MUNICIPAL CONSULTATION FILING

TO FULFILL THE INFORMATION REQUIREMENTS OF SECTION 16-501(l)(e) OF THE CONNECTICUT GENERAL STATUTES

FOR THE

CONSTRUCTION AND OPERATION OF A NEW DISTRIBUTION SUBSTATION

IN THE

TOWN OF STRATFORD, CONNECTICUT

BY

THE UNITED ILLUMINATING COMPANY

AUGUST 14, 2015

A UIL HOLDINGS COMPANY

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 5
I.A. Overview of the Proposed Project and Project Need 5
I.B. Purpose of the Municipal Consultation Filing 5
I.C. Alternative Site Evaluation Process 7
I.D. Environmental Impact 8
I.E. Design Modifications 9
II. UI INFORMATION: LEGAL NAME AND CONTACTS 11
III. PROJECT NEED 12
III.A. Benefits of the Substation 14
III.B. Alternative Energy and Capacity Solutions Considered 14
IV. DESCRIPTION OF PROPOSED FACILITY 16
IV.A. Project Location 16
IV.B. Land Requirements and Access 20
IV.C. Site History and Environmental Remediation 21
IV.D. Description of Proposed Substation Facilities 21
IV.E Estimated Cost of the Project 23
IV.F Facility Service Life 23
V. PROPOSED CONSTRUCTION AND OPERATION / MAINTENANCE PROCEDURES 23
V.A. Construction Sequencing 23
V.B. Stormwater Management Approach 25
V.C. Operation and Maintenance Procedures 26
V.D. Traffic Considerations 28
V.E. Physical Site Security and Energy Security 28
VI. EXISTING ENVIRONMENTAL CONDITIONS 28
VI.A. Topography, Geology, and Soils 29
VI.B. Water Resources and Water Quality 30
VI.C. Biological Resources 31
VI.D. Land Use, Zoning, Land Use Plans, and Recreation 32
VI.E. Visual and Aesthetic Characteristics 32
VI.F. Transportation and Utilities 32
VI.G. Cultural (Archaeological and Historic) Resources 33
VI.H. Noise 34
VI.I. Lighting 35

VII. POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES 35
VII.A. Topography, Geology, and Soils 35
VII.B. Water Resources and Water Quality 36
VII.C. Biological Resources 36
VII.D. Visual and Aesthetic Characteristics 37
VII.E. Transportation and Utilities 37
VII.F. Cultural (Archaeological and Historic) Resources 38
VII.G. Air Quality, Noise, and Lighting 38
VIII. ELECTRIC AND MAGNETIC FIELD CONSIDERATIONS 40
IX. ALTERNATIVES CONSIDERED 40
IX.A. UI SITE SELECTION CRITERIA 42
IX.B. IDENTIFICATION AND SCREENING OF POTENTIAL SITES 44
X. PROJECT SCHEDULE 49

APPENDICES

APPENDIX A. MAPS AND DRAWINGS

DR.1 U.S.G.S. Topographic Quadrangle Map: Proposed Project Location

DR.2 Site Plan

DR.3 Substation Drawings

DR.4 Existing and Historic Aerial Photographs of the Project Site

DR.5 Photographic Simulation of Proposed Substation

APPENDIX B. AGENCY CORRESPONDENCE

SH.1 Natural Diversity Data Base – Baird Annex

SH.2 Natural Diversity Data Base – West Broad Street

SH.3 State Historic Preservation Office – Baird Annex

APPENDIX C. WETLANDS AND WATERCOURSES REPORT

APPENDIX D. NOISE ASSESSMENT

APPENDIX E. SITE SELECTION STUDY

LIST OF FIGURES

Figure No.

IV-1 General Property Location……. 18

IV-1 Aerial Overlay……. 19

IX-1 Alternative Sites Evaluated…… 46

I. EXECUTIVE SUMMARY

I.A. OVERVIEW OF THE PROPOSED PROJECT AND PROJECT NEED

The United Illuminating Company ("UI") proposes to construct and operate a new 115/13.8 kilovolt (kV) distribution substation adjacent to an existing UI substation, Baird substation ("Baird"), located at 1770 Stratford Avenue in Stratford ("Stratford"), Connecticut in order to address several compliance and aging infrastructure needs ("the Project"). The proposed distribution substation will occupy 3.5-acres of land comprised of two UI owned parcels ("Site"). The proposed substation will replace the existing Baird substation. After the new substation is placed in service and all circuits are cutover to the new substation, UI will remove the existing Baird substation from service.

The existing Baird substation has a number of needs that together require improvements to almost all areas of the substation to address both compliance and aging infrastructure concerns. The improvements include but are not limited to the replacement of the transmission path through the substation due to capacity limitations, replacement of support structures due to integrity issues, additional equipment to control voltage levels to the customers, replacement of 50-year old equipment and control room expansion to allow for needed upgrades. In light of the extensive improvements needed to the existing Baird substation, the Company determined that construction of a new substation was the preferred option.

The construction, operation and maintenance of the proposed substation will result in generally minor impacts that will be localized to the Site and the immediate vicinity of the Site. Overall, the Project will result in beneficial reuse of a portion of a former industrial site. As the project proceeds UI would implement measures to mitigate adverse effects, as within this document.

I.B. PURPOSE OF THE MUNICIPAL CONSULTATION FILING

UI proposes to seek approval from the Connecticut Siting Council ("Council") for the construction and operation of the new substation.

In the fourth quarter of 2015, UI plans to submit to the Council an Application for the proposed substation. UI will submit the Application in accordance with the Siting Council's A*pplication Guide for an Electric Substation Facility* (April 2010) and pursuant to the Public Utility Environmental Standards Act, Section 16-50g et seq. of the Connecticut General Statutes ("Conn. Gen. Stat.") and Section 16-50j-1 et seq. of the Regulations of Connecticut State Agencies ("RCSA").

In accordance with state law, prior to the submission of the Application, UI must provide information about the proposed Project and consult with any municipalities in which any portion of the primary or alternative sites proposed for the substation are located and any municipalities within 2,500 feet of such sites. Specifically, Conn. Gen. Stat. § 16-50l(e) requires that:

> [a]t least sixty days prior to the filing of any application with the council, the applicant shall consult with the municipality in which the facility may be located and with any other municipality required to be served with a copy of the application under subdivision (1) of subsection (b) of this section concerning the proposed and alternative sites of the facility. Such consultation with the municipality shall include, but not be limited to good faith efforts to meet with the chief elected official of the municipality. At the time of the consultation, the applicant shall provide the chief elected official with any technical reports concerning the public need, the site selection process and the environmental effects of the proposed facility.
>
> Conn. Gen. Stat. § 16-50l(e).

Accordingly, UI is providing this MCF as part of the pre-Application process. This document seeks to inform representatives of Stratford and the public about the proposed Project and to provide an opportunity for municipal officials and the public to provide input to UI regarding the Project.

I.C. ALTERNATIVE SITE EVALUATION PROCESS

UI identified and evaluated various alternatives for mitigation of the infrastructure and compliance needs identified for the Baird substation. For example, UI considered replacement of the substation's 115 kV transmission bus in place while relocating the 13.8 kV distribution portion of the station but discarded this alternative as it was considered either impractical or insufficient to address all of the identified needs. Additionally, UI rejected the "No Action" alternative as it would result in violation of several standards for voltage regulation and transmission capacity, creating a significant adverse impact on system reliability, customer satisfaction and the economic vitality of the Stratford area. UI also investigated an "In-Kind" alternative that would replace each individual component requiring replacement at the substation with minimal expansion to the existing footprint. While this option appeared feasible, it would be considerably more costly than full replacement of the substation, require a significantly longer construction period, and increase complexity of construction sequencing and hazards due to the need for the substation to remain energized and serving customers during construction. Therefore, a new substation is the preferred solution for providing long-term reliable electric service to the Stratford Area.

UI used an iterative process to identify feasible alternative sites for the development of the new substation. UI first identified and screened potential locations in accordance with UI's standard objectives for substation siting. UI's screening included the following guiding principles:

- Minimize the need to acquire residences and viable commercial/industrial use to accommodate substation development.
- Maintain consistency/compatibility with existing land uses and land use plans to the extent possible.
- Minimize adverse effects on sensitive environmental resources and the social environment.
- Maintain public health and safety.
- Demonstrate cost effectiveness, while adhering to good engineering and sound environmental planning practices.
- Present the public with a clear and well documented methodology for the identification of the proposed and alternative sites.

Other key considerations in the site evaluation process included the locations of potential sites in relation to the existing substation and to the 115 kV transmission lines that traverse east to west along the Metro-North Railroad Corridor and feed adjacent UI substations in Bridgeport and Stratford. Proximity to these two existing distribution and transmission assets reduces the likelihood of conflicts with physical encumbrances, presence of other utilities, and the cost associated with the installation of new infrastructure.

This alternatives evaluation process led to the selection of the proposed, preferred substation Site at the Baird Annex site, as well as the alternative site at West Broad Street.

I.D. ENVIRONMENTAL IMPACT

The development of the new substation at the Baird Annex location will result in the beneficial redevelopment of this brownfield site. UI has assessed the potential effects of the project on various environmental factors, including soils, geology, and topography, biological resources, water resources, land use, cultural resources, noise, and air quality.

The construction and operation of the substation represents a long-term change in the current land use of the Site, but will be consistent with the historical use of the Site for industrial purposes. The project will modify on-Site vegetation and wildlife habitat, as well as localized views of the Site. In addition, development of the substation will require the unavoidable filling of the small wetland located in the forested strip of land on adjacent UI property, due to the repositioning of the substation to provide a buffer to the Two Roads Brewing Company.

In general, however, these changes will be localized to the Site and the immediate vicinity of the Site. Further, UI would implement measures to mitigate adverse effects, as appropriate, based on further consultations during the Siting Council process and other permit and approval processes required for the Project.

I.E. DESIGN MODIFICATIONS

Through discussions with Stratford and the property abutters, UI has made several design modifications to reduce the substation's visual and aesthetic impacts, as well as to accommodate planned modifications of abutting properties. These modifications are outlined as follows:

- Roundabout on Stratford Avenue –Stratford purposes to construct a new roundabout at the corners of Stratford Avenue, Honeyspot Road, and South Avenue. This roundabout as well as corresponding sidewalks and street beautification, requires that a portion of the UI owned property to the south would be utilized. To accommodate this, UI shifted the substation to the north to maintain adequate setback to the roundabout and allow for the planting of vegetation.
- Proximity to Two Roads Brewing Company - The Baird Annex property, on which the new substation is proposed, directly abuts the Two Roads Brewing Company property to the east. During discussions with Stratford, the Two Roads Brewing Company and UI, concerns were raised regarding the proposed substations proximity to the brewery. To alleviate these concerns, UI revaluated the design of the substation and modified the positioning to better utilize a forested strip of land on adjacent UI owned property to the west. This forested area was previously avoided due to visible rock outcroppings and a small wetland. This modification created an approximately 110 foot "buffer area" between the proposed substation fence line and the Two Roads Brewing Company property line.
- Lighting – To ensure physical security of critical infrastructure and the safety of the general public, UI's standard substation design utilizes high mast lights mounted on the same masts used for lightning protection to properly illuminate the substation during nighttime hours. However, given the surrounding landscape of the proposed substation, low level LED lighting will be utilized to minimize light dissipation to abutting properties.
- Lightning Protection – To prevent damage to critical infrastructure within the substation yard, UI utilizes industry standard practices for protection against lightning strikes. Complete lightning protection is obtained through a combination of shielding wires on transmission lines, standalone 70 foot lightning masts, and finials mounted on support

structures. The standard lightning masts can be reduced to 55 feet, but the total number of these masts must then be increased. UI discussed options for lightning protection with Stratford and the Two Roads Brewing Company and agreed that the 70 foot lightning masts would be the least visibly intrusive due to their reduced numbers.

II. UI INFORMATION: LEGAL NAME AND CONTACTS

UI is a specially chartered Connecticut corporation. UI's name and permanent place of business is:

The United Illuminating Company
157 Church Street
New Haven, CT 06506

Mailing Address: P.O. Box 154
New Haven, CT 06506

Telephone: 800.722.5584

Internet Address: The United Illuminating Company website
www.uinet.com

Applicant Contacts: Richard J. Reed
The United Illuminating Company
180 Marsh Hill Road
Orange, CT 06477
203.499.4500 (Telephone)
203.499.3664 (FAX)

rich.reed@uinet.com

Bruce L. McDermott, Esq.
James R. Morrissey, Esq.
The United Illuminating Company
157 Church Street
New Haven, CT 06506
203.499.2422 (Telephone)
203.499.2864 (Telephone)
bruce.mcdermott@uinet.com
james.morrissey@uinet.com

III. PROJECT NEED

The existing Baird substation requires major modifications due to the following issues:

1. Inadequate transmission bus capacity.
2. Lack of structural integrity of the transmission bus and support structures.
3. Inability to provide adequate distribution voltage regulation.
4. Aging and antiquated switchgear.
5. Insufficient control enclosure space for planned modifications.

Four 115kV transmission circuits carry electricity through the substation along the Metro-North Railroad Corridor. These transmission circuits not only deliver electricity to the Baird substation but also allow electricity to pass through it to adjacent substations feeding UI customers. The Southwest Connecticut Area Transmission Needs Assessment from July 13, 2011 identified these circuits as requiring significant capacity upgrades due to projected load growth, generation and system topology changes. In addition, this assessment determined that the Baird transmission bus would be substantially overloaded under contingency conditions. These overloads range in severity under worst case contingency conditions. These necessary modifications to alleviate overloaded elements of the Baird substation require a substantial investment in the transmission bus system.

The transmission bus at Baird substation is also structurally at risk due to the potential for overstressing of the existing strain bus and support structures under extreme weather conditions or due to certain faults on the transmission bus. The overstressed conditions could lead to a structural failure of the bus system which in turn could lead to an extended duration outage for the customers fed from the substation. This kind of extended duration outage could have significant negative impacts on customer satisfaction and the economic vitality of the region.

Baird substation delivers electricity to UI's residential, commercial and industrial customers through a series of 13.8kV distribution circuits. The Baird substation utilizes two 115kV/13.8kV transformers to transform (step down) the electric power carried by the railroad corridor transmission circuits. Currently these two transformers fail to maintain adequate distribution voltages to UI's customers under normal and contingency conditions. Under ANSI C84.1-2006

voltage regulations, voltages provided to customers should not fall below 91.6% nominal voltage. UI's System Integrity Department completed a formal report[1] on the Baird substations ability to adequately regulate voltage on its distribution circuits. The analysis found that voltages in 2011 would be below the ANSI allowable voltage level on all 16 distribution circuits supplied by the substation under line and transformer contingency conditions. These levels also violate the allowable voltage levels defined by PURA of .95 per unit to 1.03 per unit.

The distribution circuits fed from Baird are controlled by switchgear manufactured over 50 years ago, which is reaching the end of its useful operating life. This equipment will need to be replaced in the near future. Although UI can keep this equipment in service, doing so will likely result in increased maintenance, custom fabrication of replacement components, and harvesting parts from spare switchgear on UI's system. Aged equipment of this vintage can experience sudden failures resulting in unexpected customer outages, increased maintenance and unscheduled replacement activities. The increased risk of frequent sudden failures contributes to increased reliability risk and maintenance efforts. As a result of this equipment's deteriorating condition and risks to reliability, its replacement is required.

The existing Baird control enclosure lacks sufficient space to accommodate any future expansion, upgrades or modifications at the substation. Existing identified protection system upgrades at adjacent substations will require modification of the protection and control systems at Baird Substation. These modifications are not viable within the existing control enclosure. Additionally, the existing cable tray system within the control enclosure is significantly overfilled and any additional protection and control cable work at the station will be difficult to implement.

All of the aforementioned needs as well as several others were evaluated and thoroughly documented in the formal Baird Substation Needs Assessment.[2] All of the needs exist with present day conditions and require remediation as soon as practical.

[1] Baird Substation Condition Assessment – Distribution Capacity and Voltage Regulation November 18, 2011.
[2] Baird Substation Assessment Report – Needs Assessment April 2, 2012.

Due to the extensive modifications and significant investment required to address the many needs of the Baird substation, UI undertook a comprehensive Solution Study[3] to evaluate potential alternatives. The Baird Substation Solution Study determined that UI should construct a new substation on property owned by UI to the east of the existing Baird substation.

III.A. BENEFITS OF THE SUBSTATION

The proposed Project will provide a new substation on land already owned by UI to the east of the existing Baird substation. The new substation will replace Baird and allow UI to take the existing facility out of service once the new substation is in service. UI will construct the new substation to meet or exceed the capacity of the interconnected transmission circuits and utilize Load Tap Changing ("LTC") transformers to provide adequate distribution voltage regulation. New 13.8kV switchgear will control the new distribution circuits. As a result, the new substation will eliminate significant compliance issues and mitigate reliability risks to UI customers as a result of aging and antiquated equipment.

III.B. ALTERNATIVE ENERGY AND CAPACITY SOLUTIONS CONSIDERED

As options for addressing the numerous needs of the existing substation, UI identified and evaluated five potential solutions, as follows:

1. No Action;
2. Rebuild 115kV Transmission Bus in Place and Relocate 13.8kV Distribution System;
3. Rebuild 13.8kV Distribution System in Place and Relocate 115kV Transmission Bus;
4. In-Kind Replacement;
5. Full Replacement.

These potential solutions were evaluated based on economics and system performance (capacity, availability, and reliability), as well as engineering considerations. The following section summarizes the analysis of the above-referenced alternatives.

[3] Baird Substation Solution Study Report – March 2013.

In the "No Action" alternative, UI would need to accept the risks and consequences associated with this option, including the possibility of insufficient transmission capacity during peak load and contingency scenarios. UI would also need to accept the risk of unacceptable distribution voltages provided to customers, potentially violating ANSI and CT PURA requirements, as well as the reliability risks associated with the aging and antiquated distribution switchgear. Accepting the risk associated with the "No Action" option is not advisable and was rejected due to the significant adverse impact on system reliability levels and in turn, customer satisfaction and the economic vitality of the region.

UI discussed alternatives that involved changes to the existing substation configuration in terms of transmission and distribution connections or separation of the transmission and distribution facilities from each other. Both options are either impractical or insufficient to address all of the identified needs and are no longer viable.

The In-Kind Replacement alternative was based on the concept of upgrading the existing substation in a piecemeal fashion to address each area identified as requiring modification under the Needs Assessment. The parts of the substation not identified in the Needs Assessment would remain in place as much as feasible. This alternative requires:

- Upgrading the existing 115kV transmission bus current carrying components to at least the ratings of the incoming/outgoing transmission lines;
- Replacement of two (2) existing 115kV/13.8kV non-LTC transformers with two (2) 115kV/13.8kV transformers with LTC capability;
- Replacement of the existing 13.8kV distribution switchgear with new switchgear of a modern design inside the existing control enclosure;
- Addition of a new control enclosure, located adjacent to the existing masonry block enclosure, to allow for the additional space for planned modification/upgrades of protection and control equipment.

Any other minor ancillary needs would be addressed through modifications to the existing substation facility with minimal expansion of the existing footprint. While this alternative addressed all identified needs, it would expose UI's customers to significant reliability risks, due

to the long equipment outages required to replace nearly the entire substation while the facility remained energized, operational and serving customers in the Stratford area. The construction sequencing and construction hazards are substantially greater in this alternative than for greenfield construction. In addition, this alternative creates a longer construction duration and is substantially more expensive than a full replacement of the facility on adjacent property.

This evaluation concluded that the construction of a new 115kV/13.8kV distribution substation in the Stratford area would best meet the long-term capacity, infrastructure, and compliance needs of the area safely and reliably. A Site Selection Study identified three different sites. UI evaluated each site from an engineering perspective as potential locations for a new substation in this area. Section IX discusses the alternative site evaluation process in greater detail.

IV. DESCRIPTION OF PROPOSED FACILITY

IV.A. PROJECT LOCATION

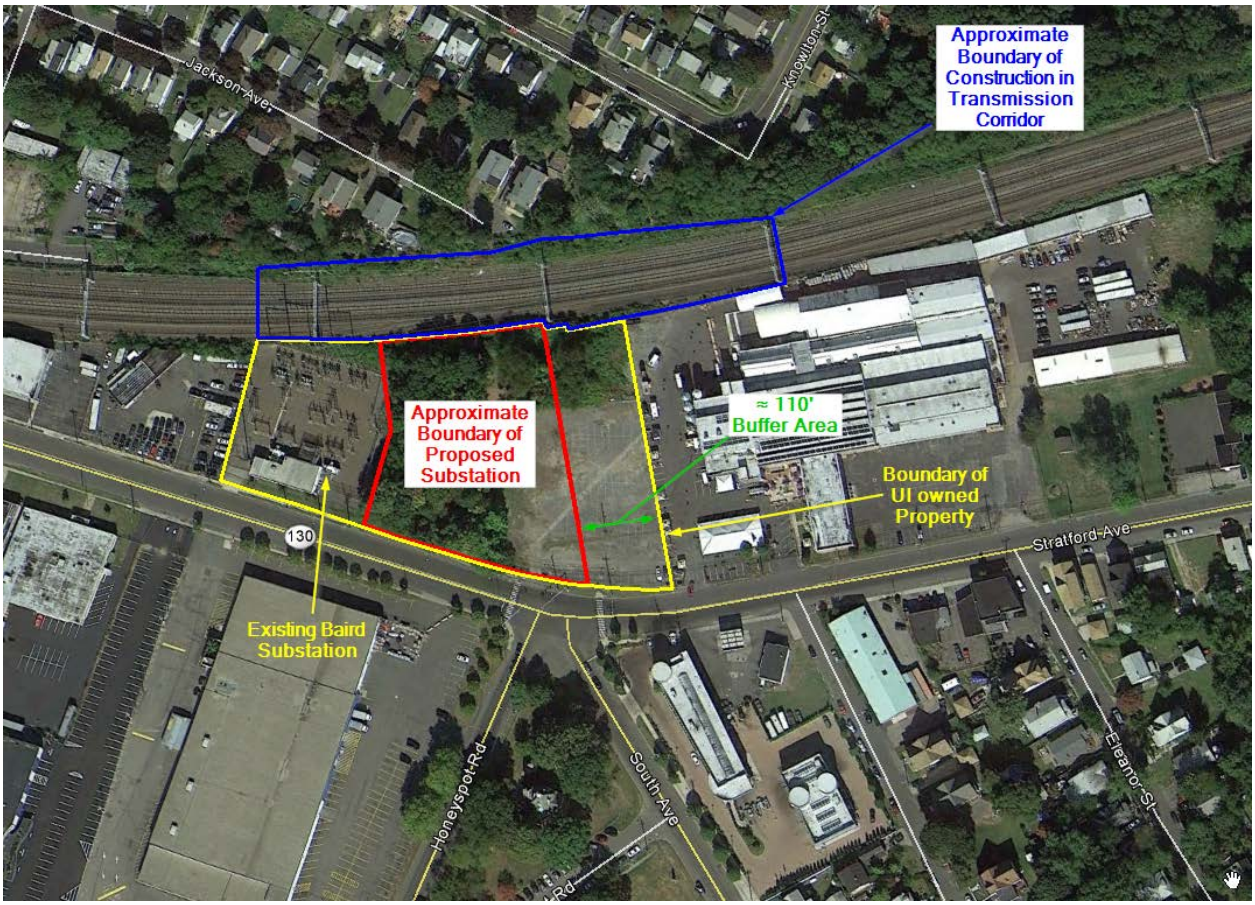
New Baird Substation was originally proposed for location solely on a 1.8-acre parcel of UI owned property located at 1700 Stratford Avenue in Stratford adjacent to Stratford Avenue. UI purchased the property in December 2010. However, amongst discussions between UI, Stratford and the abutting property owners, several modifications were made to the original positioning of the substation which are described in the following sections.

During initial conversations regarding the project, Stratford notified UI of a proposed roundabout at the intersection of Stratford Avenue, Honeyspot Road and South Avenue which would impact the proposed substation. The proposal included new sidewalks and street beautification in addition to the roundabout. This positioning of the roundabout would require use of the southern portion of the UI owned 1.8-acre parcel. To accommodate the proposal, UI shifted the substation to the north to allow adequate set back and street beautification associated with the proposed roundabout. Additionally, analysis was performed to ensure large equipment access to the substation would be feasible. Incorporating the analysis and UI access requirements, the substation access road was relocated to the west on Stratford Avenue away from the roundabout to ensure safe access and egress from the substation.

Further, Stratford and neighboring property abutters voiced concerns regarding the substations proximity to the Two Roads Brewing Company. To alleviate these concerns UI re-evaluated the substation location to better utilize adjacent UI property to the west, resulting in a shift of the proposed substation approximately 110 feet to the west and creating a buffer area between the substation and the Two Roads Brewing Company. The existing Baird substation occupies the majority of this parcel. The eastern portion of this adjacent parcel includes a forested area with low lying shrubs, a small wetland and visible rock outcroppings. The proposed shifted positioning of the substation incorporates portions of both UI owned parcels.

Figure IV-1 illustrates the location of the proposed substation within the UI owned properties. The Site is bounded to the east by an approximately 110 foot buffer area to the Two Roads Brewing Company, to the south by Stratford Avenue, to the west by the existing Baird Substation, and to the north by the Metro-North Railroad. Existing stormwater and sanitary sewer easements extend the width of the property on the southern side along Stratford Avenue. Appendix A, Drawing 1 includes a U.S. Geological Survey map of the proposed Site and vicinity, as well as a current aerial photograph of the Site.

Figure IV-1: General Property Location



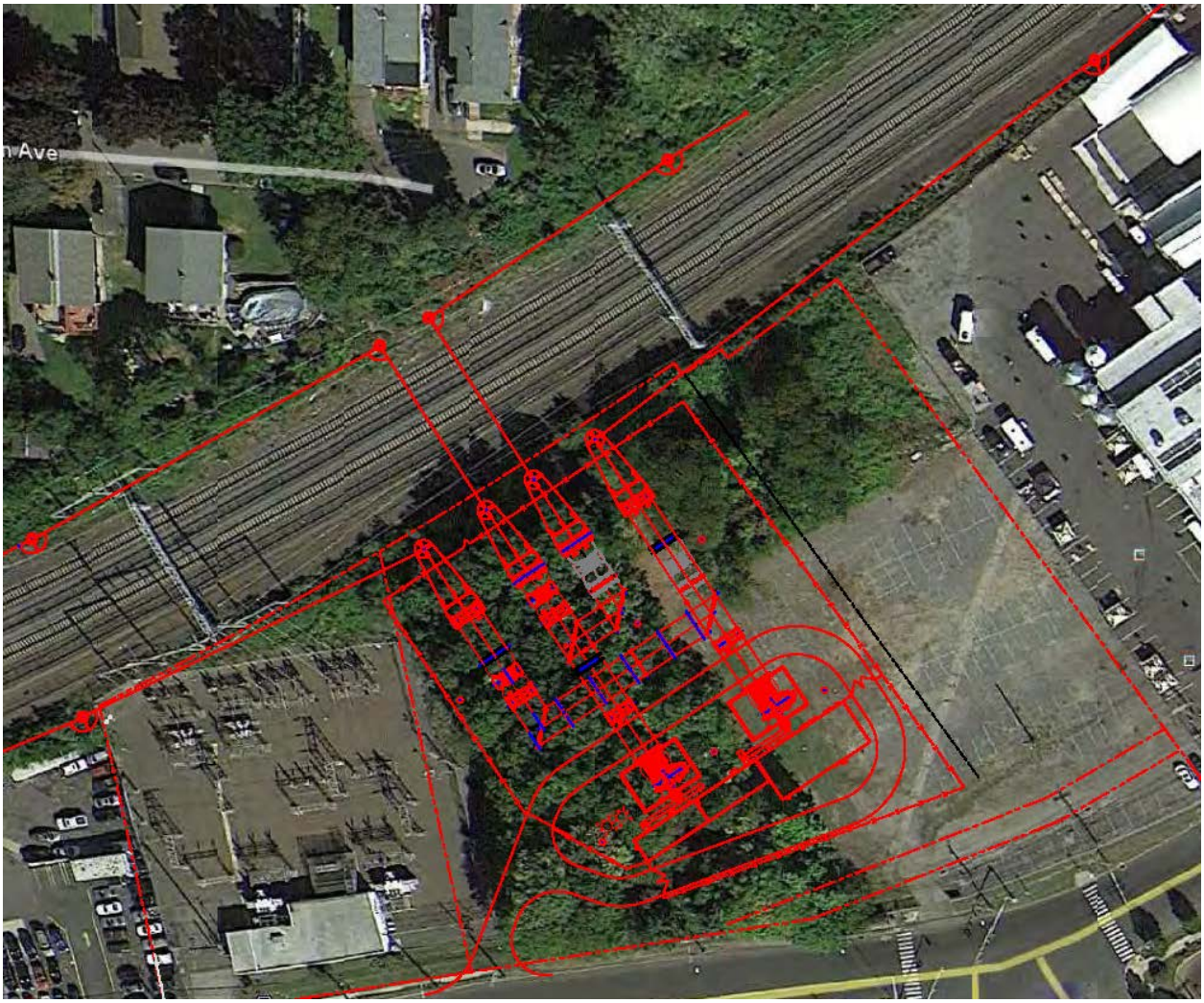
Source: Google Earth, July 2015

The majority of the property consists of undeveloped land with trees and low lying vegetation between the existing Baird substation and the adjacent parking lot. Inside of this wooded strip of land is as an approximately 654 square foot wetland as well as visible rock outcroppings. The eastern portion of the property consists of paved asphalt surfacing used for overflow parking by the Two Roads Brewing Company through an agreement with UI. The area to the north of the property consists primarily of low lying vegetation and sparse trees as well as concrete footings and sections of rail from an abandoned railroad spur. UI presently uses portions of the property for staging equipment and vehicles for construction activities on UI's four 115kV transmission circuits.

The Site was historically developed for industrial purposes by the U.S. Baird Corporation. The company dates back to the 1890s, with evidence of original building occupation at the Site in

1920. Additional structures were added at other locations on the original Baird property, but no structures except for a small storage shed were constructed on this parcel. The parcel remained substantially wooded until the 1970s when it was partially paved and used for additional parking areas for the U.S. Baird Corporation.

Figure IV-2: Aerial Overlay



IV.B. LAND REQUIREMENTS AND ACCESS

The proposed Site is located on approximately 1.5 acres spanning two UI-owned properties with a combined size of 3.5-acres. The existing Baird substation constructed in the early 1960's occupies approximately 0.9 acres of the combined properties. The new station would utilize portions of both UI owned properties and would abut the Metro-North Railroad corridor to the north. This corridor is presently occupied by two UI owned 115kV transmission lines.

The proposed Project will occupy an area of approximately 65,000 square feet. Development of the Site includes a trap rock surface and installation of a 14-foot high chain link fence equipped with opaque slats, topped with 1 foot of barbed wire (three strands) around the perimeter.

UI will construct a new access road for the proposed Project off of Stratford Avenue. This access road would exit the western portion of the substation in order to accommodate Stratford's roundabout proposed at the front of the station.

Construction of eight new monopole structures in the Metro-North Railroad corridor and UI property will be required to redirect the two existing 115kV transmission circuits through the proposed substation. These new monopole structures will support the energized circuits that will transmit electricity to and from the proposed substation. Due to the high voltage nature of these circuits, appropriate electrical clearances are required for buildings, vegetation, temporary structures etc. to ensure safety of the general public and reliable operation of the circuits. To maintain these clearances, an easement is required across the northern border of the adjacent Two Roads Brewing Company property. This easement will ensure that new or existing structures are constructed / modified while maintaining a safe electrical clearance to the 115kV transmission circuits. The easement required on Two Roads Brewing Company property varies in width depending on the location of the transmission circuits, but would extend approximately 12 feet from the property line at its widest point. This easement addresses not only the construction planned for the proposed Project, but also construction planned for the transmission circuits heading east along the Metro-North Railroad corridor during potential future UI projects.

IV.C. SITE HISTORY AND ENVIRONMENTAL REMEDIATION

The primary use of the Site by the U.S. Baird Corporation during their occupancy was for parking or material storage. Based on the Connecticut Department of Energy and Environmental Protection's ("CT DEEP") records, the segment of the Site where the substation will be located, has had no historic environmental soil and/or groundwater contamination issues. However, according to CT DEEP, properties abutting the site such as 1725 Stratford Avenue and 1650-1700 Stratford Avenue are on record with the CT DEEP as having remedial activities performed. These activities at the abutting properties include but are not limited to Leaking Underground Storage Tanks and a Phase II/III Site Investigation.

IV.D. DESCRIPTION OF PROPOSED SUBSTATION FACILITIES

UI proposes to locate the Project adjacent to the Metro-North Railroad corridor and the existing 115kV transmission lines. The two 115kV transmission lines will be segmented and looped through the substation. Within the substation, UI will step down the power from these transmission lines to 13.8kV for delivery to the electric distribution system in the Stratford region. As illustrated on the Site Plan and Drawings in Appendix A, the proposed substation facilities would include:

- Two 115kV circuit breakers;
- Eight 115kV disconnect switches;
- Two 50 MVA power transformers to step down the voltage from 115kV to 13.8kV;
- Provisions to accommodate a temporary, mobile transformer for emergency conditions;
- Two switchgear enclosures, each approximately 42 feet long, 15 feet wide, and 13 feet high, would be installed to provide for the switching equipment, relaying and control equipment; and
- A control enclosure (for equipment protection), approximately 60 feet long by 28 feet wide by 13 feet high would be installed at the southern end of the substation and attached to the two switchgear enclosures. This enclosure would be designed to house the protective relaying and control equipment as well as the DC station service equipment.

UI will design the new Baird substation to meet or exceed the state Building and Fire Codes, which takes into account seismic loading, wind loading, and snow and ice loadings, among others.

UI's existing transmission lines are supported on the Metro-North Railroad catenary structures running east to west along the northern most edge of the Project site. These transmission lines feed the existing Baird substation in a similar configuration as the proposed substation. The existing transmission lines would be routed into the substation by installation of eight new steel monopoles.

The eight new steel monopoles, which will be installed to connect the substation to the existing transmission lines, will be similar in height to the monopole structures installed to the east of the Project Site on the Metro-North Railroad corridor. The height of each new monopole can be found on the Site Plan (Drawing #25253-401) included in Appendix A. Four of the new monopoles will interconnect to the substation along the northern most portion of the Project Site and will be located on UI property. To the north of the project Site UI will install two monopoles directly across the Metro-North Railroad corridor, as well as one monopole northeast of the existing railroad catenary structure to support the new transmission conductors. The remaining monopole must be installed in the Metro-North Railroad corridor behind the Two Roads Brewing Company as the existing catenary structure is insufficient to support the required interconnection to the proposed substation. The precise positioning and height of each monopole may vary marginally due to physical access considerations and design requirements. The final positioning and height of each monopole will be described in detail as part of UI's Application to the Connecticut Siting Council.

To access the proposed substation, UI will create a new access road to the Site from Stratford Avenue. This new access road would enter Stratford Ave to the west of the Honeyspot Rd., South Avenue, and Stratford Avenue intersection. The new access road will have a travel

surface of approximately 190 feet, and will extend into the substation to provide direct ingress and egress to the station equipment and enclosures.

Development of the proposed substation requires protective relay system changes within the existing control enclosures at remote substations, including the existing Baird substation. These upgrades are required for the safe and proper operation of the proposed substation. Additionally, these upgrades will allow for both the existing and the new Baird substation to be in service simultaneously, enabling the transference of load between the two stations without interruption to customers. A temporary fiber connection will run between the existing and new control enclosures to coordinate protective relaying systems between the two facilities while they are both in service.

IV.E ESTIMATED COST OF THE PROJECT

The estimated cost for the siting, design, and construction of the new Baird Substation and supporting infrastructure is approximately $35 million.

IV.F FACILITY SERVICE LIFE

The substation equipment and supporting infrastructure is estimated to have a service life of approximately 40 years.

V. PROPOSED CONSTRUCTION AND OPERATION / MAINTENANCE PROCEDURES

UI will construct, operate, and maintain the new Baird Substation in full compliance with the standards of the National Electrical Safety Code, any conditions of the Siting Council's approval of the Project, and good utility practice.

V.A. CONSTRUCTION SEQUENCING

The general construction sequence of the substation and the 115kV line interconnection is as follows:

- Install erosion and sedimentation control measures;
- Prepare the site for development (cut, fill grading);
- Install perimeter fencing;

- Install substation foundations, conduits, grounding grid and distribution facilities;
- Spread trap rock;
- Offload and install power transformers;
- Install high voltage circuit breakers;
- Offload and set control enclosure and switchgear enclosures;
- Install steel structures and substation equipment;
- Install transmission line interconnections;
- Commission the substation;
- Install asphalt access drives;
- Complete site restoration activities; and
- Remove temporary erosion and sedimentation control measures after site stabilization is achieved.

Temporary erosion and sediment controls will be deployed during the earthwork and construction phases of the Project in accordance with the *CT DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* and the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, and as depicted on approved Project Site Plans in Appendix A. On a weekly basis, UI will inspect and maintain the temporary erosion control measures throughout the construction phase of the Project, removing sediment from the erosion control measures as needed. In addition, inspections may occur within 24 hours after each qualifying storm event, assessing turbidity and the stability of sediment erosion controls. After each qualifying storm event, UI's contractor will dispose of sediments in an upland area, such that sedimentation will not occur into water resources.

In addition, UI will be fully responsible for sequencing construction activities such that earth materials are exposed for a minimum of time before they are covered, seeded, or otherwise stabilized to prevent or minimize the potential for erosion. Upon completion of construction and establishment of permanent ground cover, the contractor will remove and dispose of erosion-control measures and remove sediment and debris from areas where control measures were used. UI will grade the substation Site to contain and treat stormwater runoff on the Site via a series of containment basins and underground storage chambers. The remainder of the stormwater will then infiltrate through the gravel base of the substation.

Upon completion of construction activities, all disturbed/exposed areas that are not otherwise developed with the substation facilities, graveled, or paved, would be stabilized with topsoil, seed and mulch. Erosion and sedimentation controls would remain in place until final site stabilization is achieved.

The substation design includes two 50 MVA transformers that will contain insulating (mineral) oil. The transformer equipment will each have a secondary containment designed to hold 110 percent of a transformer's fluid capacity and accidental spill prevention measures in place. UI proposes to install a petro barrier gravity drain system to assist in minimizing the potential for inadvertent oil discharges from the containment. Further, UI will monitor remotely a low oil level alarm that is integral to the system and will notify UI in the event of an abnormal condition at the Site. Periodic inspections of the sumps would be performed by UI personnel to promote proper function of the systems.

The distribution circuit get-away from the substation at the Site will be two new PVC underground duct banks from the substation property exiting directly into two new splicing chambers located on Stratford Avenue in front of the new substation. These new duct banks would interconnect to existing and new underground infrastructure on Stratford Avenue. To accommodate Stratford's proposed roundabout and to address aging underground infrastructure, UI will replace/repair duct banks and splicing chambers along Stratford Avenue in a separate project. The new duct banks and splicing chambers required for the proposed Project will interconnect to this new underground infrastructure on Stratford Avenue.

V.B. STORMWATER MANAGEMENT APPROACH

The final grade elevations throughout the Site will be constructed to create a relatively uniform grade within the new substation area. The existing drainage patterns will be revised to direct runoff to flow to the catch basins located within the Project Site.

The stormwater system for the proposed substation would consist of a network of five catch basins with grates at grade elevation to collect runoff for various drainage areas within the Project Site. The catch basins will transport runoff via Corrugated High-Density Polyethylene

("CHDPE") piping to an underground storage chamber, located in the southwestern portion of the substation. The below grade stormwater storage chamber will be designed with a treatment chamber ahead of the storage chamber. This treatment chamber will provide for removal of sediment, trash or debris that enters the catch basin and piping system. The below grade stormwater storage chamber will convey runoff via a pipe to the existing stormwater sewer system of Stratford. To maintain the post-development peak flow rates less than the pre-development peak flow rates, the below grade stormwater storage chamber will have a controlled outlet pipe. The pipe will transfer the excess runoff into the adjacent drainage swale located along southwest border of the Site. Stormwater runoff from the access road will be conveyed via vegetated swales to the Site stormwater drainage system. The quantity and size of the swales will be finalized in final grading and drainage design for the project Site. Additionally, the stormwater system design will be modified and finalized to accommodate Stratford's proposed roundabout design.

