



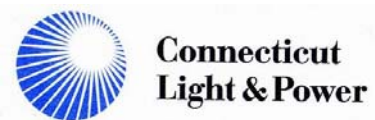
**Connecticut Siting Council  
Docket No. 272**

**Development & Management Plan  
for the  
Middletown-Norwalk  
345-kV Transmission Line Project**

**Segment 4b – Sasco Creek to  
Father Conlon Place in Norwalk**

**Volume 1 of 3**

**May 2006**



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**for the**

**Middletown-Norwalk  
345-kV Transmission Line Project**

**Segment 4b - Sasco Creek to  
Father Conlon Place in Norwalk**

**Volume 1**

**Connecticut Siting Council  
Docket No. 272**

**Submitted By:  
The Connecticut Light and Power Company**

**May 2006**

**Prepared by:  
Burns & McDonnell Engineering Company, Inc**

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## 1.0 INTRODUCTION

The Connecticut Light and Power Company (CL&P) hereby submits this Development and Management (D&M) Plan for the portion of the Middletown-Norwalk Project (the Project) between the Fairfield/Westport town line at Sasco Creek and Father Conlon Place (hereinafter "Segment 4b"), in accordance with the Connecticut Siting Council (Council) Decision and Order for Docket No. 272 of April 7, 2005, and pursuant to Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies, *Requirements for a right-of-way development and management plan*. The Middletown-Norwalk Project consists of approximately 69 miles of 345-kV transmission line from CL&P's existing Scovill Rock Switching Station (located in the City of Middletown in Middlesex County), through New Haven County to CL&P's existing Norwalk Substation (located in the City of Norwalk in Fairfield County). The Project will include approximately 45 miles of overhead transmission line construction and 24 miles of underground transmission line construction. The overhead portion of the Project will extend from the Scovill Rock Switching Station in the Town of Middlefield to the East Devon Substation in the City of Milford. The underground portion will extend from the East Devon Substation to the Norwalk Substation in Norwalk. The Project will include the construction of two new electric substations (East Devon Substation in Milford and United Illuminating's Singer Substation in the City of Bridgeport) and one new switching station (Beseck Switching Station in the Town of Wallingford), as well as modifications to the existing Norwalk Substation and Scovill Rock Switching Station. CL&P will own all overhead portions of the Project, as well as the underground portion from East Devon Substation to the first vault west of the Housatonic River. CL&P ownership continues for the entire underground portion from the Singer Substation to the Norwalk Substation. The United Illuminating Company will build and own the Singer Substation and the underground portion from the Singer Substation to the first splice-vault, inclusive of the splice vault west of the Housatonic River, a distance of approximately 5.6 miles.

CL&P plans to submit thirteen D&M plans for its portion of the Project. The D&M plans will be developed based on the type of construction and geographic location along the route, as follows:

### Switching Stations and Substations (4 D&M plans)

- Scovill Rock (Middletown) – Approved by the Council on August 25, 2005
- Beseck (Wallingford) – Approved by the Council on February 22, 2006
- East Devon (Milford)
- Norwalk (Norwalk)

### Overhead Lines (4 D&M plans)

- Segment 1a: Scovill Rock Switching Station to Chestnut Junction, Oxbow Junction to Beseck Switching Station, and Black Pond Junction to Beseck Switching Station (Middletown, Haddam, Durham, Middlefield, Meriden, Wallingford) – Approved by the Council on March 8, 2006
- Segment 1b: Royal Oak By-pass (Middletown)
- Segment 2a: Beseck Switching Station to Cheshire/Hamden Town line (Wallingford, Cheshire) - Filed with the Council on March 31, 2006
- Segment 2b: Cheshire/Hamden Town line to East Devon Substation (Hamden, Bethany, Woodbridge, West Haven, Orange, Milford)

### Underground Lines (4 D&M plans)

- Segment 3: East Devon Substation to the Housatonic River Crossing (Milford) – Approved by the Council on March 29, 2006

