

# DRAFT

**Petition No. 1642**  
**The Connecticut Light and Power Company d/b/a Eversource Energy**  
**Danbury Underground Cable Replacement Project**  
**Danbury**

**Staff Report**  
**February 28, 2025**

**Notice**

On September 27, 2024, 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 Danbury Underground Cable Replacement Project (Petition or Project) within existing and new right-of-way (ROW) in the City of Danbury (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 1270 and 1337 Lines with cross linked polyethylene (XLPE) cables in the City along approximately 3.6 miles of existing and new ROW between Middle River Substation and Triangle Substation; and related electric transmission cable and substation improvements.

On September 26, 2024 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 September 30, 2024, 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 October 27, 2024. No comments were received from the City.

Under RCSA §16-50j-40, neither Eversource nor the Council is required to provide notice to the state agencies listed in CGS §16-50j(i) when a petition for a declaratory ruling for modifications to an *existing facility* is submitted to the Council. On October 23, 2024, the Council on Environmental Quality submitted comments on the Project.<sup>1</sup>

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.<sup>2</sup>

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 November 21, 2024, 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 March 26, 2024, which is the 180-day statutory deadline for a final decision under CGS §4-176(i).

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<sup>1</sup> [https://portal.ct.gov/-/media/csc/3\\_petitions-medialibrary/petitions\\_medialibrary/mediapetitionnos1601-1700/pe1642/sac\\_municipal\\_official\\_comments/pe1642\\_ceq\\_commentsrecd\\_a.pdf?rev=7692902e821542c0a2c6ffb33e1cb354&hash=A67AFC15E98564FB460A649F635D5342](https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1642/sac_municipal_official_comments/pe1642_ceq_commentsrecd_a.pdf?rev=7692902e821542c0a2c6ffb33e1cb354&hash=A67AFC15E98564FB460A649F635D5342)

<sup>2</sup> *Corcoran v. Connecticut Siting Council*, 284 Conn. 455 (2007)

The Council issued interrogatories to Eversource on December 4, 2024. Eversource submitted responses to the Council's interrogatories on December 23, 2024. The Council issued a second set of interrogatories to Eversource on January 15, 2025. Eversource submitted responses to the Council's interrogatories on February 4, 2025.

### **Community Outreach**

Eversource provided an initial briefing on the Project to the City on May 17, 2022. Eversource met with City officials between March 2023 and August 2024. Since the filing of the Petition with the Council, the City expressed concerns regarding potential underground utility conflicts in the roadway and requested a City representative to be on site during the survey work and advance notification to the community of the survey work, which commenced on December 9, 2024 and is projected to be complete by the end of February 2025. The City is also working with Eversource to determine the final locations for the duct banks and vaults along the proposed route and to develop a Traffic Management Plan (TMP) for construction.<sup>3</sup>

Eversource initiated outreach to property owners along the Project route in June 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.

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 3.6 miles of Eversource road ROW between Middle River Substation at Middle River Road and Triangle Substation at Triangle Street that varies in width from 30 feet to 120 feet and extends in an approximately east to southeast direction through a dense urban area with commercial and residential uses, including, but not limited to, Ellsworth Avenue School, Locust Avenue School, and Western Connecticut State University; light industrial uses; and transportation corridors that include Interstate 84 (I-84)/Route 6/Route<sup>74</sup>, Route 53, Housatonic Railroad, and Metro North Railroad Danbury Branch.

The existing underground 115-kV HPFF 1270 and 1337 Lines utilize 1,000 kcmil aluminum cables with one conductor per phase and were installed in 1976. The 1270 and 1337 Lines are primarily located within City streets, Eversource-owned substation properties and privately owned properties.

Beginning at Middle River Substation, the existing 1270 and 1337 Lines share a route that runs in a southerly direction and then east along Middle River Road and then turns south onto Westville Avenue Extension and then turns east onto Gregory Street. The route continues along Gregory Street to its end and then turns east onto Franklin Street Extension passing underneath I-84, where the road becomes Franklin Street. At the intersection with Main Street (Route 53), the route continues east onto East Franklin Street, crosses beneath Padanaram Brook (north of Garamella Boulevard) and then continues south onto Maple Avenue and east onto Union Avenue, a portion of which is privately owned property, before turning south onto Balmforth Avenue where the route turns east onto Osborne Street. The route continues along Osborne Street until the intersection with Ninth Avenue and continues along Ninth Avenue until it ends. The route turns east onto White Street and then turns immediately south onto Wildman Street, crossing beneath two sets of railroad tracks, before turning southwest onto Taylor Street. The route continues along Taylor Street before turning northeast, crossing Triangle Street and then entering Triangle Substation.