Offsite runoff from the neighboring property along the eastern portion of the Site will be directed to a boundary swale constructed to limit offsite water to the existing Town of Stratford's stormwater sewer system.

For rainfall events greater than the regulated rainfall events (100 year, 24 hour), the excessive runoff will be designed to flow through the substation stormwater sewer system (including below grade stormwater storage chamber) and conveyed to the site stormwater outlet.

V.C. OPERATION AND MAINTENANCE PROCEDURES

UI will operate and maintain the new Baird Substation in accordance with standard UI protocols and in conformance with required industry standards.

UI will equip the substation with measures designed to ensure continued service in the event of outages or faults on transmission or substation equipment. The Project will achieve continued reliability by incorporating a "loop through" design configuration for the existing 115kV overhead transmission lines, transformer protection, and redundant automatic protective relaying equipment.

In the event that an energized line or substation equipment fails, protective relaying equipment will immediately remove the failed line or equipment from service, thereby protecting the public and the remaining equipment within the substation. The Project design includes protective relaying equipment to automatically detect abnormal system conditions (e.g., a faulted overhead transmission line) and will send a protective trip signal to circuit breakers to isolate the faulted section of the transmission system. The protective relaying schemes will include fully redundant primary and backup equipment so that a failure of one scheme would not require the portion of the system being monitored by the protective relaying equipment to be removed from service.
UI will house the protective relaying and associated equipment, along with a Supervisory Control and Data Acquisition ("SCADA") system for 24/7 remote control and equipment monitoring at the UI System Operations Center in a weatherproof, environmentally-controlled electrical equipment enclosure.

UI incorporates IEEE/ANSI and NFPA standards for fire protection in its substation design and operates these facilities to minimize the impact of fire, in the unlikely event it occurs. UI also trains its employees and the local fire department on the safe methods to deal with a substation fire. UI will secure the control enclosure and equip it with fire extinguishers, as well as remotely monitored smoke detectors. Smoke detection will automatically activate an alarm at The UI System Operations Center and the system operators would then take appropriate action.

Additional devices will constantly monitor the substation to alert UI of any abnormal or emergency situations. UI will enclose the perimeter of the substation with a 14-foot high chain link fence equipped with opaque slats, topped with an additional 1 foot of three strands of barbed wire to discourage unauthorized entry and/or vandalism. UI will install lighting within the substation yard to facilitate work at night or during inclement weather.

UI will additionally install oil-spill containment basins around the proposed transformers. UI will design the oil-spill containment basins so that they may contain the maximum potential spill in the event of an inadvertent release of oil.

V.D. TRAFFIC CONSIDERATIONS

UI will design the substation for remote operation, with personnel on site only for periodic inspections, maintenance, and (as needed) emergency work. Permanent access to the property will be via the gate from Stratford Avenue. UI will develop an on-site access road to facilitate the movement of maintenance equipment and access to the control enclosure. This access road has been positioned to accommodate Stratford's planned roundabout in front of the substation.

V.E. PHYSICAL SITE SECURITY AND ENERGY SECURITY

The proposed Site is located on approximately 1.5 acres spanning two UI-owned properties with a combined size of 3.5 acres. UI's properties are presently fenced and gated. A license agreement is in place with the Two Roads Brewing Company for overflow parking on the paved parcel Wednesday through Sundays of each week.

The substation also would be protected with additional security measures, including fencing and access gates. *See supra* section V.B. Appropriate signs would be posted at the substation fence and gates alerting the general public of the presences of high voltage facilities. Should the substation equipment experience a failure, protective relaying would immediately remove the affected equipment from service, thereby protecting the public and the equipment. Other devices installed within the substation will constantly monitor the equipment to alert UI of any abnormal or emergency situations.

VI. EXISTING ENVIRONMENTAL CONDITIONS

This section summarizes the existing environmental conditions on the proposed Site and within the project area of the Baird Annex. In addition to summarizing the current conditions this section is meant to illustrate any potential environmental effects and the methods used to mitigate such effects.

The Wetlands and Watercourses report included in Appendix C outlines the existing environmental conditions on the proposed Site and within the project area. These conditions include:

- Residential, commercial and industrial uses;
- Vegetative community types;
- Wetlands;
- Existing Transmission infrastructure.

UI gathered the data included in this section and Appendix B through site assessment(s), historic data research and consultation with CT DEEP, Connecticut State Historic Preservation Office ("CT SHPO") and Stratford.

VI.A. TOPOGRAPHY, GEOLOGY, AND SOILS

The proposed substation Site is located within the southern portion of the Western Uplands, near the Coastal Slope physiographic province. The topography on the Site is relatively level, with elevations of approximately 13-15 feet NAVD 88 Datum. In general, past development modified the topography, including the former use of the Site for industrial uses and the associated installation of parking areas and access roads. The topography on the western portion of the Site varies, with elevation of approximately 9-23 feet NAVD 88 Datum. In general, the topography is wooded with several rock outcrops. The western portion of the Site also includes a small wetland.

Connecticut's bedrock geology has a direct effect on landscape forms because of its different resistances to weathering and erosion. The proposed substation Site is located within the Western Uplands geologic terrain, where granitic gneisses and schists predominate. Bedrock beneath the proposed substation Site consists of medium-grained schists in the Trap Falls Formation.

The surficial (unconsolidated) materials that overlie bedrock in Connecticut consist of deposits from the continental glaciers that covered New England at least twice during the Pleistocene ice age. In the vicinity of the substation Site, these deposits are classified as glacial till, the most common type of deposit, which was laid down directly by glacier ice and consists of a matrix of sand, silt, and clay with variable amounts of stones and large boulders. The till is generally less than 10-15 feet thick.

The U.S. Department of Agriculture, Natural Resources Conservation Service maps soil types and produces county-wide soils surveys. The Soil Survey of Fairfield County provides information concerning soil characteristics, including depth to bedrock, slope, drainage, and erosion potential; soils information is also mapped and available via Connecticut Environmental Conditions Online.[4]

The soils on a portion of the proposed substation Site have been altered due to previous industrial development. The upland soil on the Site is characterized as an udorthent. This soil unit consists primarily of man-made or disturbed cut and/or fill areas that are not wet, with slopes ranging from 0 to 8%. Portions of the Site also include small areas of well-drained loamy soils and non-soil impervious areas (e.g., parking lot).

VI.B. WATER RESOURCES AND WATER QUALITY

UI reviewed the proposed Site for water resources including inland and tidal wetlands, watercourses, vernal pools and floodplains. UI also assessed the groundwater quality, as Connecticut has established both Water Quality Standards and Classifications in order to protect its surface and groundwater resources

Surface Water Resources

On April 14, 2015, UI performed a Site wetland delineation to assess the presence of water resources such as wetlands, watercourses, vernal pools and/or floodplains. In the State of Connecticut wetlands are determined by soils. These soil types include poorly drained, very poorly drained and alluvial plain soils. In addition to delineating wetlands in accordance with the State of Connecticut requirements, vegetation and hydrology were assessed in accordance with the ACOE *Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0; January 2012).

During the wetland delineation, UI only identified one small palustrine emergent nonpersistant wetland (approximately 654 square feet), located on the Site. Based on historic aerial

[4] **Map Catalog,** Connecticut Environmental Conditions Online, available at http://www.cteco.uconn.edu/map_catalog.asp?town=138.

photography, this area has historically consisted of primarily wooded and captured stormwater runoff from the railroad corridor to the north. Large deciduous trees and scrub shrub vegetation are the dominant forms of plant life surrounding the wetland.

Groundwater Resources

Based on the latest available (January 2011) DEEP Groundwater Quality Classification Map data, groundwater at the site in classified as GB. Water with a GB classification includes industrial process and cooling waters and baseflow for hydraulically-connected water bodies. Such water is presumed not suitable for human consumption without treatment. The classification of groundwater as GB is consistent with the historic uses at the Site. Therefore, in this section of Stratford, due to industrial and commercial activities Aquarion Water Company supplies potable water.

Flood Zones

Based on a review of the Federal Emergency Management Agency Flood Insurance Rate Map (Map Number 09001C0442G) the proposed Site is not in a "Flood Hazard Area."

VI.C. BIOLOGICAL RESOURCES

Vegetation

Although the proposed substation Site is previously disturbed from commercial/industrial activities, the site is predominantly occupied by deciduous and scrub shrub vegetation. Mature hardwoods such as red oak, hemlock and American beech primarily extend along the western and northern sides of the site. The eastern and southern portions of the site do not contain vegetation.

Biological Habitat

In March, 2015 UI submitted a "Project Review Form" to CT DEEP for a Natural Diversity Database ("NDDB") review of the proposed projects potential impact on special concern, threatened and endangered species. In April, 2015 the NDDB responded to UI and stated that DEEP anticipates no negative impact will occur to State-listed species resulting from the proposed activities.

Additional wildlife inhabiting the Site and areas around the Project area include, but are not limited to, raccoons, squirrels, chipmunks, rats and native birds such as crows, robins, Canadian geese. These species are typically more tolerant of human disturbance and are capable of adapting to alternate environments.

On July 8, 2015 UI was notified that the U.S. Fish & Wildlife Service had amended Section 7 of the Endangered Species Act, pertaining to the conservation of the Northern Long Eared Bat ("NLEB") and its habitat(s). Based on this amendment UI began assessing the Baird Annex property for the presence of this species.

VI.D. LAND USE, ZONING, LAND USE PLANS, AND RECREATION

The Site is a portion of a former industrial property that is located in a substantially commercial area, although there are some nearby residential areas. The property is zoned industrial. The Site is adjacent the Metro-North Railroad Corridor to the north. Beyond the rail corridor, additional mixed use areas include residential and small commercial/industrial properties. The Site is approximately ¼ mile southeast of High Park on Graham Street in Stratford.

VI.E. VISUAL AND AESTHETIC CHARACTERISTICS

As a former industrial property, a portion of the Site itself has no scenic value; the remainder would be considered a wooded area. Further, the visual landscape in the vicinity of the substation Site is a mix of commercial, utility, and transportation features, including Stratford Avenue (State Route 130), the overhead UI 115kV transmission lines, the Two Roads Brewing Company, Metro-North Railroad tracks, other commercial and retail uses abutting Stratford Avenue, and the existing Baird Substation. Residential areas are located across the Metro-North Railroad tracks on the north and south of Stratford Avenue and south of the commercial businesses. Appendix A includes photographs that illustrate the visual environment on and in the vicinity of the site.

VI.F. TRANSPORTATION AND UTILITIES

The proposed substation site is readily accessible via Stratford Avenue. Interstate 95 is accessible via South Avenue that intersects Stratford Avenue in front of the site. Stratford

Avenue is a major arterial that extends generally east-west through Stratford as part of state highway route 130. Route 130 extends approximately 40 miles from Fairfield to Stratford. Other major regional highways, including State Route 8 and the Merritt Parkway (State Route 15) are accessible from Interstate 95.

UI's overhead 115kV transmission lines extend east-to-west across the northern portion of the proposed substation site along the Metro-North Railroad Corridor. The Metro-North Railroad Corridor is approximately 100 feet wide and is occupied by two active transmission lines that loop through the existing Baird substation.

A municipal storm water line also extends across the southern portion of the site within a 15 foot wide easement. This storm water line extends across Stratford Avenue in front of the Site and to the east onto the Two Roads Brewing Company's property.

Additionally, a sanitary sewer line extends across the southernmost portion of the site within a 10-12 foot easement retained by the U.S. Baird Corporation. The sanitary sewer line easement is directly between the adjacent storm water line easement to the north and the site property line to the south.

Lastly, Stratford proposes to construct a roundabout at the intersection of Stratford Avenue, Honeyspot Road and South Avenue. The construction of this roundabout requires use of the southern portion of the UI owned property presently occupied by the aforementioned stormwater and sanitary line easements.

VI.G. CULTURAL (ARCHAEOLOGICAL AND HISTORIC) RESOURCES

Based on the historical uses of the Baird Annex property, UI performed a review of any archeological or historic structures contained within the Site. In February of 2015 UI determined that the proposed project would not affect any historical archeological sites. To further assess the site, in April of 2015 a "Project Review Form" was submitted to CT SHPO in order to review the National and State Registers of Historic Places. On May 14, 2015 a response from CT SHPO was received by UI indicating that "no historical properties will be affected by this project."

VI.H. NOISE

To assess the existing sound environment in the vicinity of the Project site, UI commissioned a noise survey. Black and Veatch completed the noise survey in March 2015. The results of this survey are presented in Appendix D and summarized below and in Section VII.H.

In order to effectively quantify and qualify the existing daily sound levels surrounding the Project site, the ambient survey included continuous sound level monitoring and short-term (attended) sound level measurements. Noise measurement locations ("NMLs"s) were selected to represent nearby noise-sensitive receptors. Specifically, NMLs were established at the end of Jackson Avenue (a residential neighborhood north of the Project Site) and south of the Project Site along Old Honeyspot Rd. (St. Nichols Russian Orthodox Church and a residential neighborhood).

The existing ambient sound levels in the vicinity of the Project site ranged from 52 dBA to 64 dBA at the two survey locations. The quietest periods occurred during the early morning hours (2:00AM, 11 March) when traffic on Interstate 95 had subsided. In general, the existing ambient conditions at the nearest noise-sensitive receptors are influenced by traffic on local roads and Interstate 95, train traffic, existing Baird Substation, VIP Car Wash dryer fans, and wind blowing in the trees.

The proposed Project is subject to state and local regulations regarding noise emissions. However, Stratford regulations are more restrictive than those specified by the State of Connecticut. As such, UI used the noise level standards in Chapter 142 of the Stratford Town Code to evaluate regulatory compliance of the Project. To ensure regulatory compliance, the Project must meet the following:

- The sound levels associated with the Project should not exceed 45 dBA along the residential zoning boundaries to the north and south.

- The sound levels associated with the Project should not exceed 62 dBA along the commercial zoning boundaries to the east and west.

VI.I. LIGHTING

The proposed Project Site is located in a busy, well-lit industrial area. Parking lot and commercial lighting is evident along Stratford Avenue, as well as from the various factories, warehouses, retail, and restaurant locations in the adjacent areas.

VII. POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

This section discusses the localized potential environmental effects that would result from the construction and operation of the proposed Project and the measures that UI has identified to mitigate such effects.

The construction, operation and maintenance of the proposed substation will result in generally minor impacts that will be localized to the Site and the immediate vicinity of the Site. Overall, the Project will result in beneficial reuse of a portion of a former industrial site. As the project proceeds UI would implement measures to mitigate adverse effects, as within this document.

VII.A. TOPOGRAPHY, GEOLOGY, AND SOILS

The construction and operation of the Project will not affect the overall geological conditions. However, UI must excavate or remove soil, above grade stone, and below grade stone are required in the north and west portions of the site and additional soils and fill materials will be imported to level the site. Additionally, the imported soils and fill materials will establish an appropriate base for the substation equipment and ground grid.

The existing Site drainage patterns are based on the present topography and do not include a constructed drainage system. Runoff that falls on the Site north of the abandoned railroad spur generally flows to the northeast corner of the property before flowing onto adjacent property. For the larger area south of the abandoned railroad spur, runoff flows to a low spot along the western boundary. There are multiple catch basins along the southern property line (Stratford Avenue) that connect to the Town's stormwater system.

UI will deploy temporary soil erosion and sedimentation controls around construction work areas to minimize the potential for sedimentation or storm water runoff, and will implement this control through its Stormwater Pollution Control Plan ("SWPCP"). UI will submit a registration form for the CT DEEP *General Permit*, and will comply with the applicable portions of this *General Permit*.

VII.B. WATER RESOURCES AND WATER QUALITY

Due to the proposed configuration, UI's construction activities will directly impact a small palustrine emergent nonpersistant wetland (approximately 654 square feet). UI proposes to completely fill the wetland during the development of the Site. UI's original substation configuration avoided this wetland, however due to the shifted arrangement and creation of a buffer area to the east of the Site, the wetland will now be impacted.

To mitigate the unavoidable filling of the wetland that would be affected during the development of the Site, UI will identify the appropriate mitigation techniques through consultation with the ACOE and CT DEEP.

During the construction and development of the Site, UI intends to install sediment and erosion controls in order to protect the water quality and localized resources that could be impacted from runoff. The installation of any sediment and erosion controls during the construction and development of the site will conform to both the Site specific SWPCP and the DEEP General Permit.

UI also intends to protect the water quality in this area by complying with appropriate Spill Prevention Control and Countermeasures ("SPCC") regulation, 40 CFR 112 due to the presence of oil-filled equipment. UI plans to install the necessary containment and best management techniques for oil filled equipment in order minimize the potential for inadvertent spills or leaks.

VII.C. BIOLOGICAL RESOURCES

Vegetation

During the development of the new Baird Substation the majority of the existing vegetation along the north and west sides of the site will need to be removed in order to meet certain

clearance requirements. With the removal of the vegetation any localized species to the Site will be displaced.

Biological Habitats

Based on the letter UI received from the CT DEEP NDDB Group on April 14, 2015 no State listed species reside within the project area. Therefore, UI's construction activities will not cause any adverse effects on State listed species.

UI has begun assessing the Baird Annex property for the presence of the Northern Long Eared Bat. A full disclosure of the assessment and findings on the Baird Annex property will be presented in the application to the Siting Council for the Baird Substation.

VII.D. VISUAL AND AESTHETIC CHARACTERISTICS

The proposed substation will represent a change in the current visual environment. However, the Site is in a relatively industrial and commercial area and located directly adjacent the existing substation with similar visual characteristics. The substation will be visible along Stratford Avenue, the commercial areas along the road as well as the residential areas across the Metro-North railroad corridor. Visual simulations of the proposed substation are included in Appendix A.

VII.E. TRANSPORTATION AND UTILITIES

The construction and operation of the proposed Project site will not result in any significant adverse effects on transportation or utility systems. The proposed Site is readily accessible from the local and regional highway network, and is adjacent to UI's 115kV overhead transmission lines and Metro-North Railroad. The development of the substation will improve UI's transmission system capacity, improve distribution voltage regulation, as well as replace aging and antiquated equipment, thereby affording UI customers with more reliable electric service. The Project will not affect any above grade existing municipal utilities. The operation of the substation would not require full-time on-site personnel and thus would not result in any long-term effects on traffic.

The construction of the proposed substation may have a minor and short-term effect on vehicular traffic on the local roads leading to the Site, particularly Stratford Avenue. At times, localized traffic congestion may occur when heavy construction equipment or large components are transported to the Site, as well as when construction workers travel to and from the site. However, these effects, if any, will be limited to the immediate vicinity of the site and relatively minor. UI expects to locate the parking and laydown areas in support of the construction activities on the substation property. Due to special constraints, during construction, UI must suspend the existing license agreement for overflow parking between UI and Two Roads Brewing Company. Overall, due to the Site's proximity to multi-lane, major transportation routes (i.e., near Interstate 95 Exit 31), UI expects that the effects on local traffic congestion will be insignificant.

To accommodate Stratford's proposed roundabout, UI designed the proposed substation access road to avoid direct egress to the roundabout due to safety, traffic and large equipment access considerations. To ensure unimpeded access to and from the proposed substation, with minimal disruption to local traffic, the proposed access drive will enter Stratford Avenue approximately 300' to the west of the roundabout edge.

VII.F. CULTURAL (ARCHAEOLOGICAL AND HISTORIC) RESOURCES

Based on a letter received by UI from the CT SHPO, dated May 14, 2015 no cultural resource sites (archaeological or historical) or standing historical structures are known to occur on or in the immediate vicinity of the proposed substation Site. Therefore, the Project will not have any significant adverse effects on cultural resources.

VII.G. AIR QUALITY, NOISE, AND LIGHTING

The development of the proposed substation will result in short-term and localized effects on air quality as a result of emissions from construction equipment and related vehicles. Localized noise impacts as a result of construction equipment movements and general construction activities may occur. In addition, some modifications to the ambient sound environment will occur as a result of the operation of the substation.

AIR QUALITY

The construction of the substation will require the movement of construction equipment, as well as Site preparation activities (e.g., grading, filling), that will create vehicular air emissions and dust. UI will minimize emissions from construction equipment and vehicles through proper maintenance and by limiting unnecessary idling. The Project team will control dust emissions by applying water or equivalent substances to exposed soils on the site, as necessary.

NOISE

As a result of the movement of construction vehicles, the operation of construction equipment, and the performance of construction activities, the development of the proposed facilities will cause temporary increases in the sound levels in the vicinity of the Project. However, because the proposed Project is located adjacent to a major interstate (I-95), these temporary daytime increases will generally be consistent with the existing ambient conditions.

After the substation is placed in service, infrequent impulse noise will be generated by the operation of equipment. The impulse noise levels and steady-state transformer noise levels are not expected to exceed the levels permitted by Stratford's noise regulations. Based on the results of the noise study (refer to Appendix D), the Project's sound pressure levels along the adjacent residential and commercial zoning boundaries will be below 45 dBA and 62 dBA, respectively. As such, the Project is expected to comply with the noise regulations promulgated by Stratford and State of Connecticut.

LIGHTING

A portion of the existing parking lot lighting, as well as commercial and industrial lighting along Stratford Avenue will remain intact during and after completion of the Project.

During operation, the substation will have low-level lighting for safety and security purposes. The illumination from these lights will be visible in the immediate vicinity of the station. UI will employ additional lighting only for work at night under abnormal or emergency conditions.

UI's standard lighting design for illumination of substation yards include the use of high mast lights mounted on the same masts used for lightning protection. However, in consideration of

the surrounding landscape of the proposed substation, UI will utilize alternative low-level LED lighting to achieve the necessary illumination levels while minimizing light dissipation to adjacent properties.

VIII. ELECTRIC AND MAGNETIC FIELD CONSIDERATIONS

Electric and magnetic fields ("EMF") surround anything that generates, transmits, or uses electricity. EMF are present in nearly every place we encounter daily, including our schools, workplaces, and homes. Typical sources of EMF in these locations include appliances, nearby distribution and transmission lines, wiring, and electric current flowing on conductive water pipes.

Substations are less common EMF sources than distribution lines but nevertheless, substations of varying sizes can be found in many communities. For this Project, UI proposes to construct a new substation, adjacent an existing substation, which will take electricity from existing, adjacent 115 kV transmission lines and convert it to 13.8 kV for distribution in the surrounding Stratford area.

UI has not yet completed detailed studies of EMF for the new substation at this time. However, as part of its Application to the Connecticut Siting Council, UI will provide measurements of EMF from the existing overhead transmission lines and will perform detailed modeling to project future EMF levels associated with the re-directed transmission lines, substation equipment, and outgoing distribution circuits.

IX. ALTERNATIVES CONSIDERED

After determining that UI's distribution network required the construction of a new facility to replace the existing Baird substation, UI identified and evaluated alternative substation sites that would meet distribution and transmission system needs as well as provide a cost-effective approach for interconnecting to the existing electric transmission and distribution network. The objectives of this alternatives evaluation process were to:

a) Identify and assess potential substation sites that would meet existing distribution system needs, including distribution substation requirements (size, design), as well as the new or upgraded distribution lines that would be required to interconnect any new substation site to the existing distribution infrastructure and the load centers in Stratford.

b) Evaluate potential substation sites based on engineering, constructability, environmental, social, and cost considerations, applying in particular the criteria contained in UI's *Transmission and Distribution Guideline for Substation Site Selection* (TDG 002; March 2013).

c) Select from among the locations identified in (a) and (b), potential sites that could be feasibly developed for a distribution substation to meet the overall demands for electricity in the Stratford area, taking into consideration UI's site selection guidelines.

Using this analysis process, UI identified three potentially feasible sites for the new substation, each of which was subsequently evaluated in greater detail, taking into consideration engineering design, construction, environmental, and cost factors. As a result of these evaluations, UI selected the Baird Annex property as the preferred site and the West Broad Street property as an alternative site that could be used for the new substation, but at a greater cost and with greater potential environmental and social effects. UI investigated the use of the Bruce Street site, however found it to be insufficient to accommodate the proposed substation. For the preferred Baird Annex site, UI also investigated alternative substation configurations, including the shifted arrangement proposed after discussions with Stratford and neighboring property abutters.

The following subsections:

- Summarize the step-by-step alternatives evaluation process that UI used to identify the Baird Annex property as the preferred site for the new substation;

- Describe the characteristics of the West Broad Street alternative (but not preferred) site; and

- Review the substation configuration options considered for the preferred Baird Annex site.

IX.A. UI SITE SELECTION CRITERIA

GENERAL CRITERIA

UI followed the procedures contained in the *Transmission and Distribution Guideline for Substation Site* Selection (*Guideline*), which describes the standard procedures and criteria used to identify and evaluate a location for the determination of a substation site. The key factors considered in the selection of the Site included:

- Distance to the existing Baird substation and to existing electric transmission lines;
- Site size requirements;
- Site terrain;
- Environmental and land use compatibility;
- Substation construction issues;
- Transmission and distribution line construction requirements;
- Accessibility; and
- Cost.

UI assembled a multidisciplinary team comprised of personnel with expertise in electrical distribution and transmission system planning, design, and construction, environmental science, and real estate to conduct an analysis of the alternative site. This team followed a step-by-step process, whereby potential substation locations were first identified and screened in accordance with UI's standard objectives for substation siting. In addition to the factors listed above, the UI team considered the following principles, as detailed in the *Guideline:*

- Minimize the need to acquire residences and viable commercial/industrial uses to accommodate substation development;
- Maintain consistency/compatibility with existing land uses and land use plans to the extent possible;
- Minimize adverse effects on sensitive environmental resources and the social environment;
- Maintain public health and safety;
- Demonstrate cost-effectiveness, while adhering to good engineering and sound environmental planning practices; and
- Present the public with a clear and well documented methodology for the identification of the proposed and alternative sites.

DISTRIBUTION SYSTEM CONSIDERATIONS IN THE STRATFORD AREA

To meet the distribution capacity needs of the Stratford area, UI determined that any new substation that would replace the existing Baird substation should be located to facilitate interconnections to the existing electrical transmission and distribution systems, and particularly to allow cost-effective interconnections to the existing and projected electric load areas. The following primary factors were considered when identifying and assessing potential sites:

- *Location of potential sites in relation to the existing electric distribution network.* For distribution interconnections, preferred sites are near existing distribution infrastructure or in areas where new distribution infrastructure could be economically developed to reach load centers. The distance of the Project is a primary consideration, as the distribution infrastructure required to serve the electric load areas collectively terminate at the existing substation. Location of the proposed Project in close proximity to the existing substation limits conflicts with physical encumbrances, the presence of other utilities, and costs associated with the installation of additional distribution infrastructure.

- *Availability of land for development of a distribution substation.* The minimum required area for the proposed Project, a "distribution only" open air 115/13.8kV substation supplied by four transmission lines, with two transmission circuit breakers, no expansion capability on the transmission side, and appropriate buffers and setbacks, is 1.5 acres.

- *Location of sites in relation to existing transmission lines (possible interconnections).* Four UI 115kV transmission lines extend east to west along the Metro-North Railroad corridor and are located adjacent to UI's existing Baird Substation. These four transmission lines are interconnected to several distribution and transmission substations in UI's territory. These distribution substations each feed independent electric load centers, both to the east and west of the existing Baird Substation in Bridgeport and Stratford.

After taking these factors into consideration, UI defined the preferred geographic location of the proposed Site for the Project as an approximately 1,000 foot wide corridor along the existing Metro-North Railroad corridor between the two existing distribution substations to the east and west of the existing Baird Substation. This siting region was selected because of the existing Stratford electric load area the Project would serve.

IX.B. IDENTIFICATION AND SCREENING OF POTENTIAL SITES

OVERVIEW OF THE SITE SCREENING PROCESS

UI applied the siting criteria within the preferred geographic siting region and conducted baseline research, performed field reconnaissance, and consulted with municipal officials to evaluate potential site locations. As a result of this process, UI identified 12 potential sites for initial consideration of the Project. These potential sites were identified based on the *Guidelines* and the existing distribution and transmission considerations specific to the Stratford area.

The 12 identified sites were screened using the following preliminary criteria:

- Greater than or equal to 1.5 acres of developable land (the estimated minimum size for the development of an open air distribution substation of this type);

- Sites with at least one of the following characteristics:

    - Land adjacent to the Metro-North Railroad corridor between the distribution substations directly to the east and west of the existing Baird Substation;

    - Land owned by UI; and

    - Land that is vacant, available for sale, under-developed (e.g. formerly developed properties that are available for reuse), or otherwise undeveloped.

Sites that appeared, based on the initial evaluation, to meet at least some of the preliminary siting criteria were then qualitatively evaluated using the following factors:

- Environmental – Environmental issues, including site character, present and past land uses, cultural resources, threatened and endangered species, tidal or inland wetlands, ponds, aquifers, watercourses, public watersheds and floodplains, the potential need for environmental remediation (for previously developed sites) and encumbrances.

- Surroundings – Zoning and description of the surrounding area, including the sites proximity to statutory facilities (schools, playgrounds, daycares, nursery schools, day camps, and residential neighborhoods).

- Transmission and Distribution System – System transmission and distribution interconnection costs and other considerations, including system impacts, accessibility and right-of-way requirements.

- Construction – Substation construction, vehicular access costs and other related considerations, including the effects of site size, shape, and subsurface topographical conditions.

- Acreage Available – Property availability, additional land for buffer or expansion, expected cost, and availability of easements.

- Permitability – Anticipated ability to obtain all the required siting, land use, environmental and construction permits.

Using this process, most of the potential sites initially identified were found to be impractical for the development of the proposed Project and were eliminated from further consideration. The reasons for eliminating a particular site varied, ranging from environmental issues (e.g., presence of wetlands, rock, insufficient developable area, incompatible land uses) to the identification of new information regarding the future development plans for vacant property.

When the screening analysis was completed, UI identified three sites that appeared to be feasible for the development of the proposed Project:

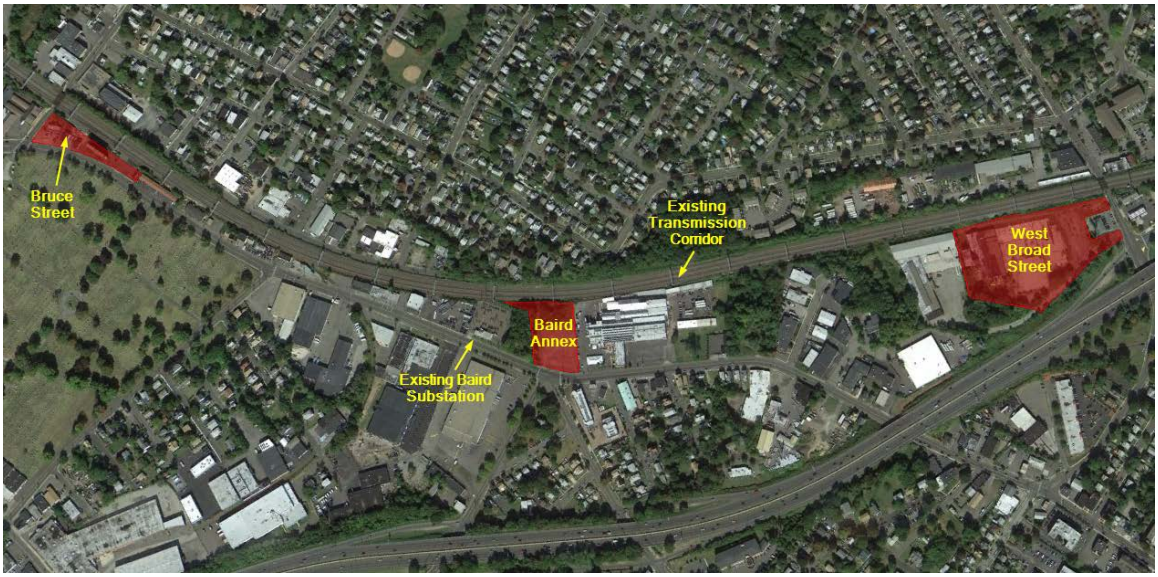
1. Bruce Street
2. West Broad Street
3. Baird Annex (UI Property)[5]

Figure IX-1 illustrates the locations of these three sites.

UI conducted a more detailed evaluation of each of these three sites. As discussed in the following subsections, of the three alternative sites, UI determined that the development of the Baird Annex site would best meet the Project objectives, based on environmental, technical and cost considerations. The West Broad Street site, although less preferable based on cost and environmental consideration, offers a second best siting option. In contrast, the Bruce Street site was found to be impractical for the development of the proposed Project.

[5] The Baird Annex site was evaluated as a standalone site using criteria outlined in UI's *Transmission and Distribution Guideline for Substation Site Selection.* The incorporation of the adjacent UI owned parcel to the west (on which the existing Baird substation resides) to accommodate the shift of the substation the west occurred after the completion of the Baird Substation Site Selection Study.

Figure IX-1: Alternate Sites Evaluated



Source: Google Earth, May 2015

BRUCE STREET

This 1.23 acre site was recommended as a potential alternative site by Stratford in preliminary discussions with UI. It is comprised of three separate properties that were assumed to be assembled into one property for evaluation as an alternative site for the proposed Project. All three of the separate properties are currently occupied by structures of varying commercial/industrial uses. The site is located directly adjacent the Metro-North Railroad Corridor and UI's existing 115kV transmission lines that run along its northern border. It is bordered to the west and south by Bruce Street and Stratford Avenue, respectively and to the east by the Stratford Motor Inn. The Bruce Street site is located approximately ½ mile west of the existing Baird substation. The site's relative close proximity to the existing Baird substation provides for the opportunity to minimize costs associated with new underground distribution infrastructure that would be required to interconnect the proposed Project to the existing distribution infrastructure.

Upon further review of the feasibility of this site, however, it was determined that there is insufficient space to accommodate the proposed Project. An engineering review of conceptual arrangement plans for the necessary equipment revealed that electrical clearances would be violated from energized equipment to the perimeter fence. In addition, the narrow nature of the parcel results in insufficient maintenance access around critical pieces of equipment that would

need to be located on the eastern portion of the site. There would also be inadequate space for UI's mobile transformer which would be brought to the site if one of the station transformers is removed from service for an extended period of time.

Although the Bruce Street site is physically located close to the existing Baird substation and shares Stratford Avenue as an access road, the parcel is not sufficiently large enough for the proposed Project. Additionally, the existing structures would need to be demolished and the foundations removed prior to construction of the Project. This would result in a significant increase in site preparation costs over a greenfield site. These factors contributed to UI's determination that the Bruce Street site would not be feasible or cost-effective for a new 115/13.8kV distribution substation.

WEST BROAD STREET

This site is located to the east of the existing Baird substation, between the Metro-North Railroad Corridor and Interstate 95 at 1297 West Broad Street. UI's two 115kV transmission lines run along its northern border. The site is the former location of an industrial facility that had several structures demolished, but still has several remaining. Abutting the property to the west along a joint access road is the MLI Redemption Services bottle and can redemption center.

In the general vicinity of the site, industrial and commercial buildings border West Broad Street and also characterize areas to the north of the site. Farther to the north, beyond the Metro-North Railroad Corridor and commercial/industrial facilities are residential neighborhoods along Knowlton Street.

The siting of the new substation at the West Broad Street site is constrained from interconnecting to the existing Baird substation's distribution infrastructure along Stratford Avenue. Utilization of this site for the proposed Project would require the interconnection of new distribution circuits to their collective termination point in front of the existing Baird substation. Since, there is no direct road access between the existing Baird substation and the West Broad Street site on Stratford Avenue, it would require a longer access route using Beardsley Avenue. No underground distribution infrastructure currently exists on the necessary portions of Beardsley

Avenue or West Broad Street. Additionally, the existing underground infrastructure on Stratford Avenue would not be sufficient to support the number of circuits that would be required. As a result, new underground infrastructure would be required over a distance of approximately 1 mile with two crossings under Interstate 95.

The site is also a brownfield and would likely require considerable remediation of contaminated soils during construction. While portions of the previous manufacturing facility have been demolished, a large building remains and is abandoned. The foundations from the demolished portions of the facility remain on site and would require removal to accommodate the necessary site grading, equipment foundations, duct lines for distribution getaways and grounding for the new substation.

BAIRD ANNEX

UI selected the Baird Annex property as the preferred site for the proposed Project due primarily to the following factors:

- The Site is consistent with the industrial/commercial land uses of the surrounding area;
- The Site is located directly along UI's existing 115kV transmission lines on the Metro-North Railroad Corridor;
- The proposed Town of Stratford roundabout requires modifications to UI's existing overhead and underground distribution infrastructure directly adjacent to the Site. With modifications to underground infrastructure already required, the costs and impacts of interconnecting the new substation distribution circuits to existing infrastructure are decreased;
- The Site is located immediately adjacent to the existing substation property, decreasing the impacts and costs of new infrastructure to interconnect the proposed Project's distribution circuits to the existing infrastructure.
- The Site provides the lowest evaluated cost option.

After discussions with Stratford and neighboring property abutters, UI re-evaluated the positioning of the substation on the Baird Annex property to better utilize the adjacent UI owned property to the west. The proposed substation position utilizes both the aforementioned Baird Annex property, as well as the UI owned property directly to the west.

SUMMARY OF SITE SELECTION PROCESS

In summary, the Baird Annex Site represents the least-cost option for the development of the new Baird substation and location of the Site is consistent with the land uses of the surrounding area, particularly the immediately adjacent existing Baird substation. The Baird Annex site's close proximity to the existing substation that it will replace is the optimal location for interconnection to existing distribution infrastructure. In addition, the Site's abutment of the Metro-North Railroad corridor provides direct access to UI's 115kV transmission lines. Furthermore, the planned modification of UI's overhead and underground infrastructure along Stratford Avenue to accommodate Stratford's proposed roundabout provides a unique opportunity to interconnect the new substation's distribution circuits to infrastructure already scheduled for modification. Finally, following discussions with Stratford and neighboring property owners, UI has revised the positioning of the substation to create a buffer area between the substation and the Two Roads Brewing Company. This shifted arrangement utilizes the Baird Annex property, as well as the adjacent UI owned property on which the existing substation resides.

The West Broad Street site represents a feasible, but not preferred, alternative to the Baird Annex site. Although the site is also adjacent to the 115kV transmission lines and would be large enough to accommodate the proposed Project, the West Broad Street site would be considerably more costly due to the additional site development costs and additional distribution infrastructure required to interconnect to UI's existing distribution line network. Additionally, however, the West Broad Street is a brownfield site that would likely require significant environmental remediation.

X. PROJECT SCHEDULE

Construction is expected to begin in the fourth quarter of 2016, with the substation scheduled for going in service in the fourth quarter of 2017.

