Development and Management Plan

(Construction--- Phase 3 Final)

For

SONO Substation

Norwalk, Connecticut

The South Norwalk Electric and Water (SNEW) hereby submits a Development and Management ("D&M") Plan, for the SONO Substation to the Connecticut Siting Council ("Council"). A D&M Plan for the tree removal, soil remediation, site grading, soil erosion & sedimentation controls measures and foundation plans have previously been submitted and approved.

The Development and Management Plan consists of the following:

I. Introduction
II. General Project Description
III. Development and Management Plan Narrative
IV. Appendix A: Figure 1, Site Location Map, USGS
    Appendix B: Plan Drawings – CL&P
    Appendix C: Plan Drawings – SNEW
    Appendix D: Stormwater Best Management

Section I
Introduction

This D&M plan for the SONO Substation was prepared to comply with a condition in the Council's Decision and Order in Docket No. 431, dated March 21, 2013. In accordance with that condition, the D&M Plan is in compliance with Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies which includes the following specific elements:

- A final site plan showing the placement of all substation equipment, structures, and building within the permanent tap structures;

- Erosion and sediment controls consistent with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Controls*:

- Provisions for storm water management and transformer oil containment.

- Details of the Connecticut Light and Power Company's transmission interconnection design, including new transmission structures

Section II
General Project Description

The Applicant, The Second Taxing District of the City of Norwalk, Fairfield County, Connecticut, South Norwalk Electric and Water (SNEW), is proposing to construct a 115-kilovolt ("kV") to 13.8-kV bulk supply substation that would be directly connected to an existing CL&P 115 kV transmission Line. The substation is proposed on an approximately 1.07 acre site owned by SNEW. The Site includes two adjoining parcels located adjacent to and west of Dr. Martin Luther King, Jr. Drive in the southwestern portion of Norwalk's Second Taxing District.

This location is zoned for industrial purposes. The site is triangular shaped and abuts the Metro-North/Amtrak rail corridor and existing CL&P electric transmission easement to the west, Dr. Martin Luther King Junior Drive to the east and a delivery distribution facility to the south (United Parcel Service- UPS). The site does not have any watercourses, known critical habitats or sites identified as having rare or endangered plant or animal species listed by federal and state government agencies, or underground facilities or utilities.

The proposed Project will involve the construction and operation of the substation, as well as the establishment of a new interconnection to CL&P's adjacent 115 kV transmission line, and the addition of three steel pole structures in the Metro-North corridor.

The overall purpose of the Project is to add capacity in response to the increasing demand for electricity in South Norwalk and its surrounding area and by so doing, improving electric distribution system reliability in the City of Norwalk.

Section III
Development and Management Plan Narrative
(Construction)

The intent of this D&M Plan is to describe the final designs of the substation and provide SNEW's stormwater best management practices for the site. With this final submission of the D&M plan SNEW has complied with Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies.

Key Map

A key map can be found in Section IV, Appendix A, *Figure 1, Site Location Map, USGS*

Plan Drawings

The Plan Drawings can be found in Section IV, Appendix B and C. Appendix B has Connecticut Light and Power drawings and Appendix C has South Norwalk Electric and Water drawings.

Land Ownership

The proposed SONO Substation is entirely located on land owned in fee by the Second Taxing District of the City of Norwalk

Public Roads and Land

The property is surrounded by Dr. Martin Luther King Junior Drive to the east, a transmission and railroad corridor to the west and a delivery distribution center, United Postal Service (UPS), to the south. There are no public roads or land crossing the property.

Grading Plan

A grading plan previously submitted and approved.

Topographic Features

Topographic features including one-foot contours are depicted on the plan drawings contained in Appendix B, *Topographic Survey Prepared For Second Taxing District City of Norwalk*.

Substation Structure Location and Details

SNEW proposes to construct the new substation on the 1.07-acre St. Ann's Site, which interconnects to CL&P's 115 kV 1890 Line and the Metro-North railroad corridor to the west, and is located adjacent to Dr. Martin Luther King, Jr. Drive on the east. The distribution portion of the substation will be owned, operated and maintained by SNEW. The transmission (PTF) portion of the substation will be owned, operated and maintained by CL&P. In the vicinity of the site, CL&P's 115 kV transmission line is built on or over Metro-North's railroad structures and conductor facilities.

The substation fence would be set back approximately three feet from the site boundary on the south and part of the east and west boundaries. On the northern portion of the property, the fence is offset from the property boundary to allow for landscaping adjacent to Martin Luther King, Jr. Drive.

CL&P's existing 1890 Line will be looped into the new substation to provide transmission service. A circuit breaker, which will normally be closed, will separate the existing 1890 Line

into two new circuits. In the event of an outage on either of the new 115 kV circuits, this looped arrangement will allow SNEW to obtain power from the other circuit.

The proposed substation and transmission/distribution line interconnections are designed in accordance with the National Electric Safety Code, and standards of the Institute of Electrical and Electronics Engineers, and the American National Standards Institute. Appendix B and C has the Plan Drawings which identify the proposed substation development plan and layout, respectively. The substation will consist of the following major components:

SNEW Owned and Operated

- Two 24/32/40 MVA power transformers, with a base rating of 24 MVA and a peak of 40 MVA (fan-cooled). The transformers will be installed on concrete pads. Each transformer will contain approximately 5,500 gallons of insulating oil. To minimize or avert the potential for spills, each transformer will include an oil containment system, consisting of a sump with the capacity to contain 110% of the oil volume.
- Appropriate circuit breakers, circuit switchers and disconnect switches.
- Connection (i.e., a high voltage tap) for a mobile transformer, in the event that one is ever needed.
- SNEW control house. This fabricated metal will house the distribution substation's relaying, control, metering, substation batteries and chargers and monitoring equipment, including the distribution Supervisory Control and Data Acquisition (SCADA) system. The building also will include heating, ventilation, and air conditioning. The control house will contain the automatic transfer switch (ATS) for the Alternating Current (AC) power from the two station service transformers.