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<sup>3</sup> As of December 4, 2024, there have been no significant changes to the proposed duct bank or vault locations.

<sup>4</sup> These three routes overlap in the vicinity of the Project.

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

The existing Middle River Substation is located at 21 Middle River Road and connects to the underground 1270 and 1337 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 Middle River Substation.

The existing Triangle Substation is located at 100-106 Triangle Street and connects to the underground 1270 and 1337 Lines. Triangle Substation also connects to the overhead 1165 and 1363 Lines that terminate at Plumtree Substation in Bethel.

**See attached Figure 1 – Project Location.**

### Project Need

The purpose of the proposed Project is to improve system reliability on the 1270 and 1337 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 (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	51
1722	1,230	Northwest Hartford 2N - Southwest Hartford 47N (Hartford)	1974	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 (Flax Hill) (Norwalk)	1959 (See Note 1)	66
1608	944	Norwalk Harbor 6J - Ely Avenue (Flax Hill) (Norwalk)	1959 (See Note 2)	66
1867	1,190	Norwalk Harbor 6J - Ely Avenue (Flax Hill) (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 1880 Line was reconducted in 2018.

Note 2: The 1608 Line was reconducted 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 1,000 kcmil aluminum HPFF 1270 and 1337 Lines with 5,000 kcmil aluminum XLPE.

The Project is identified in the 2024 Eversource Forecast of Loads and Resources Report and Eversource's Local System Plan.<sup>5</sup> The Independent System Operator New England Inc. (ISO-NE) must determine 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 \$185.2M. The cost breakdown by various components is provided below.

Item	Description	Total (\$M)	Line 1270 (\$M)	Line 1337 (\$M)
A	Engineering and Indirect	\$14.8	\$7.4	\$7.4
B	Cable installation	\$31.4	\$15.7	\$15.7
C	Duct bank installation	\$78.9	\$39.4	\$39.4
D	Microtunnel	\$4.6	\$2.3	\$2.3
E	Jack and Bore	\$4.3	\$2.1	\$2.1
F	Substation work	\$10.0	\$5.0	\$5.0
G	Commissioning	\$1.4	\$0.7	\$0.7
H	Land Rights	\$1.6	\$0.8	\$0.8
I	Environmental	\$0.7	\$0.4	\$0.4
J	AFUDC	\$14.0	\$7.0	\$7.0
K	Contingency	\$23.5	\$11.7	\$11.7
<b>Total</b>		<b>\$185.2</b>	<b>\$92.6</b>	<b>\$92.6</b>
	<b>Miles</b>		<b>3.60</b>	

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

The Project is not eligible for regional cost allocation because the 1270 and 1337 Lines are not Pool Transmission Facilities (PTF).<sup>6</sup> The entire Project cost is associated with non-PTF. It would be collected via Local Service charges and allocated among Eversource ratepayers.<sup>7</sup> 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 85 cents per month based on 700 kWh of usage.

<sup>5</sup> The Project ID is ES-23-LSP-122.

<sup>6</sup> 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.

<sup>7</sup> The 1270 and 1337 Lines are not considered PTF under ISO-NE's Transmission Operating Agreement because they serve radial load at Middle River Substation (i.e. terminate at that substation) and do not contribute any parallel capacity to the PTF system.

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 XLPE lines in Hartford.<sup>8</sup> 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.

The total estimated cost of this Project is \$185.2M or an approximate average cost of \$25.72M per circuit-mile.<sup>9</sup> It has an approximately 44.7 percent lower cost per circuit-mile than Petition 1605 because the proposed Project would utilize a single double-circuit duct bank versus two separate single-circuit duct banks, requires significantly less real estate acquisition, utilizes aluminum conductors at about 40 percent of the cost of the copper conductors selected for Petition 1605, and the proposed Project route has less congestion with existing utilities than the route of the Petition 1605 project.

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.<sup>10</sup> The first costs or costs to design, permit and construct a line are used as a comparison to total facility cost.<sup>11</sup>

The Project has a first cost of approximately \$185.2M, which is equal to the total Project cost.

Annual O&M costs are estimated at about \$10,426 per circuit-mile for both the 1270 and 1337 Lines or about \$75,067 based on about 7.2 circuit-miles 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 \$1.146M. Utilizing the same study period and discount rate along with Eversource's projected load growth and energy cost data<sup>12</sup>, the NPV of the electrical loss costs would be approximately \$128k. Thus, the total life cycle cost would be approximately \$186.5M or still within the accuracy band of total Project cost because first costs are the dominant component.