APPENDIX A. MAPS AND DRAWINGS

DR.1 U.S.G.S. Topographic Quadrangle Map: Proposed Project Location
DR.2 Site Plan
DR.3 Substation Drawings
DR.4 Existing and Historic Aerial Photographs of the Project Site
DR.5 Photographic Simulation of Proposed Substation

DR.1 U.S.G.S. Topographic Quadrangle Map: Proposed Project Location

U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

The National Map
US Topo

BRIDGEPORT QUADRANGLE
CONNECTICUT-FAIRFIELD CO.
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 18T
10 000-foot ticks: Connecticut Coordinate System of 1983

Imagery....NAIP, August 2010
Roads....©2006-2011 TomTom
Names....GNIS, 2011
Hydrography....National Hydrography Dataset, 2010
Contours....National Elevation Dataset, 2012
Boundaries....Census, IBWC, IBC, USGS, 1972 - 2010

UTM GRID AND 2012 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.2

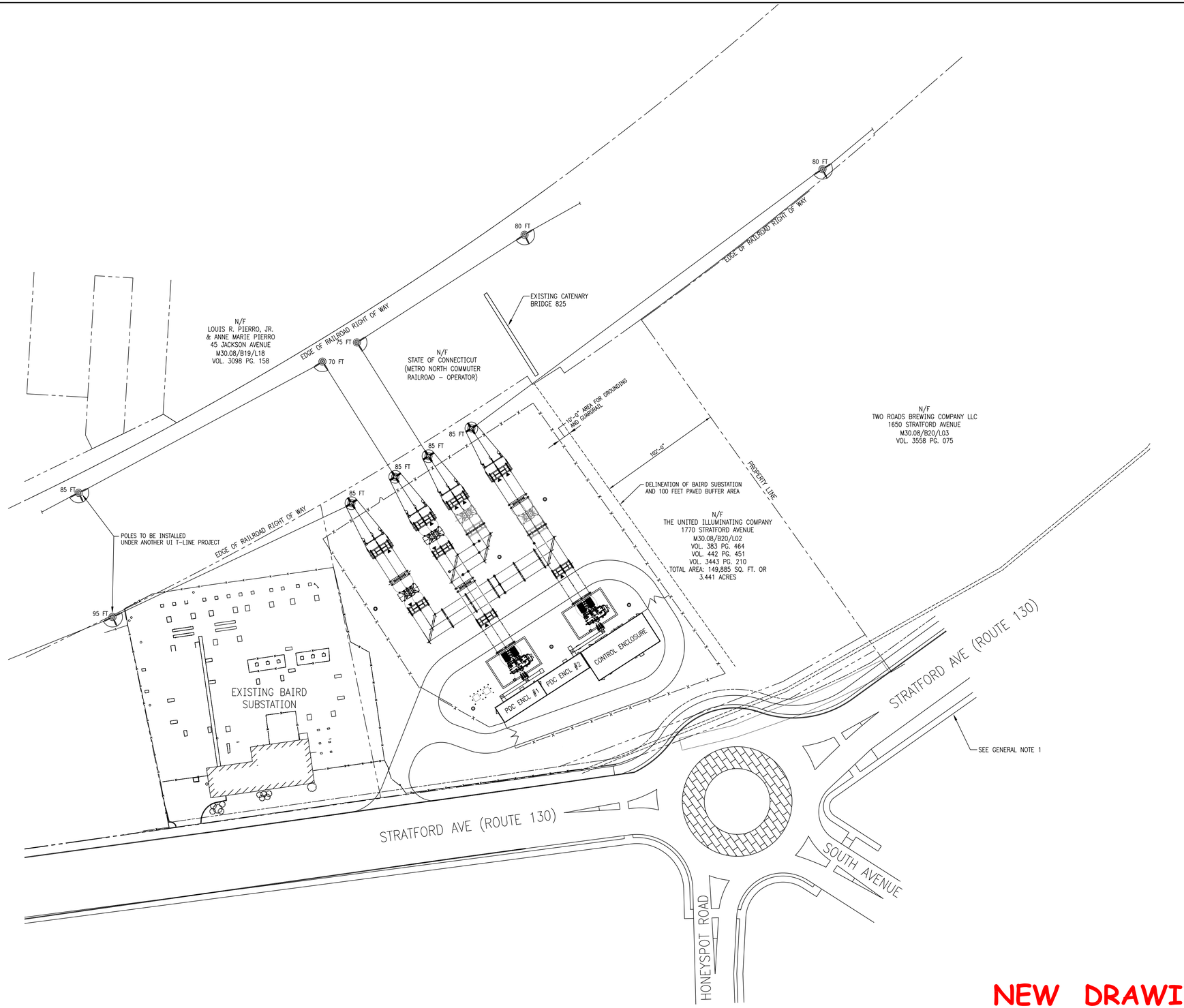
ROAD CLASSIFICATION
Interstate Route
US Route
Ramp
State Route
Local Road
4WD

QUADRANGLE LOCATION

ADJOINING 7.5' QUADRANGLES

BRIDGEPORT, CT
2012

DR.2 Site Plan



GENERAL NOTES:

1. THE ROUNDABOUT DESIGN IS PRELIMINARY AND WILL BE FINALIZED AFTER APPROVAL FROM THE CITY.

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

NEW DRAWING

40' 20' 0 40' 80'
1"=40'-0"

NORTH

BLACK & VEATCH
Building a world of difference®

DESIGNER BES	DRAWN WDS
CHECKED –	DATE
PROJECT # 186535	

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
C	07/27/2015	ISSUED FOR MCF APPLICATION–PROJECT 186535–BAIRD REPLACEMENT	WDS	JDG	TKD	MAV
B	06/19/2015	ISSUED FOR EMF STUDY –PROJECT 186535 –BAIRD REPLACEMENT	WDS/BJF	JDG	TKD	MAV
A	04/30/2015	ISSUED FOR UI 30% REVIEW–PROJECT 186535–BAIRD REPLACEMENT	WDS	JDG	ASV	MAV

No	Date	Revision	By	Chkd.	Engr.	Supv.

The United Illuminating Company

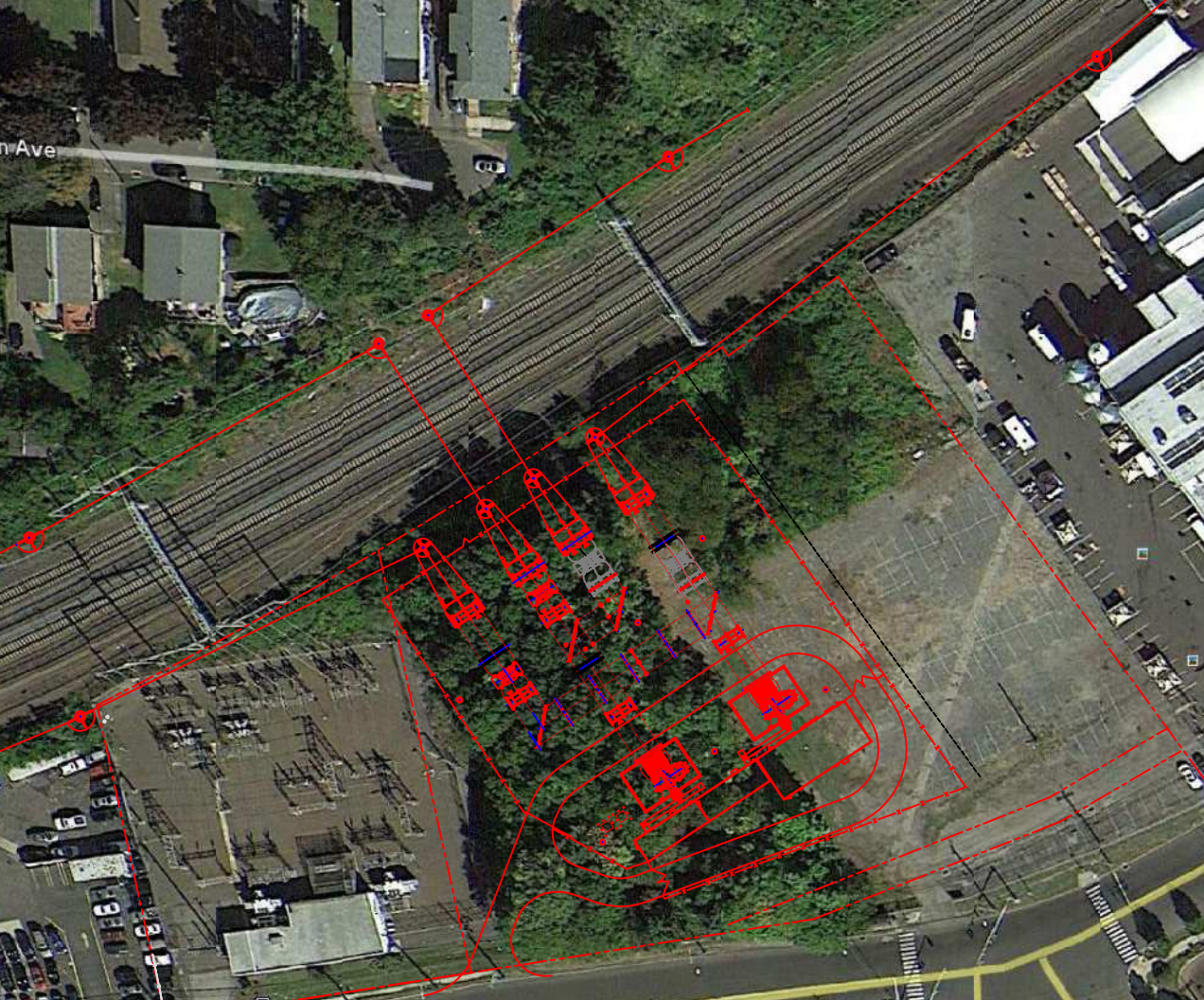
Drawn	Date 04/29/2015	Scale: 1"=40'	
Chkd.	Design Engr.	Design Supv.	

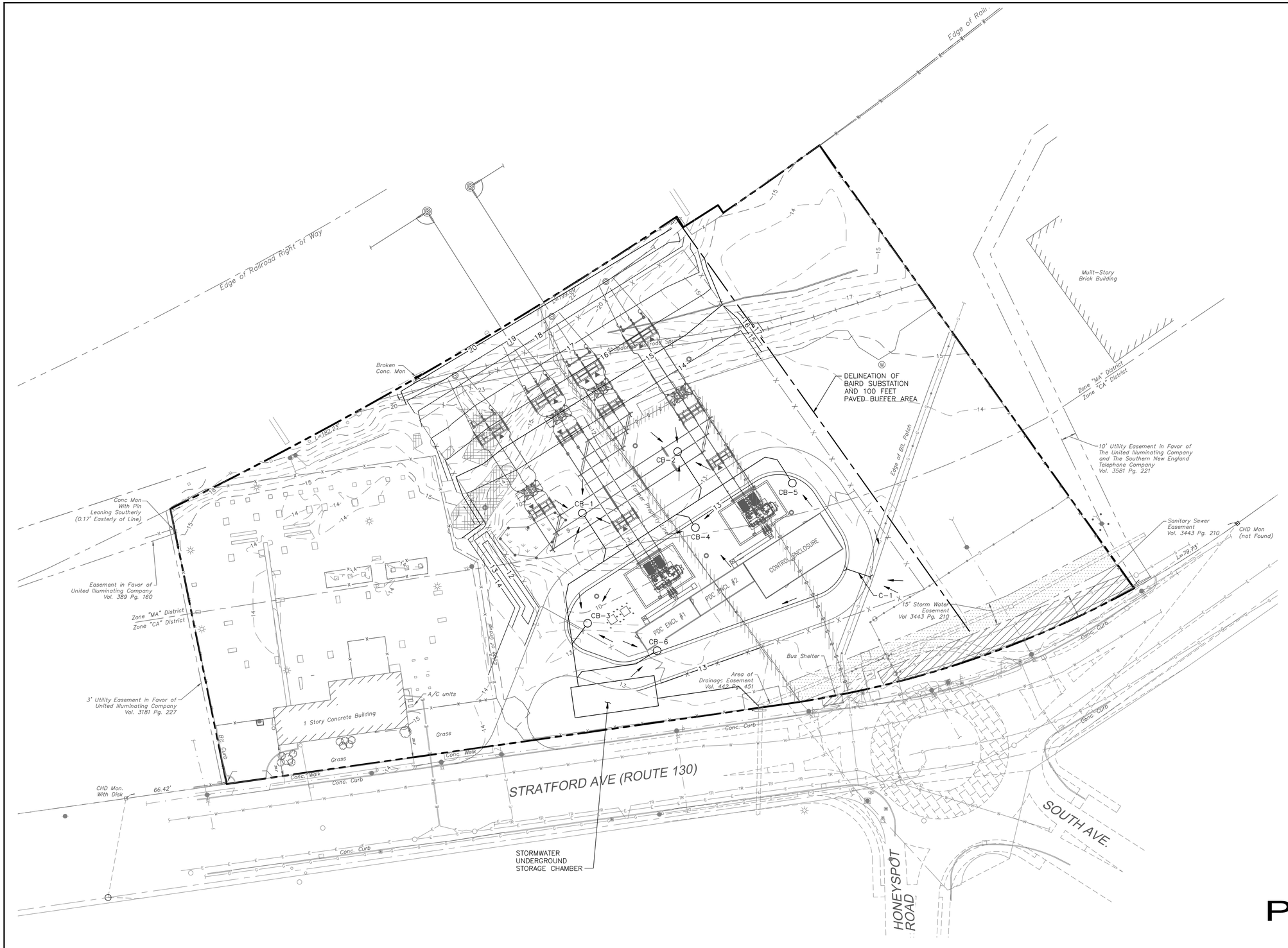
SITE PLAN

BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-401

DR.3 Substation Drawings


n Ave



GENERAL NOTES:

1. REMOVE EXISTING FENCE AS SHOWN ON DRAWING.
2. REMOVE EXISTING BITUMINOUS PAVEMENT. DISPOSAL OF PAVEMENT SHALL BE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
3. SEE DRAWING 25253-005 FOR CATCH BASIN AND CULVERT DETAILS AND INFORMATION.
4. GRADING PLAN CONCEPTUAL DESIGN FOR SUBSTATION ONLY AND DOES NOT INCLUDE FUTURE REQUIREMENTS FOR THE 100 FEET PAVED BUFFER AREA.

LEGEND

- PROPERTY LINE
- BOUNDARY LINE
- NEW SUBSTATION FENCE
- 260 NEW CONTOUR
- SURFACE FLOW INDICATOR
- CULVERT
- CB-X CATCH BASIN
- EXISTING FENCE
- EXISTING FENCE
- 260 EXISTING CONTOUR
- 15' WIDE STORMWATER EASEMENT
- FENCE TO BE REMOVED
- WETLANDS
- LEDGE
- FUTURE ROAD IMPROVEMENT (BY OTHERS)
- EXISTING WATER
- EXISTING TRAFFIC
- EXISTING ELECTRICAL
- EXISTING GAS
- EXISTING SANITARY
- EXISTING STRUCTURES

REFERENCE DRAWINGS:

GRADING AND DRAINAGE SITE PLAN	25253-004
CULVERT AND RIP RAP DETAILS	25253-005
EROSION CONTROL SITE PLAN	25253-006
EROSION CONTROL DETAILS	25253-007

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER	SMR	DRAWN	JTG
CHECKED	–	DATE	

PROJECT # 186535

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
A	07/28/2015	ISSUED FOR MCF APPLICATION-PROJECT 186535-BAIRD REPLACEMENT	JTG		SMR	MAV

TRUE NORTH

30' 20' 10' 0 30' 60'

1"=30'

NEW DRAWING

No	Date	Revision	By	Chkd.	Engr.	Supv.

The United Illuminating Company

Drawn	Date –	Scale: 1"=30'
Chkd.	Design Engr.	Design Supv.

GRADING AND DRAINAGE SITE PLAN
BAIRD SUBSTATION

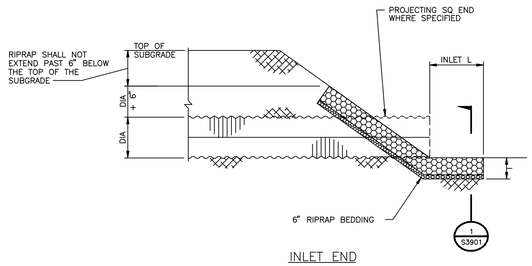
CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-004

RIPRAP TABLE

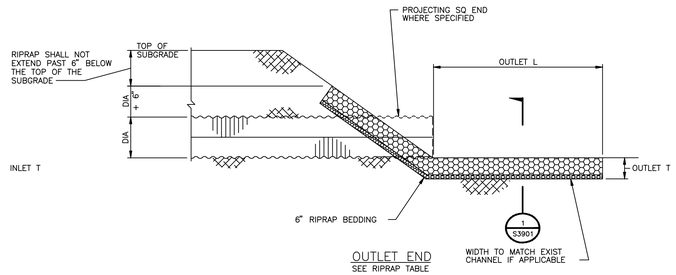
CULVERT NO.	INLET L	OUTLET L	INLET T	OUTLET T	INLET W	OUTLET W	INLET D50	OUTLET D50	REMARKS
C-1	–	–	–	–	–	–	–	–	

CULVERT TABLE

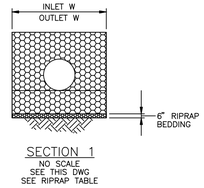
CULVERT NO.	CENTERLINE COORDINATES				LENGTH	INLET INV ELEVATION	OUTLET INV ELEVATION	END TYPE	PIPE DIAMETER	NUMBER OF BARRELS	PIPE MATERIAL	REMARKS
	INLET END		OUTLET END									
	NORTH	EAST	NORTH	EAST								
C-1	–	–	–	–	–	–	–	PROJECTING	–	–	–	



INLET END
SEE RIPRAP TABLE

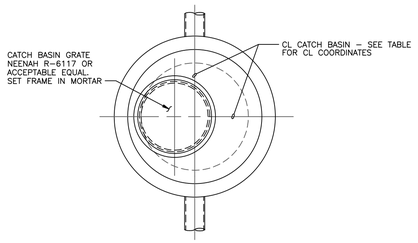


OUTLET END
SEE RIPRAP TABLE



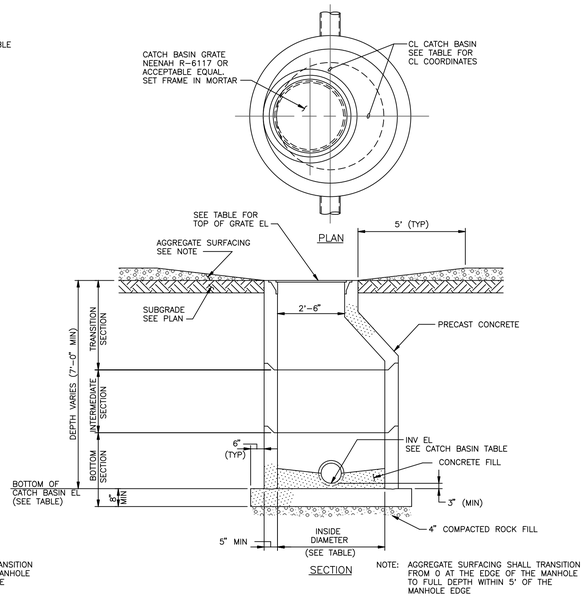
SECTION 1
NO SCALE
SEE THIS DWG
SEE RIPRAP TABLE

TYPICAL CULVERT RIPRAP
NO SCALE



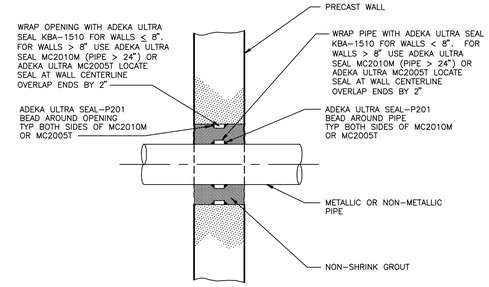
NOTE: AGGREGATE SURFACING SHALL TRANSITION FROM 0 AT THE EDGE OF THE MANHOLE TO FULL DEPTH WITHIN 5' OF THE MANHOLE EDGE

TYPICAL PRECAST CATCH BASIN UNDER 7'–0"
NO SCALE



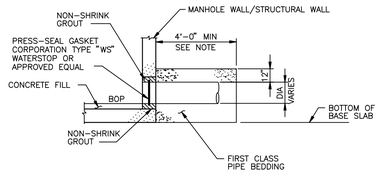
NOTE: AGGREGATE SURFACING SHALL TRANSITION FROM 0 AT THE EDGE OF THE MANHOLE TO FULL DEPTH WITHIN 5' OF THE MANHOLE EDGE

TYPICAL PRECAST CATCH BASIN 7'–0" AND OVER
NO SCALE



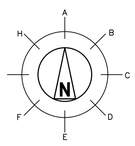
NOTE: IF ADEKA PRODUCTS NOTED IN THIS DETAIL ARE NOT AVAILABLE, AN ACCEPTABLE EQUAL SHALL BE PROVIDED.

OPTIONAL WALL PENETRATION DETAIL
NO SCALE



NOTE: FIRST CLASS PIPE BEDDING TO LIMITS SHOWN OR EDGE OF MANHOLE EXCAVATION WHICHEVER IS GREATER.

TYPICAL WALL PENETRATION DETAIL



CATCH BASIN TABLE

STRUCTURE NO.	DRAWING NO.	CENTERLINE COORDINATES		STRUCTURE SIZE ID	TOP OF GRATE ELEVATION	BOTTOM OF CATCH BASIN ELEVATION	INLET & OUTLET PIPE INFORMATION																REMARKS
							A		B		C		D		E		F		G		H		
		NORTH	EAST				INV EL	DIA	INV EL	DIA	INV EL	DIA	INV EL	DIA	INV EL	DIA	INV EL	DIA	INV EL	DIA	INV EL	DIA	
CB-1	25253-004	628549.11	891574.83	5'–0"	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
CB-2	25253-004	628589.29	891637.00	5'–0"	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
CB-3	25253-004	628451.32	891594.89	5'–0"	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
CB-4	25253-004	628513.84	891665.32	5'–0"	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
CB-5	25253-004	628542.85	891728.58	5'–0"	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
CB-6	25253-004	628433.43	891640.28	5'–0"	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	

ALL DIMENSIONS ARE IN FEET, EXCEPT DIAMETER, WHICH IS IN INCHES
FOR PIPELINE MATERIAL SEE PIPELINE LIST

NOTES

1. SEE DWG 25253-004 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. GRADATION OF RIPRAP BEDDING SHALL BE ACCORDING TO CONNDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER	SMR	DRAWN	JTG
CHECKED	–	DATE	

PROJECT # 186535

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
A	07/28/2015	ISSUED FOR MCF APPLICATION–PROJECT 186535–BAIRD REPLACEMENT	JTG		SMR	MAV

NEW DRAWING

TRUE NORTH

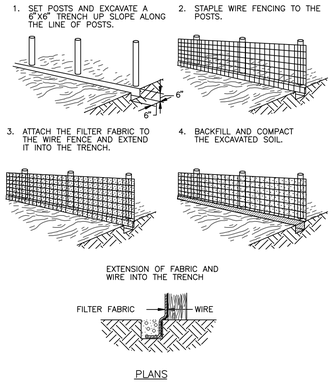
No	Date	Revision	By	Chkd.	Engr.	Supv.

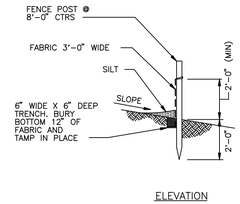
The United Illuminating Company

Drawn	Date –	Scale: NO SCALE
Chkd.	Design Engr.	Design Supv.

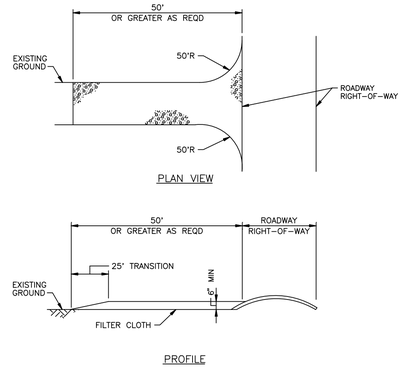
EROSION CONTROL AND CULVERT AND RIP RAP DETAILS
BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-005

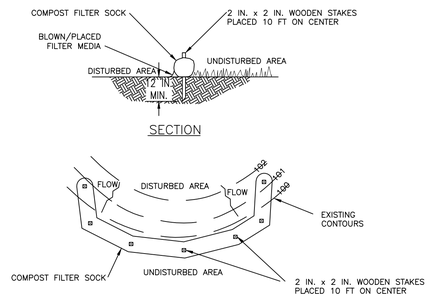




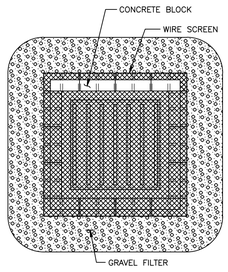
SILT FENCE DETAIL
NO SCALE

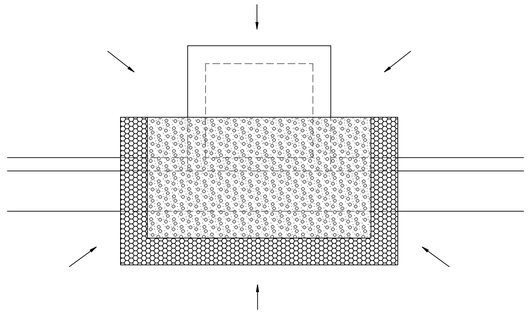


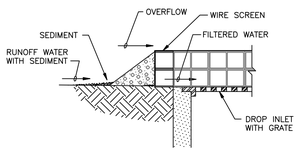
TYPICAL STABILIZED CONSTRUCTION ENTRANCE
NO SCALE
SEE NOTES 5 & 6



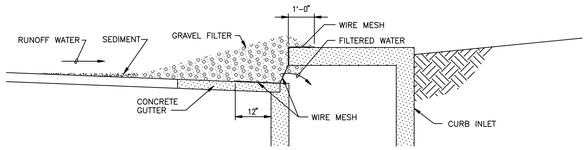
COMPOST FILTER SOCK
NO SCALE
SEE NOTES 2–7 & 15
SEE FILTER SOCK TABLE



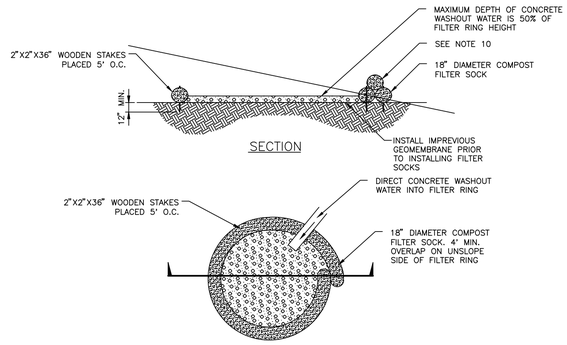




BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER
NO SCALE
SEE NOTE 2



GRAVEL CURB INLET SEDIMENT FILTER
NO SCALE
SEE NOTE 4



TYPICAL COMPOST SOCK WASHOUT INSTALLATION
NO SCALE
SEE NOTE 7

NOTES

1. SEE DWG 25253–007 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.
3. THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCENTRATED FLOWS ARE EXPECTED BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.
4. THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.
5. PROVIDE APPROPRIATE TRANSITION BETWEEN STABILIZED CONSTRUCTION ENTRANCE AND PUBLIC R.O.W.
6. DESIGN CRITERIA FOR STABILIZED CONSTRUCTION ENTRANCE.
   A. STONE SIZE – USE ASTM C–33, SIZE NO 2 OR 3, USE CRUSHED STONE.
   B. THICKNESS – NOT LESS THAN 8 INCHES.
   C. WIDTH – NOT LESS THAN FULL WIDTH OF POINTS OF INGRESS OR EGRESS.
   D. LENGTH – 50 FEET MINIMUM WHERE THE SOILS ARE SANDS OR GRAVEL OR 100 FEET MINIMUM WHERE SOILS ARE CLAYS OR SILTS, EXCEPT WHERE THE TRAVELED LENGTH IS LESS THAN 50 OR 100 FEET RESPECTIVELY. THESE LENGTHS MAY BE INCREASED WHERE FIELD CONDITIONS DICTATE.
   E. FILTER CLOTH – WILL BE PLACED OVER ENTIRE AREA PRIOR TO PLACING OF STONE.
   F. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ON TO PUBLIC RIGHT–OF–WAY THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT–OF–WAY MUST BE REMOVED IMMEDIATELY.
7. 18" DIAMETER SOCKS IN PYRAMIDAL CONFIGURATION FOR ADDED HEIGHT.

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER	SMR	DRAWN	JTG
CHECKED	–	DATE	

PROJECT # 186535

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
A	07/28/2015	ISSUED FOR MCF APPLICATION–PROJECT 186535–BAIRD REPLACEMENT	JTG		SMR	MAV

NEW DRAWING

TRUE NORTH

No	Date	Revision	By	Chkd.	Engr.	Supv.

The United Illuminating Company

Drawn	Date –	Scale: NO SCALE
Chkd.	Design Engr.	Design Supv.

EROSION CONTROL DETAILS
BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253–007

GENERAL NOTES:

1. SEE DRAWING 25253-004 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
2. SEE DRAWING 25253-007 FOR EROSION CONTROL DETAILS.

LEGEND

- PROPERTY LINE
- BOUNDARY LINE
- NEW SUBSTATION FENCE
- NEW CONTOUR
- COMPOST FILTER SOCK
- EXISTING FENCE
- EXISTING FENCE
- EXISTING CONTOUR
- 15' WIDE STORMWATER EASEMENT
- FENCE TO BE REMOVED
- WETLANDS
- LEDGE
- FUTURE ROAD IMPROVEMENT (BY OTHERS)
- INLET PROTECTION
- EXISTING WATER
- EXISTING TRAFFIC
- EXISTING ELECTRICAL
- EXISTING GAS
- EXISTING SANITARY
- EXISTING STRUCTURES

REFERENCE DRAWINGS:

GRADING AND DRAINAGE SITE PLAN	25253-004
CULVERT AND RIP RAP DETAILS	25253-005
EROSION CONTROL SITE PLAN	25253-006
EROSION CONTROL DETAILS	25253-007

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER	DRAWN
SMR	JTG
CHECKED	DATE
–	

PROJECT # 186535

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
A	07/28/2015	ISSUED FOR MCF APPLICATION–PROJECT 186535–BAIRD REPLACEMENT	JTG		SMR	MAV

30' 20' 10' 0 30' 60'
1"=30'

TRUE NORTH

NEW DRAWING

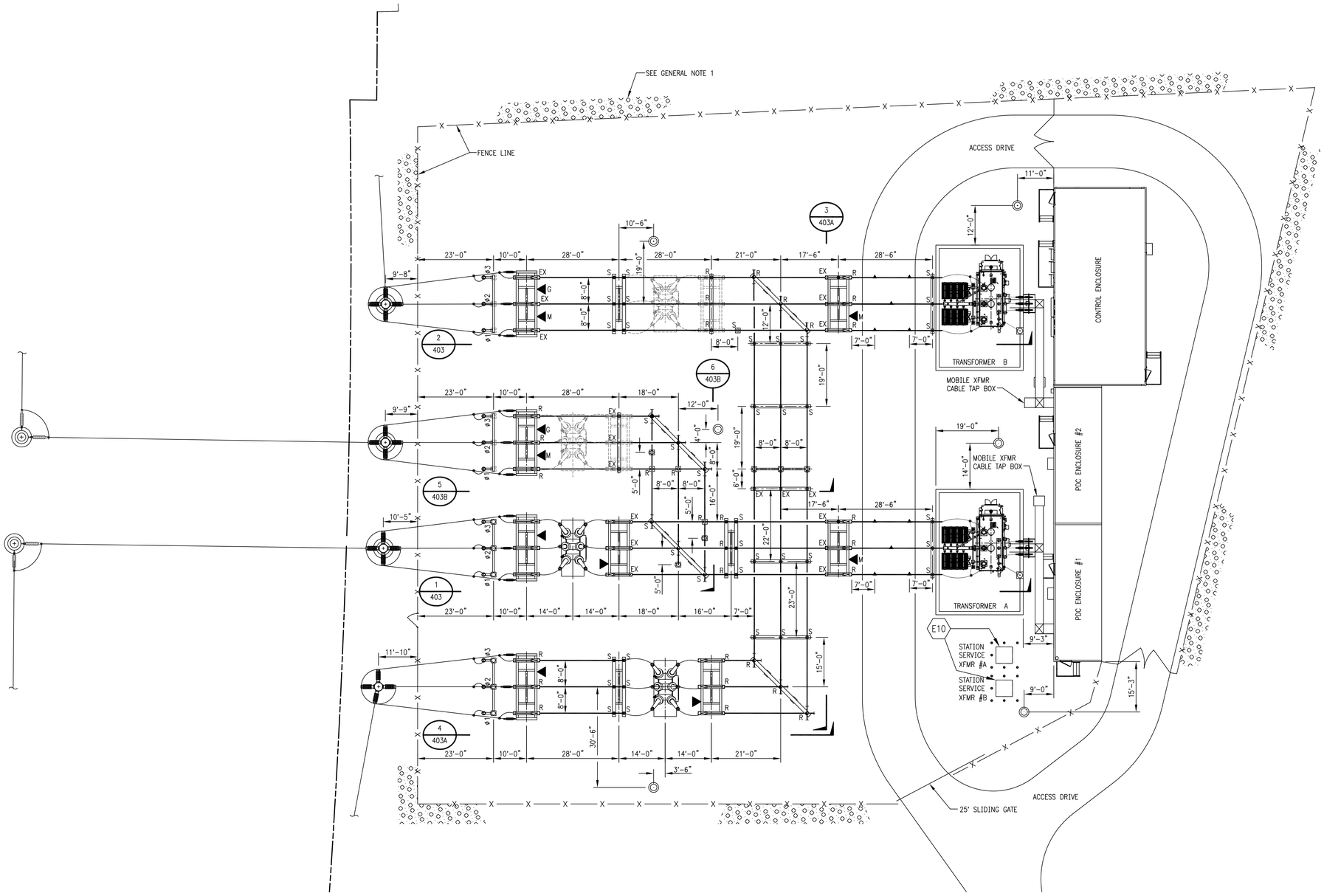
No	Date	Revision	By	Chkd.	Engr.	Supv.

The United Illuminating Company

Drawn	Date –	Scale: 1"=30'
Chkd.	Design Engr.	Design Supv.

EROSION CONTROL SITE PLAN
BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-006



LEGEND:

- MOBILE TRANSFORMER 115KV TAP
- R RIGID (FIXED) BUS CONNECTION
- S SLIP BUS CONNECTION
- EX EXPANSION BUS CONNECTION
- SURGE ARRESTER
- COUPLING CAPACITOR VOLTAGE TRANSFORMER
- LIGHTNING MAST
- M DISCONNECT SWITCH MOTOR OPERATOR
- G GROUNDING SWITCH MANUAL OPERATOR
- DISCONNECT SWITCH MANUAL OPERATOR
- WHITE ROCK SURFACING

GENERAL NOTE:

1. WHITE ROCK SURFACING SHALL BE INSTALLED 6'-0" OUTSIDE SUBSTATION FENCE.

REFERENCE DRAWINGS:

SECTIONS 1 & 2	25253-403
SECTIONS 3 & 4	25253-403A
SECTIONS 5 & 6	25253-403B
FOUNDATION PLAN	25253-407
GROUNDING PLAN	25253-412
RACEWAY PLAN	25253-413
BILL OF MATERIALS	25253-499

NEW DRAWING

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER	DRAWN
BES	WDS
CHECKED	DATE

PROJECT # 186535

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
C	07/27/2015	ISSUED FOR MCF APPLICATION–PROJECT 186535–BAIRD REPLACEMENT	WDS	JDG	TKD	MAV
B	06/19/2015	ISSUED FOR EMF STUDY –PROJECT 186535 –BAIRD REPLACEMENT	WDS/BJF	JDG	TKD	MAV
A	04/30/2015	ISSUED FOR UI 30% REVIEW–PROJECT 186535–BAIRD REPLACEMENT	WDS	TKD	BES	MAV

No	Date	Revision	By	Chkd.	Engr.	Supv.

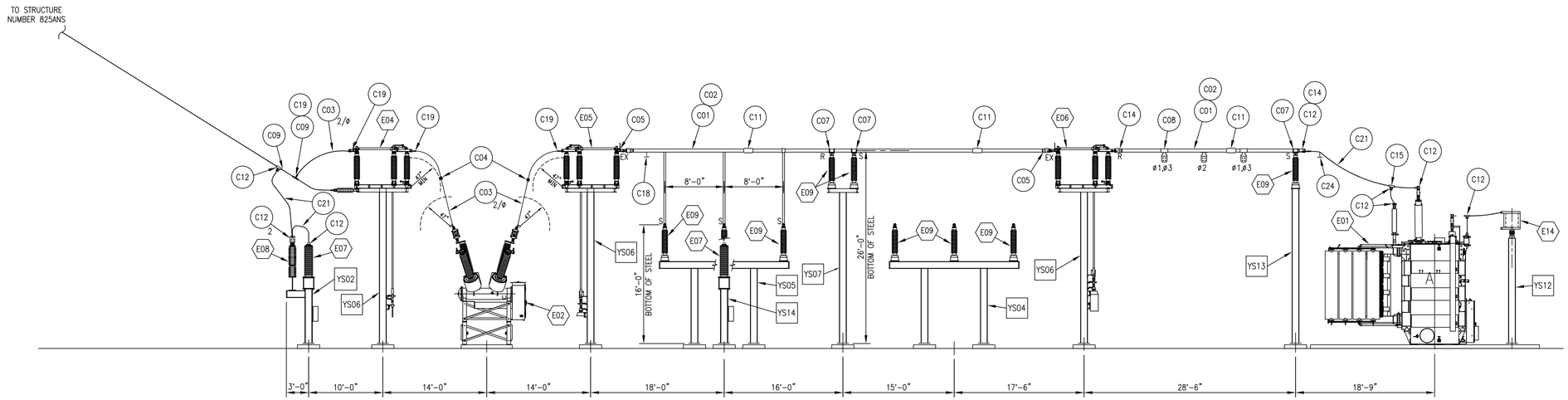
The United Illuminating Company

Drawn _____ Date 03/24/2015 Scale: 1/16"=1'-0"
Chkd. _____ Design Engr._____ Design Supv._____

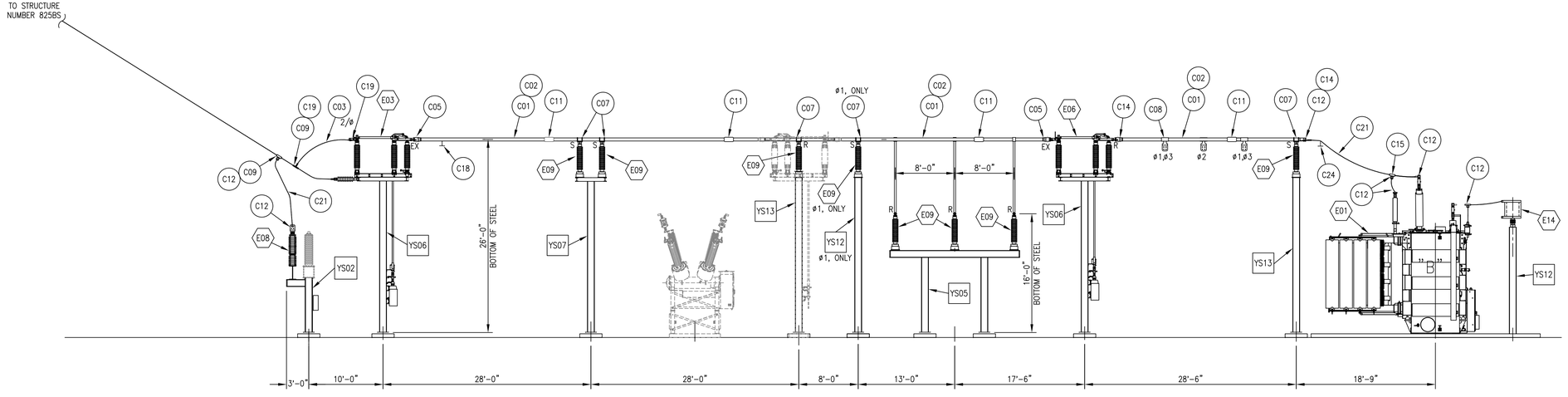
SUBSTATION PLAN

BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-402



SECTION 1



SECTION 2

NOTES:

1. SEE BILL OF MATERIALS FOR DESCRIPTIONS OF EQUIPMENT, STRUCTURES AND FITTINGS.

REFERENCE DRAWINGS:

SUBSTATION PLAN	25253-402
SECTIONS 3 AND 4	25253-403A
SECTIONS 5 AND 6	25253-403B
BILL OF MATERIALS	25253-499

8' 4' 0 8' 16'

1/8"=1'-0"

NEW DRAWING

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER ASV	DRAWN WDS
CHECKED	DATE
PROJECT # 186535	

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
C	07/27/2015	ISSUED FOR MCF APPLICATION-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	TKD	MAV
B	06/19/2015	ISSUED FOR EMF STUDY -PROJECT 186535 -BAIRD REPLACEMENT	WDS/BJF	JDG	TKD	MAV
A	04/30/2015	ISSUED FOR UI 30% REVIEW-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	ASV	MAV

No	Date	Revision	By	Chkd.	Engr.	Supv.

