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Petition No. 1661
The Connecticut Light and Power Company d/b/a Eversource Energy
Stamford Underground Cable Modernization Project
Stamford

Staff Report
August 28, 2025

Notice

On March 31, 2025, the Connecticut Siting Council (Council) received a petition from The Connecticut Light and Power Company d/b/a Eversource Energy (Eversource) for a declaratory ruling pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k, for the Stamford Underground Cable Modernization Project (Petition or Project) within existing and new right-of-way (ROW) in the City of Stamford (City).

The Project consists of the replacement and partial relocation of existing underground 115-kilovolt (kV) electric transmission high pressure fluid filled (HPFF) cables on the 1753 and 1792 Lines with cross linked polyethylene (XLPE) cables in the City along approximately 5.2 miles of existing and new ROW between Cedar Heights Substation and Glenbrook Substation; and related electric transmission cable and substation improvements.

On March 21, 2025, in compliance with Regulations of Connecticut State Agencies (RCSA) §16-50j-40, Eversource provided notice of the proposed Project to the City and abutting property owners.

On March 31, 2025, the Council sent correspondence to the City stating that the Council has received the Petition and invited the City to contact the Council with any questions or comments by April 30, 2025. No comments were received from the City.

Under CGS §16-50x, the Council retains exclusive jurisdiction over the existing electric transmission line and substation facility sites. Under RCSA §16-50j-2a(29), “site” means a contiguous parcel of property with specified boundaries, including, but not limited to, the leased area, right-of-way, access and easements on which a facility and associated equipment is located, shall be located or is proposed to be located. The Council cannot delegate its statutory authority to any other entity.¹

Pursuant to CGS §4-176(e) of the Uniform Administrative Procedure Act, an administrative agency is required to take action on a petition for a declaratory ruling within 60 days of receipt. During a regular meeting held on May 15, 2025, pursuant to CGS §4-176(e), the Council voted to set the date by which to render a decision on the Petition as no later than September 27, 2025, which is the 180-day statutory deadline for a final decision under CGS §4-176(i).

The Council issued interrogatories to Eversource on July 9, 2025. Eversource submitted responses to the Council’s interrogatories on July 30, 2025. The Council issued a second set of interrogatories to Eversource on August 12, 2025. Eversource submitted responses to the Council’s interrogatories on August 18, 2025.

Community Outreach

Eversource provided an initial briefing on the Project to the City on May 17, 2022. Eversource met with the Mayor and City departments including, but not limited to, City Traffic & Parking, Engineering, Permit Clerk, Police, Fire, and neighborhood associations. The City expressed concerns regarding the Traffic Management

¹ *Corcoran v. Connecticut Siting Council*, 284 Conn. 455 (2007)

Plan (TMP) and outreach to other utilities. As of July 29, 2025, the TMP is still being developed by Eversource in consultation with the City.

Eversource initiated outreach to property owners along the Project route in March 2024. All abutting property owners were notified of the Project and provided instructions on how to obtain additional information, as well as how to submit comments to the Council. Property owners expressed concerns regarding potential impacts to private property. No work is planned on private property; however, in the unlikely event that work impacts private property outside of an easement or temporary access/use space, Eversource has a claims process to restore or compensate the property owner for unintended impacts.

During the construction phase of the Project, Eversource would inform the City and abutting property owners of construction activities and Project restoration work.

Existing Facility Site

The existing facility site includes approximately 5.2 miles of Eversource road ROW between Cedar Heights Substation at Duke Drive and Glenbrook Substation at Hamilton Avenue that varies in width from 25 feet to 70 feet and extends in an approximately south and east direction through a dense urban area with commercial and residential uses; public and private schools; and transportation corridors that include Interstate 95, Route 137, and Metro North Railroad (MNRR) – New Haven Service Main Line and New Canaan Service Branch Line.

The existing underground 115-kV HPFF 1753 and 1792 Lines utilize 500 kcmil copper cables with one conductor per phase and went into service in 1968. The 1753 and 1792 Lines are primarily located within City streets as well as Eversource-owned substation properties, privately owned properties and Connecticut Department of Transportation (DOT)-owned property (railroad ROW).

Beginning at Cedar Heights Substation, the existing 1753 and 1792 Lines share a route that runs in a southerly direction along Duke Drive and then east along Cedar Heights Road and then turns south onto High Ridge Road (Route 137) and turns east onto Vine Road. The route continues until Vine Road ends and turns south onto Newfield Avenue. The route continues along Newfield Avenue and turns east onto Colonial Road and south onto Pilgrim Walk and then crosses Hope Street onto Scofield Avenue. The route continues along Scofield Avenue until it ends and turns south onto Glenbrook Road and east onto Windell Place. The route crosses under the DOT railroad ROW along an existing easement and continues south across private property along an existing easement before crossing Hamilton Avenue and entering Glenbrook Substation.

There are 12 existing splice vaults, intermittently spaced along the existing cable route with utility manhole access at the surface grade level.

The existing Cedar Heights Substation is located at 64 Rapids Road and connects to the underground 1753 and 1792 Lines. This substation is served by two lines to maintain continuity of service in the event of the loss of one of the lines (e.g. during a fault, maintenance or repair). No other electric transmission lines terminate at Cedar Heights Substation.

The existing Glenbrook Substation is located at 97 Hamilton Avenue and connects to the underground 1753 and 1792 Lines. Glenbrook Substation also connects to the following 115-kV lines: the overhead 1450 Line and underground 1151 Line that connect to South End Substation in Stamford; the overhead 1440 Line that connects to Waterside Substation in Stamford; the overhead 1880, 1867 and 1608 Lines that connect to Norwalk Harbor Substation in Norwalk; and the underground 1522 and 1734 Lines that connect to Norwalk Substation in Norwalk.

See attached Figure 1 – Project Location.