#### *Cost – Alternative Cable Size/Material*

Eversource evaluated 5,000 kcmil copper XLPE cables as an alternative, similar to the Petition 1605 design. This alternative was rejected because 5,000 kcmil copper cables cost approximately \$138 per foot compared to the proposed 5,000 kcmil aluminum cables which cost approximately \$55 per foot. The proposed route requires approximately 125,000 feet of cable. Thus, the 5,000 kcmil copper XLPE alternative would cost approximately \$10.4M more than the proposed 5,000 kcmil aluminum XLPE cable. This would increase the total Project cost from \$185.2M to \$195.6M.

Eversource also evaluated 3,500 kcmil copper XLPE cables as an alternative, similar to the Docket 461A design in Greenwich. The 3,500 kcmil copper alternative would have comparable ratings to the proposed Project cables. However, this alternative would cost approximately \$122 per foot as compared to the proposed cables at approximately \$55 per foot. Thus, the 3,500 kcmil copper XLPE cable alternative would cost approximately \$8.4M more than the proposed 5,000 kcmil aluminum XLPE cable. This would increase the total Project cost from \$185.2M to \$193.6M.

<sup>8</sup> [https://portal.ct.gov/-/media/csc/3\\_petitions-medialibrary/petitions\\_medialibrary/mediapetitionnos1601-1700/pe1605/decisionstaffreport/pe1605\\_dcltr\\_energy\\_a.pdf?rev=61530afa813244c39d1fb23f648e3ef4&hash=FF2D4B2AC20FC8BD02053BCA450822BC](https://portal.ct.gov/-/media/csc/3_petitions-medialibrary/petitions_medialibrary/mediapetitionnos1601-1700/pe1605/decisionstaffreport/pe1605_dcltr_energy_a.pdf?rev=61530afa813244c39d1fb23f648e3ef4&hash=FF2D4B2AC20FC8BD02053BCA450822BC)

<sup>9</sup> The two replacement cables for the Project are approximately 3.6 linear miles each or a total of approximately 7.2 circuit-miles.

<sup>10</sup> 2022 Life Cycle Report, p. 21

<sup>11</sup> O&M costs and electrical loss costs components are not related to the Project cost total.

<sup>12</sup> The projected load growth rate is 0.65 percent. Energy cost is \$100/MWh with a 4.1 percent annual escalation rate.

Eversource seeks to standardize its cable and accessory (e.g. splices and terminations) designs to simplify the spare parts inventory, facilitate maintenance, and streamline the internal design and procurement processes. Thus, Eversource believes that, of the cable designs it has standardized, 5,000 kcmil aluminum XLPE would be the best option available 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 1270 and 1337 cables would generally follow the existing HPFF cable routes with the exception of two minor route deviations: Garamella Boulevard Deviation and Middle River Substation Deviation. Collectively, these two deviations result in approximately a 1.2 percent net reduction in total Project length. The proposed route, including the proposed deviations, was selected for the following reasons:

- a) Consideration of constructability challenges such as utility conflicts and 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.

#### Garamella Deviation – 1270 and 1337 Lines

This proposed route would deviate from the existing route beginning at the intersection of Franklin Street/East Franklin Street, Main Street, and Garamella Boulevard. Rather than cross Main Street onto East Franklin Street, the proposed route would cross Main Street onto Garamella Boulevard. The proposed route would continue along Garamella Boulevard to Balmforth Avenue and then would continue along the original route. The proposed route deviation is approximately 400 feet shorter than the existing route in this area. This deviation results in a cost savings of approximately \$1.7M.

Garamella Boulevard did not exist at the time the HPFF lines were constructed. This route deviation was selected because utilizing Garamella Boulevard provides a more direct path as well as cost savings.

#### Middle River Substation Deviation – 1270 and 1337 Lines

The proposed route would deviate from where the existing lines exit Middle River Substation and where the lines reach Middle River Road. The existing lines exit the eastern side of Middle River Substation, pass under Wetland 1 and reach Middle River Road to the east. The proposed route would exit the southern side of Middle River Substation, continue east under Wetland 1 (via micro-tunneling), and then reach Middle River to follow the original route. The proposed route deviation is approximately 165 feet longer than the existing route in this area. This deviation results in an incremental cost (cost delta) of approximately \$2.8M. This cost delta consists of approximately \$2.1M for the micro-tunneling and approximately \$700k for the longer open trench portion of this deviation.

This route deviation was selected to allow sufficient space to complete micro-tunneling under Wetland 1 and Boggs Pond Brook. Micro-tunneling requires a sending pit and a receiving pit. This route deviation also moves the receiving pit away from Wetland 2.

### **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 3.6 linear miles of double-circuit cable would be replaced between Triangle Substation and Middle River Substation. Specifically, the Project entails the replacement of 1,000 kcmil aluminum HPFF with 5,000 kcmil aluminum XLPE for both the 1270 and 1337 Lines.