The United Illuminating Company

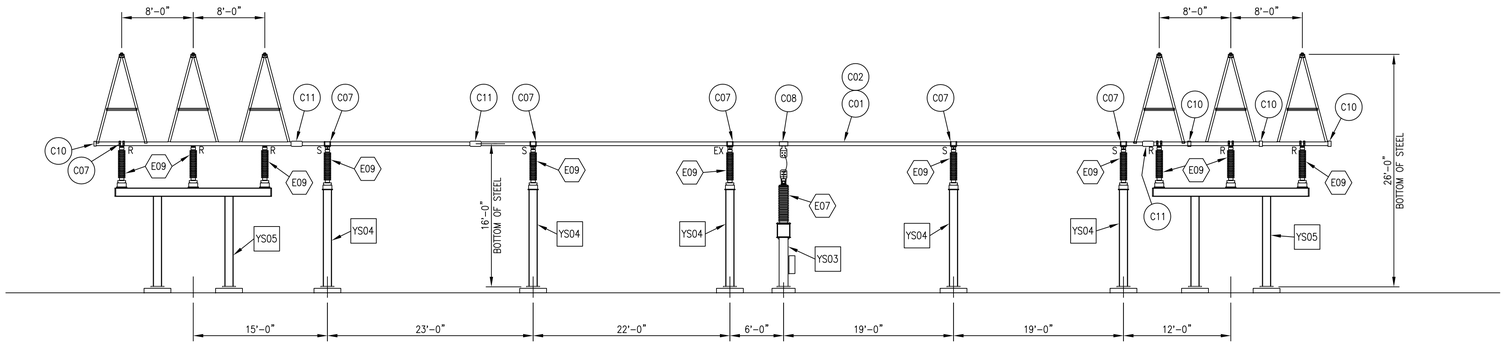
Drawn _____ Date 03/27/2015 Scale: 1/8"=1'-0"

Chkd. _____ Design Engr._____ Design Supv._____

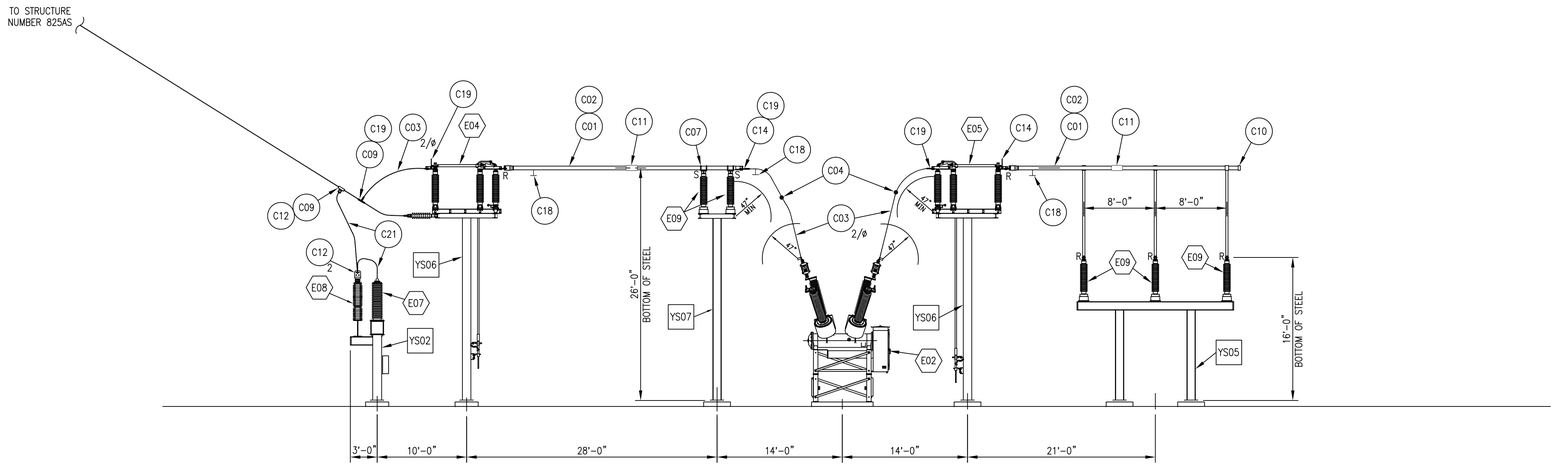
SECTIONS 1 AND 2

BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	—	25253-403



SECTION 3



SECTION 4

NOTES:

1. SEE BILL OF MATERIALS FOR DESCRIPTIONS OF EQUIPMENT, STRUCTURES AND FITTINGS.

REFERENCE DRAWINGS:

SUBSTATION PLAN	25253-402
SECTIONS 1 AND 2	25253-403
SECTIONS 5 AND 6	25253-403B
BILL OF MATERIALS	25253-499

8' 4' 0 8' 16'
1/8"=1'-0"

NEW DRAWING

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER	DRAWN
ASV	WDS
CHECKED	DATE

PROJECT # 186535

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
C	07/27/2015	ISSUED FOR MCF APPLICATION-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	TKD	MAV
B	06/19/2015	ISSUED FOR EMF STUDY -PROJECT 186535 -BAIRD REPLACEMENT	WDS/BJF	JDG	TKD	MAV
A	04/30/2015	ISSUED FOR UI 30% REVIEW-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDS	ASV	MAV

No	Date	Revision	By	Chkd.	Engr.	Supv.

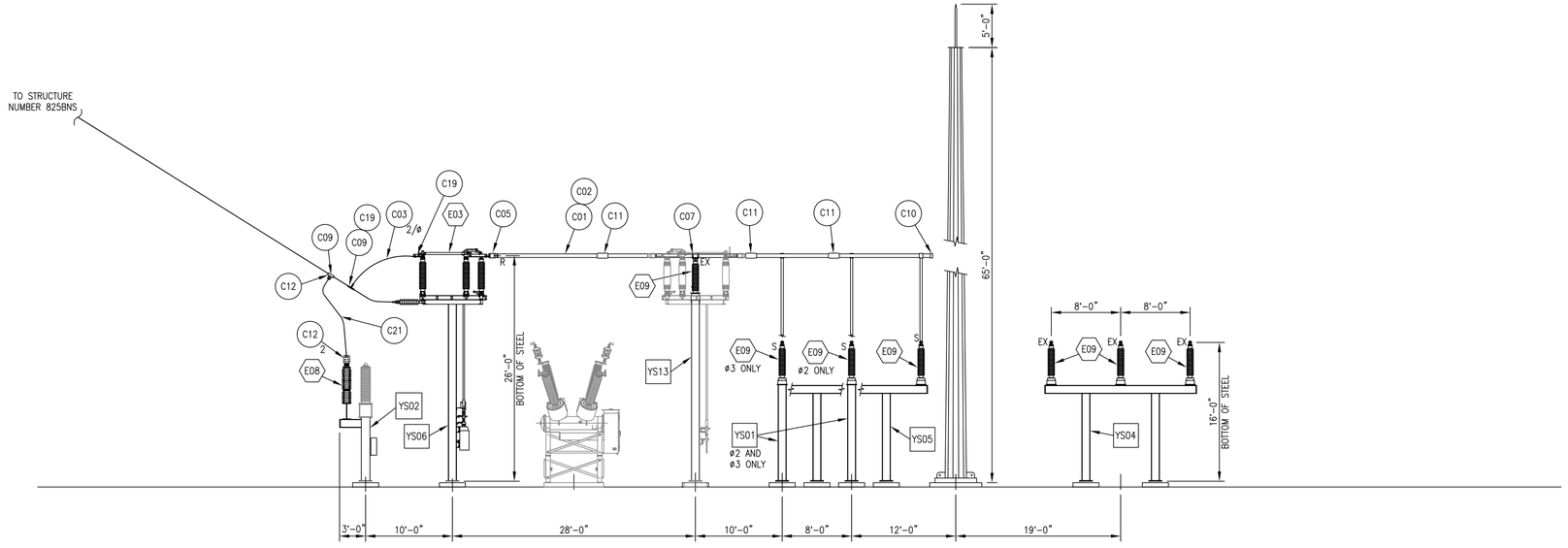
The United Illuminating Company

Drawn _____ Date 04/10/2015 Scale: 1/8"=1'-0"
Chkd. _____ Design Engr._____ Design Supv._____

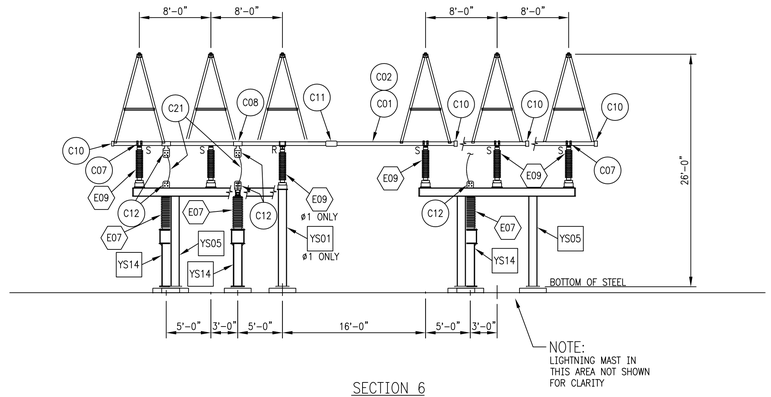
SECTIONS 3 AND 4

BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-403A



SECTION 5



SECTION 6

NOTES:

1. SEE BILL OF MATERIALS FOR DESCRIPTIONS OF EQUIPMENT, STRUCTURES AND FITTINGS.

REFERENCE DRAWINGS:

SUBSTATION PLAN	25253-402
SECTIONS 1 AND 2	25253-403
SECTIONS 3 AND 4	25253-403A
BILL OF MATERIALS	25253-499

8' 4' 0 8' 16'

1/8"=1'-0"

NEW DRAWING

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER ASV	DRAWN WDS
CHECKED	DATE
PROJECT # 186535	

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
C	07/27/2015	ISSUED FOR MCF APPLICATION-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	TKD	MAV
B	06/19/2015	ISSUED FOR EMF STUDY -PROJECT 186535 -BAIRD REPLACEMENT	WDS/BJF	JDG	TKD	MAV
A	04/30/2015	ISSUED FOR UI 30% REVIEW-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	ASV	MAV

No	Date	Revision	By	Chkd.	Engr.	Supv.

The United Illuminating Company

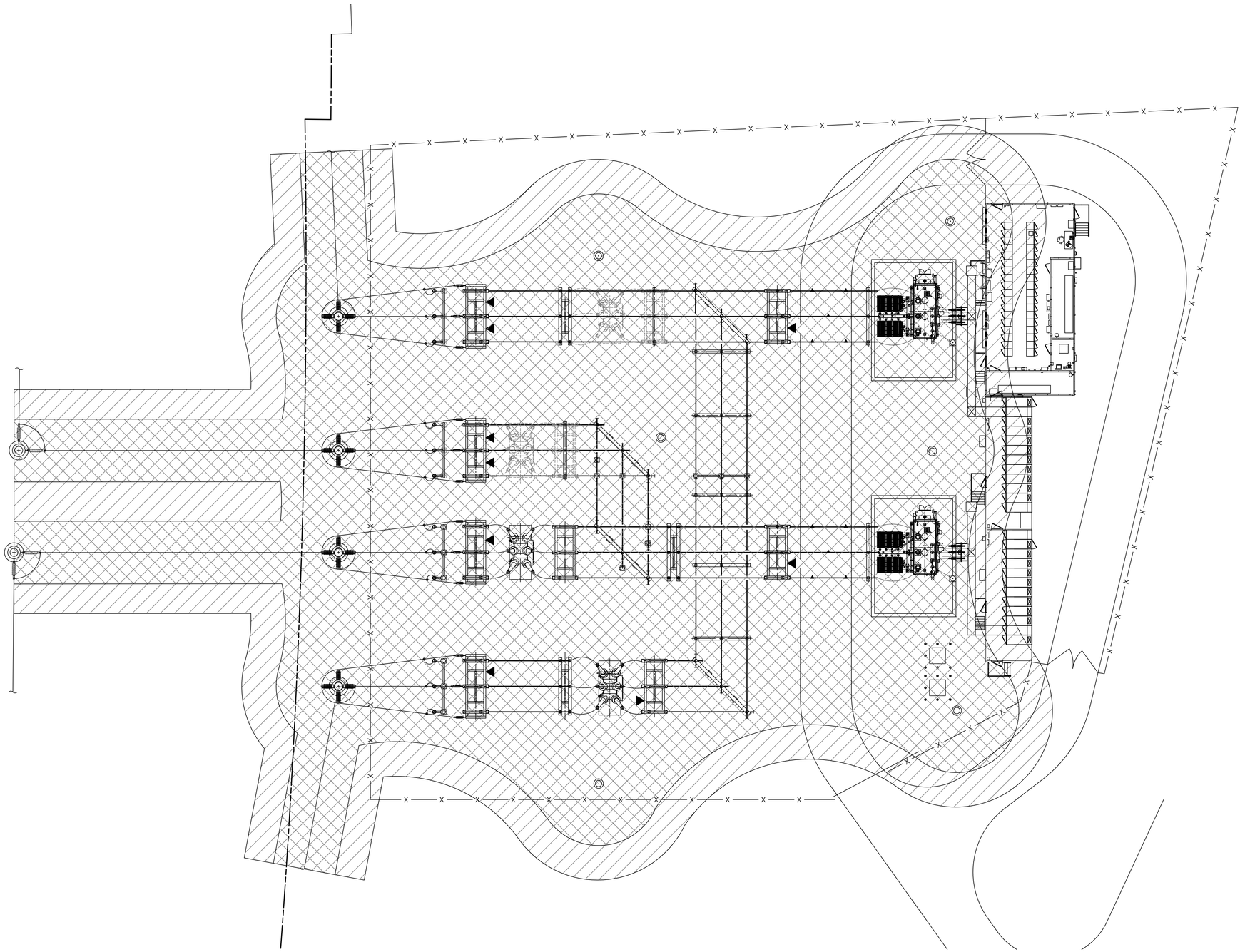
Drawn _____ Date 04/10/2015 Scale: 1/8"=1'-0"

Chkd. _____ Design Engr._____ Design Supv._____

SECTIONS 5 AND 6

BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-403B



16' 12' 8' 4' 0 16' 32'
1/16"=1'-0"

NORTH

LEGEND:

PROTECTED AREA AT HIGH BUS HEIGHT (ELEV. 26 FT.)

PROTECTED AREA AT LOW BUS HEIGHT (ELEV. 16 FT.)

LIGHTNING SHIELDING DESIGN SUMMARY:

1. INPUT PARAMETERS

BIL:	550 KV
LOW BUS HEIGHT:	16 FEET
HIGH BUS HEIGHT:	26 FEET
MAST HEIGHT:	70 FEET
SHIELD WIRE HEIGHT:	85 FEET
SURGE IMPEDANCE:	300 OHMS

2. CALCULATED VALUES

STROKE CURRENT:	4.03 KA
PROTECTED AREA RADIUS:	
HIGH BUS:	19.44 FEET
LOW BUS:	30.25 FEET

REFERENCE DRAWINGS:

SUBSTATION PLAN	25253-402

NEW DRAWING

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER ASV	DRAWN BJF
CHECKED	DATE
PROJECT # 186535	

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
C	07/27/2015	ISSUED FOR MCF APPLICATION–PROJECT 186535–BAIRD REPLACEMENT	WDS	JDG	ASV	MAV
B	06/19/2015	RE–ISSUED FOR UI 30% REVIEW–PROJECT 186535–BAIRD REPLACEMENT	WDS	JDG	ASV	MAV
A	04/30/2015	ISSUED FOR UI 30% REVIEW–PROJECT 186535–BAIRD REPLACEMENT	WDS	JDG	ASV	MAV

No	Date	Revision	By	Chkd.	Engr.	Supv.

The United Illuminating Company

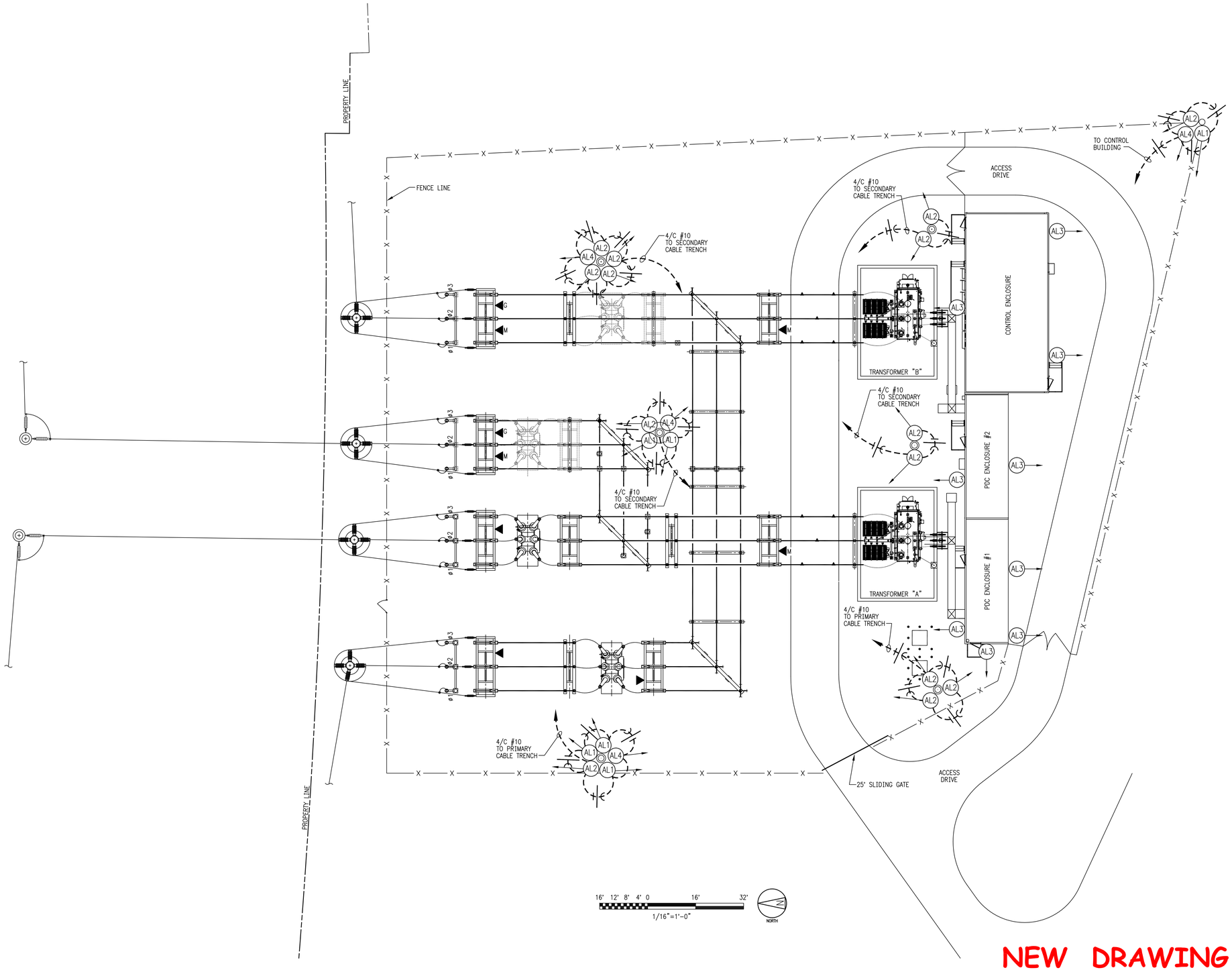
Drawn	Date 03/24/2015	Scale: 1/16"=1'-0"
Chkd.	Design Engr.	Design Supv.

LIGHTNING PROTECTION PLAN

BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-406

FIXTURE LIST				
	SYMBOL	FIXTURE TYPE	MOUNTING ELEVATION	DESCRIPTION
L01	AL1	267W, 120V, LED LUMINAIRE, 15 DEGREE	30'-0"	CREE FLD-EHO-15-XX-12-E-UL-XX-700-50K
L02	AL2	267W, 120V, LED LUMINAIRE, 40 DEGREE	30'-0"	CREE FLD-EHO-40-XX-12-E-UL-XX-700-50K
L03	AL3	42W, LED WALL PACK	12'-0"	CREE XSPWAX3MC-U
L04	AL4	134W LED DOWNLIGHT	15'-0"	CREE SEC-EDG-4M-06-D-UL-700-40K



LEGEND:

CIRCUITING DESIGNATION WITH CONDUCTOR SIZE AND QUANTITY INDICATED ON DRAWING
CONDUCTOR CODE:
SHORT DASH – PHASE OR SWITCHED CONDUCTOR
LONG DASH – NEUTRAL CONDUCTOR
ARC – GROUND CONDUCTOR

(AL) FIXTURE TYPE WITHOUT PHOTOCELL CONTROL

CONSTRUCTION NOTES:

1. THE CONTRACTOR (186535.73.0601) SHALL AIM THE LIGHTS IN THE GENERAL DIRECTION OF THE FIXTURE ARROWS, SUBJECTED TO FINAL ACCEPTANCE BY THE OWNER.
2. THE CONTRACTOR (186535.73.0601) SHALL CONFIRM THAT THE MOUNTING ELEVATION OF THE FLOODLIGHT PROVIDES A MINIMUM MAINTENANCE CLEARANCE OF 10'-8" BETWEEN FLOODLIGHT AND ANY ENERGIZED EQUIPMENT. THE FLOODLIGHT ELEVATION SHALL BE ADJUSTED, IF REQUIRED, TO PROVIDE MINIMUM CLEARANCE.

REFERENCE DRAWINGS:

SUBSTATION PLAN	25253-402
RACEWAY PLAN	25253-413
YARD LIGHTING DETAILS	25253-XXX
YARD LIGHTING DETAILS	25253-XXXA
BILL OF MATERIALS	25237-499A

NEW DRAWING

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER	DRAWN
ASV	WDS
CHECKED	DATE
PROJECT # 186535	

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
B	07/27/2015	ISSUED FOR MCF APPLICATION-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	TKD	MAV
A	04/30/2015	ISSUED FOR UI 30% REVIEW-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	ASV	MAV

No	Date	Revision	By	Chkd.	Engr.	Supv.

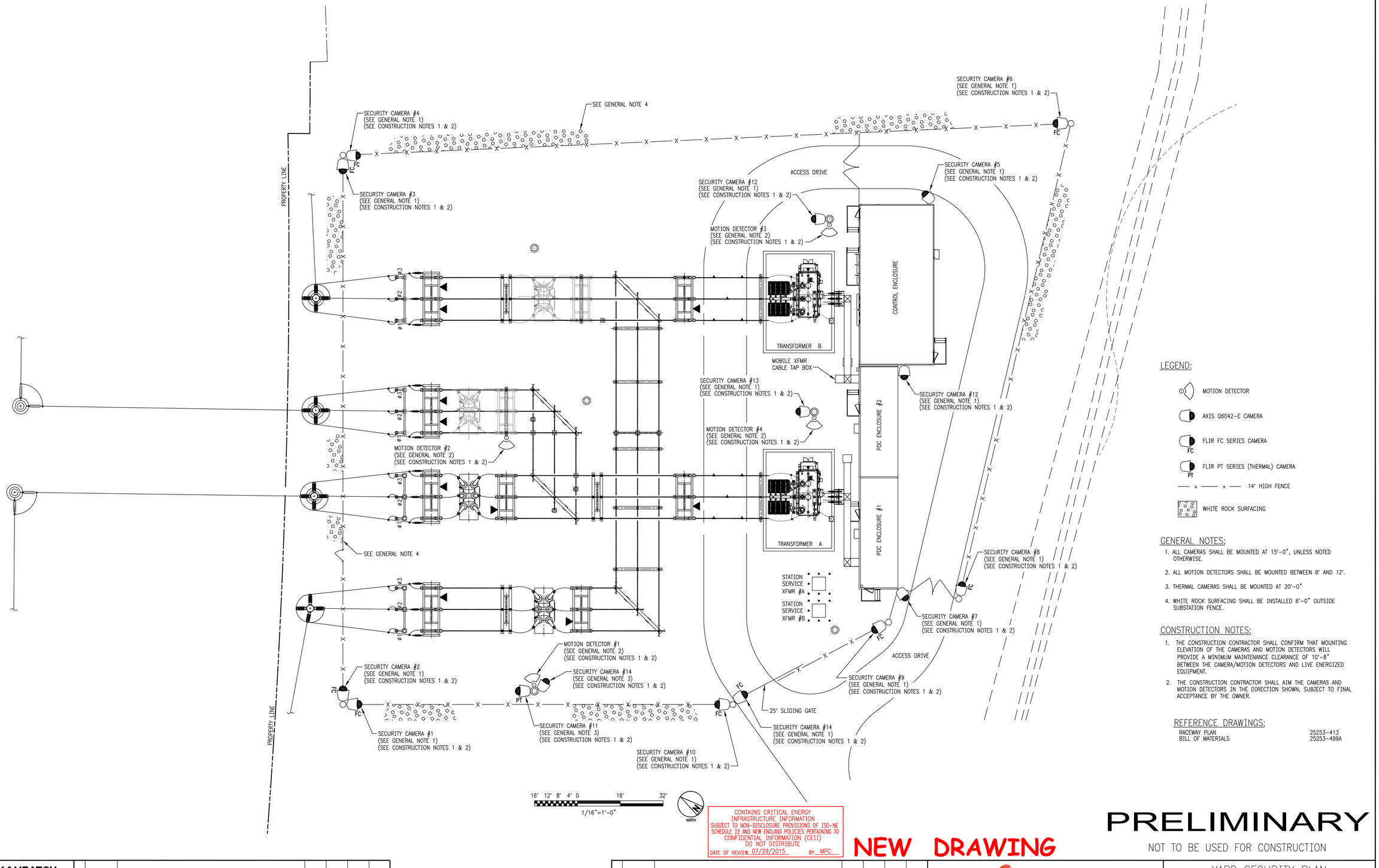
The United Illuminating Company

Drawn _____ Date 04/16/2015 Scale: 1/16"=1'-0"
Chkd. _____ Design Engr._____ Design Supv._____

LIGHTING PLAN

BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-415



LEGEND:

- MOTION DETECTOR
- AXIS Q6042-E CAMERA
- FC — FLIR FC SERIES CAMERA
- PT — FLIR PT SERIES (THERMAL) CAMERA
- x —— x —— 14' HIGH FENCE
- WHITE ROCK SURFACING

GENERAL NOTES:

1. ALL CAMERAS SHALL BE MOUNTED AT 15'-0", UNLESS NOTED OTHERWISE.
2. ALL MOTION DETECTORS SHALL BE MOUNTED BETWEEN 8' AND 12'.
3. THERMAL CAMERAS SHALL BE MOUNTED AT 20'-0"
4. WHITE ROCK SURFACING SHALL BE INSTALLED 6'-0" OUTSIDE SUBSTATION FENCE.

CONSTRUCTION NOTES:

1. THE CONSTRUCTION CONTRACTOR SHALL CONFIRM THAT MOUNTING ELEVATION OF THE CAMERAS AND MOTION DETECTORS WILL PROVIDE A MINIMUM MAINTENANCE CLEARANCE OF 10'-8" BETWEEN THE CAMERA/MOTION DETECTORS AND LIVE ENERGIZED EQUIPMENT.
2. THE CONSTRUCTION CONTRACTOR SHALL AIM THE CAMERAS AND MOTION DETECTORS IN THE DIRECTION SHOWN, SUBJECT TO FINAL ACCEPTANCE BY THE OWNER.

REFERENCE DRAWINGS:

RACEWAY PLAN	25253-413
BILL OF MATERIALS	25253-499A

CONTAINS CRITICAL ENERGY INFRASTRUCTURE INFORMATION
SUBJECT TO NON-DISCLOSURE PROVISIONS OF ISO-NE SCHEDULE 22 AND NEW ENGLAND POLICIES PERTAINING TO CONFIDENTIAL INFORMATION (CEII)
DO NOT DISTRIBUTE
DATE OF REVIEW 07/29/2015 BY MPC

NEW DRAWING

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

BLACK & VEATCH
Building a world of difference®

DESIGNER DRJ	DRAWN WDS
CHECKED	DATE
PROJECT # 186535	

NO	DATE	REVISION	DRN	CHKD	DESN	SUPR.
B	07/27/2015	ISSUED FOR MCF APPLICATION-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	TKD	MAV
A	04/30/2015	ISSUED FOR UI REVIEW-PROJECT 186535-BAIRD REPLACEMENT	WDS	JDG	BES	MAV

No	Date	Revision	By	Chkd.	Engr.	Supv.

The United Illuminating Company

Drawn	Date 04/20/2015	Scale: 1/16"=1'-0"
Chkd.	Design Engr.	Design Supv.

YARD SECURITY PLAN

BAIRD SUBSTATION

CAD FILE NAME	SEQUENCE No.	DRAWING NUMBER
	–	25253-416

DR.4 Existing and Historic Aerial Photographs of the Project Site

Project Site
Scale 1" = 1,000'
Source: Bing Maps, July 2015
Boston Ave
Barnum Ave
Barnum Ave Cutoff
Stratford Ave
Connecticut Ave
Ferry Blvd
Main St
Lordship Blvd
Surf Ave
Honeyspot Rd
Seymour St
Grant St
Stratford Center Historic District
South End
East End
Mill Hill
Boston Avenue
Bridgeport Hospital
Clover Field
St Michaels Cemetery
Academy Hill Park
Newfield Park
Nells Island
Housatonic River
Frash Pond
Selby's Pond
Johnsons Creek
95
1
113
30
31
32
33


Project Site
Scale: 1" = 100'
Source: Bing Maps, July 2015


Project Site Circa 1991
Source: Google Maps, July 2015

DR.5 Photographic Simulation of Proposed Substation

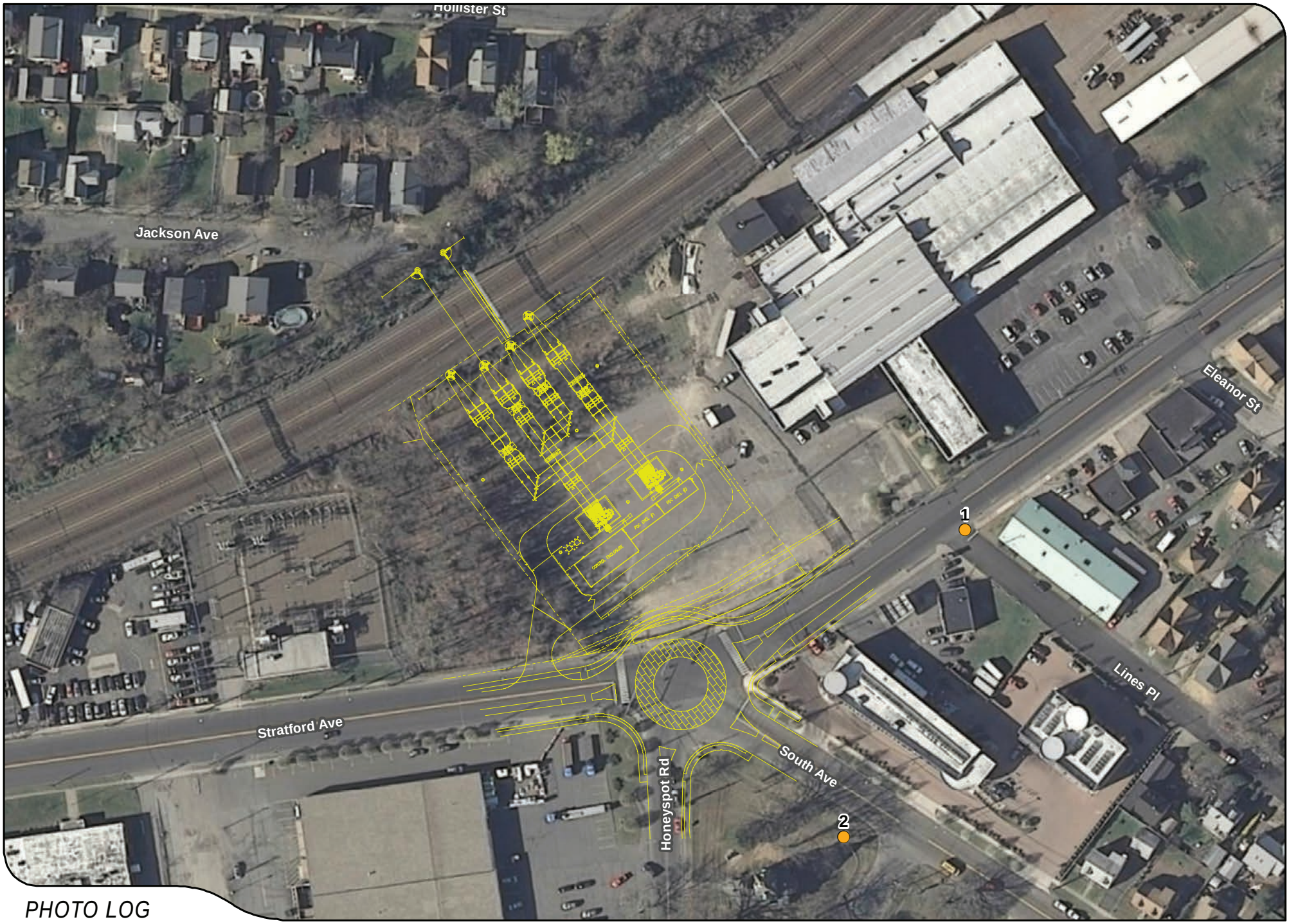


PHOTO LOG

Legend

Photo Location — Approximate Proposed Substation Layout

BAIRD SUBSTATION

N W E S

75 37.5 0 75 Feet

1 inch = 125 feet

ALL-POINTS TECHNOLOGY CORPORATION

The United Illuminating Company

EXISTING CONDITIONS

ALL-POINTS TECHNOLOGY CORPORATION

The United Illuminating Company

PROPOSED CHANGES

ALL-POINTS TECHNOLOGY CORPORATION

The United Illuminating Company

FINAL CONFIGURATION

ALL-POINTS TECHNOLOGY CORPORATION

The United Illuminating Company

DOCUMENTATION

PHOTO	LOCATION	ORIENTATION
1	**INTERSECTION OF LINES PLACE AND STRATFORD AVENUE**	**WEST**

SIMULATION

PHOTO	LOCATION	ORIENTATION
1	**INTERSECTION OF LINES PLACE AND STRATFORD AVENUE**	**WEST**

ALL-POINTS TECHNOLOGY CORPORATION

The United Illuminating Company

DOCUMENTATION

PHOTO	LOCATION	ORIENTATION
2	**SOUTH AVENUE**	**NORTHWEST**

SIMULATION

PHOTO	LOCATION	ORIENTATION
2	**SOUTH AVENUE**	**NORTHWEST**

ALL-POINTS TECHNOLOGY CORPORATION

The United Illuminating Company

APPENDIX B. AGENCY CORRESPONDENCE

SH.1 Natural Diversity Data Base – Baird Annex

SH.2 Natural Diversity Data Base – West Broad Street

SH.3 State Historic Preservation Office – Baird Annex

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

April 14, 2015

Shawn C. Crosbie
The United Illuminating Company
180 Marsh Hill Road
Orange, CT 06477
shawn.crosbie@uinet.com

Project: Baird Substation Rebuild Located at 1746 Stratford Avenue in Stratford
NDDB Determination No.: 201501881

Dear Shawn C. Crosbie,

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding the area delineated on the map provided for the proposed Baird Substation Rebuild Located at 1746 Stratford Avenue in Stratford, Connecticut. I do not anticipate negative impacts to State-listed species (RCSA Sec. 26-306) resulting from your proposed activity at the site based upon the information contained within the NDDB. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits. This determination is good for one year. Please re-submit an NDDB Request for Review if the scope of work changes or if work has not begun on this project by April 14, 2016.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base.

Sincerely,

Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3

Natural Diversity Data Base Areas

STRATFORD, CT

December 2014

State and Federal Listed Species & Significant Natural Communities

Town Boundary

NOTE: This map shows general locations of State and Federal Listed Species and Significant Natural Communities. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDB) from a number of data sources . Exact locations of species have been buffered to produce the general locations. Exact locations of species and communities occur somewhere in the shaded areas, not necessarily in the center. A new mapping format is being employed that more accurately models important riparian and aquatic areas and eliminates the need for the upstream/downstream searches required in previous versions.

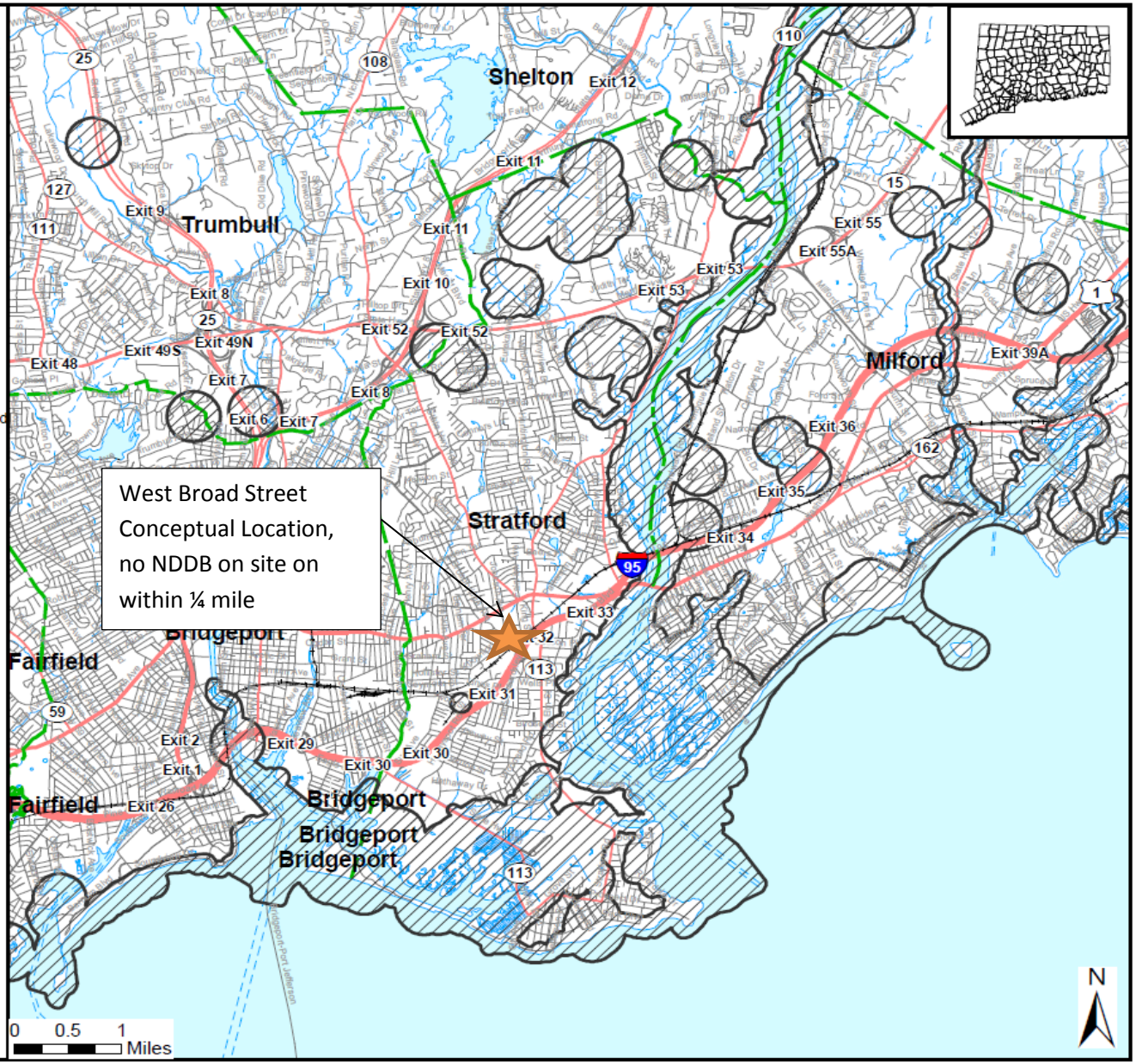
This map is intended for use as a preliminary screening tool for conducting a Natural Diversity Data Base Review Request. To use the map, locate the project boundaries and any additional affected areas. If the project is within a shaded area there may be a potential conflict with a listed species. For more information, complete a Request for Natural Diversity Data Base State Listed Species Review form (DEP-APP-007), and submit it to the NDDB along with the required maps and information. More detailed instructions are provided with the request form on our website.

www.ct.gov/deep/nddbrequest

Use the CTECO Interactive Map Viewers at www.cteco.uconn.edu to more precisely search for and locate a site and to view aerial imagery with NDDB Areas.