Project Need

The purpose of the proposed Project is to improve system reliability on the 1753 and 1792 Lines by replacing existing HPFF electric transmission cables with XLPE cables as part of Eversource's long-term plan to modernize its aging underground cable systems. Over 60 percent of Eversource's existing HPFF lines are over 40 years old. The location of existing Eversource HPFF lines in Connecticut and their associated ratings are as follows:

Circuit Number	Steady State Rating (Amps)	Line Section	In-Service Date	Age In Years
1270	615	Triangle 11A – Middle River 28M (Danbury)	1976	49
1337	615	Triangle 11A – Middle River 28M (Danbury)	1976	49
1704	1,230	South Meadow 1A – Southwest Hartford 47N (Hartford)	1974 (See Note 1)	51
1722	1,230	Northwest Hartford 2N – Southwest Hartford 47N (Hartford)	1974 (See Note 1)	51
	567	Aetna Tap – Aetna Cogen (Hartford)	1988	37
1753	470	Glenbrook 1K – Cedar Heights (Stamford)	1968	57
1792	470	Glenbrook 1K – Cedar Heights (Stamford)	1968	57
1880	975	Norwalk Harbor 6J – Ely Avenue (Norwalk)	1959 (See Note 2)	66
1608	944	Norwalk Harbor 6J – Ely Avenue (Norwalk)	1959 (See Note 3)	66
1867	1,190	Norwalk Harbor 6J – Ely Avenue (Norwalk)	1972	53
500	655	Hallville Junction – SCRRRA Cogen American Ref-Fuel (Preston)	1991	34
3403 C/D	2,212	Archer's Lane – Norwalk Junction (Wilton and Redding)	2006	19

Note 1: The 1704 & 1722 Lines are under construction and being replaced with new XLPE cables. Reference Petition 1605.

Note 2: The 1880 Line was reconductored in 2018.

Note 3: The 1608 Line was reconductored in 2019.

The existing HPFF cable systems require ancillary equipment such as fluid pressurizing plants and backup generators to maintain the temperature and pressure of the dielectric fluid (mineral oil) that surrounds the HPFF cables. The presence of insulating fluids also includes the risk of release. Additionally, there is only one global supplier left that produces HPFF cables, and technicians with experience in maintaining and repairing HPFF systems are becoming increasingly scarce. The pending obsolescence of HPFF makes it difficult for Eversource to maintain a reliable and continuous inventory of replacement materials and equipment.

XLPE technology does not require dielectric fluid, and it has fewer components subject to potential failure. In terms of operations and maintenance, XLPE systems are easier and faster to repair and maintain because such work would occur primarily within manholes/vaults. On the other hand, HPFF repairs and maintenance can require excavations to locate and repair damaged cables and/or to address oil leaks. XLPE also provides a higher load-carrying capability than HPFF. Thus, for the proposed Project, Eversource proposes to replace the 115-kV 500 kcmil copper HPFF 1753 and 1792 Lines with mostly 5,000 kcmil aluminum XLPE. One segment of the replacement cables would be 5,000 kcmil copper beneath 88 Hamilton Avenue and Glenbrook Substation to support the load requirements and to avoid derating the lines or adjacent existing electric utilities.²

Neither the 1753 Line nor the 1792 Line have experienced any recent operational issues, and there are no operation or outage reports for these Lines.

The Project is identified in the 2025 Eversource Forecast of Loads and Resources Report and Eversource's Local System Plan.³ On September 22, 2022, ISO New England Inc. (ISO-NE) determined that the Project will not have an adverse impact on the transmission system. There are no generation facilities or battery energy storage facilities listed on the ISO-NE interconnection queue associated with the proposed Project.

Cost

The total estimated cost of the Project is approximately \$239.9M. The cost breakdown by various components is provided below.

Item	Description	Total (\$M)	Line 1753 (\$M)	Line 1792 (\$M)
A	Engineering and Indirect	\$14.3	\$8.7	\$5.6
B	Cable installation (5000-kcmil)	\$38.5	\$20.0	\$18.5
C	Duct bank installation	\$101.5	\$90.7	\$10.7
D	Micro-tunneling	NA	NA	NA
E	Jack and Bore	\$4.2	\$4.2	\$0
F	Substation work	\$7.8	\$3.9	\$3.9
G	Commissioning	\$0.88	\$0.44	\$0.44
H	Land Rights	\$6.2	\$3.3	\$2.9
I	Environmental	\$0.93	\$0.47	\$0.46
J	AFUDC	\$32.9	\$24.3	\$8.6
K	Contingency	\$32.6	\$24.3	\$8.6
Total		\$239.8¹	\$180.9	\$58.9

Accuracy band: Overall estimates are +/- 25%.

² The copper cable segment is approximately 1,110 linear feet for the 1753 Line and 1,520 linear feet for the 1792 Line. The lengths are not equal due to different routes to reach the terminal positions at Glenbrook Substation.

³ The Project ID is ES-23-LSP-118.

The Project is not eligible for regional cost allocation because the 1753 and 1792 Lines are not classified by ISO-NE as Pool Transmission Facilities (PTF).⁴ The Lines are classified by ISO-NE as radial facilities. The entire Project cost is associated with non-PTF. It would be collected via Local Service charges and allocated among Eversource ratepayers.⁵ Specifically, about 96 percent of the Project cost would be borne by Eversource end-use customers, and about 4 percent of the Project cost would be borne by Eversource wholesale customers (e.g. CMEEC). Any cost overruns associated with the Project would also be allocated to Eversource ratepayers. The estimated rate increase for Eversource customers is approximately \$1.09 per month based on 700 kWh of usage.

On June 7, 2024, the Council issued a Declaratory Ruling in Petition 1605 for the replacement and partial relocation of 6.79 circuit-miles of the 115-kV HPFF 1722 and 1740 Lines with 5,000 kcmil all copper XLPE lines in Hartford.⁶ Construction commenced in December 2024. The total estimated cost of the Petition 1605 project is \$315.8M or an approximate average cost of \$46.51M per circuit mile.

On March 7, 2025, the Council issued a Declaratory Ruling in Petition 1642 for the replacement and partial relocation of 7.2 circuit-miles of the 115-kV HPFF 1270 and 1337 Lines with 5,000 kcmil all aluminum XLPE lines in Danbury.⁷ Construction has not yet commenced. The total estimated cost of the Petition 1642 project is \$185.2M or an approximate average cost of \$25.72M per circuit mile.