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 1270 and 1337 circuit loads each have a compound annual growth rate (CAGR) of approximately 0.45 percent from 2025 through 2033. Eversource notes a CAGR of approximately 0.65 percent for loads in the area based on recent 10-year forecast information published by ISO-NE. The proposed replacement cables would have additional capacity relative to the existing cables to be replaced. A table of cable capacities is included below.

<b>Cable</b>	<b>Normal Rating (MVA)</b>	<b>Long-term Energy Rating (MVA)</b>	<b>Short-term Emergency Rating (MVA)</b>
<b>Existing 1270 Line</b>	<b>135</b>	<b>149</b>	<b>153</b>
<b>Existing 1337 Line</b>	<b>135</b>	<b>149</b>	<b>153</b>
<b>Replacement 1270 Line</b>	<b>216</b>	<b>266</b>	<b>366</b>
<b>Replacement 1337 Line</b>	<b>216</b>	<b>266</b>	<b>366</b>

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 horizontal phase arrangement to minimize the depth of excavation. The vertical arrangement would typically be reserved for areas where it is necessary for routing between adjacent utilities and/or approaching vaults.

#### **See attached Figures 2 and 3 – Duct Bank Configurations.**

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

Approximately 22 splice vaults are proposed for the Project. Splice vaults would typically be spaced between 600 feet to 2,000 feet apart, with most of the spacing at approximately 1,800 feet. A typical splice vault would have outside dimensions of approximately 24 feet long, by 9 feet wide by 9 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 4 – Splice Vault Configuration.**

Eversource would utilize a combination of open trench construction and two forms of trenchless construction: jack-and-bore and micro-tunneling to install the XLPE. See section titled "Project Construction."

*Middle River Substation*

Modifications necessary to facilitate this Project at the substation related to the 1270 and 1337 Lines include, but are not limited to, the following:

- a) Install a new approximately 21-foot 6-inch tall termination pothead/lightning arrester structure with cable supports and potheads for each line;
- b) Install three surge arresters on the new pothead structure for each line;
- c) Install one 115-kV TR-287 insulator on ground on the rigid bus for each line;
- d) Retrofit the motor operated disconnect switches and manual ground switches assembly to accommodate the line replacements;
- e) Install three new 115-kV potential transformers in lieu of existing coupling capacitor voltage transformer (CCVT) for each line;
- f) Install two new 115-kV pothead structure drilled shaft foundations for transmission lines and other structures;
- g) Replace the existing line relays and meters in the control house;
- h) Install two new fiber patch panels and associated supervisory control and data acquisition (SCADA) and telecommunications equipment within the control house for each line;
- i) Expand the substation southeast fence line 20 feet to accommodate the new termination pothead riser structures and new perimeter yard lighting;
- j) Remove the existing 115-kV HPFF potheads, structure and foundations after the replacement lines are in service;
- k) Remove the existing surge arresters;
- l) Remove the HPFF able pressurization system (pump house) and all associated equipment; and
- m) Remove the CCVT, line tuner, phase wave trap (only equipment and support adapter).

The height of the proposed termination structure would be shorter than the height of the tallest existing structure of 37 feet 6 inches.

*Triangle Substation*

Modifications necessary to facilitate this Project at the substation related to the 1270 and 1337 Lines include, but are not limited to, the following:

- a) Install a new approximately 21-foot 6-inch tall termination pothead/lightning arrester structure with cable supports and potheads for each line;
- b) Install three surge arresters on the new pothead structure for each line;
- c) Install one 115-kV TR-287 insulator on ground on the rigid bus for each line;
- d) Install three new 115-kV TR-287 insulators on an adaptor in existing surge arrester location for each line;
- e) Install two 115-kV XLPE pothead structures drilled shaft foundations used for transmission lines and other structures;
- f) Retrofit the motor operated disconnect switches and manual ground switches assembly to accommodate the line replacements;
- g) Replace the line relays and meters for both lines in the existing control house;
- h) Install two new fiber patch panels and associated SCADA and telecommunications equipment within the control house;
- i) Remove the HPFF cable pressurization system (pump house) and all associated equipment;
- j) Remove the existing 115-kV HPFF potheads, structure and foundations after the replacement lines are in service;
- k) Remove the existing surge arresters; and
- l) Remove the CCVT, line tuner, wave trap and associated foundations.

The height of the proposed termination structure would be shorter than the height of the tallest existing structure of 77 feet 6 inches.

### **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.

Some night work is expected to be necessary. Many portions of the Project route have traffic congestion, especially the downtown area, due to morning and afternoon commuting, school-related traffic and emergency vehicles traveling to and from Danbury Hospital. Thus, Eversource expects that some nighttime open trench construction would be required to minimize impacts to daytime traffic and meet City requirements. Additionally, trenchless construction would require continuous 24-hour work after it begins.