QUESTIONS: Department of Energy and Environmental Protection (DEEP)
79 Elm St., Hartford CT 06106
Phone (860) 424-3011

Connecticut Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division



Department of Economic and Community Development

Connecticut
still revolutionary

State Historic Preservation Office

One Constitution Plaza | Hartford, CT 06103 | 860.256.2800 | Cultureandtourism.org

PROJECT REVIEW COVER FORM

1. This information relates to a previously submitted project. ☐ You do not need to complete the rest of the form if you have been previously issued a SHPO Project Number. Please attach information to this form and submit

SHPO Project Number _____
(Not all previously submitted projects will have project numbers)

Project Address Intersection of Stratford Avenue and Honeyspot Road in Stratford, Connecticut
(Street Address and City or Town)

2. This is a new Project. ☐ If you have checked this box, it is necessary to complete ALL entries on this form .

Project Name Baird Substation Expansion Project

Project Location Intersection of Stratford Avenue and Honeyspot Road
Include street number, street name, and or Route Number. If no street address exists give closest intersection.

City or Town Stratford, Connecticut
In addition to the village or hamlet name (if appropriate), the municipality must be included here.

County Fairfield
If the undertaking includes multiple addresses, please attach a list to this form.

Date of Construction (for existing structures)_____

PROJECT DESCRIPTION SUMMARY (include full description in attachment):

United Illuminating plans to expand the footprint of the existing substation at this location to encompass additional land to the east.

TYPE OF REVIEW REQUESTED

a. Does this undertaking involve funding or permit approval from a State or Federal Agency?

[x] Yes [ ] No

Agency Name/Contact	Type of Permit/Approval	State	Federal
CT SHPO		[x]	[ ]
		[ ]	[ ]
		[ ]	[ ]

	Yes	No
b. Have you consulted the SHPO and UCONN Dodd Center files to determine the presence or absence of previously identified cultural resources within or adjacent to the project area?	[x]	[ ]
If yes: Was the project site wholly or partially located within an identified archeologically sensitive area?	[ ]	[x]
Does the project site involve or is it substantially contiguous to a property listed or recommended for listing in the CT State or National Registers of Historic Places?	[ ]	[x]
Does the project involve the rehabilitation, renovation, relocation, demolition or addition to any building or structure that is 50 years old or older?	[ ]	[x]

Department of Economic and Community Development

Connecticut
still revolutionary

State Historic Preservation Office

One Constitution Plaza | Hartford, CT 06103 | 860.256.2800 | Cultureandtourism.org

PROJECT REVIEW COVER FORM

The Historic Preservation Review Process in Connecticut Cultural Resource Review under the National Historic Preservation Act – Section 106 http://www.achp.gov/106summary.html involves providing technical guidance and professional advice on the potential impact of publicly funded, assisted, licensed or permitted projects on the state's historic, architectural and archaeological resources. This responsibility of the State Historic Preservation Office (SHPO) is discharged in two steps: (1) identification of significant historic, architectural and archaeological resources; and (2) advisory assistance to promote compatibility between new development and preservation of the state's cultural heritage.

Project review is conducted in two stages. First, the SHPO assesses affected properties to determine whether or not they are listed or eligible for listing in the Connecticut State or National Registers of Historic Places. If so, it is deemed "historic" and worthy of protection and the second stage of review is undertaken. The project is reviewed to evaluate its impact on the properties significant materials and character. Where adverse effects are identified, alternatives are explored to avoid, or reduce project impacts; where this is unsuccessful, mitigation measures are developed and formal agreement documents are prepared stipulating these measures. For more information and guidance, please see our website at: http://www.cultureandtourism.org/cct/cwp/view.asp?a=3933&q=293820

ALL PROJECTS SUBMITTED FOR REVIEW MUST INCLUDE THE FOLLOWING MATERIALS*:

[x] **PROJECT DESCRIPTION** Please attach a full description of the work that will be undertaken as a result of this project. Portions of environmental statements or project applications may be included. The project boundary of the project should be clearly defined**

[x] **PROJECT MAP** This should include the precise location of the project – preferably a clear color image showing the nearest streets or roadways as well as all portions of the project. Tax maps, Sanborn maps and USGS quadrangle maps are all acceptable, but Bing and Google Earth are also accepted if the information provided is clear and well labeled. The project boundary should be clearly defined on the map and affected legal parcels should be identified.

[ ] **PHOTOGRAPHS** Clear, current images of the property should be submitted. Black and white photocopies will not be accepted. Include images of the areas where the proposed work will take place. May require: exterior elevations, detailed photos of elements to be repaired/replaced (windows, doors, porches, etc.) All photos should be clearly labeled.

For Existing Structures	Yes	N/A	Comments
Property Card	☐	☐	
For New Construction	**Yes**	**N/A**	**Comments**
Project plans or limits of construction (if available)	☐	☐	
If project is located in a Historic District include renderings or elevation drawings of the proposed structure	☐	☐	
Soils Maps http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm	☐	☐	
Historic Maps http://magic.lib.uconn.edu/	☐	☐	
For non-building-related projects (dams, culverts, bridge repair, etc)	**Yes**	**N/S**	**Comments**
Property Card	☐	☐	
Soils Map (see above)	☐	☐	
Historic Maps (see above)	☒	☐	

STAFF REVIEW AREA	Above	Date	Below	Date
Indicate date of Review and Initials of Reviewer				

PROJECT CONTACT

Name Mr. Shawn Crosbie Title Environmental Analyst

Firm/Agency United Illuminating Holdings Corporation

Address 180 Marsh Hill Road

City Orange State CT Zip 06477

Phone 203.926.4595 Cell 203.915.2573 Fax

Email shawn.crosbie@uinet.com

*Note that he SHPO's ability to complete a timely project review depends largely on the quality of the materials submitted.

** Please be sure to include the project name and location on *each page* of your submission.

Department of Economic and Community Development

Connecticut
still revolutionary

State Historic Preservation Office

One Constitution Plaza | Hartford, CT 06103 | 860.256.2800 | Cultureandtourism.org

PROJECT REVIEW COVER FORM

SHPO USE ONLY

Based on our review of the information provided to the State Historic Preservation Office, it is our opinion that:

☒ No historic properties will be affected by this project. No further review is requested.

☐ This project will cause no adverse effects to the following historic properties. No further review is requested:

☐ This project will cause no adverse effects to the following historic properties, conditional upon the stipulations included in the attached letter:

☐ Additional information is required to complete our review of this project. Please see the attached letter with our requests and recommendations.

☐ This project will adversely affect historic properties as it is currently designed or proposed. Please see the attached letter for further details and guidance.

Laura L. Mancuso 5.14.15

~~Daniel T. Forrest~~ Laura L. Mancuso Date

Deputy State Historic Preservation Officer

APPENDIX C. WETLANDS AND WATERCOURSE REPORT

CONESTOGA-ROVERS
& ASSOCIATES

45 Farmington Valley Drive
Plainville, CT 06062
Telephone: (860) 747-1800 Fax: (860) 747-1900
www.CRAworld.com

July 17, 2015 Reference No. 083167

Mr. Shawn C. Crosbie
Environmental Analyst
UIL Holdings Corporation
180 Marsh Hill Road
Orange, CT 06477

Dear Mr. Crosbie:

Re: Wetland Delineation Report, Revised
Baird Substation
1770 Stratford Avenue, Stratford, Connecticut

Conestoga-Rovers & Associates, Inc. (CRA) was retained by UIL Holdings Corporation (UIL) to conduct a wetland delineation at the Baird Substation (Site) located 1770 Stratford Avenue in Stratford, Connecticut. The location of the Site and the surrounding physical features including topography, nearby water bodies, man-made structures, and access routes are shown on Figure 1. The Site encompasses 3.52 acres on two parcels of land and located on the north side of Stratford Avenue at the intersection of Stratford Avenue, Honeyspot Road, and Surf Avenue.

The report includes copies of the United States Geologic Survey (USGS) topographic map (Figure 1) and a recent aerial photograph (Figure 2) of the Site, which includes the surveyed location of the wetland delineation flagging.

This wetland delineation was completed in anticipation of expansion of the existing electrical substation. The proposed substation expansion is shown on Figure 2. This letter discusses the wetland delineation methodology and provides the results of the field investigation performed. The wetland delineation was completed by David Lord, Certified Soil Scientist, Soil Resource Consultants, of Meriden Connecticut. The survey of the wetland flagging was prepared by David L. Nafis, PE, LS, Nafis & Young Engineers, Inc., of Northford, Connecticut.

1.0 Regulatory Framework and Wetland Delineation Methodology

This investigation involved a wetland delineation completed by a qualified soil scientist and conducted in accordance with the principles and practices noted in the United States

Department of Agriculture (USDA) Soil Survey Manual (1993). The soil classification system of the National Cooperative Soil Survey was used in this investigation to identify the soil map units present on the project site. The wetland boundaries were also established using procedures outlined in the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, January 1987*.

Vegetation, soils, and hydrology were observed and documented during the site investigation in order to meet the criteria of state and federal delineation methodologies. Soil types were identified by observing soil morphology (soil texture, color, structure, etc.). To observe the morphology of the soils, test borings were advanced with a hand auger or shovel. Where wetlands were determined to be present, their boundaries were identified with flags and hung from vegetation.

2.0 Review of Secondary Data

As shown on Figure 1, the topography on the Site is generally level to gently sloping with an elevation between 10 to 20 feet, North American Vertical Datum 1988 (NAVD88). The aerial photograph, provided as Figure 2, shows the Site bordered by railroad tracks for the State of Connecticut (Metro-North Commuter Railroad) to the north, Stratford Avenue to the south, Two Roads Brewing Company to the east, and Savings Auto Center to the west. There is a 15-foot wide storm water easement along the southern portion of the Site in favor of U.S. Baird Corporation, the former property owner of the Two Roads Brewing Company parcel. Currently, the Site is developed with an existing electrical substation in the western portion, a parking lot in the eastern portion, and an undeveloped wooded portion in the center of the property.

As shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM-Figure 3), the Site is not located within a mapped Flood Hazard Area. The nearest wetland identified in the National Wetlands Inventory (NWI) Map (Figure 4) is approximately 1,300 feet northwest from the Site. As shown on the NRCS Web Soil Survey (Figure 5), the following soil series are mapped on and adjoining the Site:

- 260C: Charlton-Urban land complex, 8 to 15 percent slopes
- 307: Urban land (Udorthents)

Soil surveys in Connecticut were originally conducted for primarily agricultural purposes and do not provide site specific information. The minimum area delineated on a soil survey map sheet is approximately 2 to 3 acres in size. For this reason there may be some differences between the Site specific information (Section 5) and that published in the Soil Survey.

3.0 Regulatory Information

Federal Jurisdiction

Jurisdictional wetlands at the Federal level consist of "waters of the United States", which includes lakes, rivers, and streams, as well as vegetated wetlands (See 33 CFR 328.8). In Connecticut, wetlands and waterways are regulated at the Federal level by the U.S. Army Corps of Engineers (ACOE) under Section 404 of the Clean Water Act. However, projects that have minimal individual and cumulative impacts on the aquatic environment within the State of Connecticut are regulated under the Connecticut General Permit issued by the ACOE. In order for any work authorized under the General Permit to be valid, State and any local approvals must be obtained.

State Jurisdiction

In 1972, the Connecticut Inland Wetlands and Watercourses Act (IWWA – sections 22a-36 through 22a-45 of the General Statutes of Connecticut) was passed that requires the regulation of activities affecting the wetlands and watercourses of our state. Under the IWWA, wetlands are defined by soil type. The soil types of wetlands are poorly drained, very poorly drained, alluvial, and floodplain. In 1987, the IWWA was amended to require municipal regulation of such activities. However, State agency actions within inland wetlands and waterways are regulated at the state level by the Connecticut Department of Energy and Environmental Protection (CTDEEP). Coastal wetlands are regulated by the CTDEEP.

Municipal Jurisdiction

The proposed substation improvement is subject to the Department of Public Utility Control (DPUC) Document No. 95-08-34 entitled "DPUC Investigation of the Process of and Jurisdiction over Siting Certain Utility Company Facilities and Plant in Connecticut." Pursuant to Orders 1 through 3 of the above decision document, the Town of Stratford Inland Wetland Department will be notified of the proposed substation improvements.

4.0 Field Activities

As stated above, projects that have minimal individual and cumulative impacts on the aquatic environment within the State of Connecticut are regulated under the Connecticut General Permit issued by the ACOE; and are subject to State regulation. Wetlands regulated in Connecticut are defined by soil type. The wetland delineation via soil type was conducted by David Lord, Certified Soil Scientist, on April 14, 2015. The surveyed limits of the wetland delineation are shown on Figure 2 and Figure 5. No vernal pools were identified on the property. A copy of the wetland delineation report is provided in Appendix A.

The wetlands were also delineated using the Routine Onsite Determination Method in the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, January 1987,* by David Lord, Certified Soil Scientist, on July 8, 2015. According to this methodology, wetlands are identified by the presence of three parameters: the dominance of hydrophytic vegetation, the presence of hydric soils, and positive indicators of wetland hydrology. Typically, all three parameters must be present for an area to be considered ACOE jurisdictional wetlands. However, in areas where one or more of the wetland parameters have been significantly disturbed (e.g., mowed lawn areas, agricultural fields, etc.), the remaining parameters and best professional judgment are used to delineate the extent of jurisdictional wetlands.

A completed copy of the Wetland Delineation Report using the ACOE data form referenced in the ACOE 1987 *Wetlands Delineation Manual* is provided in Appendix B. The limit of the ACOE Method wetland delineation is consistent with the delineation by soil type only.

5.0 Results of the Wetland Delineation

The wetland area on-Site was delineated with sequentially numbered flags 1 through 8 (closed loop) and its location is depicted on Figure 2 and Figure 5. The calculated area of the wetland is approximately 654 square feet. It is the lowest point on the site where the ground water table was observed in the bottom of this subject wetland at the time of the inspection. No inlet or

outlet is associated with this wetland. This wetland is classified as palustrine emergent nonpersistant (PEM2) and is a small sparsely vegetated depression.

The wetland area is located between an existing electrical substation to the west, the Metro-North rail road right of way to the north, Stratford Avenue to the south, and a parking lot to the west. This area is extremely disturbed due to the development of the property and surrounding properties. Hydrologic conditions are influenced by the storm water runoff, ponding, and groundwater connection. The soil profile is considerably disturbed from historic site activities.

The wetland soil series is identified as Aquents (Aq). The Aq map unit consists primarily of disturbed soil materials with poorly drained characteristics generally less than 20 inches down from the existing soil surface. The natural soil profile has been disturbed by previous filling and/or grading activities and classification into natural soil map units is not possible.

The upland (non-wetland) soil types are described as Charlton-Urban Land Complex and Udorthents (Urban Land). The Charlton series consists of very deep, well drained loamy soils formed in till derived from parent materials that are very low in iron sulfides. They are nearly level to very steep soils on till plains and hills. Slope ranges from 0 to 50 percent. Saturated hydraulic conductivity is moderately high or high. Udorthents are moderately well to well drained disturbed soils composed of filled areas and areas consisting of both cut and fill. Original diagnostic soil horizons are not present. Udorthents have a wide range of characteristics. Textures are predominantly gravelly fine sandy loams.

The undeveloped portion of the Site can be classified as wooded land; and the remaining portions of the Site support the existing UIL electric substation and a parking lot. No indicators of wetland hydrology were observed in the uplands portion of the Site.

CONESTOGA-ROVERS
& ASSOCIATES

If you have any questions or require additional information, please call me at (860) 747-1800 or smanley@craworld.com.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Stuart Manley, LEP, CHMM

SD/ro/13
Enclosures

SOURCE: USGS QUADRANGLE MAP;
BRIDGEPORT, NORTH CONNECTICUT, 1984

figure 1

SITE LOCATION
BAIRD SUBSTATION
1770 STRATFORD AVENUE
Stratford, Connecticut

83167-61(CROS012)GN-WA001 MAY 5/2015

SOURCES:
IMAGE - NAIP IMAGERY OF CONNECTICUT, 2008 - U.S. DEPARTMENT OF AGRICULTURE (USDA) FARM SERVICE AGENCY, AERIAL PHOTOGRAPHY FIELD OFFICE.
PROPERTY LINES AND SITE SURVEY - PRELIMINARY DRAWING, WETLAND AREA AROUND BAIRD SUBSTATION, BLACK & VEATCH, APRIL 02, 2015.
PROPOSED DEVELOPMENT PLAN - SUBSTATION ARRANGEMENT PLAN. FULL REPLACEMENT SITE, BAIRD SUBSTATION, BLACK & VEATCH FEBRUARY 02, 2015.
WETLAND DELINEATION - DAVID LORD, CERTIFIED SOIL SCIENTIST, APRIL 14, 2015.
WETLAND LIMITS SURVEY - COMPLETED BY NAFIS & YOUNG ENGINEERS, INC., APRIL 14, 2015.

CRA

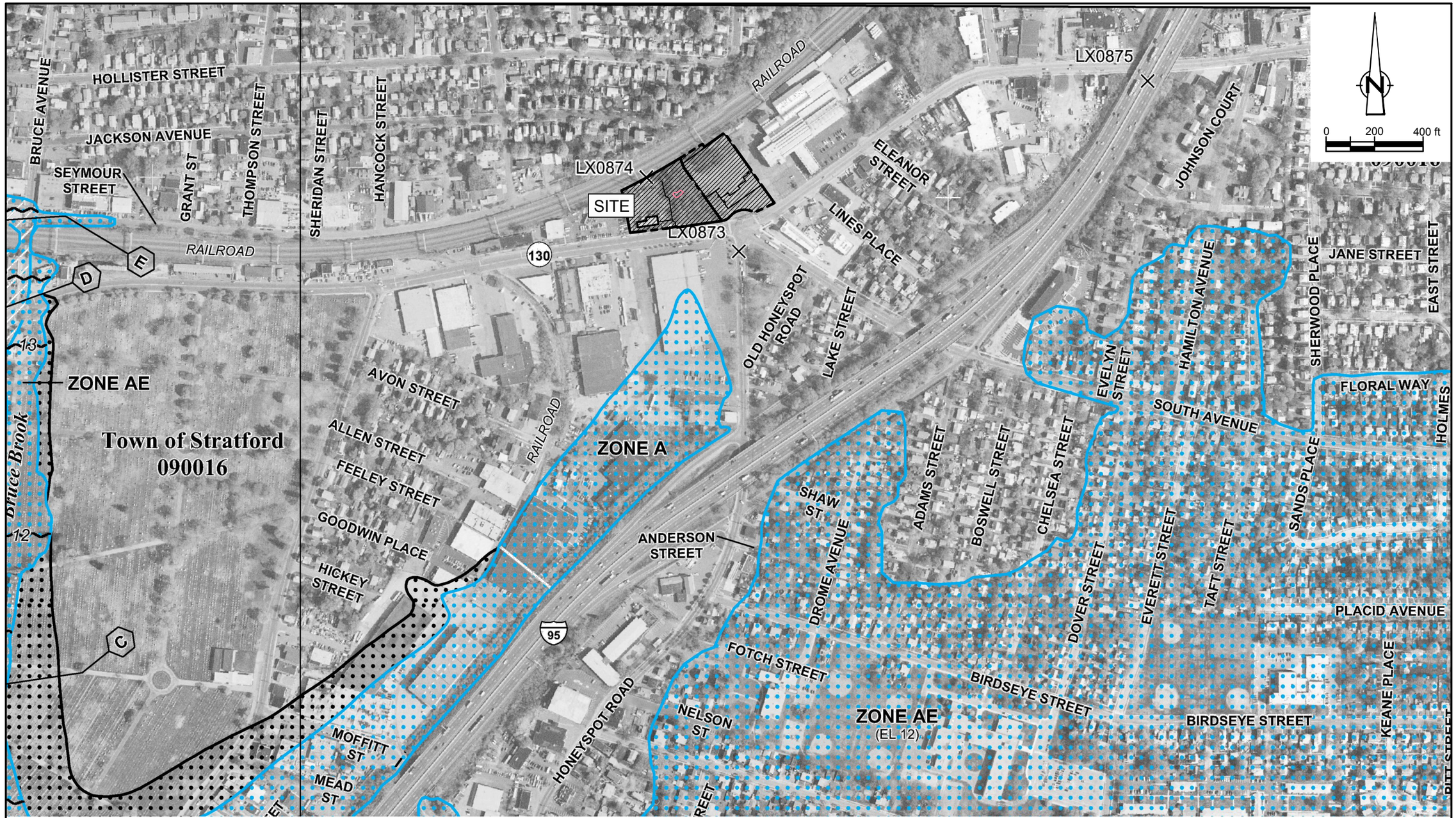
LEGEND

- PROPERTY BOUNDARY
- FENCE
- PROPOSED FENCE
- WETLAND LIMITS
- WETLAND FLAG
- T1A WETLAND TRANSECT SAMPLING LOCATION

figure 2

WETLAND DELINEATION MAPPING
BAIRD SUBSTATION
1770 STRATFORD AVENUE
Stratford, Connecticut

83167-61(CROS012)GN-WA002 JUL 23/2015



SOURCE: PANEL 0442G, FLOOD INSURANCE RATE MAP, FAIRFIELD COUNTY CONNECTICUT, MAP NUMBER 09001C0442G, JULY 8, 2013.

LEGEND
- PROPERTY BOUNDARY
- FENCE
- PROPOSED FENCE
- SURFACE WATER

figure 3

FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP
BAIRD SUBSTATION
1770 STRATFORD AVENUE
Stratford, Connecticut

N

0 200 400 ft

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

SOURCE: U.S. FISH AND WILDLIFE SERVICE, NATIONAL WETLANDS INVENTORY, BAIRD SUBSTATION, APRIL 17, 2015.

LEGEND

- PROPERTY BOUNDARY
- x FENCE
- X PROPOSED FENCE
- SURFACE WATER

figure 4

NATIONAL WETLANDS INVENTORY MAP
BAIRD SUBSTATION
1770 STRATFORD AVENUE
Stratford, Connecticut

CRA

83167-61(CROS012)GN-WA004 MAY 11/2015

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
260C	Charlton-Urban land complex, 8 to 15 percent slopes	1.8	30.9%
307	Urban land	4.0	69.1%
Totals for Area of Interest		**5.8**	**100.0%**

SOURCES:
IMAGE - USDA-NRCS, WEB SOIL SURVEY URL: http://websoilsurvey.nrcs.usda.gov STATE OF CONNECTICUT, VERSION 13, OCT. 28, 2014. IMAGE PHOTOGRAPHY JUN 27 TO JUL 22, 2014.
PROPERTY LINES AND SITE SURVEY - PRELIMINARY DRAWING, WETLAND AREA AROUND BAIRD SUBSTATION, BLACK & VEATCH, APRIL 02, 2015.
PROPOSED DEVELOPMENT PLAN - SUBSTATION ARRANGEMENT PLAN. FULL REPLACEMENT SITE, BAIRD SUBSTATION, BLACK & VEATCH FEBRUARY 02, 2015.
WETLAND DELINEATION - DAVID LORD, CERTIFIED SOIL SCIENTIST, APRIL 14, 2015.
WETLAND LIMITS SURVEY - COMPLETED BY NAFIS & YOUNG ENGINEERS, INC., APRIL 14, 2015.

figure 5

NATURAL RESOURCES CONSERVATION SERVICE SOILS SURVEY MAP
BAIRD SUBSTATION
1770 STRATFORD AVENUE
Stratford, Connecticut

Appendix A

Wetland Delineation Report

SOIL RESOURCE CONSULTANTS

P.O. Box 752 Meriden, CT 06450

May 18, 2015

SRC Job No. 15-11

Stuart Manley
Conestoga Rovers & Associates, Inc.
45 Farmington Valley Drive
Plainville, CT 06062

Dear Mr. Manley:

Re: **Wetland Delineation - Baird Substation - 1770 Stratford Avenue - Stratford, CT**

At your request, I have completed an onsite investigation of this site. The purpose of my investigation was to determine if the proposed location of the future Baird Substation contained any vernal pools, inland/tidal wetlands and or watercourses. One small wetland area was identified and delineated on April 14, 2015.

The wetland and watercourse boundaries were marked with blue plastic flagging numbered **WF -1** through **WF-8**. As no site plan drawing was available I have sketched the approximate limits of the small wetland area on the attached aerial photograph. I have also attached a photograph of the wetland taken on the day of my investigation.

The wetland soil map to be prepared for this site will be a refinement of data found in the **Soil Survey of Fairfield County**. Each map unit is composed of a unique combination of soils. Areas with the same symbol have a similar soil composition.

The map units described below are based on data collected at this particular site. Soil surveys in Connecticut were originally conducted for primarily agricultural purposes and do not provide site specific information. The minimum area delineated on a soil survey map sheet is approximately 2-3 acres in size. For this reason there may be some differences between the following information and that published in the Soil Survey.

INLAND WETLAND SOILS

The identification of inland wetland areas on this site is based on my field observations of test borings and the guidelines of the **National Cooperative Soil Survey Program**. Test borings were done using a shovel and or hand auger.

In Connecticut inland wetland soil categories include poorly drained soils, very poorly drained soils, alluvial and flood plain soils.

The subject wetland occupies a very small subarea in the west central portion of this site. It is the lowest point on the site. The apparent ground water table is present in the bottom of this subject wetland. No inlet or outlet is associated with this wetland.

No vernal pool habitat conditions or functioning was observed within the small wetland soil area. Only a couple inches of water were observed in the bottom of the wetland. No vernal pool obligate species were present within this wetland. Signs of a rapidly receding water table were also apparent. This area is not a vernal pool.

Aq

The **Aq** map unit consists primarily of disturbed soil materials with poorly drained characteristics generally less than 20 inches down from the existing soil surface. The natural soil profile has been disturbed by previous filling and or grading activities. Classification into natural soil map units is not possible. This map unit is referred to taxonomically as - Aquents.

NON-WETLAND SOILS

The non-wetland soils were not studied or mapped in detail. Some observations were made of these soils during the process of identifying the inland wetland areas. Random soil boring locations were flagged with pink & black stripped plastic ribbon. The following map unit descriptions do not constitute a detailed soil investigation of these upland areas, but may be used as a guide in site planning.

Charlton-Urban Complex

This map unit located in a less than 100 foot band along the railroad tracks is composed primarily of two soils that are so intermingled on the ground that they could not be separated on the site map. Slopes range from 3 to 15 percent. The dominant is named Charlton. Charlton soils are also very deep and well drained. Typically they have fine sandy loam textures to a depth of 60 inches or more.

The other soil is referred to taxonomically as Udorthents. Udorthents are moderately well to well drained disturbed soils composed of filled areas and areas consisting of both cut and fill. Original diagnostic soil horizons are not present. Udorthents have a wide range of characteristics. Textures are predominantly gravelly fine sandy loams.

Ud (307)

The **Ud** map unit consists of moderately well to well drained disturbed soils. It is composed of filled areas and areas consisting of both cut and fill. Soils in this map unit have been extensively disturbed by grading and filling activities associated with the existing developed\altered portions of this site.

Classification into natural soil units is impossible. This map unit is referred to taxonomically as Udorthents. Original diagnostic soil horizons are not present. Soils in this map unit have a wide range of characteristics. Textures are predominantly gravelly fine sandy loams. Permeability can be variable due to the lack of soil profile structure caused by the grading activities.

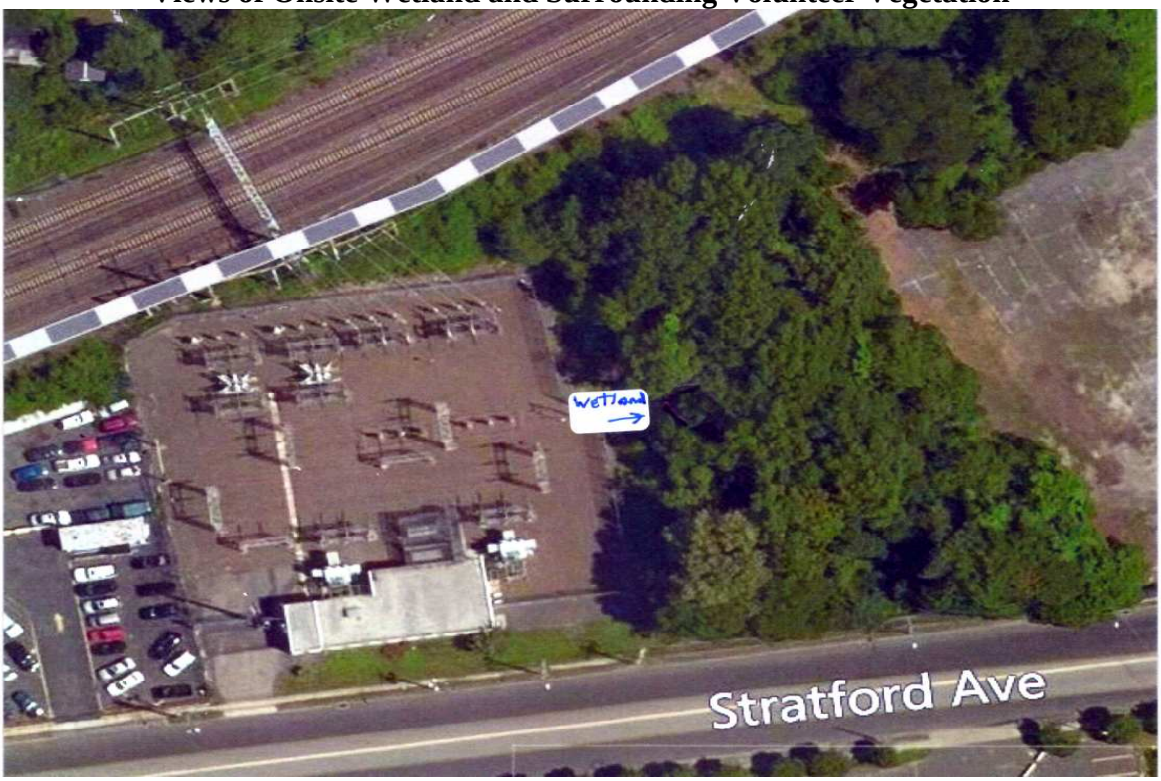
If you have any questions regarding this report, or need additional assistance with this site, please contact me. Environmental planning and wetland impact evaluation services are also available upon request. I am available to attend Inland Wetland Commission meetings and site walks.

Sincerely,

David H. Lord
Certified Soil Scientist
& Environmental Consultant

Baird Substation Project Site

Stafford Avenue
Stratford, CT
Views of Onsite Wetland and Surrounding Volunteer Vegetation



Wetland Delineations Wetland Impact Evaluations Environmental Planning

Appendix B

Wetland Delineation Report - ACOE Methodology

SOIL RESOURCE CONSULTANTS

P.O. Box 752 Meriden, CT 06450

July 14, 2015

SRC Job No. 15-11

Stuart Manley
Conestoga Rovers & Associates, Inc.
45 Farmington Valley Drive
Plainville, CT 06062

Dear Mr. Manley:

Re: **Federal Jurisdictional Wetland Delineation - Baird Substation**
- 1770 Stratford Avenue - Stratford, CT

At your request, I have completed an onsite investigation of this site. The purpose of my investigation was to identify and delineate the onsite federal jurisdictional boundaries. The field work was completed on July 8, 2015.

The subject site consists of all undeveloped portions of 1770 Stratford Avenue. The study area is wooded with a mixture of volunteer deciduous and evergreen species. Numerous invasive species including Multiflora Rose and Oriental Bittersweet. Poison Ivy is dominant as ground cover and as thick vines and many of the trees and shrubs.

One small wetland area was observed in the central western area of the woods. This shallow depressional pocket is a remnant of past earth moving and re-grading activities. Soils are very disturbed with very little or no original soil profile horizons present. Upland soils are classifiable at the taxonomic level as Udothents - Upland non-wetlands. The soils within the identified wetland are classified as Aquents - disturbed soils with persistent water table conditions at less than 6 inches below existing grades.

The wetland boundaries were established using procedures outlined in the ***Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, January 1987***. 2 sample points along one transect were established to conduct the delineation. Please refer to the enclosed sketch for the approximate location of the federal wetland boundaries. The sketch is not drawn to scale but is a field drawn representation of wetland configurations. Sample point numbers and other landmarks can be used to locate the points in the field.

The attached Wetland Delineation Dataform sheets were completed during the site investigation. These Dataform sheets are the basis for the placement of the wetland boundary line.

I have attached several photos of the site focusing on the wetland characteristics and conditions.

If you have any questions regarding this report, or need additional assistance with this site, please contact me.

Sincerely,

David H. Lord
Certified Soil Scientist
& Environmental Consultant

Baird Substation Project Site

Photo #1 - Westerly View of Subject Wetland

Photo #2 - Existing Character of Vegetation at Sample Points T1A & T1B

Photo #3 - Oxydized Rhizospheres in Topsoil Layer At Sample Point T1B

Photo #4 - Overall View of Wetland with Existing Substation in Background

Town of Stratford			
Parcel: 17247 Acres: 1.73			
Name:	UNITED ILLUMINATING CO	Land Value:	674700
Site:	1770 STRATFORD AVE	Improvement Value:	187700
Sale:	$0 on 0000-00-00 Reason= Qual=U	Accessory Value:	0
Mail:	P O BOX 1564 NEW HAVEN, CT 06506-0901	Total Value:	876000

The Town of Stratford makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The assessment information is from the last certified taxroll. All data is subject to change before the next certified taxroll.
Date printed: 07/15/15 · 20.02·17

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Baird Substation City/County: Stratford Sampling Date: 7-8-15

Applicant/Owner: UI State: CT Sampling Point: T1A

Investigator(s): David H. Lord Section, Township, Range:

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 41°11' 10" N Long: 73° 8' 38" W Datum:

Soil Map Unit Name: Udorthent NWI classification: Upl

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x No

Are Vegetation x, Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No	**Is the Sampled Area**		
Hydric Soil Present?	Yes	No x	**within a Wetland?**	**Yes**	**No** x
Wetland Hydrology Present?	Yes	No x	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)
subject wetland is located in a heavily disturbed area lacking natural soil profiles and dominated by volunteer vegetative species including numerous invasives. Site is entirely surrounded by existing developments including parkinbg lots, rail lines, and the existing substation facility.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ### FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No x	Depth (inches):	>24"
Water Table Present?	Yes	No x	Depth (inches):	>24"
Saturation Present? (includes capillary fringe)	Yes	No x	Depth (inches):	>24"

Wetland Hydrology Present? **Yes** **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: T1A

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. QUERCUS PALUSTRIS	50	Y	FACW
2. QUERCUS bicolor	20	N	FACW+
3.			
4.			
5.			
6.			
7.			
	80	=Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. CORNUS AMOMUM	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	

Herb Stratum (Plot size: 5')			
1. TOXICODENDRON RADICANS	80	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	=Total Cover	

Woody Vine Stratum (Plot size:)			
1.			#NAME?
2.			#NAME?
3.			#NAME?
4.			#NAME?
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ### No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5YR 2/1	80	—				FSL	
10-22	7.5YR 4/4	80	—				SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: —

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Baird Substation City/County: Stratford Sampling Date: 7-8-15

Applicant/Owner: UI State: CT Sampling Point: T1B

Investigator(s): David H. Lord Section, Township, Range:

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 41 11' 10" N Long: 73 8' 38" W Datum:

Soil Map Unit Name: Udorthent NWI classification: Upl

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)

Are Vegetation x, Soil x, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes x No

Are Vegetation x, Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No	**Is the Sampled Area**
Hydric Soil Present?	Yes x	No	**within a Wetland?** **Yes** x **No**
Wetland Hydrology Present?	Yes x	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)
subject wetland is located in a heavily disturbed area lacking natural soil profiles and dominated by volunteer vegetative species including numerous invasives. Site is entirely surrounded by existing developments including parkinbg lots, rail lines, and the existing substation facility.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- x Surface Water (A1)
- High Water Table (A2)
- x Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- x Sparsely Vegetated Concave Surface (B8)
- x Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- x Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- x Geomorphic Position (D2)
- Shallow Aquitard (D3)
- x Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes x	No	Depth (inches): 2"
Water Table Present?	Yes x	No	Depth (inches): <6"
Saturation Present? (includes capillary fringe)	Yes x	No	Depth (inches): O

Wetland Hydrology Present? **Yes** x **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Refer to Transect T1A datasheet

VEGETATION – Use scientific names of plants.

Sampling Point: T1B

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			FACW
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	=Total Cover		
Woody Vine Stratum (Plot size:)			
1.			#NAME?
2.			#NAME?
3.			#NAME?
4.			#NAME?
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

US Army Corps of Engineers

Northcentral and Northeast Region – Version 2.0

SOIL Sampling Point: TJB

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR2/1	80					FSL	Oxydized Rhizospheres
8-16	10YR3/2	80	25Y R4/6	40	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: —

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

APPENDIX D. NOISE ASSESSMENT

DRAFT

BAIRD REPLACEMENT SUBSTATION PROJECT NOISE EVALUATION

B&V PROJECT NO. 186535

PREPARED FOR

The United Illuminating Company

28 MAY 2015

BLACK & VEATCH
Building a world of difference.

Table of Contents

Executive Summary **ES-1**
1.0 Introduction **1-1**
2.0 Applicable Noise Regulations **2-1**
2.1 State of ConNeCticut 2-1
2.2 Town of Stratford 2-2
2.3 Noise Regulation Applicability 2-3
3.0 Existing Acoustical Environment **3-1**
3.1 Survey Procedure and Conditions 3-1
3.2 Survey Results 3-2
3.2.1 NML1: Representative of the Nearest Noise Sensitive Properties along Jackson Ave 3-3
3.2.2 NML2: Representative of the Nearest Noise Sensitive Properties along Old Honeyspot Rd 3-4
3.3 Survey Results Summary 3-5
4.0 Project Noise Emissions **4-1**
4.1 Project Noise Modeling 4-1
4.2 Project Equipment Specifications 4-1
4.3 Regulatory Compliance 4-2
Appendix A. Ambient Survey Test Equipment **A-1**
Appendix B. Ambient Survey Meteorological Conditions **B-1**
Appendix C. Acoustical Terminology **C-1**
Appendix D. Site Arrangement Drawing **D-1**

LIST OF TABLES

Table 3-1 Nosie Measurement Locations (NML's) 3-2
Table 3-2 Summary of Survey Results 3-5
Table 4-1 Equipment Sound Levels for the Project 4-1

LIST OF FIGURES

Figure 1-1 Aerial view of the existing substation and Project 1-1
Figure 2-1 Project noise limits per the State of Connecticut 2-2
Figure 2-2 Project noise limits per the Town of Stratford 2-3
Figure 3-1 Noise measurement locations (NML's) 3-2
Figure 3-2 NML1 continuous monitoring results (10 min measurement interval) 3-3
Figure 3-3 NML1 short-term measurement results 3-4
Figure 4-1 Project A-weighted sound pressure levels, normal operation consistent with Summer months. 4-2

Executive Summary

The United Illuminating Company (UI) is proposing to replace the existing Baird Substation located at 1770 Stratford Avenue, Stratford, Connecticut with a new substation (Project) located in the adjacent lot to the northeast. The Project will include the installation of two (2) 30/40/50 MVA transformers and HVAC equipment associated with the ancillary control enclosure and PDC enclosures.