The total estimated cost of this Project is \$239.9M or an approximate average cost of \$23.99M per circuit-mile.⁸ It has an approximately 48.4 percent lower cost per circuit-mile than the Petition 1605 project for reasons including, but not limited to, use of a single double-circuit duct bank versus two separate single-circuit duct banks and use of aluminum conductors for much of the route at about 39 percent of the cost of the copper conductors selected for Petition 1605. The proposed Project also has an approximately 6.7 percent lower cost per circuit-mile than the Petition 1642 project for reasons, including, but not limited to, lower engineering costs, lower jack-and-bore costs, no micro-tunneling, and lower substation work costs on a dollars per circuit-mile basis.

Per the Council's *2022 Life-Cycle Cost Analysis of Overhead and Underground Electric Transmission Lines* (2022 Life Cycle Report), the life cycle cost for a transmission facility is the sum of the net present values (NPV) of three components over the study period: first costs, operations and maintenance (O&M) costs and electrical loss costs.⁹ The first costs or costs to design, permit and construct a line are used as a comparison to total facility cost.¹⁰

The Project has a first cost of approximately \$244.3M, which is comparable to the total Project cost.

⁴ ISO-NE defines Pool Transmission Facilities as facilities rated 69-kV or above owned by the participating transmission owners over which ISO-NE has operating authority in accordance with the terms set forth in the Transmission Operating Agreements.

⁵ The 1753 and 1792 Lines are not considered PTF under ISO-NE's Transmission Operating Agreement because they serve radial load at Cedar Heights Substation (i.e. terminate at that substation) and do not contribute any parallel capacity to the PTF system.

⁶ https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1605/decisionstaffreport/pe1605_dcltr_energy_a.pdf?rev=61530afa813244c39d1fb23f648e3ef4&hash=FF2D4B2AC20FC8BD02053BCA450822BC

⁷ https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1642/decision_staffreport/pe1642_dcltr_030725_a.pdf?rev=8a11de10d89c4236a5d5e5066f4d0120&hash=DC4982ED987813DC574BBD5788CD8BB9

⁸ The two replacement cables for the Project are approximately 5.0 linear miles each or a total of approximately 10.0 circuit-miles.

⁹ 2022 Life Cycle Report, p. 21

¹⁰ O&M costs and electrical loss costs components are not related to the Project cost total.

Utilizing an annual O&M escalation rate of 2 percent, a discount rate of 8 percent and a 40-year study period from the 2022 Life Cycle Report, the NPV of O&M would be approximately \$300k per circuit-mile or a total of \$3M based on about 10 circuit-miles. Utilizing the same study period and discount rate along with Eversource's projected load growth and energy cost data¹¹, the NPV of the electrical loss costs would be approximately \$1.8M. Thus, the total life cycle cost would be approximately \$249.1M or still within the accuracy band of total Project cost because first costs are the dominant component.

Cost – Cable Alternatives

XLPE cables are a more modern technology “dry” cable design that utilize cross-linked polyethylene to act as insulation versus HPFF where the oil insulates and acts as a coolant. XLPE dissipates heat naturally rather than relying on a liquid coolant.

Eversource prefers 5,000 kcmil aluminum XLPE cable for most of the Project route because coordination with ISO-NE determined that the steady state and long-term emergency rating requirements are lower for this Project than a 5,000 kcmil all copper XLPE cable, which was used for the Petition 1605 project.

Eversource evaluated 5,000 kcmil copper XLPE cable (for the entire Project route) as an alternative design. It is feasible; however, 5,000 kcmil copper XLPE cables cost approximately \$142 per foot versus approximately \$55 per foot for the aluminum 5,000 kcmil XLPE cables. The proposed route requires approximately 5 linear miles of two circuits or about 10 circuit-miles of three-phase cables, resulting in roughly 158,400 linear feet of cable. This would increase total Project cost by at least \$13.1M despite the higher capacity/ampacity of copper cable versus aluminum.¹² Additionally, the increase in first costs is expected to outweigh any decrease in electrical loss costs associated with copper.¹³ The total life cycle cost for this alternative would be at least \$260.4M, or at least \$11.3M greater than the proposed Project life cycle cost of \$249.1M, and this alternative was rejected.

Eversource evaluated 3,500 kcmil copper XLPE cable. It is feasible; however, it costs approximately \$122 per foot versus approximately \$55 per foot for the aluminum 5,000 kcmil XLPE cables. With approximately 158,400 linear feet of cable required, this alternative would increase total Project cost by roughly \$10.6M. Additionally, the NPV electrical loss costs would increase from \$1.8M to approximately \$2.3M due to the smaller conductor size outweighing the lower resistance benefit of copper. The total life cycle cost for this alternative would be approximately \$266.6M, or \$17.5M greater than the proposed Project life cycle cost of \$249.1M, and this alternative was rejected.

Thus, Eversource proposes the 5,000 kcmil aluminum XLPE cable configuration as the best option for the Project.

Project Development

The replacement cables cannot be installed in exactly the same locations as the existing cables because the existing cables must remain in service until the replacement cables are installed and energized. Notwithstanding, the replacement of the 1753 and 1792 cables would generally follow the existing HPFF cable routes with the exception of two minor route deviations: Northrop Field Park Deviation and DOT Railroad ROW Deviation. Collectively, these two deviations result in an approximately 0.76 percent net increase in total Project route length. The proposed route, including the proposed deviations, was selected for the following reasons:

¹¹ The projected load growth rate is 4.70 percent. Energy cost is \$100/MWh with a 4.1 percent annual escalation rate.

¹² This takes into account that, of the 158,400 linear feet, roughly 150,510 linear feet would be aluminum.

¹³ The proposed configuration has an electrical loss cost NPV of approximately \$1.8M. A decrease in this number due to lower electrical resistance of copper would not offset a \$13.1M first cost delta. Thus, total life cycle costs for the 5,000 kcmil all copper alternative would be expected to be greater than the proposed configuration.