- Segment 4a: Singer Substation to Fairfield/Westport Town line (Bridgeport, Fairfield) – Approved by the Council on February 22, 2006 (Revisions to portions of this D&M Plan were filed on May 2, 2006)
- Segment 4b: Fairfield/Westport Town line to Westport Avenue in Norwalk (Westport, Norwalk)
- Segment 4c: Westport Avenue in Norwalk to Norwalk Substation (Westport, Norwalk)

Underground Watercourse and Railroad Crossings (1 D&M plan)  
(Milford, Stratford, Bridgeport, Fairfield, Westport, Norwalk)

## 1.1 PROJECT DESCRIPTION

This D&M Plan covers the work associated with the installation of two (2) underground 345-kV cross-linked polyethylene (XLPE) transmission cable circuits and corresponding splice vaults from Sasco Creek at the Fairfield/Westport town line to Father Conlon Place in the City of Norwalk. The underground cable system will be installed primarily within existing public road rights-of-way (ROW). This segment covers approximately 6.7 of the 15.2 miles of Segment 4. All watercourse crossings in Segments 3 and 4 will be addressed in a separate D&M Plan.

The work in Segment 4b will include five separate construction activities that occur sequentially, and at times concurrently, but not continuously. As described in greater detail below, these activities include the following:

- Duct-bank Installation
- Splice-vault Installation
- Cable Pulling
- Cable Splicing
- Restoration (temporary and final)

### 1.1.1 Duct-bank Installation

The typical duct-bank configuration includes the six 3000-kcmil copper XLPE transmission cables, associated communication fiber and grounding wires. At certain limited locations along the route (primarily river crossings) 3500-kcmil XLPE cables may be needed to meet system ampacity requirements. The work zone for duct-bank construction will measure approximately 400 feet in length. The following activities will occur in the work zone:

- saw cutting pavement
- trench excavation
- duct placement
- backfilling
- temporary pavement restoration (see 1.1.5 for Permanent Pavement Restoration)

#### 1.1.1.1 Saw Cutting Pavement

Roadway pavement will be saw cut on both sides of the planned excavation to a width slightly greater than that for the standard duct-bank configuration (See Volume 2). Alternate duct-bank configurations to avoid existing utilities will require slight variations in the width of pavement requiring saw cutting.

### **1.1.1.2 Trench Excavation**

The standard duct-bank configuration requires excavation of a 4-foot wide trench to a minimum depth of 5 feet. This depth provides a minimum cover of 2.5 feet, as will be set forth in the General Encroachment Agreement between CL&P and ConnDOT. As previously mentioned, at certain locations alternative duct-bank configurations will be required to avoid existing utilities, and these locations will typically require greater trench depths. Typical cross sections are provided in Volume 2. Trenching is anticipated to proceed at a rate of 50 to 200 linear feet per day. Steel plating of the open trench will be utilized as allowed by ConnDOT, the Town of Westport and the City of Norwalk to facilitate the construction process and open up travel lanes during restricted construction periods. A soil management plan for handling spoil material removed during excavation will be developed.

Subsurface utility engineering (SUE), including the locating of potential conflicts with existing utilities, has been performed. Results of this study are incorporated on the Plan Drawings in Volume 2. Excavations for relocations of existing utilities will be necessary at certain locations, and this work will be performed prior to trenching for duct-bank installation. The size work area necessary for excavations will vary by utility site-specific requirements. Steel plating will be used when necessary to maintain road availability. Site specific traffic plans will be developed for excavations and included in the MTP. Utilities scheduled for relocation are noted in the profile view of the Plan and Profile drawings of Volume 2. Specific measures for the relocation of existing utilities will be determined by the Owner of the existing utilities.

### **1.1.1.3 Duct Placement**

Schedule 40 Polyvinyl Chloride (PVC) ducts housing the XLPE cables, grounding cables and signal and control fibers will be placed into the excavated trench in a predefined arrangement. Six eight-inch ducts will house each of the three cables of each circuit. Two 4-inch ducts will house signal and control fiber-optic cables and two 2-inch conduits will contain the coated copper grounding cables. The ducts will be supported by incrementally spaced duct spacers and, in certain locations, these ducts will be strapped together to prevent movement during backfilling operations. Spacing of the ducts is critical and is dictated by system ampacity requirements which are negatively affected by mutual heating of the cables. Detailed information regarding spacing is provided in the duct-bank cross-section drawings noted as construction details in Volume 2.