The Project is subject to state and local regulations regarding noise emissions. However, the Town of Stratford regulations are more restrictive than those specified by the State of Connecticut. As such, the noise level standards in Chapter 142 of the Town Code have been used to evaluate regulatory compliance of the Project. To ensure regulatory compliance, the Project must meet the following:

- The sound levels associated with the Project should not exceed 45 dBA along the residential zoning boundaries to the north and south.
- The sound levels associated with the Project should not exceed 62 dBA along the commercial zoning boundaries to the east and west.

In order to characterize the existing acoustical environment surrounding the Project, an ambient sound level survey was conducted. The sound level survey was conducted at two (2) locations selected to represent nearby noise-sensitive receptors (homes & church). Measured ambient sound levels in the vicinity of the Project ranged from 52 dBA to 64 dBA. The quietest periods occurred during the early morning hours (2:00AM, 11 March) when traffic on Interstate 95 had subsided. In general, the existing ambient conditions at the nearest noise-sensitive receptors are influenced by traffic on local roads and Interstate 95, train traffic, existing Baird Substation, VIP car wash dryer fans, and wind blowing in the tress.

An acoustical model was developed to predict the sound levels due solely to the Project. The predicted Project noise emissions do not include noise associated with either site development or construction. The primary noise sources associated with the Project will include the two (2) 30/40/50 MVA transformers. Project sound pressure levels along the adjacent residential zoning boundaries to the north (residential neighborhood) and south (Russian Orthodox Church) are anticipated to be 44 dBA and 41 dBA, respectively. Project sound levels along the adjacent commercial zoning boundaries to the east (Two Roads Brewery) and the west (Savings Auto Center) are anticipated to be 48 dBA and 43 dBA, respectively. As such, the Project is expected comply with the noise regulations specified by the Town of Stratford and State of Connecticut.

1.0 Introduction

The United Illuminating Company (UI) is proposing to replace the existing Baird Substation (existing substation) located at 1770 Stratford Avenue, Stratford, Connecticut with a new Substation (Project) located in the adjacent lot to the northeast. Based on available design information and drawings, the Project will include the installation of two (2) 30/40/50 MVA transformers and HVAC equipment associated with the ancillary control enclosure and PDC enclosures. For reference, an aerial view of the existing substation and the Project are shown in Figure 1-1.

In support of the Project, a noise evaluation has been conducted to address the following questions:

- *What noise regulations are applicable to the Project?*
- *What are the current existing ambient sound levels in the vicinity of the Project?*
- *What are the expected environmental noise emissions associated with the Project?*
- *What (if any) noise mitigation measures are anticipated to be necessary for the Project to support compliance with the applicable noise regulations?*

Figure 1-1 Aerial view of the existing substation and Project

2.0 Applicable Noise Regulations

Regulations, standards, and guidelines related to environmental noise emissions were investigated and reviewed to determine applicability to the Project. No quantifiable noise requirements or guidelines in Fairfield County were identified. However, the following sections summarize the noise regulations established by the State of Connecticut and the Town of Stratford and the applicability of each.

2.1 STATE OF CONNECTICUT

The state regulation governing noise is contained in the Regulations of Connecticut State Agencies (RCSA) Title 22a, Section 22a-69-1 to 22a-69-7.4. The statutes provide limits that are based on the noise zone and time of day. Noise zones are established based on the Standard Land Use Classification Manual of Connecticut.

- Class A noise zone generally includes residential areas where human beings sleep or areas where serenity and tranquility are essential to the intended use of the land such as residential areas (single and multi-family), hotels, hospitals, and religious facilities.
- Class B noise zone generally includes commercial areas where human beings converse and such conversation is essential to the intended use of the land such as retail business, professional services, and recreational activities.
- Class C noise zone generally includes industrial areas where protection against damage to hearing is essential and the necessity for conversation is limited such as manufacturing facilities, utility uses, and agricultural activities.

The Substation site is designated as a Class C noise zone. In accordance with the designations and the noise limits detailed in RCSA Section 22a-69-3.5, noise zone boundaries and corresponding noise limits adjacent to the Substation are shown in Figure 2-1. Compliance with these specified limits is determined by measuring the A-weighted sound pressure level at one (1) foot beyond the emitter's boundary inside the receptor's noise zone. The emitter's zone includes contiguous rights of way for streets, highways, railroads, and waters of the state.

In addition to these limits, there is a 5 dB penalty (reduction in the applicable limit) when a prominent discrete tone is present. Per the statute, a prominent discrete tone is "the presence of acoustic energy concentrated in a narrow frequency range". The determination of the tone is relative to the sound pressure levels in the adjacent frequency bands as specified in RCSA Section 22a-69-1.2 (r). If a discrete tone exists, the daytime and nighttime limits are reduced to 56 dBA and 46 dBA, respectively, for noise from a Class C noise zone to a Class A noise zone.

Although these limits are objective and straightforward, the statute also contains language that can be used to file a complaint. For example, Section 22a-69-1.5 states that "compliance of a source with these Regulations is not a bar to a claim of nuisance by any person. A violation of any portion of these regulations shall not be deemed to create a nuisance per se." This would seem to permit some leeway in determining whether a source is a nuisance or not regardless of whether it meets the objective requirements.

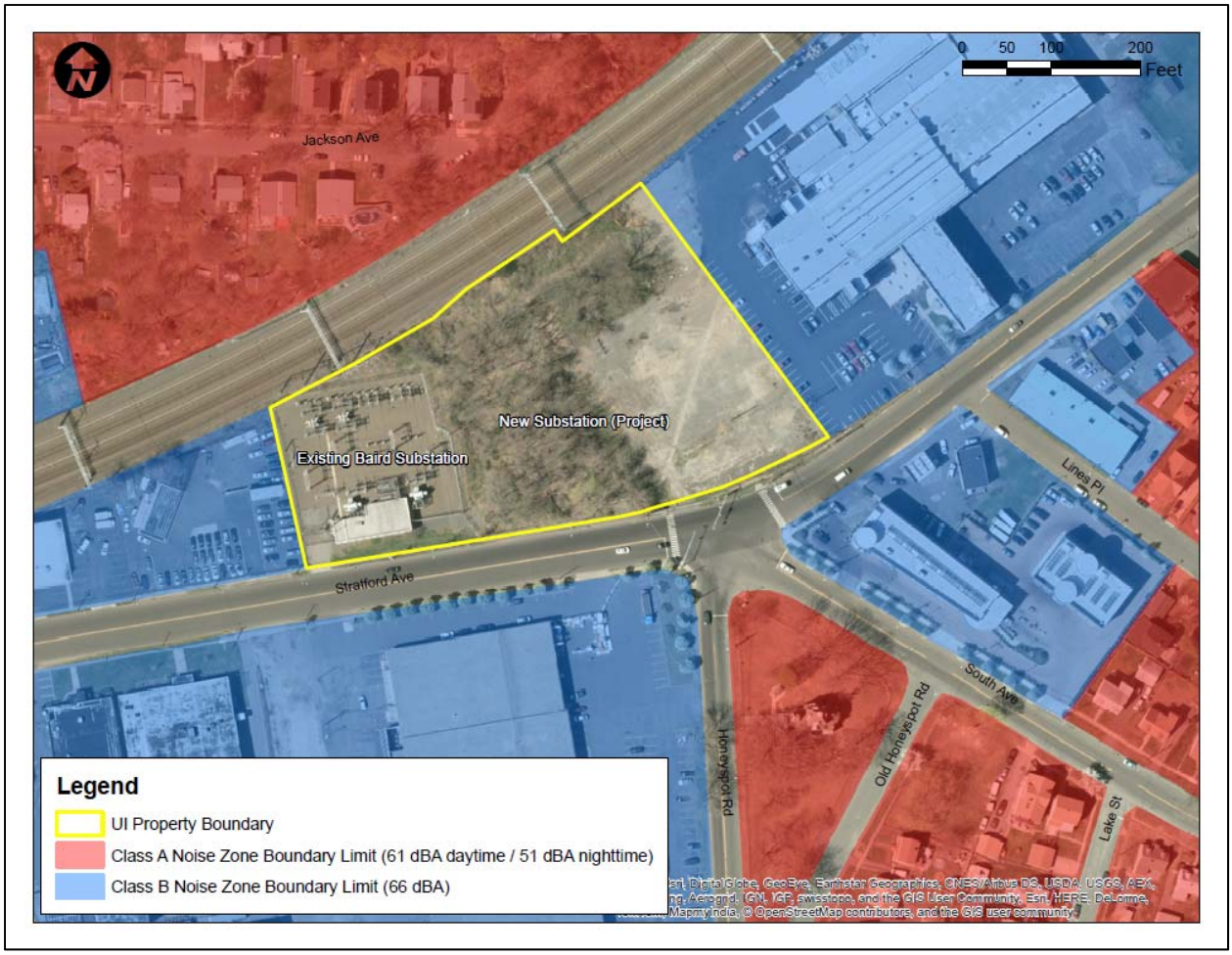


Figure 2-1 Project noise limits per the State of Connecticut

2.2 TOWN OF STRATFORD

The Town of Stratford identifies noise level standards in Chapter 142 of the Town Code. Unlike the State of Connecticut, which establishes limits based on land use, the Town of Stratford noise level standards are specified for the zoning designations of the emitting and receiving land and the time of day. Based upon zoning information provided by UI, the Project site is currently zoned both industrial and commercial. However, due to the lower noise limits associated with the commercial zoning designation, the entire Project property has been conservatively assumed to be a commercial zone. As such, the noise limits and corresponding zone boundaries adjacent to the Project are shown in Figure 2-2.

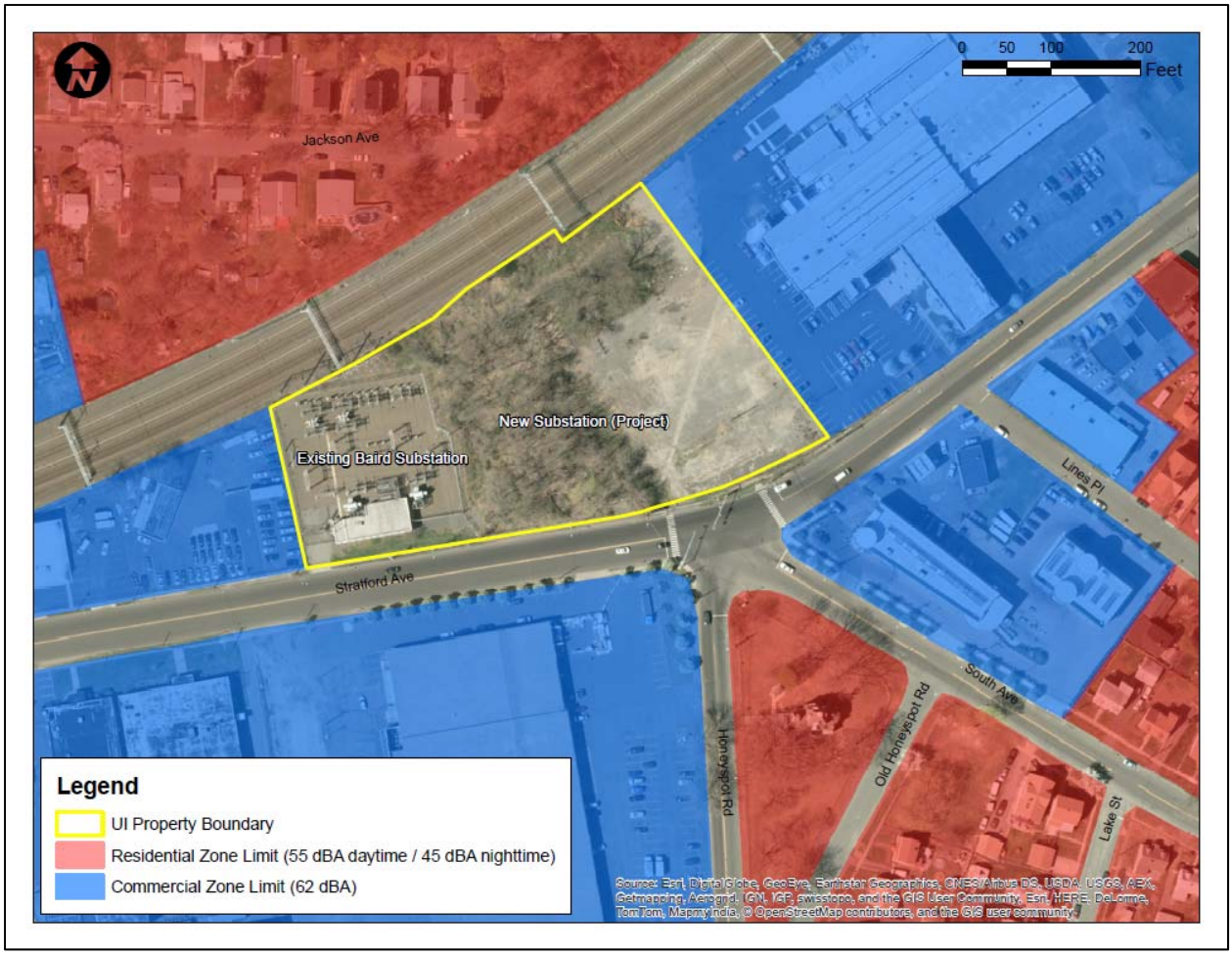


Figure 2-2 Project noise limits per the Town of Stratford

2.3 NOISE REGULATION APPLICABILITY

Since the Project will operate during both daytime and nighttime hours the Project will need to comply with the more restrictive nighttime limits. Based on the regulations reviewed, the nighttime limits specified by the Town of Stratford are more stringent and have been used as the design basis for the Project. Regulatory compliance with the Town of Stratford limits will subsequently result in compliance with the limits specified by the State of Connecticut.

As such, to ensure compliance with the most restrictive noise limits, the Project must meet the following:

- The sound levels associated with the Project should not exceed 45 dBA along the residential zoning boundaries (refer to Figure 2-2).
- The sound levels associated with the Project should not exceed 62 dBA along the commercial zoning boundaries (refer to Figure 2-2).

3.0 Existing Acoustical Environment

An ambient sound level survey was conducted in order to characterize the existing acoustical environment in the area surrounding the Project site prior to the installation and operation of the new Substation. This section describes the results of the survey and the nature of the existing acoustical environment.

3.1 SURVEY PROCEDURE AND CONDITIONS

The ambient sound level survey was conducted March 9 through March 11, 2015. The survey procedure was based on relevant portions of general industry standards including, but not limited to ANSI S1.13, ANSI S12.9, and ANSI S12.18. Sound level measurements were conducted using Type 1 and Type 2 sound level meters that met the requirements of ANSI S1.4. The sound level meters were field calibrated immediately before and after each measurement period. All equipment had been laboratory calibrated within the last 12 months. A list of the measurement equipment utilized during the survey and copies of corresponding calibration certificates are included in Appendix A.

With the exception of a few periods of light precipitation during the evening (March 10) and early morning hours (March 11) of the survey, meteorological conditions were suitable for environmental noise monitoring. Temperatures ranged from approximately 28 to 50°F and skies were generally clear or overcast. Wind speeds ranged from 0 to 4 mph with sporadic gusts up to 14 mph. The temperature, humidity, and wind speed trends during the hours of the ambient sound level survey are detailed in Appendix B.

Additionally, it is important to note that snow cover was present during the survey. However, the snow cover was not considered to be a light, powder but rather a heavy, dense snow pack simulating hard ground and thus was deemed acceptable for environmental sound level measurements.

In order to effectively quantify and qualify the existing daily sound levels surrounding the Project site, the ambient survey included continuous sound level monitoring and short-term (attended) sound level measurements. Noise measurement locations (NML's) were selected to represent nearby noise-sensitive receptors (homes & church). Geographic coordinates and the location of each measurement location are summarized in Table 3-1 and identified on Figure 3-1.

Several sound level metrics were used to quantify the fluctuating environmental noise. These metrics included the L10, L50, and L90 sound levels. The L90 sound level is generally considered representative of the residual or background sound level (i.e., without discrete noise events such as occasional traffic, aircraft, etc.), the L50 sound level is considered the median sound level, and the L10 sound level is generally considered the intrusive sound level (i.e., with the occasional discrete events such as traffic, aircraft, etc.). For a more detailed discussion regarding the acoustical terminology referenced within this report please refer to Appendix C.

Table 3-1 Nosie Measurement Locations (NML's)

LOCATION	UTM COORDINATES ZONE 18 (m E/m N)	LOCATION DESCRIPTION	TYPE OF MONITORING
NML1	655652 / 4561075	End of Jackson Avenue, residential neighborhood, north of the Project site.	Continuous and Short-term
NML2	655792 / 4560871	South of the Project site, along Old Honeyspot Rd, St. Nichols Russian Orthodox Church parking lot.	Short-term

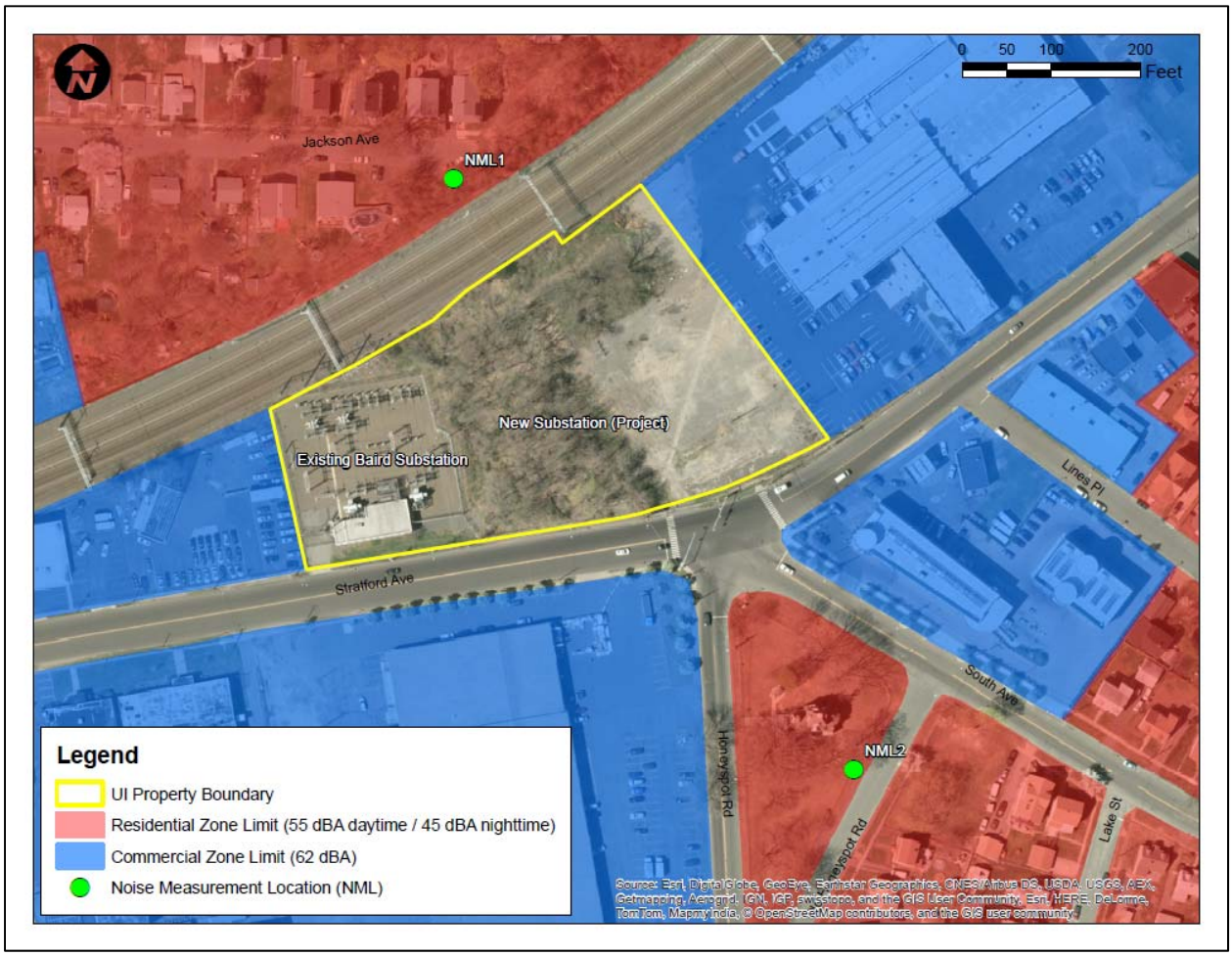


Figure 3-1 Noise measurement locations (NML's)

3.2 SURVEY RESULTS

The ambient sound level survey included continuous sound level monitors and short-term (attended) sound level measurements. Continuous sound level monitoring collected sound level data at NML1 throughout the survey period. Short-term, 10 to 20-minute, measurements were conducted periodically at both NML's in order to qualify the existing overall conditions and quantify the existing spectral conditions during various daytime and nighttime hours. The subsequent sections detail the survey results at each measurement location.

3.2.1 NML1: Representative of the Nearest Noise Sensitive Properties along Jackson Ave

Sound level measurements were conducted at NML1 to capture the acoustical environment experienced by the noise-sensitive receptors (homes) north of the Project along Jackson Avenue. The 45-hour monitoring results are detailed in Figure 3-2 and provide an indication of the daily sound level trends. The background sound levels (L_{90}) ranged from 52 dBA to 63 dBA during the daytime hours (8:00AM to 9:00PM) and 52 dBA to 64 dBA during the nighttime hours (9:00PM to 8:00AM). The quietest periods occurred during the early morning hours (2:00AM, 11 March) when traffic on Interstate 95 had subsided.

It is important to note that the L_{90} sound levels represent the background conditions without the influence of discrete events such as dogs barking, aircraft flyovers, etc. The L_{10} sound levels, shown in Figure 3-3, are generally representative of the higher sound levels that occurred during noisy discrete events.

Short-term sound level measurements were also conducted at NML1 during both daytime and nighttime hours and are shown in Figure 3-3. The short-term measurements are consistent with the continuous monitoring results. Influential noise sources observed during the short-term measurements included traffic on Interstate 95 and Stratford Avenue, Metro train traffic, VIP car wash dryer fans, existing Baird Substation transformer hum, and neighbors talking.

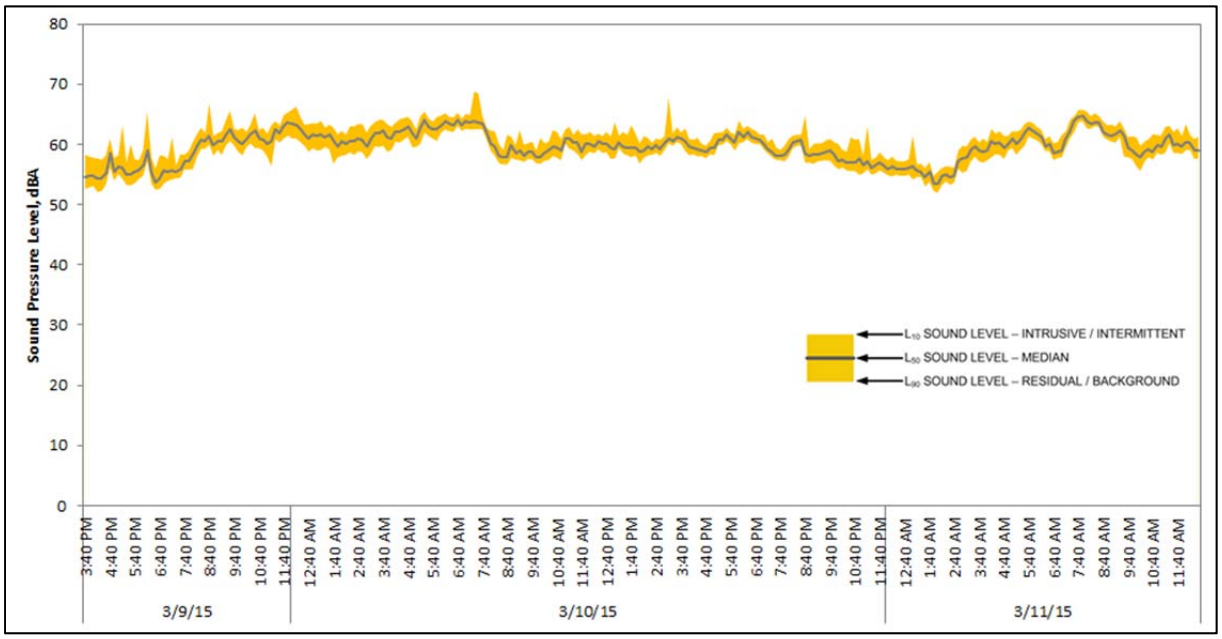


Figure 3-2 NML1 continuous monitoring results (10 min measurement interval)

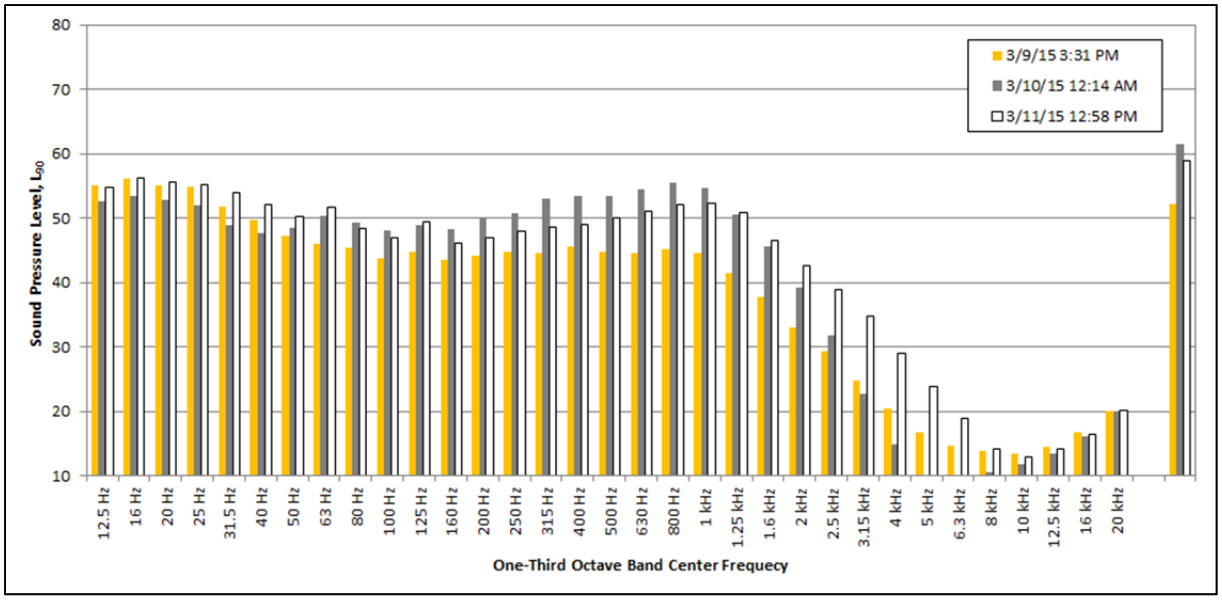


Figure 3-3 NML1 short-term measurement results

3.2.2 NML2: Representative of the Nearest Noise Sensitive Properties along Old Honeyspot Rd

Short-term sound level measurements were conducted at NML2 during both daytime and nighttime hours to capture the acoustical environment experienced by the noise-sensitive receptors (church & homes) south of the Project along Old Honeyspot Road. The details of the measurement location are shown in Figure 3-4. Influential noise sources observed during the short-term measurements included local traffic on Stratford Rd, South Ave, and Interstate 95, Metro and distant train traffic, VIP car wash dryer fans, and wind blowing through the trees.

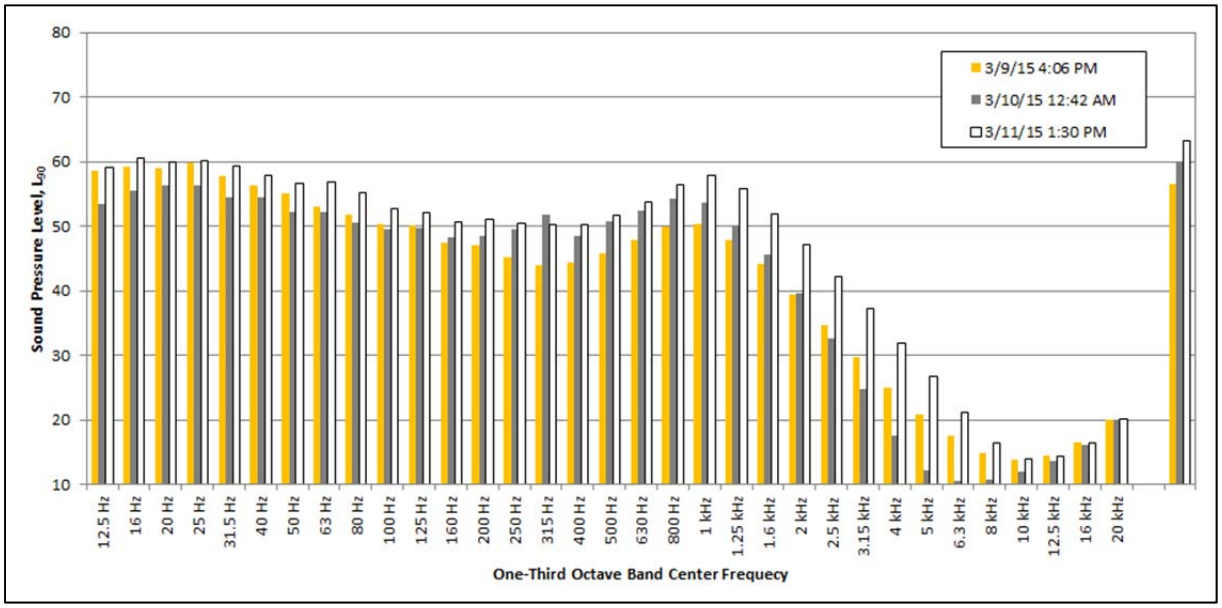


Figure 3-4 NML2 short-term measurement results (L_{90})

3.3 SURVEY RESULTS SUMMARY

As summarized in Table 3-2, the existing ambient sound levels in the vicinity of the Project site ranged from 52 dBA to 64 dBA at the two survey locations. The quietest periods occurred during the early morning hours (2:00AM, 11 March) when traffic on Interstate 95 had subsided. In general, the existing ambient conditions at the nearest noise-sensitive receptors are influenced by traffic on local roads and Interstate 95, train traffic, existing Baird Substation, VIP car wash dryer fans, and wind blowing in the tress.

Table 3-2 Summary of Survey Results

LOCATION	RANGE OF DAYTIME BACKGROUND SOUND LEVELS (10 min L_{90}), dBA	RANGE OF NIGHTTIME BACKGROUND SOUND LEVELS (10 min L_{90}), dBA	OBSERVED NOISE SOURCES
NML1	52 – 63	52 –64	Interstate 95 and Stratford Avenue traffic, train traffic, VIP car wash, existing Baird Substation, and neighbors talking
NML2	57 (4:06 PM, 9 March)[1] 63 (1:30 PM, 11 March)	60 (12:42 AM, 10 March)[1]	Stratford Rd, South Ave, and Interstate 95 traffic, train traffic, VIP car wash, and wind in the trees

Notes:
1. **20 minute measurement period**

4.0 Project Noise Emissions

The environmental noise emissions from the Project have been predicted in order to evaluate compliance with the applicable noise regulations. This section discusses noise emissions solely from the Project and is based on the equipment layout drawing provided by the project design team which is included in Appendix D.

4.1 PROJECT NOISE MODELING

The environmental noise emissions associated with the Substation have been modeled using noise prediction software (Cadna/A version 4.5.151), which is based on methodologies specified in ISO 9613. The model simulated the outdoor propagation of sound from each noise source and accounted for sound wave divergence, atmospheric and ground sound absorption, and sound shielding due to interceding barriers, buildings, and terrain. A database was developed which specified the location, and octave-band sound levels of each noise source. A receptor grid was specified which covered the entire area of interest. The model calculated the sound pressure levels within the receptor grid based on the octave-band sound level contribution of each noise source. Finally, a noise contour plot was produced based on the overall sound pressure levels within the receptor grid, including at specific receptor locations.

To account for increased transformer sound levels associated with peak Project loading conditions modeling was based on normal operation consistent with Summer months which includes noise contributions from the transformer cooling fans. The noise model did not consider any abnormal or upset operating conditions. Various structures associated with the Project were included in the model to account for their shielding effect.

4.2 PROJECT EQUIPMENT SPECIFICATIONS

The primary noise sources associated with the Project will be the two (2) 30/40/50 MVA transformers and the HVAC equipment associated with the ancillary control enclosure and PDC enclosures. Equipment sound levels used to develop the acoustical model are shown in Table 4-1 and are based on a combination of measured data of similar substation installations and information received from past equipment suppliers.

Please note that any deviations from the current site arrangement, the assumed equipment specifications, or the acoustical design elements outlined herein, may affect the overall Project noise emissions and thus the modeling results presented below. If such design or specification changes occur, the noise emissions should be re-evaluated to determine the impacts of the proposed design change.

Table 4-1 Equipment Sound Levels for the Project

EQUIPMENT	QTY	EQUIPMENT SOUND LEVELS	BASIS
30/40/50 MVA transformer	2	75 dBA per IEEE C57.12.90 9 (FOA, fans operation)	In-house[1]
5 Ton HVAC Unit (Control Bldg.)	2	75 dBA @ 3 ft (1)	In-house[1]
6 Ton HVAC Unit (PDC's)	2	75 dBA @ 3 ft (1)	In-house[1]

Notes:

1. **In-house data is based on a combination of measured data of similar substation installations and information received from past equipment suppliers.**

4.3 REGULATORY COMPLIANCE

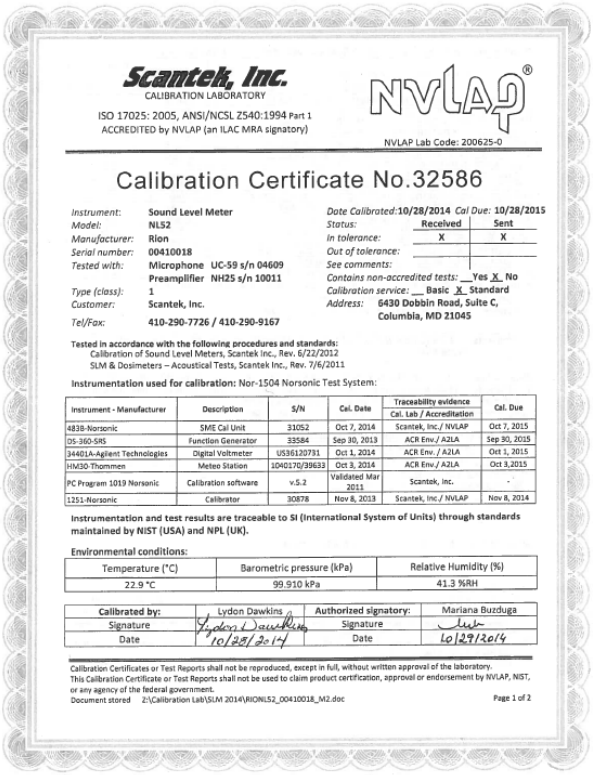
The calculated sound pressure levels associated with the Project are presented in Figure 4-1. It is important to note that the calculated noise emissions only include noise from the Project and are exclusive of any other sound sources, including background noise. Project sound pressure levels along the adjacent residential zoning boundaries to the north (residential neighborhood) and south (Russian Orthodox Church) are anticipated to be 44 dBA and 41 dBA, respectively. Project sound levels along the adjacent commercial zoning boundaries to the east (Two Roads Brewery) and the west (Savings Auto Center) are anticipated to be 548 dBA and 43 dBA, respectively. As such, the Project is expected comply with the noise regulations specified by the Town of Stratford and State of Connecticut.