- a) Consideration of constructability challenges such as utility conflicts and potential impacts to public and private properties;
- b) Consideration of environmental impacts and costs; and
- c) Following the existing route alignment to the extent feasible.

The two route deviations are listed below.

Northrop Field Park Deviation – 1753 and 1792 Lines

This proposed route would deviate from the existing route at the intersection of Glenbrook Road and Scofield Avenue. Rather than turn at the intersection, the proposed turn would be shifted slightly to the southwest to run underneath the northeastern corner of the Northrop Field Park baseball field.¹⁴ This would avoid a busy intersection to maintain traffic flow during construction. The proposed route deviation is approximately 75 feet shorter than the existing route in this area. This deviation results in cost savings of approximately \$198k.

DOT Railroad ROW Deviation – 1753 and 1792 Lines

This proposed route would deviate from the existing route from Windell Place (west of the railroad ROW) to the Renatus Group, LLC d/b/a 88 Hamilton Ave LLC parcel (east of the railroad ROW). This deviation would provide the workspace for a jack-and-bore installation in a location north of an existing building footprint on the east side of the railroad ROW to accommodate construction and line bend and placement requirements. The proposed route deviation would result in approximately 250 feet of additional duct bank and 25 feet of additional jack-and-bore installation of the conductor casing or a total length increase of approximately 275 linear feet. This deviation results in an incremental cost (cost delta) of approximately \$694k.

Proposed Project

The Project is proposed to address identified asset condition deficiencies by replacement of aging HPFF transmission cables with new XLPE cables to improve long-term reliability, meet load growth needs, and reduce the risk of dielectric fluid releases to the environment. Approximately 5.2 linear miles of double-circuit cable would be replaced between Cedar Heights Substation and Glenbrook Substation. Specifically, the Project entails the replacement of 500 kcmil copper HPFF cable with 5,000 kcmil mostly aluminum (with some copper) XLPE cable for both the 1753 and 1792 Lines.

The ten-year load forecast for the 1753 and 1792 Lines is 33.8 MW in 2025 and 35.4 MW in 2034 for each line, or 67.6 MW in 2025 and 70.8 MW in 2034 in total. The New England region's clean energy goals and expected load growth associated with electrification (such as heating and electric vehicles) results in a higher load-carrying capacity necessary to address the ongoing energy transition. Based on Eversource's load projections, the 1753 and 1792 circuit loads each have a compound annual growth rate (CAGR) of approximately 0.52 percent from 2025 through 2034. Eversource notes a CAGR of approximately 4.70 percent for loads in the area based on ISO-NE projections to establish substation loads for transmission system assessments.¹⁵ The proposed replacement cables would have additional capacity relative to the existing cables to be replaced. A table of cable capacities is included below.

¹⁴ Eversource is coordinating with the City to secure an easement for the route deviation over a portion of Northrop Field Park.

¹⁵ This higher CAGR is utilized in the life cycle cost analysis and is the more conservative number for the purposes of electrical loss cost calculations.

Table A-1				
Cable Ratings (MVA refers to Megavolt-Amperes)				
	Normal Summer	LTE Summer	Normal Winter	LTE Winter
Existing 1753 and 1792 cables	94 MVA	103 MVA	106 MVA	113 MVA
Proposed replacement 1753 and 1792 cables	118 MVA	357 MVA	133 MVA	421 MVA
LTE refers to the Long-Term Emergency cable rating, which is 12 hours in the summer and 4 hours in the winter; summer ratings are in effect from April 1 through October 31, and winter ratings are in effect from November 1 through March 31.				

The duct bank would contain six 8-inch diameter polyvinyl chloride (PVC) conduits or one conduit per phase based on two circuits. Most of the duct bank would utilize a double-circuit horizontal (3 x 2) phase arrangement to minimize the depth of excavation. A vertical arrangement would typically be reserved for areas where it is necessary for routing between adjacent utilities and/or approaching vaults. Specifically, near vaults, the double-circuit configuration would split into two single-circuit (typically vertical 1 x 3) configurations.¹⁶

See attached Figures 2 and 2a – Duct Bank Configurations.

In addition, two 2-inch diameter conduits (or one per circuit) would be located within the duct bank to carry fiber optic cables for remote protection and control of the cable system and associated equipment.

Approximately 26 splice vaults (or 13 per line) are proposed for the Project. Splice vaults would typically be spaced from 830 feet to 2,630 feet apart, with an average spacing of approximately 1,890 feet. A typical splice vault would have outside dimensions of approximately 22 feet long, by 7 feet wide by 7 feet tall. For each circuit, a ground continuity conductor would be installed in 2-inch diameter PVC conduit to ground the cable sheaths and equipment within the proposed vaults.

See attached Figure 3 – Splice Vault Configuration.

Eversource would utilize a combination of open trench construction and jack-and-bore trenchless construction to install the XLPE. See section titled “Project Construction.”

Cedar Heights Substation

The Cedar Heights Substation load in 2024 was 63.2 MW and the projected 10-year load for Cedar Heights Substation is 70.8 MW in 2034. Cedar Heights Substation loads are served exclusively by the radial facilities. Modifications necessary to facilitate this Project at the substation related to the 1753 and 1792 Lines include, but are not limited to, the following:

- Install new approximately 22-foot tall pothead structures for each line to transition from underground to overhead within the substation;
- Replace coupling-capacitor voltage transformers (CCVTs) with three line potential transformers (PTs) reaching a height of approximately 45 feet including the lightning mast;
- Retrofit the ground disconnect switches with new motor operators;
- Replace HPFF line relays and meters in the existing control house with new line relays and meters;

¹⁶ A horizontal single-circuit (3 x 1) configuration may also be used to achieve a more shallow trench depth to avoid interfering with other utilities.

- e) Install four all dielectric self-supporting (ADSS) fiber optic cable patch panels (or two per line) and associated supervisory control and data acquisition (SCADA) and telecommunications equipment within the control house; and
- f) Remove HPFF potheads.

The height of the tallest proposed equipment (45-foot tall PTs) would be shorter than the height of the tallest existing structure (46-foot tall disconnect switch structures) within the substation.