Eversource utilized the Federal Aviation Administration (FAA) Notice Criteria Tool (NCT) and determined that the proposed substation terminal structures at Triangle Substation would not require notice to the FAA, and no marking or lighting would be required. The NCT results indicated that the proposed terminal structure at Middle River Road Substation exceeds the Notice Criteria and requires notice to the FAA to determine whether marking or lighting would be required. Eversource notes that this structure is not the tallest structure at the substation, so it is not anticipated that marking or lighting will be necessary.

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 levels<sup>13</sup> are presented in the table below:

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<sup>13</sup> MF levels are based on peak forecasted steady state load conditions which is more conservative than utilizing average annual load conditions.

<b>Location</b>	<b>Magnetic Field Strength Calculations (mG)</b>	
	<b>25 Feet from the Center Line</b>	<b>Maximum</b>
Trench	0.6	22.6
Vault	13.4	78.1
Trenchless Crossing	3.3	8.5

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 cable 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. Due to the distances between the terminal structures and the substation property boundaries, as well as the contributions of MF (e.g. substation bus and distribution feeders), the change in MF around both substations as a result of the Project would be negligible.

### **Environmental Effects and Mitigation Measures**

Minimal vegetation removal would be required due to the largely urban nature of the site. However, approximately 0.46 acre of vegetation removal would be performed on Eversource property between Middle River Road and Middle River Substation to accommodate the duct bank, relocated swale, expanded area of Middle River Substation on the southeastern side, and to add a portion of access road. Vegetation removal activities would be performed in accordance with Eversource BMPs.

A portion of a wetland (Wetland 1) is located southwest of Middle River Substation. The wetland crossing to reach Middle River Substation would be performed via micro tunneling under the wetland, and the send and receive pits would be located in upland areas. Temporary impacts to wetlands would be approximately 180 square feet (sf) due to construction matting to access the Substation expansion work area.

An approximately 200-foot long drainage feature is located adjacent to the southeastern fence line of Middle River Substation. The proposed substation expansion area would result in this drainage swale to be filled, and it would result in approximately 1,000 sf of permanent impacts. A new drainage swale (of the same size as the existing swale) would be created southeast of the substation expansion area outside of the expanded fence line.

The Project route crosses two unnamed streams (S5 and S6) carried in culvert pipes under Franklin Street Extension and Padanaram Brook (S8) carried in a box culvert under Garamella Boulevard. Work proposed at S5, S6 and S8 would consist of installing concrete duct bank below the culverted stream crossings. These watercourses are used mainly to collect and convey stormwater and have little value as a natural aquatic ecosystem.

Micro-tunneling would be performed under Bog Ponds Brook (S1) associated with Wetland 1. Construction activities within wetlands and across watercourses would be conducted in accordance with Eversource BMPs.

No vernal pools are located proximate to the site.

Portions of the replacement cables would be located within the 100-year and 500-year Federal Emergency Management Agency-designated flood zones associated with Padanaram Brook. However, the existing cables already pass through these flood zones. Additionally, the proposed duct bank in Garamella Boulevard will not affect the flood zone because the Padanaram Brook watercourse is culverted under the road, and the crossing would be performed via micro tunneling under the boxed culvert. Also, the underground vaults proximate to Padanaram Brook are not located within the 100-year or 500-year flood zone.

The Project is not within a DEEP-designated Aquifer Protection Area. 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.

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, USACE self-verification procedures, 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 into wetlands, 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.

According to DEEP Fish Community Data, Pandanaram Brook was studied for the presence of freshwater fish and macroinvertebrates in 2006. Eight freshwater fish were observed including, but not limited to, the longnose dace, white sucker, tessellated darter, and blacknose dace. No macroinvertebrates were identified during the survey. None of the watercourses at the site are listed on the DEEP Anadromous Fish Runs list dated July 1, 2021.

A final DEEP Nddb Determination was issued for the Project on September 12, 2024. The wood turtle, a state special concern species, may occur near the Project site. Eversource would implement DEEP recommended species-specific protection measures during construction, which include, but are not limited to, time of year best management practices.

Eversource also consulted with the U.S. Fish & Wildlife Service's (USFWS) Information, Planning and Consultation (IPaC) service regarding federally-listed species that may be present within the Project site. The IPaC report identified the northern long-eared bat (NLEB), a federally-listed and state-listed Endangered Species. Tree clearing would not occur during the NLEB active pup season. There are no known NLEB maternity roost trees within 150 feet of the Project site, and the nearest known NLEB hibernaculum is located over 12 miles to the north in the Town of Roxbury. Thus, the Project is not expected to result in impacts to potential NLEB habitat.

