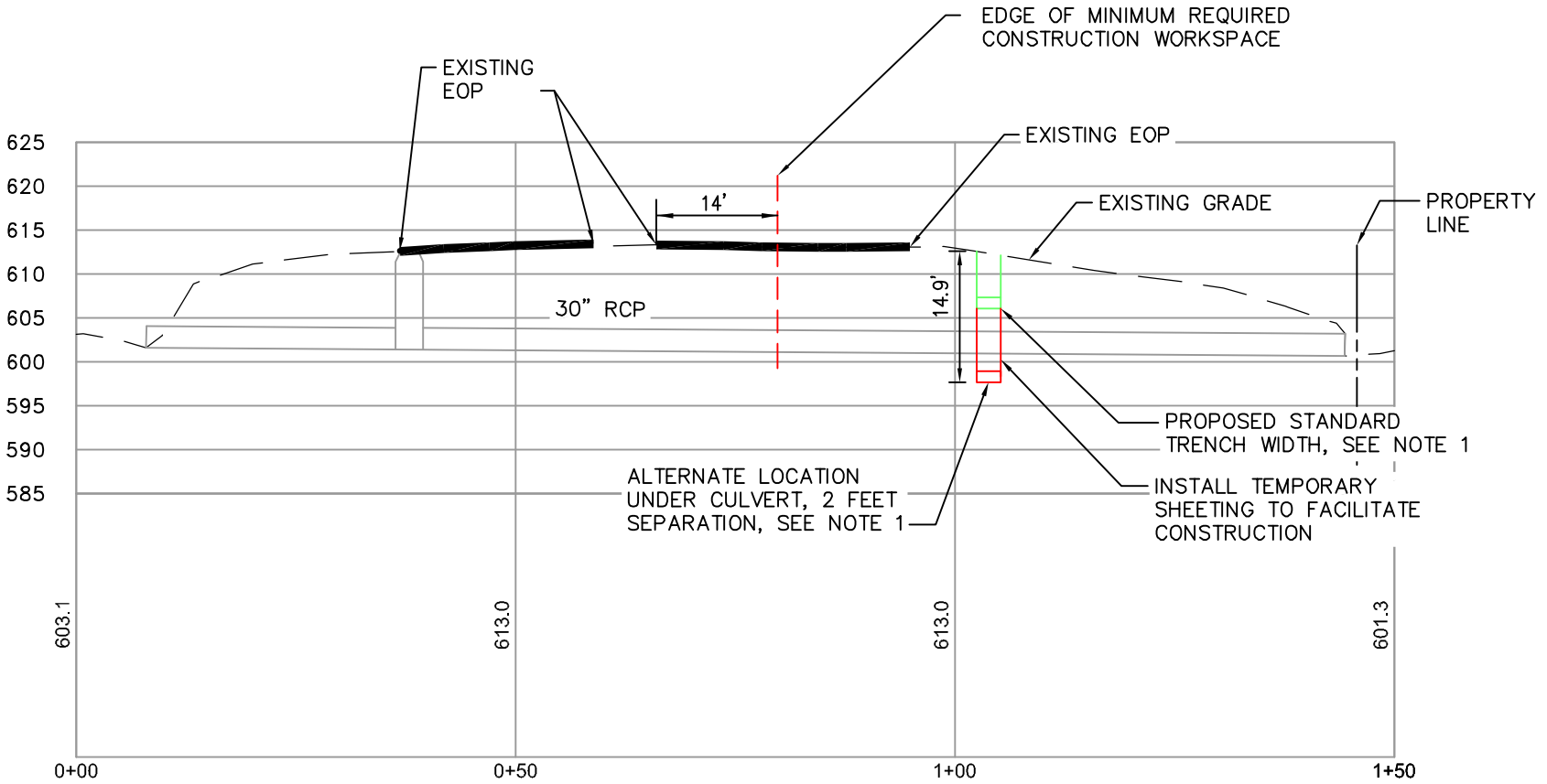
SCALE:

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

TOWN: WOODSTOCK

TRANSMISSION LINE: WBR3

EXHIBIT A.2



SECTION A-A

SCALE: 1"=20'

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

SCALE: 1" = 20'

20 10 0 20 40

JOB NO.: 1384001

TITLE:

EXCEPTION 70
CROSSING OVER EXISTING UTILITY/DRAINAGE
NPT-WBR3 UNDERGROUND ALIGNMENT
WBR3 SECTION-STA 1750+25±
TOWN: WOODSTOCK

PREPARED FOR:

NH DOT
7 HAZEN DRIVE
CONCORD, NH

REVISIONS:

NO.	DATE	EXCEPTION REQUEST
0	05/26/2017	

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

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: 207-217-5769, Fax: 207-217-6018
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

Exhibit C - Exception 70 Cost Estimates

Additional Cost for Trenching Under 30" RCP Culvert

Length	200			
Max Depth	14.9'			
Min Depth	6.7'			
	Quantity	Units	Unit Price	Total
Trench Cost for Deeper Trench	200	LF	$800.00	$160,000.00
Deduct for Base Trench Cost	200	LF	$150.00	($30,000.00)
Net Additional Cost				$130,000.00

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	22'			
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.