SUDBURY TO HUDSON 115KV UNDERGROUND TRANSMISSION LINE

UNDERGROUND TRANSMISSIONS ENGINEERING SERVICES

Eversource

20 OCTOBER 2016

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1.0 Site Walk Down

On October 21, 2016 a site walk down of particular areas of interests was performed by the following participants:

1. Bill Bernoe – B&V
2. Reece Wheat – B&V
3. Doug Charles – B&V
4. Aaryn French – Bond Brothers
5. Denise Bartone – Eversource

The areas of interest were the known problem areas which included the three water crossings along the route (all Station references pertain to the drawings issued September 18, 2015 by B&V):

1. Fort Meadow Brook near Chestnut Street (Approx. STA 50+00)
2. Hop Brook (Approx. STA 215+50)
3. Hop Brook Crossing (Approx. STA 361+00)

Other areas of interest included wetland areas, narrow widths along the track route, steep slopes, high water etc.

All observations made in this report are based solely on visual inspection. Additional data will be required to make a formal assessment.

2.0 Water Crossings

2.1 Hop Brook #127 (STA 50+00)

This bridge appeared to be in a condition that would allow for rehabilitation and repurposing of the bridge. The steel members appeared to be in satisfactory condition while the foundations remain in question. To do this an experienced bridge inspector would need to perform a full inspection as well as work with the design team to understand the modifications that would need to be performed to utilize for the Underground Transmission Lines.

If the bridge is deemed unacceptable the existing bridge would be removed and replaced with a bridge design to carry both pedestrian traffic and the Underground Transmission Lines. The new bridge would not exceed the existing footprint of the existing bridge.

2.2 Hop Brook #128 (STA 215+50)

This bridge also appeared to be in satisfactory condition to rehab and repurpose. The steel members appeared to be in a satisfactory condition while the foundations remain in question. This would require an experienced bridge inspector as well for inspection and understand from the design team what modifications would be done to the bridge.

2.3 Fort Meadow (STA 361+00)

The bridge was in poor condition and very much deteriorated. The foundation abutments were missing and the bridge was only being held up by piers in the water. This bridge would require removal. The wood was rotted or missing, foundations missing, etc.

3.0 Bike Path / Access Roads

3.1 Chestnut Street Crossing

The route is located some distance below Chestnut Street (approximately 20ft) and to cross it will require a road closure for up to approximately 2 months. To allow for the bike bath a precast section could be installed of roughly 9ft high by 12ft wide that would allow for a passage way under Chestnut Street. The transmission duct bank would be installed underneath the bike path in the passage way.

3.2 Existing Typical Sections

The existing rail alignment consists of a few different cross section types. Each presents different advantages and challenges to the future development. The existing rail, ballast and ties remains in place in most areas. The width of the rail bed is approximately 10 to 12 feet wide.

3.2.1 Typical Fill Section Without Restrictions

Much of the alignment is built in fill consisting of the track and ballast with approximately 1.5:1 side slopes on each side. The fill sections can either be widened to accommodate the additional width of the roadway and the ductbank or cut down in elevation until the top width is wide enough to accommodate the new roadway and ductbank. These areas can be modified relatively easily but may require substantial cut or fill.

3.2.2 Typical Fill Sections With Restrictions

Approximately 25% of the areas observed were built in fill but have restrictions that will make it difficult to either widen the berm or cut in elevation. These areas are generally adjacent to wetlands. The water levels in some areas will limit the amount of cut that can occur. In these areas the ductbank and road will have to share the same corridor to minimize the width. Manholes will have to be adjusted so that they are not placed in these areas.

3.2.3 Typical Cut Sections

A small percentage of the route is built in a cut section. These areas generally have shallow ditches adjacent to the railway ballast. If these areas are widened to accommodate the additional width required, then care will have to be taken to ensure the drainage is maintained. This will likely require substantially more cut in order to maintain the profile.

3.3 Soil Condition and Erosion Concerns

The existing side slopes along the alignment are fairly steep, estimated to be approximately 1.5:1 to 2:1. Since the slopes are currently vegetated, no substantial erosion was noted. Once the slopes are cleared for construction, an erosion issue could develop. The slope stability will need to be evaluated as a part of the geotechnical investigation.

The existing soil at the track section consists of approximately 4 to 6 inches of organic material and topsoil over the ballast and fill material. The topsoil should be stripped and stockpiled prior to general cut and fill operations. The topsoil can be restored on the slopes after construction to promote re-vegetation.

3.4 Stormwater Drainage

Several existing steel culverts approximately 24 inches in diameter were noted along the alignment. These culverts will be disturbed during construction of the ductbank and will require replacement.

The high-water level of the wetland areas will need to be confirmed to help determine the minimum elevation of the road. Some areas will not be able to be cut due to the water level.

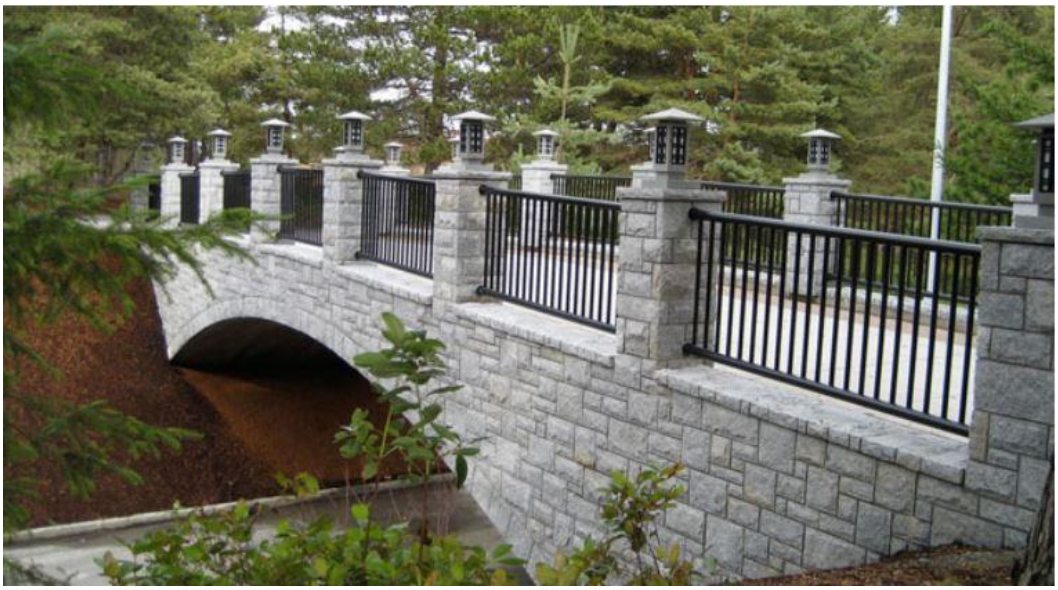
In areas where a cut section with side ditches is being modified, the back slopes will have to be cut back to maintain the drainage ditches.

4.0 Water Crossing Options

After some discussions and investigations a few options for the bridge at STA 361+00 which is in deteriorated condition or if any of the other bridges turn out to be unsalvageable are replacing the bridges with a precast or steel truss type bridge. These would be pre-manufactured and shipped to the site to minimize erection time and impact to the area. Some examples of the options can be seen in the following pictures.

TRUSS BRIDGES

PRECAST BRIDGES



5.0 Recommendations and Next Steps

5.1 Detailed Ground Survey

A detailed ground survey with profiles cut every 10-15 feet will be required to evaluate the full alignment and determine the appropriate new cross section for the area. This will also allow a detailed analysis of the cut/fill balance.