A Phase 1A Cultural Resources Assessment (Phase 1A) determined that one property listed on the National Register of Historic Places (NRHP) is located within 500 feet of the Project. This NRHP-listed property is the Joseph W. Pepin Memorial Building (f/k/a Alternative Center for Excellence and Locust Avenue School) located north of Ninth Avenue. This building is located over 75 feet away from the edge of Ninth Avenue. There are no properties listed on the State Register of Historic Places (SRHP) within 500 feet of the Project. One known archaeological site was identified within 500 feet of the Project. The archaeological site and the NRHP-listed property are both located outside of the public roadway. By letter dated June 25, 2024, SHPO indicated that the proposed Project would not affect historic properties.

There are no publicly-accessible recreational resources proximate to the Project site.

The Project route passes south of the Ridgewood Country Club golf course, the Ellsworth Avenue School playground and west of Locust Avenue School, which has a small lawn area for volleyball and other activities. These recreational areas are located over 100 feet from any proposed construction.

The Project would include the replacement of underground cables which would not be expected to have visual impacts on the surrounding area. Substation modifications would be above-ground and would not be taller than the tallest existing structures at such substations. The 4,900 sf expansion of Middle River Substation is not expected to result in a significant visual impact.

## Project Construction

Eversource would utilize City streets for access. No new access is expected to be necessary, except for a short segment of new access road proposed within the Eversource-owned parcel at Middle River Substation. Access to work areas would be in accordance with the TMP.

Eversource would obtain a Connecticut Department of Transportation (CDOT) Encroachment Permit to cross I-84 and Route 53 within the Project route. Eversource would also obtain railroad encroachment permits for the Housatonic Railroad and the Danbury Branch rail 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 April 2022 Best Management Practices Manual for Massachusetts and Connecticut (BMPs).<sup>14</sup> Temporary E&S control measures 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 Project is eligible for certification through the U.S. Army Corps of Engineers (USACE)/DEEP Self-Verification Notification process in regard to wetland/watercourse impacts. The self-verification notification forms would be submitted to the USACE - New England District and DEEP prior to the start of project construction, as required by the SWPCP.

The general construction sequence for duct banks and vaults 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 permanent work zone for excavation and utilize barriers and fencing for safety;
- c) Saw-cut pavement;
- d) Excavate and shoring for duct bank and vault installations;
- e) Install steel plates over open excavations after each work shift;
- f) Relocate existing utilities where necessary;
- g) Install precast concrete vaults;
- h) Install PVC casing pipe and internal conduits and encase in concrete;
- i) Backfill excavations; and
- j) Restore work areas in accordance with City specifications.

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<sup>14</sup> [2022 Eversource Best Management Practices MA\\_ CT](#)

Open trench construction would be utilized for the majority of the Project. Mechanical excavation would remove the concrete or asphalt surface, topsoil and sub-grade material. Removed material would be relocated to an appropriate off-site location for disposal or temporarily stockpiled and reused as clean backfill.

After a trench has been opened to the design depth and width and shoring has been installed, conduits are assembled and supported in the trench. The area around the conduits is then filled with concrete. After the concrete has set, the remainder of the trench is backfilled with thermal sand and/or a fluidized thermal backfill concrete mix.

Jack-and-bore construction is a trenchless installation method that would be used to cross beneath the following rail lines: the Housatonic and CDOT Danbury Branch rail lines operated by Metro-North Railroad.<sup>15</sup> 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.

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).

Micro-tunneling is a trenchless installation method that would be used to cross beneath two locations: Padanaram Brook that runs under Garamella Boulevard; and Boggs Pond Brook and Wetland 1 to enter Middle River Substation. A micro-tunnel boring machine will drill an approximately 4-foot diameter bore horizontally from the sending pit towards the receiving pit. This creates a path to push the pipe through the bore via pipe jacking system. Pumps would remove the slurry and send it to equipment for slurry material separation. 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 casing 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 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 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.

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<sup>15</sup> Micro-tunneling might be used in lieu of jack-and-bore for the railroad crossings, subject to the contractor's final plans.

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 CDOT permits. Eversource would communicate with local businesses to avoid interruptions to critical product deliveries and would also notify municipal officials and the public as part of its outreach plan.