Glenbrook Substation

Glenbrook Substation loads are not served exclusively by the radial facilities. It is connected to other lines besides the radial facilities: 1753 and 1792 Lines. Modifications necessary to facilitate this Project at the substation related to the 1753 and 1792 Lines include, but are not limited to, the following:

- a) Install new approximately 22-foot and 25-foot tall pothead structures for the 1792 and 1753 Lines, respectively, to transition from underground to overhead within the substation;
- b) Install a new approximately 22-foot tall disconnect switch structure for the 1792 Line;
- c) Install two lightning masts approximately 65-foot tall within the fenced substation;
- d) Replace CCVTs with three line PTs reaching a height of approximately 20 feet;
- e) Relocate the 1792 Line to the 115-kV A3 & B3 ring bus;
- f) Install a new 115-kV circuit breaker (1K-24T-2) with associated motorized switches;
- g) Install a set of CCVTs between the existing 115-kV breaker and the new 115-kV breaker;
- h) Retrofit the ground disconnect switch for the 1753 Line with new motor operators;
- i) Replace HPFF line relays and meters in the existing control house with new line relays and meters;
- j) Install four ADSS patch panels (or two per line) and associated supervisory control and data acquisition (SCADA) and telecommunications equipment within the control house;
- k) Remove HPFF potheads on each line;
- l) Remove the 1792 Line position on the 115-kV A1 bus including the existing breaker, switches and CCVTs; and
- m) Remove the HPFF cable pressurization system (pump house) and all associated equipment.

The height of the tallest proposed equipment (65-foot lightning masts) would be comparable in height to the height of the tallest existing structure (60-foot tall termination structures) within the substation.

Public Health and Safety

The NESC is the authoritative code for ensuring the continued practical safeguarding of persons and utility facilities during the installation, operation and maintenance of electric power and communications utility systems, including substations, overhead lines and underground lines. The Project would comply with the 2023 NESC, which became effective February 1, 2023.

There would be no permanent changes to existing sound levels after completion of the Project. Noise associated with construction activities is exempt from DEEP Noise Control Regulations. Notwithstanding, any construction-related noise would be short-term and localized in the vicinity of work sites.

The Project would not include any new permanent lighting sources. Temporary lighting may be necessary to perform work during winter months, but such lighting would be focused on targeted work areas and result in a short-term localized effect.

Most construction activities would be performed during daylight hours to the extent feasible. However, some night work is expected to be necessary subject to City, DOT or MNRR requirements based on traffic and track outage availability. Additionally, trenchless construction would require continuous 24-hour work after it begins. Eversource would work with residents in areas where night construction work impacts may occur.

The proposed structures at Cedar Heights Substation and Glenbrook Substation do not require notice to the Federal Aviation Administration, and no marking or lighting would be required.

Electric fields (EF) are produced whenever voltage is applied to electrical conductors and equipment. Electric fields are typically measured in units of kilovolts/meter (kV/m). As the weight of scientific evidence indicates that exposure to electric fields, beyond levels traditionally established for safety, does not cause adverse health effects, and as safety concerns for electric fields are sufficiently addressed by adherence to the NESC, as amended, health concerns regarding Electric and Magnetic Fields (EMF) focus on magnetic fields (MF) rather than EF. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has established a guideline of 4.2 kV/m.

The Project route contains an existing transmission line that emits MF. In the United States, no state or federal exposure standards for 60-Hertz MF based on demonstrated health effects have been established, nor are there any such standards established worldwide. However, the ICNIRP has established a level of 2,000 milliGauss (mG), based on extrapolation from scientific experimentation, and the International Committee on Electromagnetic Safety (ICES) has calculated a guideline of 9,040 mG for exposure to workers and the general public, and recognized in the Council's *Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut*.

Eversource reviewed MF levels associated with the Project. Pre- and post-construction MF levels¹⁷ are presented in the table below:

Location	Magnetic Field Calculations (mG)	
	25 feet from centerline (at 1 meter above ground)	Maximum - over centerline (at 1 meter above ground)
Duct Bank	0.08	4.31
Transmission Line Vault	1.57	10.12
Trenchless Crossing	1.30	11.33

All MF values would be below the ICNIRP exposure guidelines of 2,000 mG.

The cables would not be a source of EF due to the shielding effects of the XLPE cable sheath.

The Project would replace cables rather than add new lines at the substations, and the replacement cables would be located proximate to the locations of the existing cables. Thus, the Project would not be expected to substantially change MF at the substation property boundaries.

¹⁷ MF levels are based on peak forecasted steady state load conditions which is more conservative than utilizing average annual load conditions.

Environmental Effects and Mitigation Measures

Minimal vegetation removal would be required due to the urban nature of the site. However, removal of vegetation would be conducted on Eversource-owned property along an approximately 300-foot long by 40-foot wide area centered over the proposed cable installation between Cedar Heights Substation and the end of Duke Drive. Some trees would also be removed at the end of Windell Place, near the adjacent DOT railroad ROW to accommodate the trenchless construction receiving pit workspace.

Total vegetation clearing associated with the Project is approximately 12,000 square feet. Vegetation removal activities would be performed in accordance with Eversource's April 2022 Best Management Practices Manual for Massachusetts and Connecticut (BMPs).¹⁸

A total of nine wetlands and three watercourses are located within or proximate to the Project ROW. One wetland complex includes Wetland 4 (W04) and Wetland 5 (W05) to the north of Vine Road; Wetland 6 (W06) and Wetland 7 (W07) to the south of Vine Road; and Watercourse S03 is carried under Vine Road by multiple 15-inch and 18-inch culvert pipes. Open trenching would be utilized in this area and would not impact the wetlands or Watercourse S03 culvert pipes.

One potential vernal pool (PVP1) was identified east of Vine Road within W04. PVP1 is not located within the disturbance area and thus is not expected to be impacted by the Project.

A potential watercourse crosses under Newfield Avenue just north of Dorlen Road. However, this potential watercourse is carried under Newfield Avenue via a 15-inch pipe. Open trenching would be utilized in this area and would not affect the pipe. Thus, the Project is not expected to impact this watercourse.