### **1.1.1.4 Trench Backfilling**

Backfilling will be performed incrementally with various materials. The ducts will be encased in 3000-psi concrete (earthen formed), and then the trench will be backfilled with a 100-psi fluidized thermal backfill to a depth below the existing unbound layers or as specified by ConnDOT, the Town of Westport and/or the City of Norwalk. Aggregate material will then be installed in multiple lifts with alternating compaction techniques.

### **1.1.1.5 Temporary Pavement Restoration**

Pavement restoration using hot patch will be temporarily used until final pavement restoration occurs. The temporary hot patch will be installed in the width of the saw-cut trench and will match the existing roadway grade.

## **1.1.2 Splice-vault Installation**

Splice vaults serve as the location where successive lengths of cable are connected. Each vault will house three cable splices, one splice for each phase of the circuits. Pre-cast concrete splice vaults with outside dimensions of 32 feet in length, 10 feet in width and 10 feet in height, with an approximate 1-foot wall thickness, will be installed at approximate intervals of 1,650 feet along the underground route. Each vault

corresponds to a single circuit; therefore, each splice-vault location will have two splice-vaults. Splice-vault excavations will be to a minimum depth of 15 feet, providing a minimum cover of 2.5 feet, with over excavations of two feet on each side for workspace. At each splice-vault location, one vault will be installed and then backfilled prior to excavation for the second vault. Each vault will have two 36-inch entry man-holes. Vault locations are provided on the Plan and Profile Drawings in Volume 2.

Typically two additional hand holes, each measuring 5 feet in length by 5 feet in width by 5 feet in depth, will be located close to vault locations to provide access for equipment to monitor cable-sheath voltage. Typical drawings of these hand holes in relation to the splice-vaults are included in the Construction Detail drawings Volume 2 (01224-45003 PG 001). Hand-hole installations will be performed simultaneously with vault construction.

Depending on site-specific conditions, such as overhead obstructions, proximity to existing structures and geotechnical conditions, vault installation will take approximately 7-14 days (assuming 12-hour shifts). Alternatively, installation could be completed in 4-7 days if 24-hour shifts were used. Handling and disposal of spoil materials will be included in the soil management plans.

CL&P has made extensive efforts to locate splice vaults so as to minimize impacts to traffic, taking additional social factors into account. A temporary steel plating system may be utilized at the vault locations within roadways to maintain traffic flow during restricted work hours. Traffic control, which is a concern of Westport and Norwalk, is addressed in the Maintenance and Protection of Traffic (MPT) Plans that will be issued to the municipalities and ConnDOT.

### **1.1.3 Cable Pulling**

The approximately 5-inch diameter XLPE transmission cable will be pulled into ducts between splice-vaults using reel carts located above splice vaults and pulling machines situated at the adjacent set of splice vaults along the alignment. Typical reels with 1,800 feet of cable measure 12-14 feet in height and eight feet in width and weigh approximately 50,000 lbs. Due to the size of reel carts and clearance limitations along the route, an engineering review will be performed to designate shipping routes and approved travel routes from potential material staging areas. Pulling operations will take 6 days per set of splice vaults. Specific traffic control measures for each vault location will be included in the MPT plans.

### **1.1.4 Cable Splicing**

Cable splicing within the splice vaults requires controlled temperature and humidity, provided by splicing trailers parked on top of the vault locations. Splicing operations will take 24 days per set of splice-vaults (12 days for each vault) based on 12-hour shifts, as recommended by cable manufacturers.

### **1.1.5 Permanent Pavement Restoration**

Permanent pavement restoration will be performed to standards outlined by ConnDOT, the Town of Westport and the City of Norwalk for locations within public roadway right-of-way (ROW). Restoration plans for vault locations located outside of the public ROW will be specific to each location. Restoration of Connecticut Department of Environmental Protection (DEP) property will be discussed with and approved by the DEP. For cases involving restoration other than pavement (i.e., landscaping), final restoration cannot occur until after the pulling and splicing operations have been completed.