Construction is expected to begin in the second quarter of 2025 and conclude by the end of 2027. Complete decommissioning and restoration of affected areas is anticipated to be completed by mid-2028. Normal work hours would be Monday through Saturday from 7:00 a.m.<sup>16</sup> 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**

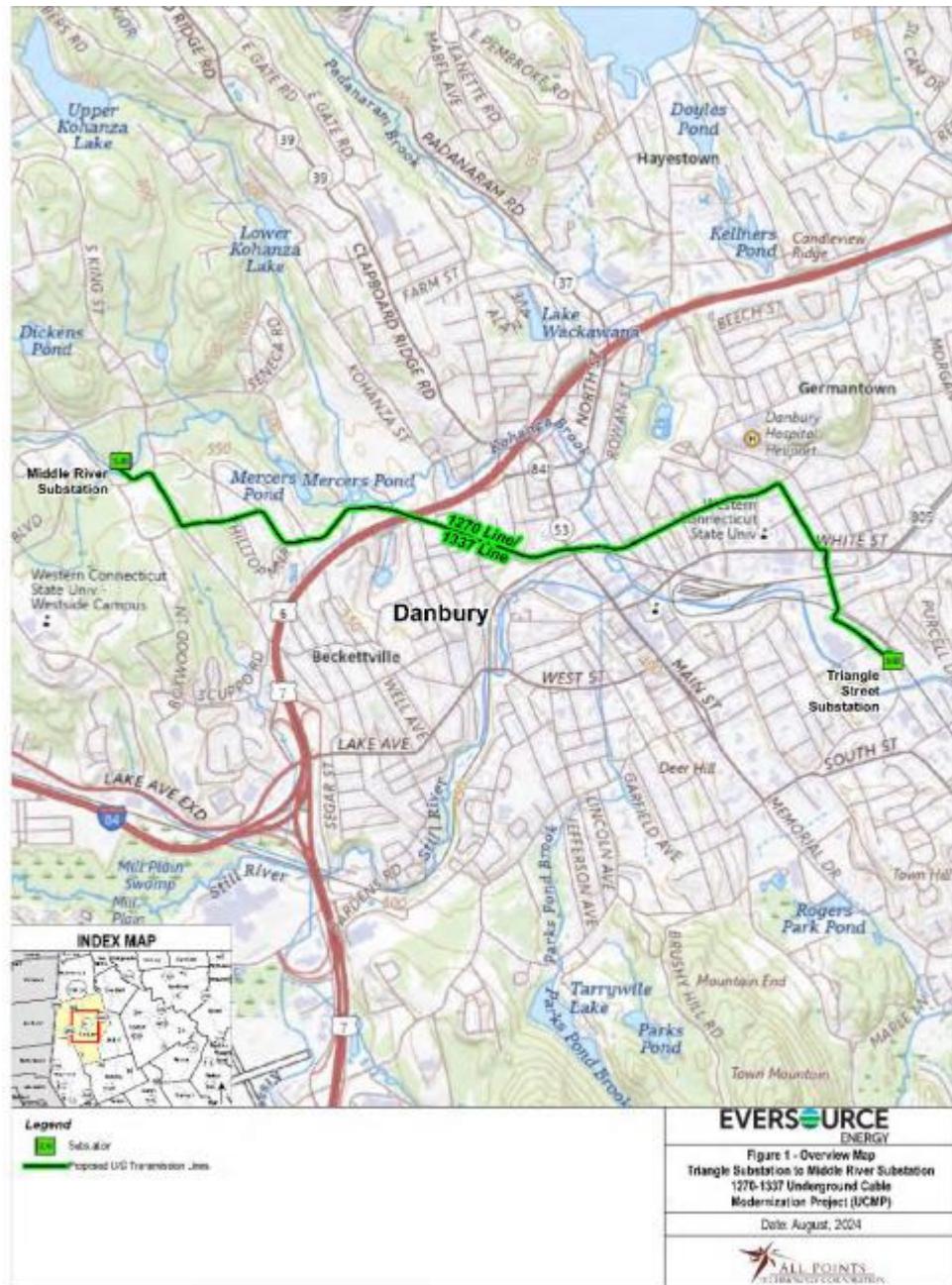
If approved, staff recommends the following conditions:

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;
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;
6. Submit a copy of the final Traffic Management Plan; and
7. Submit a copy of the final FAA Determination for the proposed terminal structure at Middle River Substation and include marking and/or lighting plan, if applicable.