Figure 4-1 **Project A-weighted sound pressure levels, normal operation consistent with Summer months.**

Appendix A. Ambient Survey Test Equipment

Table A-1 Ambient Survey Test Equipment

MODEL	SERIAL NUMBER	LAST CALIBRATION DATE
Rion Model NL-52	00410018	28 October 2014
Rion Model NL-22 (#1)	01110135	15 July 2014
CEL 177 Acoustic Calibrator	558038	15 July 2014



Scantek, Inc.
CALIBRATION LABORATORY
ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)
NVLAP Lab Code: 200625-0

Calibration Certificate No.32586

Instrument: Sound Level Meter
Model: NL52
Manufacturer: Rion
Serial number: 00410018
Tested with: Microphone UC-59 s/n 04609
Preamplifier NH25 s/n 10011
Type (class): 1
Customer: Scantek, Inc.
Tel/Fax: 410-290-7726 / 410-290-9167

Date Calibrated: 10/28/2014 Cal Due: 10/28/2015
Status: Received X Sent X
In tolerance:
Out of tolerance:
See comments:
Contains non-accredited tests: __Yes X No
Calibration service: __ Basic X Standard
Address: 6430 Dobbin Road, Suite C, Columbia, MD 21045

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	31052	Oct 7, 2014	Scantek, Inc./ NVLAP	Oct 7, 2015
DS-360-SRS	Function Generator	33584	Sep 30, 2013	ACR Env./ A2LA	Sep 30, 2015
34401A-Agilent Technologies	Digital Voltmeter	US36120731	Oct 1, 2014	ACR Env. / A2LA	Oct 1, 2015
HM30-Thommen	Meteo Station	1040170/39633	Oct 3, 2014	ACR Env./ A2LA	Oct 3,2015
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014

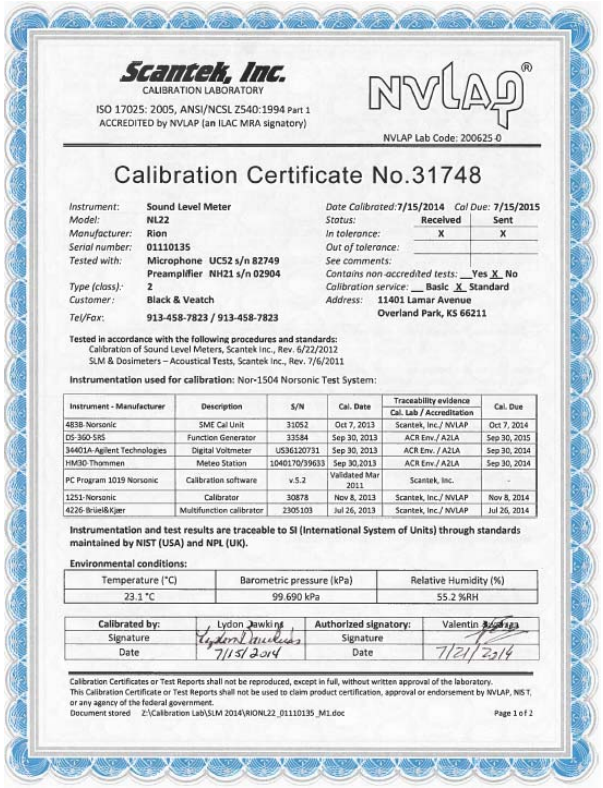
Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
22.9 °C	99.910 kPa	41.3 %RH

Calibrated by:	Lydon Dawkins	Authorized signatory:	Mariana Buzduga
Signature	Lydon Dawkins	Signature	
Date	10/28/2014	Date	10/29/2014

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.
Document stored Z:\Calibration Lab\SLM 2014\RIONL52_00410018_M2.doc
Page 1 of 2



Scantek, Inc.
CALIBRATION LABORATORY
ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)
NVLAP Lab Code: 200625-0

Calibration Certificate No.31748

Instrument: Sound Level Meter
Model: NL22
Manufacturer: Rion
Serial number: 01110135
Tested with: Microphone UC52 s/n 82749
Preamplifier NH21 s/n 02904
Type (class): 2
Customer: Black & Veatch
Tel/Fax: 913-458-7823 / 913-458-7823

Date Calibrated: 7/15/2014 Cal Due: 7/15/2015
Status: Received X Sent X
In tolerance:
Out of tolerance:
See comments:
Contains non-accredited tests: __Yes X No
Calibration service: __ Basic X Standard
Address: 11401 Lamar Avenue Overland Park, KS 66211

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	31052	Oct 7, 2013	Scantek, Inc./ NVLAP	Oct 7, 2014
DS-360-SRS	Function Generator	33584	Sep 30, 2013	ACR Env./ A2LA	Sep 30, 2015
34401A-Agilent Technologies	Digital Voltmeter	US36120731	Sep 30, 2013	ACR Env. / A2LA	Sep 30, 2014
HM30-Thommen	Meteo Station	1040170/39633	Sep 30,2013	ACR Env./ A2LA	Sep 30, 2014
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014
4226-Brüel&Kjær	Multifunction calibrator	2305103	Jul 26, 2013	Scantek, Inc./ NVLAP	Jul 26, 2014

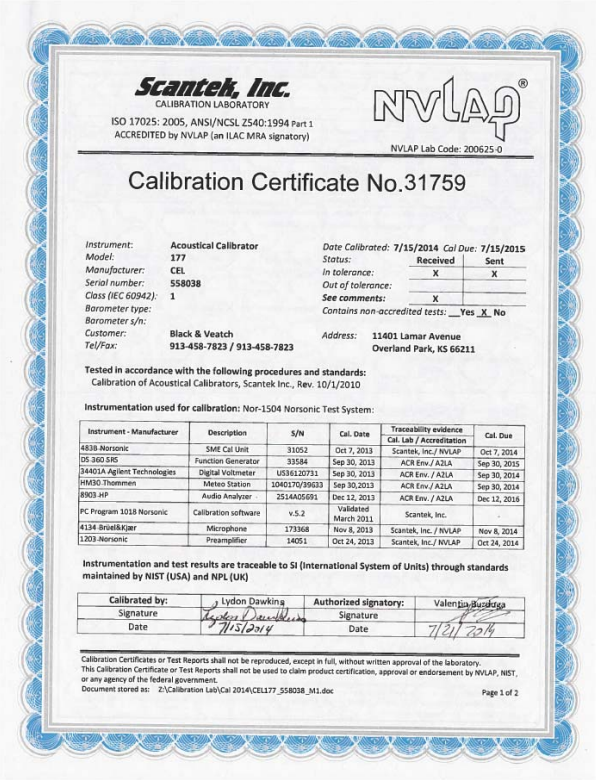
Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
23.1 °C	99.690 kPa	55.2 %RH

Calibrated by:	Lydon Dawkins	Authorized signatory:	Valentin Buzduga
Signature	Lydon Dawkins	Signature	
Date	7/15/2014	Date	7/21/2014

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.
Document stored Z:\Calibration Lab\SLM 2014\RIONL22_01110135_M1.doc
Page 1 of 2



Scantek, Inc.
CALIBRATION LABORATORY
ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.31759

Instrument:	**Acoustical Calibrator**	*Date Calibrated:*	**7/15/2014** *Cal Due:* **7/15/2015**
Model:	**177**	*Status:*	**Received** / **Sent**
Manufacturer:	**CEL**	*In tolerance:*	X / X
Serial number:	**558038**	*Out of tolerance:*	
Class (IEC 60942):	**1**	***See comments:***	X
Barometer type:		*Contains non-accredited tests:*	**__Yes _X_ No**
Barometer s/n:			
Customer:	**Black & Veatch**	*Address:*	**11401 Lamar Avenue**
Tel/Fax:	**913-458-7823 / 913-458-7823**		**Overland Park, KS 66211**

Tested in accordance with the following procedures and standards:
Calibration of Acoustical Calibrators, Scantek Inc., Rev. 10/1/2010

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

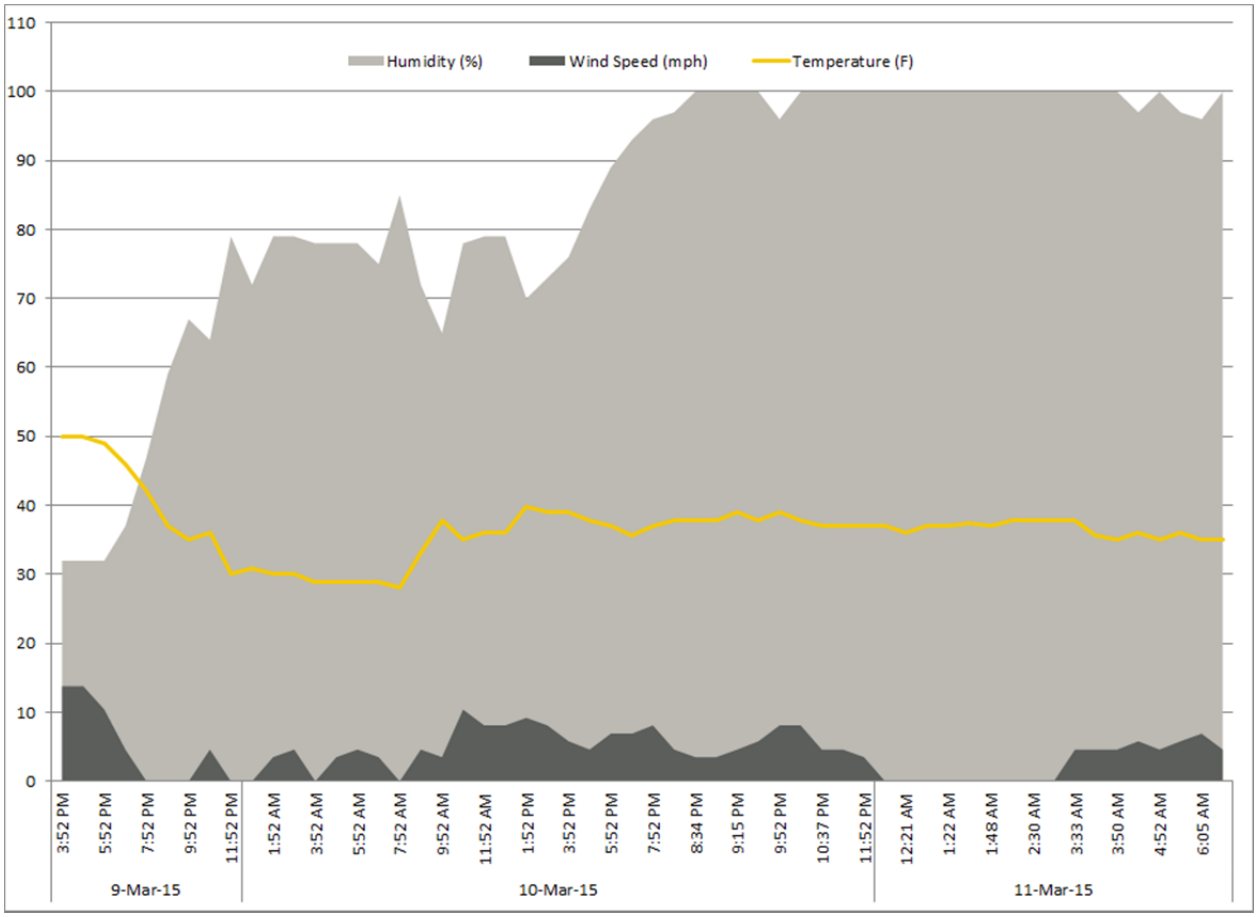
Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
4838-Norsonic	SME Cal Unit	31052	Oct 7, 2013	Scantek, Inc./ NVLAP	Oct 7, 2014
DS 360 SRS	Function Generator	33584	Sep 30, 2013	ACR Env. / A2LA	Sep 30, 2015
34401A Agilent Technologies	Digital Voltmeter	US36120731	Sep 30, 2013	ACR Env. / A2LA	Sep 30, 2014
HM30.Thommen	Meteo Station	1040170/39033	Sep 30,2013	ACR Env. / A2LA	Sep 30, 2014
8903.HP	Audio Analyzer	2514A05691	Dec 12, 2013	ACR Env. / A2LA	Dec 12, 2016
PC Program 1018 Norsonic	Calibration software	v.5.2	Validated March 2011	Scantek, Inc.	
4134 Brüel&Kjær	Microphone	173368	Nov 8, 2013	Scantek, Inc. / NVLAP	Nov 8, 2014
1203 Norsonic	Preamplifier	14051	Oct 24, 2013	Scantek, Inc./ NVLAP	Oct 24, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK)

Calibrated by:	Lydon Dawkins	**Authorized signatory:**	Valentin Buseikin
Signature	Lydon Dawkins	Signature	
Date	7/15/2014	Date	7/21/2014

Document stored as: Z:\Calibration Lab\Cal 2014\CEL177_558038_M1.doc
Page 1 of 2

Appendix B. Ambient Survey Meteorological Conditions



Appendix C. Acoustical Terminology

SOUND ENERGY

Sound is generated by the propagation of energy in the form of pressure waves. Being a wave phenomenon, sound is characterized by amplitude (sound level) and frequency (pitch). Sound amplitude is measured in decibels, dB. The decibel is the logarithmic ratio of a sound pressure to a reference sound pressure. Typically, 0 dB corresponds to the threshold of human hearing. A 3 dB change in a continuous broadband noise is generally considered "just barely perceptible" to the average listener. A 5 dB change is generally considered "clearly noticeable" and a 10 dB change is generally considered a doubling (or halving) of the apparent loudness (Bies and C.H. Hansen, Engineering Noise Control, 2009). For reference, the sound pressure levels and subjective loudness associated with common noise sources are shown in Table C-1.

Frequency is measured in hertz, Hz (cycles per second). Most sound sources (except those with pure tones) contain sound energy over a wide range of frequencies. In order to analyze sound energy over the range of frequencies, the sound energy is typically divided into sections called octave bands. Octave bands are identified by their center frequencies including 31.5, 63, 125, 250, 500 1000, 2000, 4000, and 8000 Hz. For more detailed analyses, narrow bands such as ⅓-octave bands or 1/12-octave bands are employed. The sum of the sound energy in all of the octave bands for a source represents the overall sound level of the source.

The normal human ear can hear frequencies ranging from 20 Hz to 20,000 Hz. At typical sound pressure levels, the human ear is more sensitive to sounds in the middle and high frequencies (1,000 to 8,000 Hz) than sounds in the low frequencies. Various weighting networks have been developed to simulate the frequency response of the human ear. The A-weighting network was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting network emphasizes sounds in the middle to high frequencies and de-emphasizes sounds in the low frequencies. Most sound level instruments can apply these weighting networks automatically. Any sound level to which the A-weighting network has been applied is expressed in A-weighted decibels, dBA. To characterize sound that contains relatively more low frequency energy—and to approximate the ear's response to relatively high sound levels—the C-weighting network was developed. C-weighting places more equal emphasis on low and high frequencies relative to A-weighting. Any sound level to which the C-weighting network has been applied is expressed in C-weighted decibels, dBC.

SOUND LEVEL METRICS

Noise in the environment is constantly fluctuating, such as when a car drives by, a dog barks, or a plane passes overhead. Therefore, noise metrics have been developed to quantify fluctuating environmental noise levels. These metrics include the equivalent-continuous sound level and the exceedance sound levels.

The equivalent-continuous sound level, L_{eq}, is used to represent the equivalent sound pressure level over a specified time period. The L_{eq} metric is the sound level of a steady-state sound that has the same (equivalent) total energy as the time-varying sound of interest, taken over a specified time period and covering a specified set of conditions. Thus, L_{eq} is a single-value level that expresses the time-averaged total energy of a widely varying or fluctuating sound level.

The exceedance sound level, Lx, is the sound level exceeded "x" percent of the sampling period and is referred to as a statistical sound level. The most common Lx values are L_{90}, L_{50}, and L_{10}. L_{90} is the

sound level exceeded 90 percent of the sampling period. The L_{90} sound level represents the sound level without the influence of loud, transient noise sources and is therefore often referred to as the residual or background sound level (ANSI S12.9, Quantities and Procedures for Description and Measurement of Environmental Sound, 2003). The L_{50} sound level is the sound level exceeded 50 percent of the sampling period or the median sound level. The L_{10} sound level is the sound level exceeded 10 percent of the sampling period. The L_{10} sound level represents the occasional louder noises and is often referred to as the intrusive sound level. As previously discussed, the L_{90} environmental sound level typically represents the background (residual) sound level.

The variation between the L_{90}, L_{50}, and L_{10} sound levels can provide an indication of the variability of the acoustical environment. If the acoustical environment is perfectly steady, all values are identical. A large variation between the values indicates the environment experiences highly fluctuating sound levels. For instance, measurements near a roadway with frequent passing vehicles may cause a large variation in the statistical sound levels.

TYPICAL COMMUNITY SOUND LEVELS

Typical background (residual) sound levels in various types of communities are outlined in Table C-2 for reference. However, it is important to remember that each community is unique with regard to the sources of noise that contribute to the background sound levels.

HUMAN RESPONSE TO SOUND

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. The percentage of people claiming to be annoyed by noise will generally increase as environmental sound levels increase. However, many other factors will also influence people's response to noise. These factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the noise and those associated with it, and the predictability of the noise can also influence people's response. Response to noise varies widely from one person to another and with any particular noise, individual responses will range from "highly annoyed" to "not annoyed".

Table C-1 Typical Sound Pressure Levels Associated with Common Noise Sources

SOUND PRESSURE LEVEL, dBA	SUBJECTIVE EVALUATION	COMMON OUTDOOR ENVIRONMENT OR SOURCE	COMMON INDOOR ENVIRONMENT OR SOURCE
140	Deafening	Jet aircraft at 75 ft	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	
120	Threshold of feeling	Elevated Train	Hard rock band
110	Extremely loud	Jet flyover at 1000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft	
90	Very loud	Propeller plane flyover at 1000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner, electric typewriter
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet		Private office
40	Quiet	Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without TV and stereo)
20	Just audible		Human breathing
10	Threshold of hearing		
0			

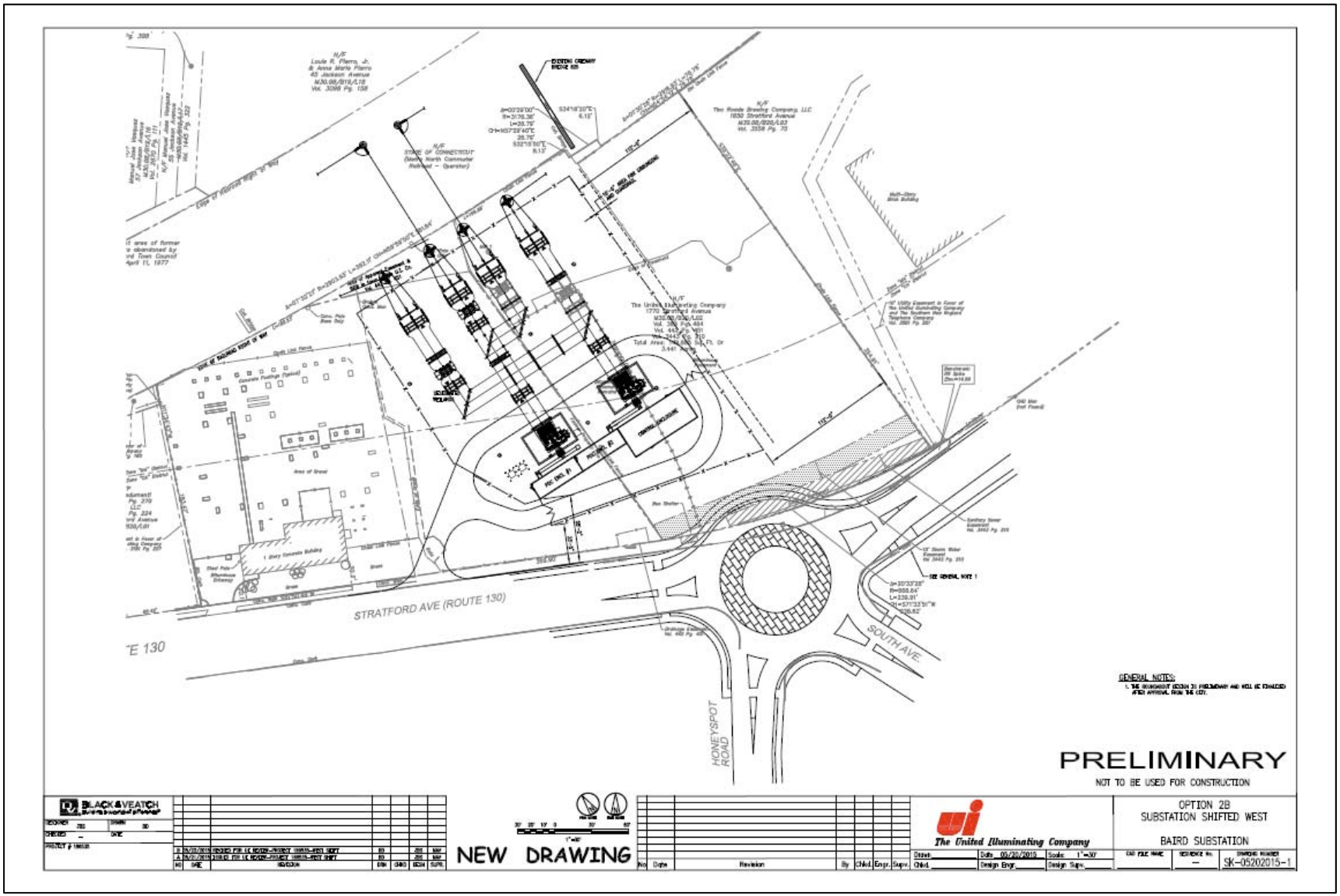
Source: Adapted by Black & Veatch from *Architectural Acoustics*, by David M. Egan (1988) and *Architectural Graphic Standards*, by Ramsey and Sleeper (1994.

Table C-2 Typical Daytime Background Sound Levels in Various Types of Communities

TYPE OF COMMUNITY	TYPICAL DAYTIME BACKGROUND SOUND PRESSURE LEVEL, dBA
Very Quiet Rural Areas	31 to 35
Quiet Suburban Residential	36 to 40
Normal Suburban Residential	41 to 45
Urban Residential	46 to 50
Noisy Urban Residential	51 to 55
Very Noisy Urban Residential	56 to 60
Adjacent Freeway or Major Airport	n/a

Source: Adapted by Black & Veatch from *Community Noise*, by the U.S. Environmental Protection Agency, (December 1971).

Appendix D. Site Arrangement Drawing



APPENDIX E. BAIRD SUBSTATION SITE SELECTION STUDY

The United Illuminating Company

Baird Substation Site Selection Study

Town of Stratford, Connecticut

July 2015

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

1. INTRODUCTION 3
   1.1 SUMMARY OF PROJECT NEED 3
   1.2 OBJECTIVES OF THE SUBSTATION SITE SELECTION STUDY.....5

2. SUBSTATION SITE IDENTIFICATION AND SELECTION CRITERIA 6
   2.1 STANDARDS AND GUIDELINES 6
   2.2 DISTRIBUTION SYSTEM CONSIDERATIONS IN THE STRATFPRD AREA.....7

3. GEOGRAPHICAL SITING REGION AND INITIAL SITE IDENTIFICATION 9
   3.1 GEOGRAPHIC SITING AREA BOUNDARIES 9
   3.2 IDENTIFICATION AND SCREENING OF POTENTIAL SITES.....9

4. DETAILED EVALUATION OF ALTERNATIVE SUBSTATION SITES 12
   4.1 DETAILED SITE EVALUATION CRITERIA.....12
   4.2 BRUCE STREET SITE: ELIMINATED FROM CONSIDERATION.....13
   4.3 WEST BROAD STREET SUBSTATION: SITE ALTERNATIVE.....14
   4.4 PREFERRED SITE: BAIRD ANNEX.....18

5. CONCLUSIONS.....22

LIST OF TABLES

1 West Broad Street Evaluation Summary.....17
2 Baird Annex Site Evaluation Summary 21

LIST OF FIGURES

1 Location of Proposed and Alternative Sites 2
2 Location of Three Alternative Sites 11
3 Bruce Street.....14
4 West Broad Street.....16
5 Baird Annex 20

APPENDICES

A UI *Transmission and Distribution Guideline for Substation Site Selection (TDG 002)* 2013

B Review of Substation Sites and Site Screening
(MAP POCKET: General Locations of Sites Screened)

.

EXECUTIVE SUMMARY

In order to address several compliance and aging infrastructure needs at the existing Baird substation, The United Illuminating Company (UI) proposes to construct and operate a new distribution substation adjacent to the existing in the Town of Stratford (Town), Connecticut. The planned substation will provide both a new interconnection to the existing 115-kilovolt (kV) electric transmission grid and a new location at which the high voltage power from the transmission system will be "stepped down" (i.e., the voltage will be decreased and current increased) for distribution to residential, commercial, and industrial customers currently served by the existing substation.

The proposed substation will replace the existing Baird substation. After the new substation is placed in service and all circuits are cutover to the new substation, the existing Baird substation will be removed from service. This will address the transmission capacity, distribution voltage regulation, and aging infrastructure needs of the existing Baird substation.

To select feasible alternative sites for the development of the new substation, and from among these to choose a proposed site, UI used an iterative process whereby potential locations were first identified and screened in accordance with UI's standard objectives for substation siting. These standard criteria, which are detailed in UI's *Transmission and Distribution Guideline for Substation Site Selection* (2007), include the following guiding principles:

- Minimize the need to acquire residences and viable commercial/industrial uses to accommodate substation development.
- Maintain consistency/compatibility with existing land uses and land use plans to the extent possible.
- Minimize adverse effects on sensitive environmental resources and the social environment.
- Maintain public health and safety.
- Demonstrate cost-effectiveness, while adhering to good engineering and sound environmental planning practices.
- Present the public with a clear and well documented methodology for the identification of the proposed and alternative sites.

Applying these siting criteria and then consulting with Town officials and performing baseline field reconnaissance, UI initially identified 12 potential sites. UI then performed screening analyses of the sites, followed by more detailed evaluations of sites that appeared potentially feasible for the location of the proposed new distribution substation facilities.

Key considerations in the site evaluation process were the locations of the potential sites in relation to the existing substation and to the existing transmission lines that traverse Stratford along the Metro North Railroad Corridor that feed directly adjacent substations to the east and west serving areas of Bridgeport and Stratford. In addition, the length of new transmission and distribution lines that

would have to be developed to effectively interconnect the new substation to the transmission network and to UI's distribution system were considered.

This alternative evaluation process led to the selection of the proposed substation site as well as one primary alternative site[1], as follows:

- **The proposed substation site – Baird Annex.** This preferred site is located on land presently owned by UI that is directly adjacent the existing substation. The site was purchased by UI in 2010 and was formerly used as a parking area for the Baird Corporation. The remaining Baird Corporation property and land including the building, is now owned by the Two Roads Brewing Company.

- **Alternate site – West Broad Street**. The alternate site, which could be developed for the new substation, is the West Broad Street property. This site is a former industrial facility that is a potential brownfield site, located approximately ½ mile away from the Baird substation.

Figure 1 identifies the locations of the proposed and alternative substation sites.

Figure 1
Location of Proposed and Alternative Sites

Source: Google Earth, May 2015

[1] A third potential site, Bruce Street, was suggested by the Town of Stratford and considered in some detail but ultimately eliminated due to the physical constraints of the property.

1. INTRODUCTION

1.1 SUMMARY OF PROJECT NEED

The existing Baird substation was constructed in the 1960's and requires major modifications to meet several compliance and aging infrastructure needs. UI conducted both a Needs Assessment identifying the needs and a Solution Study which identified the preferred solution to address the identified needs. Based on the conclusions of the Solution Study, it was determined that a new substation should be constructed to replace the existing Baird substation.

The existing Baird substation requires major modifications due to five primary needs outlined as follows:

1. Inadequate transmission bus capacity
2. Lack of structural integrity of the transmission bus and support structures
3. Inability to provide adequate distribution voltage regulation
4. Aging and antiquated switchgear
5. Insufficient control enclosure space for planned modifications

The Baird substation is part of UI's 115kV bulk transmission system and by extension, the bulk transmission system of New England. The substation is fed from (4) 115kV transmission circuits that carry electricity through the substation along UI's transmission corridor which follows the Metro North Railroad Corridor. These circuits were identified as requiring significant capacity upgrades in the Southwest Connecticut Needs Assessment due to projected load growth, generation and system topology changes. In addition, this assessment identified that the Baird transmission bus would be substantially overloaded under contingency conditions. These overloads range in severity from 144.2% to 158.4% under worst case contingency conditions. These necessary modifications to alleviate overloaded elements of the Baird substation require a substantial investment in the transmission bus system.

The transmission bus at Baird substation is also structurally at risk due to the potential for overstressing of the existing strain bus and support structures under extreme weather conditions or due to certain faults on the transmission bus. The overstressed conditions could lead to a structural failure of the bus system which in turn would lead to an extended duration outage for the customers

fed from the substation. This kind of extended duration outage could have significant negative impacts on customer satisfaction and the economic vitality of the region.

Electricity is delivered from the Baird substation to UI's residential, commercial and industrial customers through a series of 13.8kV distribution circuits. The Baird substation utilizes (2) 115kV/13.8kV transformers to transform (step down) the electric power carried by the railroad corridor transmission circuits. These two transformers fail to maintain adequate distribution voltages to UI's customers under normal and contingency conditions. Under ANSI C84.1-2006 voltage regulations, voltages seen by customers should not fall below .916 per unit or .947 per unit on the distribution circuit. UI's System Integrity Department completed a formal report on the Baird substations ability to adequately regulate voltage on its distribution circuits. The analysis found that voltages in 2011 would be below the ANSI allowable voltage level on all 16 distribution circuits supplied by the substation under line and transformer contingency conditions. These levels also violate the allowable voltage levels defined by the Connecticut Public Utilities Regulatory Agency (PURA) of .95 per unit to 1.03 per unit.

The distribution circuits fed from Baird are controlled by ITE switchgear manufactured over 50 years ago, which is reaching the end of its useful operating life. This equipment will need to be replaced in the near future. This equipment can be kept in service, likely with increased maintenance, custom fabrication of replacement components and harvesting parts from spare switchgear on UI's system, however, aged equipment of this vintage can experience sudden failures resulting in unexpected customer outages, increased maintenance and unscheduled replacement activities. The increased risk of frequent sudden failures contributes to increased reliability risk and maintenance efforts. As a result of this equipment's deteriorating condition and risks to reliability its replacement is required.

The existing Baird control enclosure lacks sufficient space to accommodate any future expansion, upgrades or modifications at the substation. Existing identified protection system upgrades at adjacent substation will require modification of the protection and control systems at Baird Substation. These modifications are not viable within the existing control enclosure. Additionally, the existing cable tray system within the control enclosure is significantly overfilled and any additional protection and control cable work at the station will be exceedingly difficult to implement.

All of the aforementioned needs as well as several additional less critical needs were evaluated and thoroughly documented in the formal Baird Substation Needs Assessment.

Due to the extensive modifications and significant investment required to address the many needs of the Baird substation, UI undertook an extensive Solution Study to evaluate potential alternatives. The results of the Baird Substation Solution Study were that a new substation should be constructed on property owned by UI to the east of the existing Baird substation.

1.2 OBJECTIVES OF THE SUBSTATION SITE SELECTION STUDY

After determining that a new substation would be required to meet compliance and aging infrastructure needs at the Baird substation, UI identified and evaluated alternative substation configurations and sites that would meet distribution system needs and provide a cost-effective solution for interconnecting to the existing transmission and distribution network. The primary objectives of the alternatives evaluation, which was performed in accordance with the requirements of the Connecticut Siting Council's *Application Guide: Electric Substation Facility* (April 2010), were to:

a) Identify and assess potential substation sites that would meet distribution system needs, including distribution substation requirements (size, design), as well as the new or upgraded distribution lines that would be required to interconnect any new substation site to the projected load centers in Stratford.

b) Evaluate potential substation sites based on engineering, constructability, environmental, social, and cost considerations, applying in particular the criteria contained in UI's *Transmission and Distribution Guideline for Substation Site Selection* (TDG 002; March 2013).

c) Select from among the locations identified in (a) and (b), potential sites that could be feasibly developed for a distribution substation to meet the overall demands for electricity in Stratford, taking into consideration UI's site selection guidelines.

This *Site Selection Report* describes the approach that was used to apply the site selection guidelines in order to:

- Identify potential candidate sites for the new substations;
- Conduct screening level analyses to review the sites, based on engineering and environmental factors, to identify locations that would address the distribution requirements; and
- Identify a proposed site for the new substation, as well as an alternate site, that would address the compliance and aging infrastructure concerns of the existing Baird substation.

2. SUBSTATION SITE IDENTIFICATION AND SELECTION CRITERIA

2.1 STANDARDS AND GUIDELINES

To identify and evaluate alternative sites for a new substation, UI followed its *Transmission and Distribution Guideline for Substation Site Selection (Guideline).* This *Guideline* describes the standard procedures and criteria to be used in the substation site selection process. Key factors considered in the site selection process include:

- Distance to the existing Baird substation and to existing electric transmission lines.
- Site size requirements.
- Site terrain.
- Environmental and land use compatibility.
- Substation construction issues.
- Transmission and distribution line construction requirements.
- Accessibility.
- Cost.

To conduct the alternative siting analyses, UI assembled a multi-disciplinary team comprised of personnel with expertise in electrical distribution and transmission system planning, design, and construction; environmental science; and real estate. The team followed a step-by-step process, whereby potential distribution substation locations were first identified and screened in accordance with UI's standard objectives for substation siting. In addition to the factors listed above, the team took into consideration the following guiding principles, as detailed in the *Guideline*:

- Minimize the need to acquire residences and viable commercial/industrial uses to accommodate substation development.
- Maintain consistency/compatibility with existing land uses and land use plans to the extent possible.
- Minimize adverse effects on sensitive environmental resources and the social environment.

- Maintain public health and safety.
- Demonstrate cost-effectiveness, while adhering to good engineering and sound environmental planning practices.
- Present the public with a clear and well documented methodology for the identification of the proposed and alternative sites.

2.2 DISTRIBUTION SYSTEM CONSIDERATIONS IN THE STRATFORD AREA

To meet the distribution capacity needs of the Stratford area, UI determined that any new substation that would replace the existing Baird substation should be located to facilitate interconnections to the existing electrical transmission and distribution systems, and particularly to allow cost-effective interconnections to the existing and projected electric load areas. The following primary factors were considered when identifying and assessing potential substation sites:

- *Location of potential sites in relation to the existing electric distribution network.* For distribution interconnections, sites are preferred that are near existing distribution infrastructure or in areas where new distribution infrastructure could be economically developed to reach load centers. For replacement of an existing substation, distance of the new replacement substation from the existing is particularly considered as the distribution infrastructure required to serve the electric load areas collectively terminate at the existing station. Location of a replacement substation in close proximity to the existing substation to be replaced limits conflicts with physical encumbrances, presence of other utilities, and cost associated with the installation of additional distribution infrastructure.

- *Availability of land for development of a distribution substation.* The minimum required area for a "distribution only" open air 115/13.8 kV substation of this type, meaning a substation supplied by four transmission lines, with two transmission circuit breakers, no expansion capability on the transmission side, and appropriate buffers and setbacks, is 1.5 acres.

- *Location of sites in relation to existing transmission lines (possible interconnections).* Four UI owned 115 kV transmission lines extend east to west along the Metro North Railroad corridor and are located adjacent to UI's existing Baird Substation. These

four transmission lines are interconnected to several distribution and transmission substations in UI's territory. The distribution substations each feed independent electric load centers, both to the east and west of the existing Baird Substation in Bridgeport and Stratford.

3. GEOGRAPHICAL SITING REGION AND INITIAL SITE IDENTIFICATION

3.1 GEOGRAPHIC SITING AREA BOUNDARIES

Taking into consideration the overall substation siting *Guidelines*, proximity to the existing Baird substation and transmission corridor, and distribution system needs, UI defined the preferred geographic location area for the substation as within an approximately 1,000 foot wide corridor along the existing Metro North Railroad corridor between the two existing distribution substations to the east and west of the existing Baird Substation. This siting region was selected because of the existing Stratford electric load area the new substation would serve.

3.2 IDENTIFICATION AND SCREENING OF POTENTIAL SITES

Within the defined geographic siting region, UI applied the siting criteria and conducted baseline research, performed field reconnaissance, and consulted with municipal officials. As a result of this process, UI identified 12 potential sites for initial consideration for the development of the new substation. These potential sites were identified based on the UI *Guidelines* and the existing distribution and transmission considerations specific to the Stratford area.

The potential sites then were screened using the following primary criteria:

- Greater than or equal to 1.5 acres of developable land (the estimated minimum size for the development of an open air distribution substation of this type)
- Sites with at least one of the following characteristics:
  - ✓ Land adjacent to the UI 115 kV transmission corridor between the distribution substations directly to the east and west of the existing Baird Substation.
  - ✓ Land owned by UI.
  - ✓ Land that is vacant, available for sale, under-developed (e.g. formerly developed properties that are available for reuse), or otherwise undeveloped.

Properties that appeared, based on preliminary study, to meet at least some of the siting criteria then were qualitatively evaluated using the following factors:

- Environmental – Environmental issues, including site character, present and past land uses of the property, cultural resources, threatened and endangered species, tidal or inland wetlands, ponds, aquifers, watercourses, public watersheds and floodplains, potential need for environmental remediation (for previously developed sites) and encumbrances.

- Surroundings – Zoning and description of surrounding area, including proximity to statutory facilities (schools, playgrounds, daycares, nursery schools, day camps, and residential neighborhoods).

- Transmission and Distribution System – System transmission and distribution interconnection costs and other considerations including system impacts, accessibility and right-of-way requirements.

- Construction – Substation construction and vehicular access costs and other related considerations, including the effects of site size, shape, and subsurface topographical conditions.

- Acreage Available – Property availability, additional land for buffer or expansion, expected cost, and availability of easements.

- Permitability – Anticipated ability to obtain all the required siting, land use, environmental and construction permits.

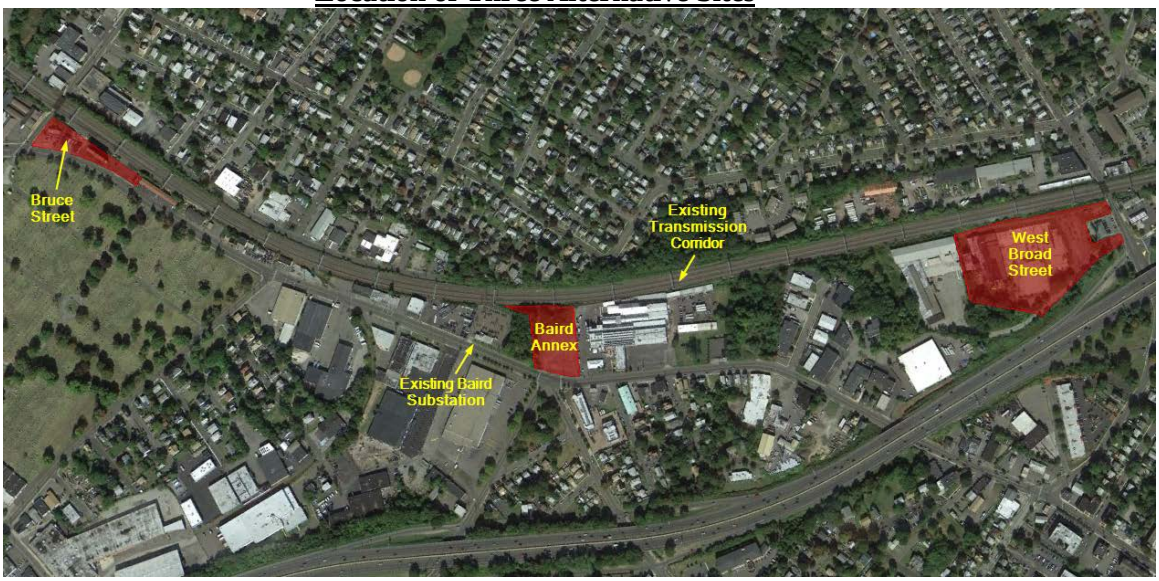
Using this process, most of the initially identified potential sites were found to be impractical for the development of the new substation and were eliminated from further consideration. The reasons for eliminating a particular site varied, and ranged from environmental issues (e.g., presence of wetlands, rock, insufficient developable area, incompatible land uses) to the identification of new information regarding the future development plans for vacant property.

However, based on the screening analyses, UI identified three sites that initially appear feasible for the development of the new substation:

- Bruce Street
- West Broad Street
- Baird Annex (UI Property)

Figure 3-1 illustrates the locations of these three sites.

Figure 2
Location of Three Alternative Sites



Source: Google Earth, May 2015

4. DETAILED EVALUATION OF ALTERNATIVE SUBSTATION SITES

4.1 DETAILED SITE EVALUATION CRITERIA

For each of the three[2] alternative sites, UI conducted more detailed evaluations, considering substation layouts and estimated costs and assessing each site based on the following, more specific siting criteria:

- Property / land issues (e.g., available useable and buffer acreage, site acquisition costs, existing and former land uses).
- Environmental and social/cultural resource factors (e.g., proximity to wetlands and watercourses, vegetative communities, wildlife resources, species of concern, visual resources, archaeological and historic resources, recreational and public resources, among others).
- Surrounding land uses (e.g., distance to the nearest residence and abutting property line, potential visibility of the substation, effect on public health and safety, consistency with local, state, and regional land use plans and future development, effects on transportation and access).
- Electric transmission and distribution system considerations (e.g., length of distribution and / or transmission system interconnections that would be required, consistency with long-range plan for the expansion of UI's electric power system
- Construction costs.
- Permitability (e.g., identification of any issues that could affect the ability to obtain approvals for substation site development).

UI determined that the development of the new substation at the Baird Annex site would best meet the project objectives, based on environmental, technical, and economic considerations. The West Broad Street site, although less preferable based on cost and environmental consideration, offers a second siting option. In contrast, the Bruce Street site was found to be impractical for the development of the new distribution substation.

[2] A detailed evaluation was performed for the Bruce Street alternative; however it was not reviewed to the same level of detail as the West Broad Street or Baird Annex alternatives. An initial detailed review showed that the property was insufficiently large to accommodate the necessary substation equipment while maintaining industry standard electrical clearances and maintenance access requirements. Further review of the property was not performed.

4.2 BRUCE STREET SITE: ELIMINATED FROM CONSIDERATION

This 1.23 acre site was recommended as a potential alternative site by the Town of Stratford in preliminary discussions with UI regarding site selection for the new substation. It is comprised of three separate properties that were assumed to be assembled into one property for evaluation as an alternative site for the proposed substation. All three of the separate properties are currently occupied by structures of varying commercial/industrial uses. The site is located directly adjacent the Metro North Railroad Corridor and UI's existing 115 kV transmission lines that run along its northern border. It is bordered to the west and south by Bruce Street and Stratford Avenue respectively and to the east by the Stratford Motor Inn. The existing Baird substation is located approximately ½ mile to the east of the Bruce St. site along Stratford Avenue. The site's relative close proximity to the existing Baird substation provides for the opportunity to minimize costs associated with new underground distribution infrastructure required to interconnect the new substation to existing infrastructure.