## 1.2 CONDITIONS

In addition to the *Requirements for a right-of-way development and management plan*, found in Sections 16-5-j-60 et seq. of the Regulations of Connecticut State Agencies, the Council stipulated certain requirements for the D&M plans in its Decision and Order for the Middletown-Norwalk 345-kV Project, in conditions 14-21. A copy of this portion of the Decision and Order is provided in Appendix A. Those requirements have been incorporated in this D&M Plan either directly or by reference. Construction procedures will also be described in the *Method and Manner to Construct* filing that will be submitted to the Connecticut Department of Public Utility Control pursuant to Connecticut General Statutes §16-243. No permits from the U.S. Army Corps of Engineers or the Connecticut Department of Environmental Protection are required for the work proposed in this D&M Plan since watercourse crossings and associated wetlands will be handled in a separate D&M Plan. A "Disruption of Solid Waste Disposal Area" permit from DEP for a closed municipal landfill located under the parking area on the east bank of the Saugatuck River in Westport may be required depending upon the final location of the horizontal directional drill entry hole.

## 1.3 CONSULTATIONS

As part of the preparation of this D&M Plan, CL&P consulted with the Town of Westport and the City of Norwalk, as well as the ConnDOT.

### 1.3.1 Town of Westport

CL&P consulted with the following representatives of the Town of Westport on June 9, 2005:

- Steven Edwards – Director of Public Works
- Daniel Delehanty – Town Engineer
- Chris Ackley – Fire Chief
- Ira Bloom – Town Attorney

During the meeting CL&P representatives outlined the D&M Plan process and reviewed the construction activities that would take place in Westport associated with the construction of Segment 4b. The main concerns voiced by Westport representatives focused on long-term health and safety issues of magnetic field exposures by residents. The Town requested that duct-bank placement be as close to the middle of the road as possible on Lincoln Street and Imperial Avenue. The Town's representatives also indicated that they seek nighttime construction on Imperial Avenue and daytime construction on Lincoln Street. Requests were made for CL&P to explore additional Saugatuck River crossing locations to avoid former landfill areas on the east side of the river. The Town requested a preconstruction meeting with emergency responders to discuss contingency plans for Route 1 and confined-space entry plans for splice vaults. CL&P also provided information regarding points of contact at the Company for the Project.

### 1.3.2 City of Norwalk

CL&P consulted with the following representatives of the City of Norwalk on June 28, 2005:

- Paul Resnick – Police Department
- Michael Dolhancryk – Norwalk 911
- Hal Alvord – Director of Public Works
- Alex Knopp – former Mayor
- Dennis McCarthy – Fire Department

- Ed Musante – Chamber of Commerce

The main concern of Norwalk city officials was minimizing the length of time the community would be impacted by construction activities. The City would like to see as many crews as possible working in Norwalk at one time to expedite the process. The City's representatives mentioned that noise near residential areas during nighttime construction is an issue. They also indicated that businesses in the project area are concerned about the Project and suggested holding a preconstruction information meeting regarding what to expect. The City requested a preconstruction meeting with emergency personnel and consultation in developing MPT plans, particularly those involving detours. CL&P also provided information regarding points of contact at the Company for the Project.

### **1.3.3 ConnDOT**

A meeting with ConnDOT engineers and staff was held on September 7, 2005. ConnDOT attendees included:

- Sohrab Afrazi, ConnDOT Utilities
- Charles Harlow, ConnDOT Traffic
- Tracy Fogarty, ConnDOT Traffic
- Barbara Ricoszi, ConnDOT Traffic
- Jerry Graci, ConnDOT Utilities
- Kurt W. Von Hone, ConnDOT Utilities
- Carmine Cavallaro, ConnDOT DIST 3, Permits
- Brian Cunningham, ConnDOT Consultant Design
- Anthony Kwentoh, ConnDOT DIST 3, Construction
- Craig Bordere, ConnDOT Rails-Property
- Dennis Murphy, ConnDOT Rails
- Andrew Przybylowicz, ConnDOT CE-Design
- Andy Fesenmeyer, ConnDOT CE-Design
- Robert Brown, ConnDOT CE-Design.