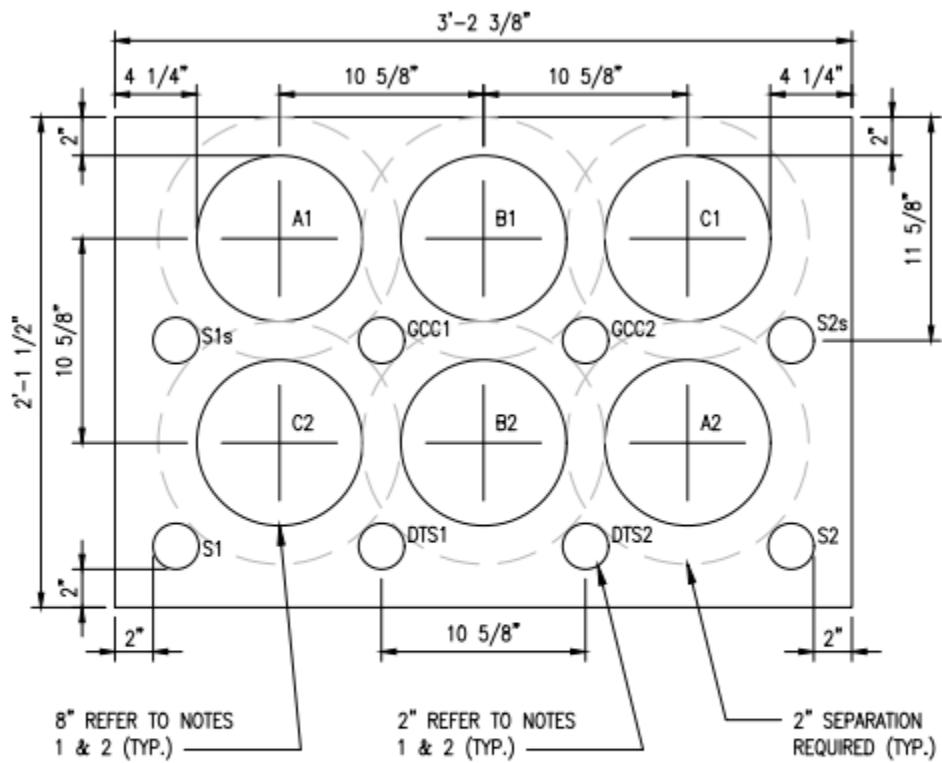
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<sup>16</sup> During the winter, snow plowing and de-icing may be necessary prior to the 7:00 a.m. start of the work day.

**Figure 1 – Project Location**



**Figure 2 – Duct Bank Configuration – Horizontal**

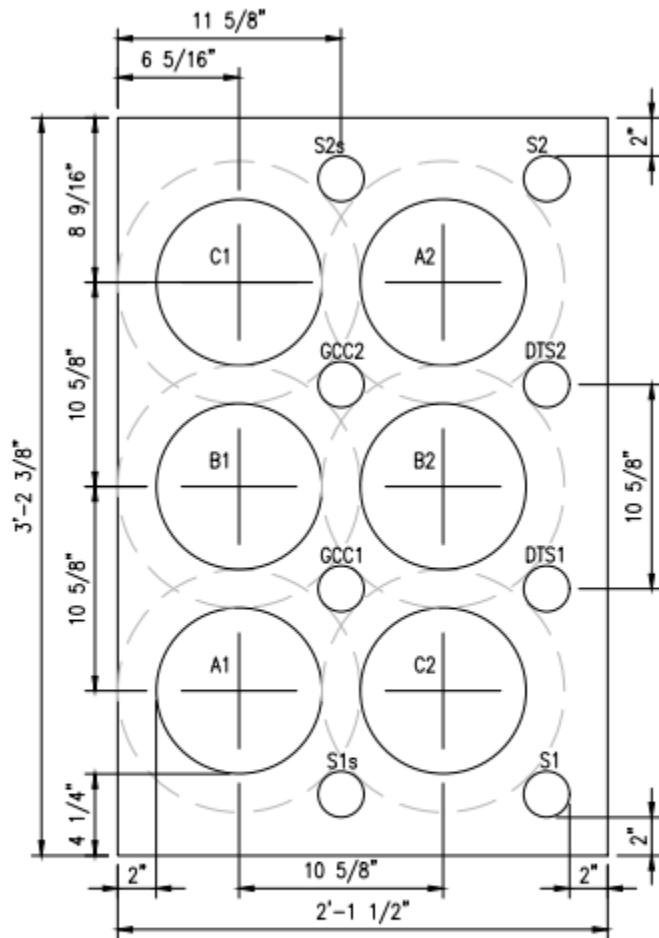


NOTES:

1. REFER TO UTRM 235 FOR CONDUIT REQUIREMENTS
2. SCHEDULE 40 PVC REQUIRED UNLESS APPROVED IN WRITING BY EVERSOURCE

**TWO CIRCUIT DUCTBANK**  
SCALE: N.T.S.

**Figure 3 – Duct Bank Configuration – Vertical**



**NOTES:**

1. REFER TO UTRM 235 FOR CONDUIT REQUIREMENTS
2. SCHEDULE 40 PVC REQUIRED UNLESS APPROVED IN WRITING BY EVERSOURCE

**TWO CIRCUIT DUCTBANK**  
SCALE: N.T.S.

**Figure 4 – Splice Vault Configuration**