However, upon further review of the feasibility of this site, it was identified that there is insufficient space to accommodate the new substation. An engineering review of conceptual arrangement plans for the necessary equipment revealed that electrical clearances would be violated from energized equipment to the necessary perimeter fence. In addition, the narrow nature of the parcel results in insufficient maintenance access around critical pieces of equipment that would need to be located on the eastern portion of the site. There would also be inadequate space for UI's mobile transformer which is brought to the site if one of the substation transformers must be removed from service for an extended period of time.

Although Bruce Street is physically located close to the existing Baird substation and shares Stratford Avenue as an access road, the parcel is not sufficient in size for the proposed substation. In addition, the existing structures would need to be demolished and the foundations removed prior to construction of the new substation. This represents a significant increase in the site preparation costs over a greenfield site. These factors contributed to UI's determination that the use of the Bruce Street site as a new 115/13.8 kV distribution substation would not be feasible or cost effective.

Figure 3
Bruce Street

Source: Google Earth, May 2015

4.3 WEST BROAD STREET SUBSTATION: SITE ALTERNATIVE

This site is located to the east of the existing Baird substation, between the Metro North Railroad Corridor and Interstate 95 at 1297 West Broad Street in Stratford. UI's two 115 kV transmission lines run along its northern border. The site is a former industrial facility with several structures demolished while some remain. Abutting the property to the west along a joint access road is the MLI Redemption Services bottle and can redemption center.

In the general vicinity of the site, industrial and commercial buildings border West Broad Street and also characterize areas to the north of the site. Farther to the north across the Metro North Railroad Corridor and commercial/industrial facilities are residential neighborhoods along Knowlton Street. Interstate 95 borders the site to the south.

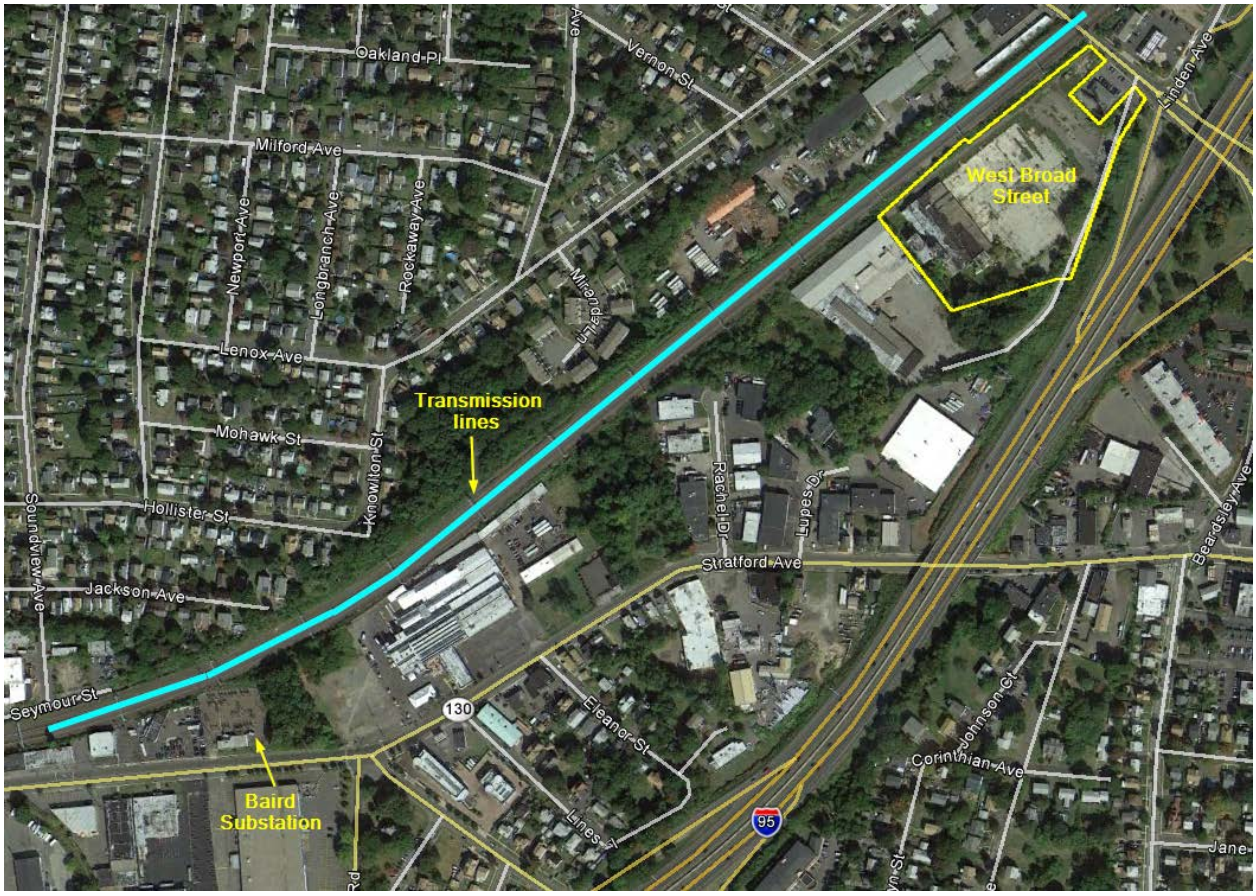
The development of the new substation at the West Broad Street site would have a number of desirable attributes, including general geographic proximity to the existing Baird substation. Other benefits would include the repurposing and re-use of a potential brownfield site, adjacency to the existing 115 kV transmission lines, the commercial/industrial land use

characteristics of the surrounding area and the large amount of property available for future facility expansion.

However, the siting of the new substation at the West Broad Street property is constrained from interconnection to the existing Baird substation's distribution infrastructure along Stratford Avenue. To utilize the site for the new Baird substation would require the interconnection of new distribution circuits to their termination point in front of the existing Baird substation. However, there is no direct road access between the existing Baird substation and the West Broad Street site, necessitating a longer access route utilizing Beardsley Avenue. No underground distribution infrastructure currently exists on the necessary portions of Beardsley Avenue or West Broad Street. In addition, the existing underground infrastructure on Stratford Avenue would not be sufficient to support the number of circuits required. As a result, new underground infrastructure would be required over a distance of approximately 1 mile with two crossings under Interstate 95. The cost for this distribution infrastructure is estimated to be $17 million.

Further, the site is a potential brownfield site and will likely require extensive remediation of contaminated soils during construction. In addition, while portions of the previous manufacturing facility have been demolished, a large building remains and is abandoned. The foundations from the demolished portions of the facility remain on site and would require removal to accommodate the necessary site grading, equipment foundations, duct lines for distribution getaways and grounding for the new substation.

Figure 4
West Broad Street



Source: Google Earth, May 2015

Table 1
West Broad Street Site Evaluation Summary

CRITERIA	KEY CHARACTERISTICS
Costs, including Substation, Transmission and Distribution	**Estimated costs ($ millions)** • Substation $37.5 • Overhead transmission lines $0.0 • Distribution circuits $17 • Total $54.5
Site layout	• Sufficiently large to accommodate future expansion • Direct interconnection to UI transmission lines
Environment	• Potential brownfield site • Over 2500 feet to nearest NDDB area • 400 feet to freshwater forested/shrub wetland • Significant portion of site falls into 100 year flood plain
Surroundings	• Commercial/industrial uses on four sides • Residential area to north screened by commercial buildings • UI transmission corridor along northern boundary • 320 feet to residence north on Knowlton Street • 645 feet to residence south on Beardsley Avenue • Sufficient land area to provide screening • Property is underutilized and prioritized for redevelopment
Transmission system	• Adjacent to existing UI transmission corridor • No transmission line ROW acquisition required for interconnection
Distribution system	• This site is geographically located approximately ½ mile from the existing Baird substation; however the sites do not share the same road access. To navigate between the two sites, an alternate route must be taken with an approximate distance of 1 mile. This path requires traversing West Broad St., Beardsley Ave., and Stratford Avenue. West Broad St. and Beardsley Ave. have no existing UG infrastructure to support the necessary routing of UG distribution circuits from the new substation location to the existing. This represents a substantial increase in cost, construction time, utility coordination, circuit relocation and risk of UG conflicts over sites located in closer proximity to the existing substation.
Land	• 4 acres, excluding factory building, areas in 100 year flood plain. • Site zoned for industrial use

4.4 PREFERRED SITE: BAIRD ANNEX

This UI owned site, which encompasses approximately 1.8 acres, was formerly used for parking for the adjacent industrial complex, previously owned by the Baird Corporation. UI acquired the property in 2010 from the Baird Corporation and currently uses portions of the site as a material laydown area. The industrial building was subsequently purchased by the Two Roads Brewing Company. UI has a License Agreement with the Two Roads Brewing Company to allow the site to be used for overflow parking 5 days per week.

Pursuant to its former use as a parking area for the Baird Corporation, and present parking area for the Two Roads Brewing Company, the site is fairly level and is predominantly covered in a mix of asphalt and compacted soils. The northern most portion of the site is covered in low lying vegetation with some sparse tree coverage. The site previously accommodated a railroad spur from the Metro North Railroad that traverses the site west to east along the north side of the property. Portions of the concrete foundation and tracks remain in place today, but are abandoned.

UI's 115 kV transmission lines are located in the Metro North Railroad Corridor, directly adjacent and to the north of the site. Overall, the property is bordered to the north by the Metro North Railroad Corridor, to the east by the Two Roads Brewing Company, to the west by a wooded area also owned by UI and the existing Baird substation, and to the south by Stratford Avenue. Extensive commercial developments are located to the south, east and west of the site along Stratford Avenue. Residential neighborhoods are located to the north of the site across the Metro North Railroad Corridor and UI's existing 115 kV transmission lines.

The development of a 115/13.8 kV distribution substation at this site would be consistent with the former use of the property for industrial purposes. The site size and location adjacent to the existing Baird substation and UI's existing 115 kV transmission lines would allow for the development of a cost-effective open air substation design. Further, the site is immediately adjacent the existing substation minimizing the costs and impacts of

interconnecting to the existing distribution circuits. Investigations into the feasibility of adding additional distribution infrastructure on Stratford Avenue to tie the existing Baird substation to the new site show that there are no congestion issues.

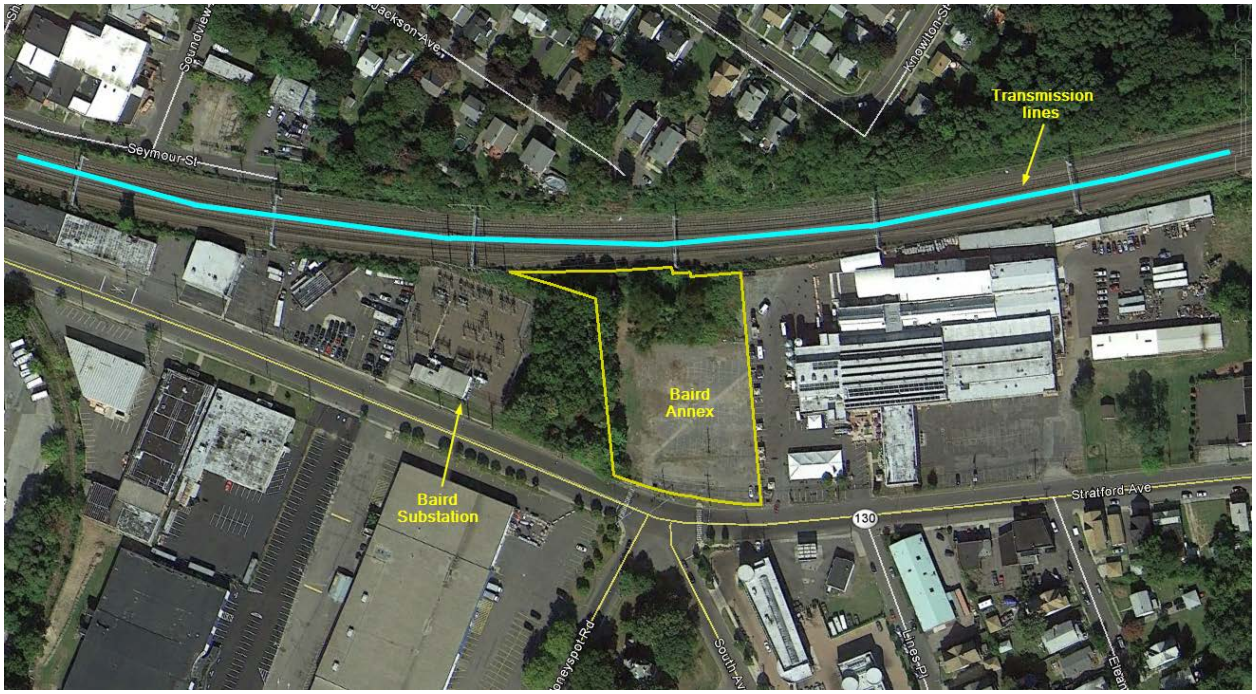
In addition, the Town of Stratford's plans for street beautification and addition of a roundabout at the intersection of Stratford Avenue, Honeyspot Road and South Avenue require modification to UI's existing overhead and underground distribution infrastructure in the immediate vicinity of the site. The current planned modification of underground infrastructure directly adjacent to the site significantly reduces the costs for distribution interconnection of the proposed substation.

UI selected the Baird Annex property as the preferred site for the new substation due primarily to the following factors:

- The site provides the lowest evaluated cost option.
- The site is located immediately adjacent the existing substation decreasing the impacts and costs of new infrastructure to interconnect new distribution circuits to existing.
- The site is consistent with the industrial/commercial land uses of the surrounding area.
- The site is located directly adjacent UI's existing 115 kV transmission lines on the Metro North Railroad Corridor.
- The proposed Town of Stratford roundabout requires modifications to UI's existing overhead and underground distribution infrastructure directly adjacent the site. With modifications to underground infrastructure already required, the costs and impacts of interconnecting the new substation distribution circuits to existing infrastructure are decreased.

Table 4-2 summarizes the characteristics of the substation development at the Baird Annex Site.

Figure 5
Baird Annex



Source: Google Earth, May 2015

Table 2
Baird Annex Site Evaluation Summary

CRITERIA	KEY CHARACTERISTICS
Costs, including Substation, Transmission and Distribution	**Estimated costs ($ millions)** • Substation with two transformers $32 • Overhead transmission lines $0 • Distribution circuits $3.3 • Total $35.3
Site layout	• Supports open air substation design. • Direct interconnection to UI transmission corridor. • Directly adjacent existing Baird substation.
Environment	• Potential for environmental contamination due to proximity to former industrial facility • 95 feet to nearest NDDB area • 400 feet to nearest 100 year flood plain.
Surroundings	• Commercial and industrial area • Residential area across transmission corridor to the north • Baird substation directly adjacent to west • Commercial properties to south and east
Transmission system	• Adjacent to existing 115-kV railroad corridor.
Distribution system	• Directly adjacent existing substation • The minimum costs required to relocate distribution circuits due to proximity to existing substation
Land	• Approximately 1.8 acres • UI owned property • Adjacent property is also UI owned

5. CONCLUSIONS

UI conducted a comprehensive alternatives evaluation process first to identify potential sites for the new distribution substation in the project area and then to assess each site based on established site selection criteria. As a result of these alternatives analyses, the Baird Annex site was selected as the preferred site for the new 115/13.8 kV Substation in the Stratford area.

The Baird Annex site represents the least-cost option for the development of the new substation. The UI-owned site is located directly adjacent the existing substation to be replaced, and is optimally located directly along the existing UI 115-kV transmission line ROW.

The West Broad Street represents a feasible, but less preferable, alternative to the Baird Annex site. Although also adjacent to the 115-kV transmission line, the West Broad Street site would be more costly to develop and would require much longer distribution lines to interconnect to the existing distribution infrastructure that terminates at the existing Baird substation. The site is a potential brownfield site which would require substantial environmental remediation to make the site viable for the substation. In addition, the existing abandoned factory building would need to be demolished. The foundations from the previously demolished portions of the factory building also remain, increasing the costs for site preparation significantly.

APPENDIX A

Transmission and Distribution Guideline for Substation Site Selection (TDG 002)

Transmission & Distribution Guideline

for

Substation Site Selection

TDG 002

Transmission and Substation Engineering Department

The United Illuminating Company

March 7, 2013

Revision 2

SUBSTATION SITE SELECTION GUIDELINE

I GENERAL

This guideline applies to The United Illuminating Company's internal procedures for identification, evaluation, and selection of proposed and alternative sites for substations. The process of identifying, evaluating, and ultimately selecting a substation site should be project-specific, with appropriate input and participation by a team of participants representing Transmission and Substation Engineering, System Integrity, Transmission Asset Planning, Real Estate, Electric System Operations, System Maintenance, Construction Management and Environmental Services (Siting Team). In addition to the company's internal procedures, public and agency input on potentially feasible sites also is solicited through the Connecticut Siting Council's (CSC's) municipal consultation and application processes.

This guideline, which addresses the company's internal substation siting procedures, defines the preferred process through which site selection is made, and the criteria upon which site selection is based. The site selection criteria includes, among other topics: distance to load centers, distance to interconnecting transmission lines, description of surrounding areas, site size requirements, site terrain, environmental and land use compatibility, substation construction, transmission and distribution line construction, access, and costs. This guideline is intended as a summary of the preferred process for identifying and analyzing sites for new substations and is intended for use in assisting the preparation of requisite documentation for the Connecticut Siting Council application process, including municipal consultation and other potential regulatory siting reviews as may be applicable. Specific project requirements or constraints may dictate that alternate or modified methods be used for certain substation siting projects.

II GUIDING PRINCIPALS

UI is committed to maintaining or improving the reliability and operability of the electric system while recognizing its responsibility to locate, construct and operate its facilities in an environmentally responsible manner consistent with the spirit, as well as the express provisions of all applicable regulations. Therefore, UI has developed and endorses the following guiding principals for siting its facilities:

i. Minimize the need to acquire residences and viable commercial/industrial uses to accommodate substation development
ii. Maintain consistency/compatibility with existing land uses and land use plans to the extent possible
iii. Minimize adverse effects on sensitive environmental resources and the social environment
iv. Maintain public health and safety

v. Demonstrate cost-effectiveness, while adhering to good engineering and sound environmental planning practices.
vi. Present the public with a clear and well documented methodology for the identification of the proposed and alternate sites.

II SITE SELECTION PROCESS OVERVIEW

A summary of the site selection process is shown in Figure 1 and described in the following sections.

Task 1 - Define Substation Need – The Statement of Need for the substation provides the basis for the site selection process and is the foundation document for the development, design and presentation of any substation project. Need is determined by system analyses and can be due to numerous electrical system issues but is typically based on requirements associated with system reliability, load growth and/or aging infrastructure. The Statement of Need, along with a description of the analyses conducted and the system alternatives considered that led to the determination that a substation is the preferred solution, is typically summarized in a separate document that is suitable for inclusion in CSC submissions.

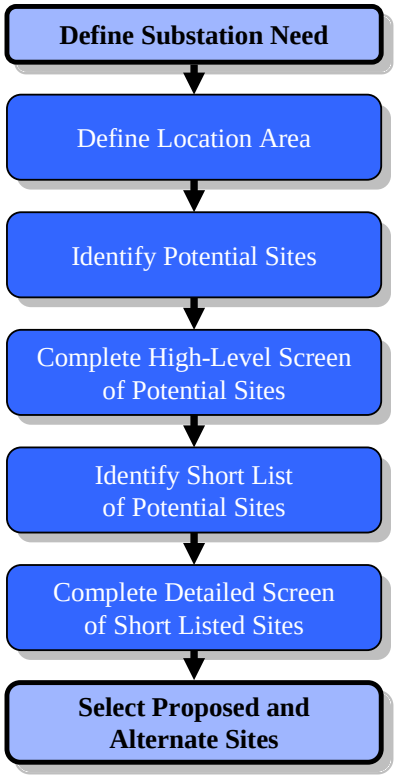


Figure 1
Site Selection Process

The Statement of Need should define the geographical region ("Siting Region") where a substation is required. The Siting Region is determined by proximity to the load that is intended to be served, existing or planned transmission and distribution lines, system access considerations and cost. UI System Integrity should begin this process by identifying one or more general geographical areas within which the new substation can provide the necessary system support. Multiple Siting Regions may be used to focus substation siting around a particular load center. Where more than one Siting Region is designated, the evaluation of transmission costs and access considerations should permit the identification of a single, preferred Siting Region. The weight of transmission costs and access considerations may also result in the adjustment of the size and shape of the Siting Region identified by System Integrity. If changes are made, the resulting Siting Region(s) should be reviewed with System Integrity prior to proceeding with the identification of possible sites.

Task 2 - Define Location Area – The substation location must be located within reasonable proximity to the distribution load center identified in the Statement of Need and, preferably, adjacent to a transmission line. Increased distance from the interconnections typically has the detrimental impacts of: increased costs (due to the cost of constructing a tie-line), increased environmental impact (from visual, land and other impacts associated with the tie-lines, even if the line is underground), and reduced reliability and increased maintenance costs (due to increased length of line exposed to failures and damage). Figure 2 provides a representation of a potential Substation Location Area within a Siting Region (cross-hatched area on either side of the transmission line and surrounding the load center).

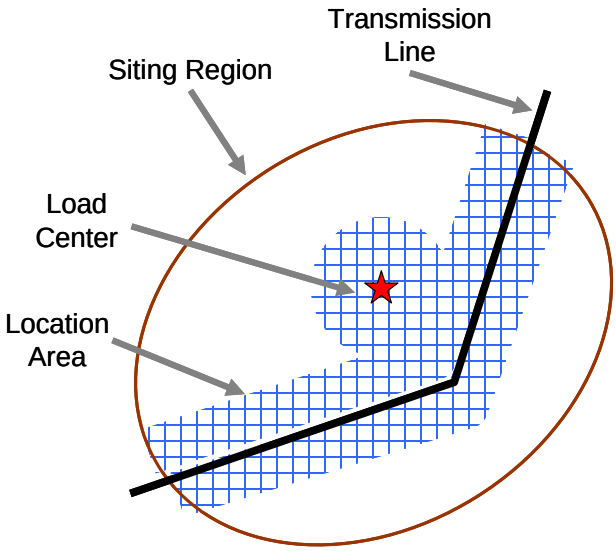


Figure 2
Location Area

The desirability of locating a substation near a transmission line must be balanced against locational impacts associated with the other substation siting criteria. The width of the Location Area is determined on a project-specific basis, taking into consideration factors such as environmental constraints, land availability, development, and similar factors that may affect the identification of potential candidate sites. An initial Location Area is typically identified on either side of the transmission line and around the load center. However, this may be modified during the siting process, depending on the number of potential sites initially identified or anticipated to be available within the Location Area. In addition, sites adjacent to and beyond the Location Area may be considered in the process, depending on the beneficial characteristics of these sites relative to other sites identified within the Location Area.

Task 3 - Identify Potential Sites – The identification of potential sites within the Location Area should follow a three-step, sub-process:

i. <u>Define Substation Land Area (acreage) Requirements</u>

The anticipated amount of land (acreage) required for the substation must be defined. The substation land area used in the site selection process and may reflect any future plans for substation expansion A one-line diagram indicating the anticipated design of the substation should be developed by UI Transmission and Substation Engineering. The diagram should include the possible future addition of transformers, 13.8-kV buses, 115-kV bus and breakers, transmission and substation capacitors,

transmission line terminations, etc. The one-line diagram should be reviewed and approved by, Transmission and Substation Engineering, Transmission Asset Planning, System Integrity, Electric System Operations, System Maintenance and Construction Operations. From this approved one-line diagram, one or more preliminary substation layouts should be developed and provided to aid in the identification of possible sites. The substation layouts should reflect the minimum required property for access, maintenance, replacement of equipment, and mobile transformer transport and connection. The required land area should consider sufficient land to allow vegetative screening of the substation. The specific physical characteristics of the site, access considerations and property line setbacks required by zoning may increase substation land requirements on a site-specific basis. Zoning setback requirements within each portion of the geographical site selection area may be determined from applicable town/city planning and zoning documents. Though UI is not required to adhere to local zoning requirements, UI prefers to accommodate local zoning ordinances when practicable, consistent with the guiding principals.

ii. Create Composite Map

To aid in the identification of a range of potential sites, a composite map of the Siting Region should be prepared, using available town/city maps, which delineate the boundaries of all land parcels within the Location Area. Also, to aid in the identification and evaluation of possible sites, the following features should be superimposed on this composite map: storm surge and tidal impact area, tidal and inland wetlands, ponds, lakes, watercourses, large hills, ridges and other significant topographical features, flood plains and land use zones from town/city zoning regulations. This information is available from various town/city, state and federal government sources. The identification of land use areas, such as industrial sites, business parks, shopping centers, schools, parks, playgrounds, hospitals, nursery schools, day-camps, churches, designated open space, residential neighborhoods, and condominiums/apartment complexes, would also be advantageous. Large scale aerial photographs and topographic maps of the site selection area also facilitate the potential site identification process.

iii. Identification of Potential Sites

Potential sites should be identified using the information from the composite map, region and site inspections and, suitable reductions of possible substation layouts. The Siting Team should identify one or more contiguous parcels of land which provide the designated site size located within the Siting Region, which are vacant or otherwise not presently being utilized. Because of the large land area of some sites identified in this manner, and the varying economic and other factors related to specific location within these sites, the proposed and alternate substation locations within these larger sites should also be identified for evaluation. The possible effect of town/city zoning property line setbacks may also be considered in the potential site identification process.

Based on the analysis of the composite map, a list of possible alternative site locations, sizes and property owners should be prepared. The number of potential sites identified may vary from project to project.

iv. Third Party Input

Though the local municipality will have an opportunity to review and comment on UI's proposed and alternate sites during the formal municipal consultation period preceding the filing of an application to the CSC, local input from the municipality should be sought in order to further refine the list of potential sites. This step benefits the site selection process in two ways 1) by possibly alerting the site selection team to unknown potential sites, or 2) giving the site selection team a leading indication of sites or areas that the municipality would want removed from consideration. NOTE: no input from the municipality should take place unless or until the senior elected official of the municipality, or their representative, has been briefed by UI, following approval of the UI Project Executive Sponsor(s).

Task 4 – Complete High-Level Screen of Potential Sites – A high-level qualitative evaluation of the significant considerations for each potential site should be performed. Consideration should be given to evaluating each of the following criteria; additional or alternative criteria may also be used:

For this preliminary screening step, a high-level, qualitative evaluation should be completed for each criterion and for each site using the guidelines below. The Property Site Evaluation Template is attached hereto as Exhibit A.

1.0 Environmental

1.1 Ecology - Wildlife and Habitat

Definition: Sites will be scored based on the professional judgment of the evaluator using criteria such as the diversity and quality of wildlife cover types onsite and in the site vicinity, the potential number of listed species for the vicinity, and other information.

Data Source: Agency websites, atlas maps, and in-house files.

Score	Criteria
5	Low potential for protected species/habitat; no significant habitat disruption
3	Moderate potential for protected species; and/or moderate habitat disruption
1	High potential for protected species and/or significant habitat disruption

1.2 Ecology - Wetlands and Water Bodies

Definition: Sites will be scored based on the professional judgment of the evaluator using criteria such as the diversity and quality of wetlands and water bodies on or adjacent to the site, and other information.
Data Source: Agency websites, NWI maps, atlas maps, and in-house files.

Score	Criteria
5	No wetlands/water bodies on or adjacent to site
3	Some wetlands/water bodies on or adjacent to site
1	Significant quantity of and/or high quality wetlands/water bodies on or adjacent to site

1.3 Existing Ownership
Definition: Property owned or leased by UI or others.
Data Source: Online agency sources; atlases, information provided by UI real estate consultant; local town or city offices.

Score	Criteria
5	UI ownership/lease.
3	Not held by UI; currently available for sale or lease
1	Not held by UI; currently unavailable for sale or lease, or unknown

1.4 Land Use and Zoning Compatibility
Definition: Existing or planned type of land use and zoning onsite and in the site vicinity.
Data Source: Online agency sources; atlases.

Score	Criteria
5	Industrial or multiple use and/or zoning.
3	Large acreage residential and/or zoned residential.
1	Green space, open space, school, park, developing residential.

1.5 Flood Potential
Definition: Potential for floods onsite.
Data Sources: Agency websites, maps, in-house files.

Score	Criteria
5	Site is outside the 100 year floodplain and/or storm surge tidal impact area at high elevation in reference to nearest surface water.
3	Site is outside the 100 year floodplain and/or storm surge tidal impact area at moderate elevation in reference to nearest surface water.
1	Site is at or below elevation of nearest surface water or is in 100 year floodplain and/or or storm surge tidal impact area.

1.6 Buffer between Substation and Receptors
Definition: The distance between and type of buffer between the substation and nearby sensitive receptors (residences, schools, hospitals nursing homes, parks and natural areas, etc.).
Data Sources: Online maps and hard copy maps.

Score	Criteria
5	Wide buffer area that will greatly diminish noticeable effects of substation on surrounding area.
3	Moderate buffer area that will lessen effects, with some effects noticeable at nearby receptors.
1	No buffer or minimal buffer area.

1.7 Cultural Resources

Definition: Historic sites listed in the National or State Register of Historic Places as well as resources that are eligible for listing. Sites will be scored according to the proximity of the site to known archaeologically significant areas or historic sites.

Data Source: Online sources (SHPO and NPS websites) and in-house files.

Score	Criteria
5	No listed resources within 0.25 mile of site.
3	Listed resources adjacent to site.
1	Listed resources onsite.

1.8 Visual Impact

Definition: Visual effect of site development on the surrounding area.

Scoring: Sites will be scored according to the potential visual impact of site development on receptors in the vicinity as well as the potential visibility of the transmission tie-in, in the professional judgment of the siting specialist.

Data Source: Online sources, atlas maps, and in-house files.

Score	Criteria
5	Low potential for visual impact
3	Moderate potential for visual impact
1	High potential for visual impact

1.9 Noise Impacts

Definition: The impacts of increased noise levels resulting from the operation of the proposed substation on nearby residences, facilities (including buildings), and population centers.

Data Source: Online sources, maps, and in-house files.

Score	Criteria
5	No residences or facilities within 0.25 mile of the site.
3	One to five residences or facilities within 0.25 mile of the site.
1	More than five residences or facilities within 0.25 mile of the site.

2.0 Technical

2.1 Site Topography

Definition: Terrain and elevation range on and near the site.

Data Source: Onsite investigations, maps, agency websites, in-house files.

Score	Criteria
5	Site relatively flat.

3	Site has moderate variations in topography.
1	Major topographic features onsite.

2.2 Site Foundation and Earthwork Conditions

Definition: Degree that conditions onsite could accommodate construction and installation work.

Data Source: Onsite investigation including possible sub-ground site survey.

Score	Criteria
5	Conditions favorable to foundation and earthwork.
3	Moderate challenges for foundation and earthwork with possibility of signs of existence of rocks/boulders or sand soils.
1	Site poses significant challenges to foundation and earthwork with obvious signs of existence of rocks/boulders or sandy soils.

2.3 Structure or Utility Displacement/Replacement

Definition: Possibility that existing structures or utilities would need relocation or replacement to accommodate site development.

Data Source: In-house files; maps.

Score	Criteria
5	No existing structures or utilities would be displaced and/or need replacement.
3	Some replacement and/or displacement would be required.
1	Significant disruption of existing structures or utilities would be required.

2.4 Distance from Transmission

Definition: Based on estimated length of lines from the substation to the nearest transmission line.

Scoring: Sites are ranked according to estimated length of line.

Data Source: In-house files, online resources, maps.

Score	Criteria
5	Site is immediately adjacent to transmission line.
3	Site is within 0.25 mile of transmission line.
1	Site is more than 0.25 mile from transmission line.

2.5 Distance from Load Center

Definition: This will be based on estimated distance from the substation to the nearest load center.

Scoring: Sites are ranked according to distance.

Data Source: In-house files; atlas maps.

Score	Criteria
5	Site is immediately adjacent to load center.
3	Site is within 2 miles of load center.
1	Site is greater than 2 miles and less than 5 miles from load center.

2.6 Road Access

Definition: Proximity of site to nearest road suitable for use by construction and maintenance vehicles and equipment.

Score	Criteria
5	Suitable road adjacent to site.
3	Suitable road within 0.25 mile of site.
1	Suitable road is more than 0.25 mile from site.

2.7 Development Costs

Definition: Development costs include land purchase costs plus site development costs.

Score	Criteria
5	Low development costs.
3	Moderate development costs.
1	High development costs.

2.8 OH or UG Transmission Line

Definition: Viability of overhead or underground transmission line interconnection.

Score	Criteria
5	High potential for OH interconnection.
3	Moderate potential for OH interconnection.
1	Low potential for OH interconnection; or only UG interconnection is possible.

Task 5 – Identify Short List of Potential Sites – Using the results of the High-Level Screen in Task 4 and the Evaluation Matrix, the Siting Team should identify potentially feasible sites for the more detailed review described in Task 6. The primary factors that eliminate the non-short-listed sites from further consideration should be summarized and documented. The evaluation matrix of Task 4 is a tool used to assist in the organization and evaluation of broad and varied data. The results of the evaluation matrix should be used as an input to the ultimate selection of the proposed and alternate site and not be considered as the definitive selection.

Task 6 – Complete Detailed Evaluation of Short-Listed Sites – The detailed evaluation of the short-listed sites should follow a two-step, sub-process:

i. Estimate Site Layouts and Costs

To facilitate a more detailed evaluation of each of the short-listed sites, a general drawing, of suitable scale showing the proposed substation should be prepared for each identified site and alternate location identified within that site. Preferred or existing Substation access right-of-way for vehicles, transmission, and distribution should be shown. All identified site factors affecting permitting, temporary construction access, permanent access and site purchase should also be clearly indicated on the drawing. The costs for substation construction and

vehicular access associated with site size, shape, access, topography, site preparation, anticipated soil conditions, potential environmental remediation and known encumbrances should be derived for each site with the assistance of members of the Siting Team, as appropriate. Significant qualitative factors pertaining to substation construction and site access should be identified. To facilitate a comparison of the costs associated with individual sites, one substation site should be chosen as a reference site, and differential costs relative to that site developed for the remaining sites.

ii. Evaluate Detailed Siting Criteria

In this detailed analysis of the short-listed sites, consideration should be given to evaluating each of the following criteria; additional or alternative criteria may also be used:

A. Environmental Concerns
   a. Federal and state jurisdictional wetlands and other water resources and public drinking water supply areas
   b. Plant communities/vegetation
   c. Wildlife and aquatic resources
   d. Threatened, endangered and other species of concern
   e. Recreational and public resources (e.g., forests, parks, public lands, hunting and wildlife management areas)
   f. Visual resources
   g. Archaeological or geological areas of interest
   h. Noise
   i. Floodplains
   j. Water quality and storm water
   k. Historic areas
   l. Proximity to areas regulated under the Coastal Zone Management Act or Tidal Wetlands Act

B. Surroundings
   a. Distance to nearest residence and nearest abutting property line
   b. Visibility of substation
   c. Distance to residential areas, private or public schools, licensed day care facilities, licensed youth camps or public playgrounds or other potential sensitive receptors
   d. Effect on cultural and historic resources
   e. Effect on public health and safety
   f. Effect on local, state, federal land use plans, including existing and future development
   g. Effect on roads (e.g., traffic patterns, access for construction and maintenance)

C. System
   a. Length of interconnection to transmission
   b. Length of interconnection to distribution
   c. How does the facility conform to the long-range plan for the expansion of the electric power grid serving the state and interconnected utility systems to meet the public need for adequate, reliable, economic service?
   d. How is the proposal consistent with the Siting Council's annual forecast reports and life-cycle cost analysis?

D. Construction
   a. Comparative construction costs of alternatives considered

E. Land
   a. Available usable acreage
   b. Available buffer acreage
   c. Cost of site
   d. Cost of rights-of-way and access-way
   e. Current land use of site and surrounding area
   f. Zoning
   g. Available easements
   h. Former land use

F. Permitability (i.e., are there red flags or fatal flaws associated with the anticipated ability to permit the site?)

For this step, an evaluation should be considered for all the criteria elements listed above for each site. A Property Site Evaluation Template should be completed for each site. An attempt should be made to evaluate each criterion using quantitative metrics where they are appropriate and can be estimated. A suggested rating scale to summarize the conclusions of the site evaluations is shown below.

5 = Favorable Evaluation

3 = Neutral or average evaluation

1 = Unfavorable evaluation

Task 7 – Select Proposed and Alternate Sites – The proposed site and an alternate site should be selected based on the results of the detailed analysis and the decision matrix completed in Task 6. The evaluation tool of Task 6 is used to assist in the organization and evaluation of broad and varied data. The results of the evaluation matrix should be used as an input to the selection of the proposed and alternate sites and not be considered as the definitive selection, though the Siting Team should be mindful that the selection of the proposed and alternate sites must adhere to Connecticut Siting Council (CSC)

requirement that UI justify its proposed site through "a comparison with alternative sites which are environmentally, technically, and economically practicable." Should the Siting Team recommend a proposed and/or alternate site that did not rank as favorably as other potential sites using this method, there must be a compelling and defensible reason for this recommendation.

Task 8 – Document Site Selection Study in a Report - A written report documenting the site selection process and the justification for the proposed and alternate sites should be prepared for the review and approval of the Siting Team. The report should provide a list and an estimated schedule for securing the expected Federal, State and local permits needed for the project. The site selection report documenting this analysis will form a portion of the CSC application and will also be provided to the municipality during the municipal consultation phase.

Prepared By:

_____
Transmission and Substation Engineering

Approved By:

_____	_____
Vice President, E S Operations	Assoc. Vice President, Transmission Business
_____	_____
Vice President, EPE	Director, Transmission Asset Planning
_____	_____
Director, Environmental Services	Senior Director, System Integrity

_____
Senior Director, Engineering & Strategic Planning

APPENDIX B

REVIEW OF SUBSTATION SITES AND SITE SCREENING

Screening Criteria Summary

To evaluate the feasibility of developing the substation at each of the 12 sites initially identified (refer to list in Table B-1 and to the map in the Map Pocket that shows general site locations), UI performed a high-level, qualitative screening of each property. The high-level screening consisted of first assessing each site to determine whether any characteristics posed constraints that would immediately eliminate the location from consideration for the development of the substation. Such constraints included, among others:

- Lack of adequate developable land (e.g., due to the presence of steep slopes, rock outcrops, or wetlands, which limited the amount of land available for development within a parcel).
- Sale of the site for other uses during the course of the study
- Privately-owned land that could not be acquired.

The screening consisted of reviewing each site based on constructability (including land availability, lot size and shape, topography and access); ability to meet UI's transmission and distribution system objectives; and potential for minimizing adverse environmental and social effects related to the site and its surroundings. If the screening analyses revealed a fatal flaw, the site was eliminated from further consideration for the development of the substation.

Site No.*	Site Name	Site Address
1	West Broad Street	1297 West Broad Street, Stratford
2	Rachel Drive	1255 West Broad Street, Stratford
3	Stratford Avenue North East	1526 Stratford Avenue, Stratford
4	Baird Annex	1770 Stratford Avenue, Stratford
5	Barnum	812 Barnum Avenue, Bridgeport
6	Hallett	252 Hallett Street, Bridgeport
7	East Washington	867 East Washington Avenue, Bridgeport
8	Crescent / Seaview East	1564 Seaview Avenue, Bridgeport
9	Crescent / Seaview West	640 Crescent Avenue, Bridgeport**
10	Bishop	1255 Connecticut Avenue, Bridgeport**
11	Stratford Avenue South East	1525 Stratford Avenue, Stratford
12	Bruce Street	2370 Stratford Avenue, Stratford**

B - 1 List of Potential Substation Sites, by Name and Address

*Refers to site number assigned on map of sites initially reviewed (see map pocket).
**Site evaluated as assemblage of more than one property with multiple addresses.

Baird Substation Siting Map