Wetland 8 (W08) is located east of the railroad ROW near Glenbrook Substation. The proposed route would cross under this wetland via trenchless construction at the DOT railroad ROW crossing. Wetland 9 (W09) is located east of the railroad ROW and south of W08. The proposed route would not cross W09. Thus, no impacts to these wetlands are expected to result from the Project.

Construction activities within wetlands and across watercourses would be conducted in accordance with Eversource BMPs.

The proposed Project is not located within a 100-year or 500-year Federal Emergency Management Agency-designated flood zone.

No work would be performed within a coastal boundary or a tidal wetland. The closest Coastal Boundary is located over 0.5-mile to the southeast of the site. Thus, no impacts to coastal resources are anticipated.

The nearest DEEP-designated Aquifer Protection Area (APA) is the Rewak APA. The limits of this APA, at its closest point to the Project route, are approximately at the intersection of Vine Road and Newfield Avenue. However, the proposed replacement cables would be located to the west or farther away from the APA than the existing cables, and the nearest proposed splice vaults would be located to the south and outside the APA. Notwithstanding, Eversource would conduct work in accordance with its BMPs which include provisions for the proper storage, secondary containment, and handling of diesel fuel, motor oil, grease and other lubricants, to protect subsurface water quality.

¹⁸ 2022 Eversource Best Management Practices MA_CT

The DEEP-approved Stormwater Pollution Control Plan (SWPCP) would contain details regarding the E&S control measures that would be implemented to protect wetlands. E&S controls would also be inspected weekly by a qualified inspector, as required by the SWPCP. The Project would comply with the SWPCP and Eversource's BMPs.

Invasive species mitigation measures would be conducted in accordance with Eversource's BMPs. Measures include the cleaning of temporary mats to prevent the introduction of invasive species, the cleaning of vehicles, equipment, materials, gear, footwear or clothing of all visible soil and plant material on site known to contain invasives or as near as practical to the invasive area, prior to leaving the Project site.

The Project is not located with a DEEP Natural Diversity Database (NDDDB) buffer area.

The northern long-eared bat (NLEB), a federal and state-listed Endangered Species, occurs in Connecticut. There are no known NLEB maternity roost trees within 150 feet of the site, and the nearest known NLEB hibernaculum is located over 6 miles to the west in Greenwich.¹⁹ Additionally, there are no known occurrences of NLEB in Stamford.²⁰ Thus, no impacts to NLEB are expected.

A Phase 1A Cultural Resources Assessment (Phase 1A Survey) determined that four properties and one district listed on the National Register of Historic Places (NRHP) are located within the study area of not less than 0.5-mile. The NRHP-listed properties are the C.J. Starr Barn & Carriage House; Hoyt-Barnum House; Octagon House; and John Knap House. The NRHP-listed district is the Renovah Manor Historic District.

The Phase 1A Survey also determined that six properties and one district on the State Register of Historic Places (SRHP) are located within the study area of not less than 0.5-mile. The SRHP-listed properties are the Roxbury School; Lord & Taylor Store; Rock Spring Manor; Michael A. Boyle Stadium; Ukraine Catholic Diocese of Stamford; and St. Basil's Chancery. The SRHP-listed district is Sterling Farms Complex.

To protect historic structures within 500 feet of construction, Eversource would implement a vibration monitoring plan. The cost of the plan is approximately \$50,000 and it is included in the Project cost.

A pedestrian survey also identified 18 previously unrecorded historical buildings within 500 feet of the Project ROW. By letter dated June 25, 2024, the State Historic Preservation Office determined that there would not be an adverse effect to historic properties subject to the implementation of an unanticipated discoveries/indirect effects plan (UDP).

The Northrop Field Park Deviation would result in a minor impact to Northrup Field Park, but recreational use of the park would not be impacted. The disturbed northeastern corner of the park would be restored in consultation with the City.

The Project route would run along Newfield Avenue/Strawberry Hill Avenue adjacent to Barret Field Park. Additionally, two splice vaults would be installed with the roadway proximate to the park. However, there would be no direct impacts to the park or its recreational use.

The Project would include the replacement of underground cables which would not have visual impacts on the surrounding area. Substation modifications would be shorter than or comparable in height to the tallest existing structures at such substations.

¹⁹ https://portal.ct.gov/-/media/deep/endangered_species/images/nlebmappdf.pdf

²⁰ <https://portal.ct.gov/-/media/deep/nddb/nolongearedbat-map.pdf>

Project Construction

Eversource would utilize City streets or parking lots for access. No new access is expected to be necessary. Access to work areas would be in accordance with the TMP.

Eversource would obtain a DOT Encroachment Permit to cross Route 137 within the Project route. Eversource would also obtain railroad right-of-entry and authorization of work permits for the MNRR – New Haven Service Main Line and New Canaan Service Branch Line.

Construction areas would be isolated by establishing erosion and sedimentation (E&S) controls in accordance with the March 2024 *Connecticut Guidelines for Soil Erosion and Sediment Control* and Eversource's (BMPs).²¹ E&S controls would include, but not be limited to, drain guard filters in catch basins near work zones to prevent sediment from entering the municipal stormwater system. If groundwater is encountered, Eversource would utilize silt sacks during dewatering of duct bank or vault or pit locations. E&S controls would also be employed for send and receive pits for the trenchless crossing.

Temporary E&S control measures (not in the public roadways) would be left in place until the areas disturbed by construction activities are permanently stabilized. Permanent stabilization would consist of the application of pavement for areas within existing road ROWs or otherwise currently paved areas. For areas without existing pavement, a grass vegetative cover would generally be used. After final stabilization is achieved, all temporary E&S controls would be removed.

A Project-specific SWPCP would be developed for registration under a Department of Energy and Environmental Protection (DEEP) Stormwater Permit. The Stormwater Permit requires the designing qualified professional to conduct the SWPCP Implementation Inspection that confirms compliance with the Stormwater Permit and the initial implementation of all SWPCP control measures for the initial phase of construction. The SWPCP also requires a qualified inspector to inspect the work areas at least once per week and within 24-hours after a rain event that meets certain permit criteria.