The meeting began with a discussion of the strategy of D&M Plan submittals, including the number and extent of D&M Plans, concurrent review with municipalities, the plan to submit water crossings in a separate D&M Plan and vault locations as they related to the ConnDOT right-of-way. CL&P requested that ConnDOT review and determine pavement restoration procedures. The time frame for review and subsequent submittals was addressed during this meeting. ConnDOT staff discussed inspection concerns and also concerns over the fact that the roads included in the transmission line route were rated for heavy loads and as such would require that all components of the transmission line be rated to weights equal to those required for the roads. ConnDOT personnel also stated that telephone and sewer relocations should be avoided.

## 2.0 DRAWINGS AND SITE INFORMATION

Segment 4b extends from Sasco Creek at the Fairfield/Westport town line to the intersection of North Avenue (Route 1) and Westport Avenue in the City of Norwalk, a distance of approximately 6.7 miles. The route is located primarily within existing municipal road and ConnDOT rights-of-way with the exception of most off-right-of-way splice-vault locations. CL&P performed and reported on extensive research on environmental conditions and cultural resources as part of the Docket No. 272 Application to the Council. Descriptive information regarding the existing conditions at the site and the modifications that will take place along Segment 4b as part of the Project follows. This information is shown graphically on the drawings described below.

### 2.1 KEY MAP

The location of Segment 4b is shown on the Key Map on Figure 2.1 on page 2-2 below.

### 2.2 PLAN DRAWINGS

In addition to the Key Map, this D&M Plan contains drawings showing the Plan and Profile for the transmission line construction using a scale of 1"=30'. The Plan and Profile drawings, which are located under separate cover in Volume 2, are noted by municipal name and stationing. These drawings depict the engineering design for installation of the duct bank, location of existing underground utilities, ROW boundary, adjacent property owners, public lands, vault locations and access points other than municipal roadways.

### 2.3 LAND OWNERSHIP

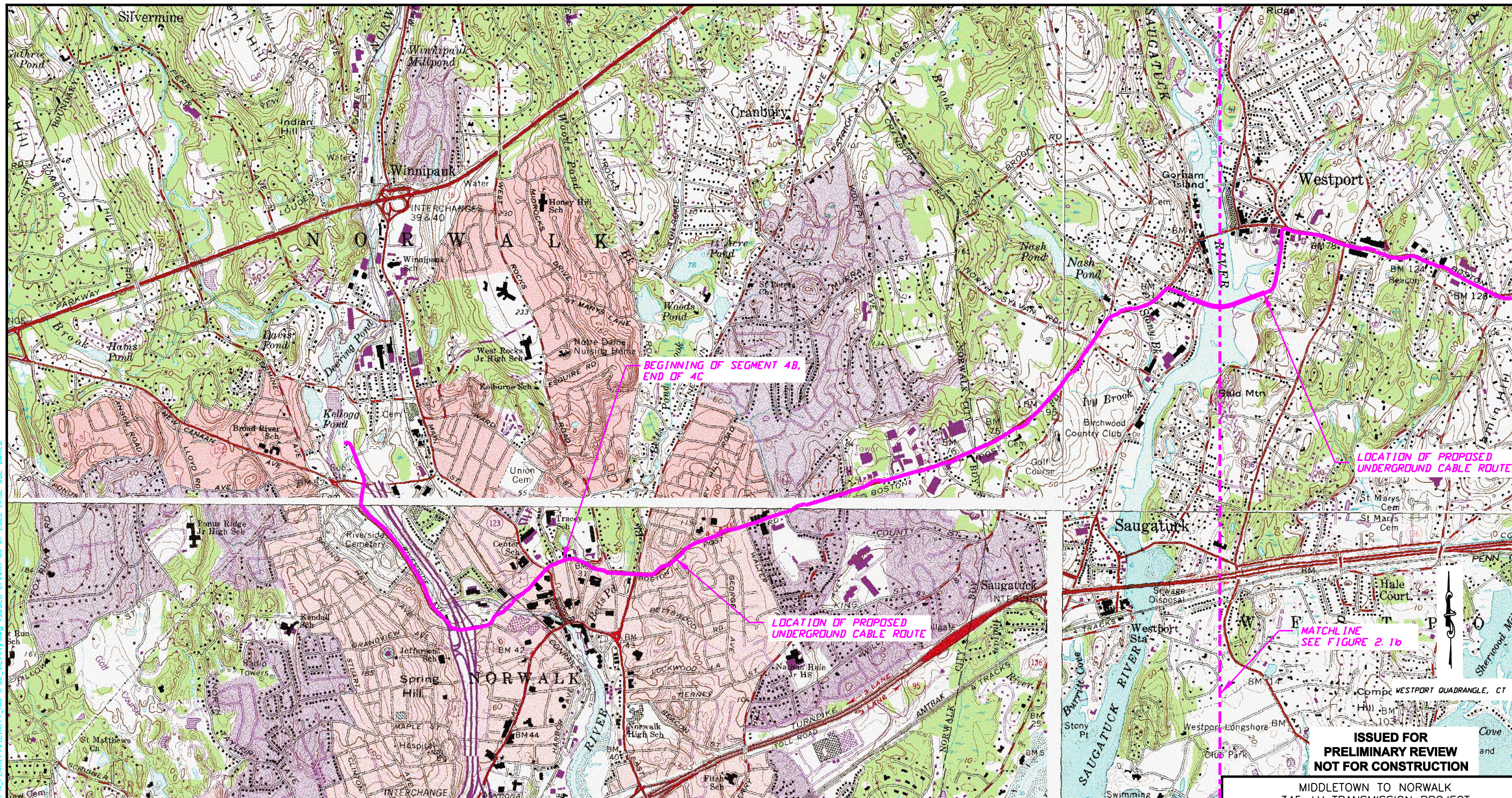
The 345-kV cable system to be installed in Segment 4b is primarily within existing municipal and ConnDOT rights-of-way. Most of the vault locations are located on private property.

Six pairs (12 total) of splice vaults will be located in Norwalk and 16 pairs (32 total) of splice vaults will be located in Westport as follows:

- Ten pairs will be outside the ConnDOT ROW on private property;
- Three pairs will be within the ConnDOT ROW inside the roadway;
- Two pairs will be within the ConnDOT ROW but outside the roadway;
- Six pairs will be partially in DOT ROW and partially on private property;
- One pair will be within the municipal roadway ROW in the Town of Westport.

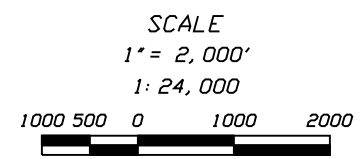
A list of private property owners identified on the Plan drawings in Volume 2 from whom temporary and permanent easements will have to be acquired is provided in Table 2-1 below. Figure 2-2 depicts the typical temporary and permanent easement layout needed for splice-vault locations. The typical layout incorporates approximately 10,000 square feet of permanent easement area and 6,500 square feet of temporary easement. Site-specific conditions, including but not limited to rock, existing utilities, available workspace, and overhead obstructions, will dictate the actual dimensions of the temporary and permanent easements at each location.

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MAP SOURCE: ENVIRONMENTAL GIS DATA FOR CONNECTICUT TOPOGRAPHIC QUADRANGLE MAP FILES 2005

### KEY MAP



**ISSUED FOR  
 PRELIMINARY REVIEW  
 NOT FOR CONSTRUCTION**

MIDDLETOWN TO NORWALK  
 345-kV TRANSMISSION PROJECT  
 PROPOSED UNDERGROUND CABLE ROUTE  
 WESTPORT AVE AND NORTH AVE TO WESTPORT  
 FAIRFIELD TOWNLINE

LOCATION: CITY OF NORWALK, TOWN OF WESTPORT  
 COUNTY: FAIRFIELD STATE: CT

Connecticut  
 Light & Power  
 The Northeast Utilities System  
 DATE: 04/17/06

FIGURE 2.1a