The general construction sequence for duct banks and vaults via open trench construction is as follows:

- a) Perform pre-construction activities including, but not limited to, marking out existing utilities, setting up traffic control, and installing E&S controls;
- b) Establish temporary work space/areas;
- c) Saw-cut pavement;
- d) Excavate and shoring for duct bank and vault installations;
- e) Relocate existing utilities where necessary;
- f) Install conduits in duct bank, precast concrete vaults and handholes;
- g) Pour thermal concrete in forms around conduits in duct bank;
- h) Backfill remaining excavations;
- i) Temporarily restore excavated surfaces and temporary work area; and
- j) Restore work areas in accordance with City specifications.

Jack-and-bore construction is a trenchless installation method that would be used to cross beneath the New Haven Service Main Line and New Canaan Service Branch Line operated by MNRR.²² This method utilizes a jacking pit where hydraulic jacking equipment pushes a casing pipe of roughly 48 inches outside diameter to a receiving pit. As the pipe advances, the soils and solids are removed from the pipe.

²¹ [2022 Eversource Best Management Practices MA_CT](#)

²² Micro-tunneling might be used in lieu of jack-and-bore for the railroad crossing, subject to the contractor's final plans.

After the jack-and-bore casing pipe is installed, the conduits for the cables, communication lines, grounding line and spare are placed inside the pipe with spacers to hold their alignment. The remaining space in the casing pipe is filled with a flowable grout material (to serve as thermal backfill).

XLPE cables would be pulled into the duct bank conduit pipes via truck or trailer mounted winch and special handling equipment. A single cable would be pulled into place within each conduit. XLPE splicing is a precise and complex procedure that would take approximately five to seven days to complete the splices for one circuit in each vault.

After completion and energization of the replacement XLPE cables, the existing HPFF cables would be de-energized and prepared for in-place retirement. The dielectric fluid would be pumped out of the pipes and transferred to a tank truck for proper recycling or disposal. HPFF cables would be separated at splice vaults, pulled from pipes, cut into approximately 20-foot long sections and removed for recycling. Mineral oil pumphouses and other HPFF-related equipment would be removed. Pipes would be cleaned, capped and pressurized with low pressure nitrogen gas to protect against internal pipe corrosion. Nitrogen was selected to avoid the use of corrosion inhibitors because if the pipe develops a leak, nitrogen would not result in any environmental contamination. The cathodic protection system would also remain active to protect against internal and external pipe corrosion.

After areas of disturbance have been stabilized, E&S controls would be removed and restoration would commence. This includes re-paving areas that were originally paved. Restoration may also include reseeding, sodding, turf, replanting and landscaping where necessary. Final restoration would be subject to applicable permitting and/or property owner agreements.

Project-related traffic would be expected to be temporary and limited to the construction area. Due to the proposed open-trenching, Eversource anticipates that road shoulder closures or single lane closures using one lane alternating traffic with police details would be required during construction. The TMP is being developed in consultation with the City and DOT permits. Eversource would communicate with local businesses to avoid interruptions to product deliveries and would also notify municipal officials and the public as part of its outreach plan.

Construction is expected to begin in 2025 and conclude by 2028. Complete decommissioning and restoration of affected areas is anticipated to be completed by early 2029. Normal work hours would be Monday through Saturday from 7:00 a.m.²³ to 7:00 p.m. Occasional Sunday work hours may be necessary.

Certain work activities would be performed during non-typical hours and, in some cases, on a continuous 24-hour basis. Non-typical hours might also be necessary due to circumstances including, but not limited to, performing work along the railroads; cable installations; cable splicing; and switching, testing, and commissioning. Additionally, non-typical hours may be necessary in certain locations to mitigate impacts to business operations or residential properties.

Conclusion

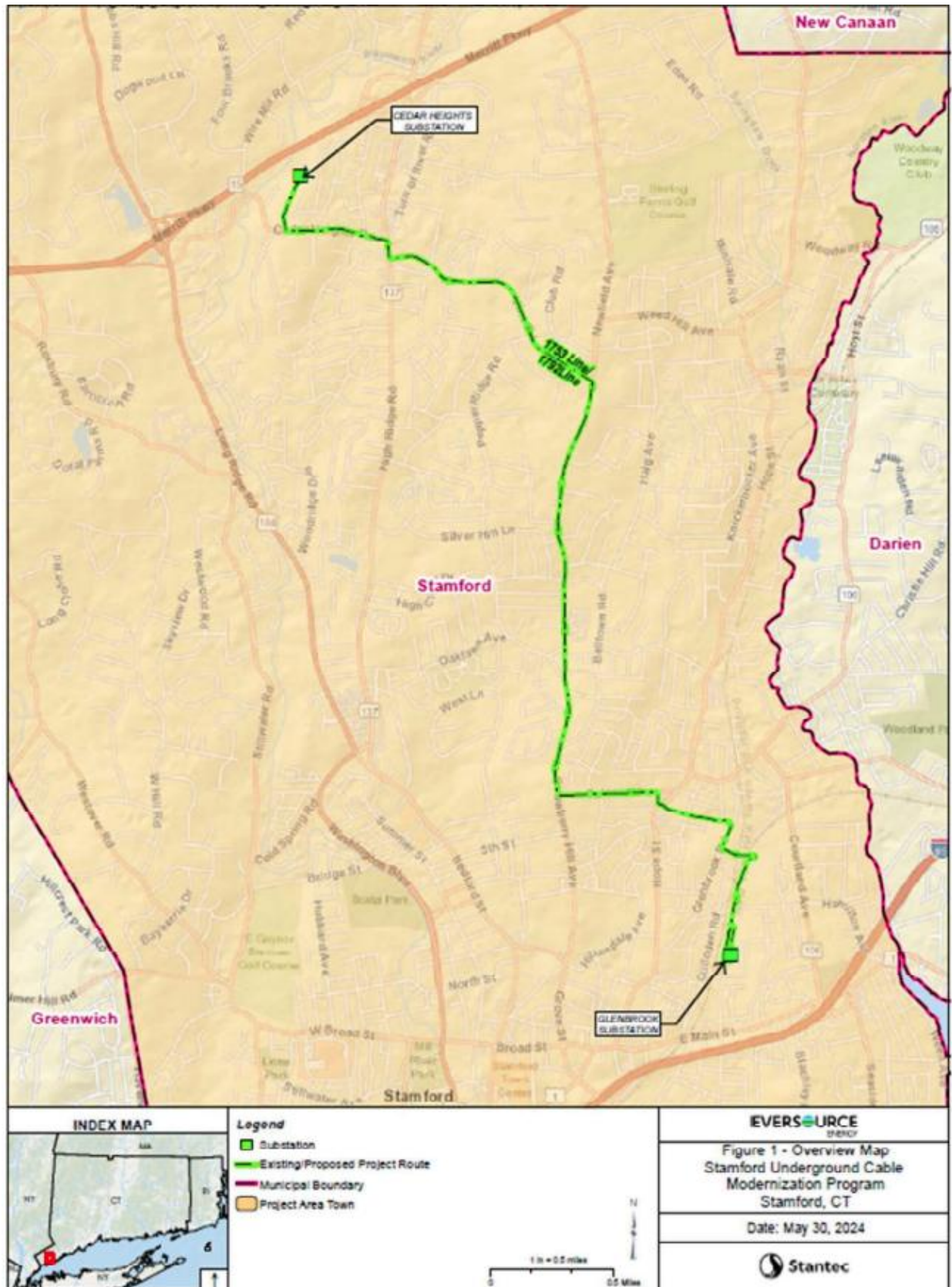
If approved, staff recommends the following conditions:

1. Approval of any project changes be delegated to Council staff;
2. Submit the location(s) of the final staging area(s) and include provisions for erosion and sedimentation (E&S) controls, if necessary, at the staging area location(s) prior to commencement of construction;
3. Submit a copy of the DEEP Stormwater Permit prior to commencement of construction;

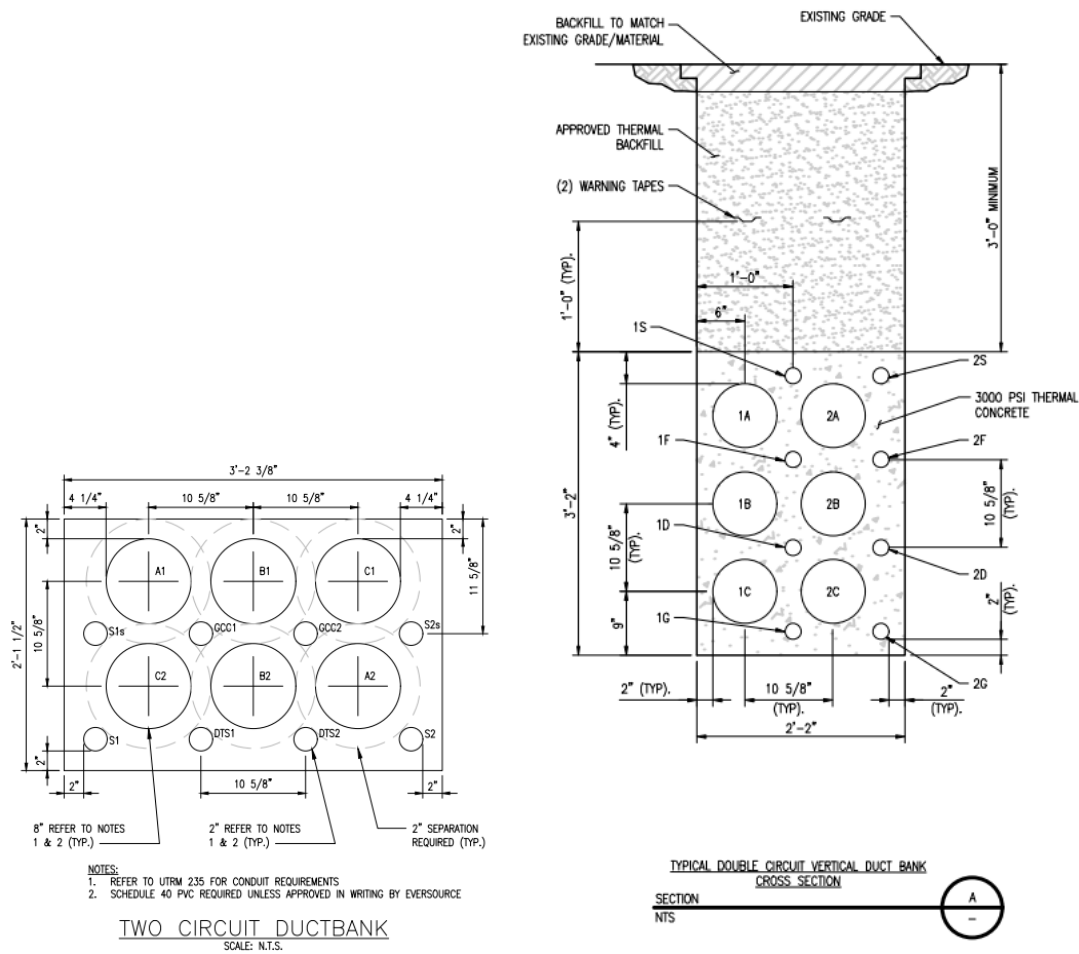
²³ During the winter, snow plowing and de-icing may be necessary prior to the 7:00 a.m. start of the work day.

4. Incorporate pollinator habitat in the restoration of disturbed areas consistent with CGS §16-50hh, where feasible;
5. Use of meshless or natural fiber erosion control blankets/netting to reduce the potential for wildlife entanglement; and
6. Submit a copy of the final Traffic Management Plan.

Figure 1 – Project Location



Figures 2 and 2a – Duct Banks – Double-Circuit Configurations*



*The horizontal double-circuit duct bank is an approximate representation from Petition 1642.

Figure 3 – Splice Vault Configuration