  The same building will house the 15kV metal clad distribution switchgear. CL&P Owned and Operated

- Three new transmission line steel support poles will be installed in the railroad right-of-way (with two adjacent to the site) to alter the existing transmission lines to improve the transmission line alignment prior to the transition to a horizontal configuration in the substation.
- Two new steel A-frame terminal structures will be installed within the new substation. The steel frame terminal structures will complete the transition of the transmission lines from the vertical arrangement in the Connecticut Department of Transportation (ConnDOT) Right-of-Way, to a horizontal arrangement within the new substation. The structures will stand approximately 60-70 feet and support line disconnect and line monitoring and protection equipment.
- CL&P control house will contain the transmission communication, control, and monitoring and protection systems. A transmission SCADA system for control, status reporting and recording. Power panels for the station AC system and its own DC power system, including DC panels, batteries and charger. The building also will include heating, ventilation, and air conditioning.

The transformers will be connected to CL&P's 115 kV transmission line via high current rated circuit switchers and 115 kV disconnect switches. The power transformers will be provided with automatic load tap changers to regulate low-side voltages. The low voltage (i.e., 13.8 kV) switchgear will include a circuit breaker for each transformer, a tie circuit breaker (which will normally be open), and distribution circuit breakers.

Should one side of the 115 kV transmission line experience power supply problems, the substation's 115 kV tie circuit breaker will open. Only a momentary outage is expected, until the 115 kV tie circuit breaker is re-closed. If the fault persists and the 115 kV tie breaker cannot be re-closed, then the 13.8 kV tie circuit breaker will close. This process will be performed automatically with relays. Matched equipment on each side of the substation is designed to

assure continuity in operations and maintenance procedures. Each transformer is capable of carrying the entire expected substation load of 40 MVA.

SNEW and CL&P have worked together to identify and evaluate options for interconnecting the substation to the 115 kV 1890 Line. The plan for the interconnection includes the following primary components:

For the entry of the 1890W line into the new substation:

- *Install a new steel pole structure,* planned for location approximately 50 feet south of the existing railroad/CL&P Tower #512. The new steel pole will be located on railroad property.
- *Install a new steel pole structure,* planned for location approximately 20 feet south of the existing railroad/CL&P Tower #B513. The new steel pole will be located partially on SNEW property and partially on railroad property (i.e., land owned by the Connecticut Department of Transportation and used by the railroad).
- *Reposition CL&P conductors and shield wire*. The existing CL&P mast is located 11 feet out, on the catenary bridge over the railroad tracks. The new steel pole for the 1890W circuit will be located clear of all railroad conductors and communications cables, with the exception of four railroad power and signal supply conductors. The new steel pole arms will be designed to extend over the tracks to the existing position of the CL&P conductors and shield wire. The CL&P wires will be moved from the mast onto the steel pole arms, and the mast will then be removed. This will allow the railroad conductors to be repositioned on the catenary bridge.

For the entry of the l890E line into the new substation:

- *Install a new steel pole structure,* to be located approximately 200 feet south of CL&P's existing tower #8-514W.S. This new steel pole is expected to be located partially on railroad property and partially on SNEW property.
- *Modify existing CL&P facilities* to accommodate conductor loops to the new steel pole and the new span into the substation.

In addition to the 115 kV interconnection to the proposed substation, CL&P will provide fiber optic cable, and implement minor modifications to primary and backup protection relays at its Sasco Creek, Glenbrook, and Norwalk Harbor substations. Such work is expected to include minor changes to relay settings, communication cards, and control circuits.

SNEW will extend its existing distribution feeders to connect to the substation. The distribution lines will be installed underground and located in duct banks. New underground distribution duct will be required to link to SNEW's existing distribution system. The existing duct bank ends just at the north end of the parcel.

The level portions of the site not occupied by equipment will be graded and finished with a gravel surface (known as trap rock). Sloped areas will be appropriately stabilized to prevent erosion. See Appendix C, Soil and Erosion Control Plan. The entire perimeter of the substation facility will be fenced. Landscaping will occur for screening purposes, particularly along Martin Luther King, Jr. Drive, as appropriate.

The substation equipment and supporting infrastructure would have a service life of approximately 40 years and would be capable of supporting the forecasted increased demand during this time.

Points of Access

Access to the site will be via Martin Luther King, Jr. Drive with two separate driveways and access gates; one to access the area owned and operated by SNEW and the other to access the separate area operated by CL&P. These gates will be located on the eastern portion of the site, and are accessible from Dr. Martin Luther King, Jr. Drive and a short driveway.

Proposed Clearing

Previously submitted in the Development and Management Plan – Phase One, Vegetation Removal and Soil Remediation.

Sensitive Areas

- A Soil Erosion and Control plan was previously submitted in the Development and Management Plant – Phase Two.
- There are no wetlands or watercourses within or near the project site.
- There are no known critical habitats or areas identified as having rare, endangered, threatened or special concern plant or animal species listed by federal and state governmental agencies.
- There are no underground utilities or resources within the site
- There are no significant environmental, historic or ecological features of local interest.
- There are no public recreation areas or activities within or adjacent to the site.

Landscape Plan

A landscape plan can be found in Appendix C. All landscaping will be conducted outside of the fence of the substation. The plantings include 13 Japanese Flowering Cherries and 45 Green Giant Arborvitaes.

Section IV

Appendix

Appendix A: Figure 1, Site Location Map, USGS

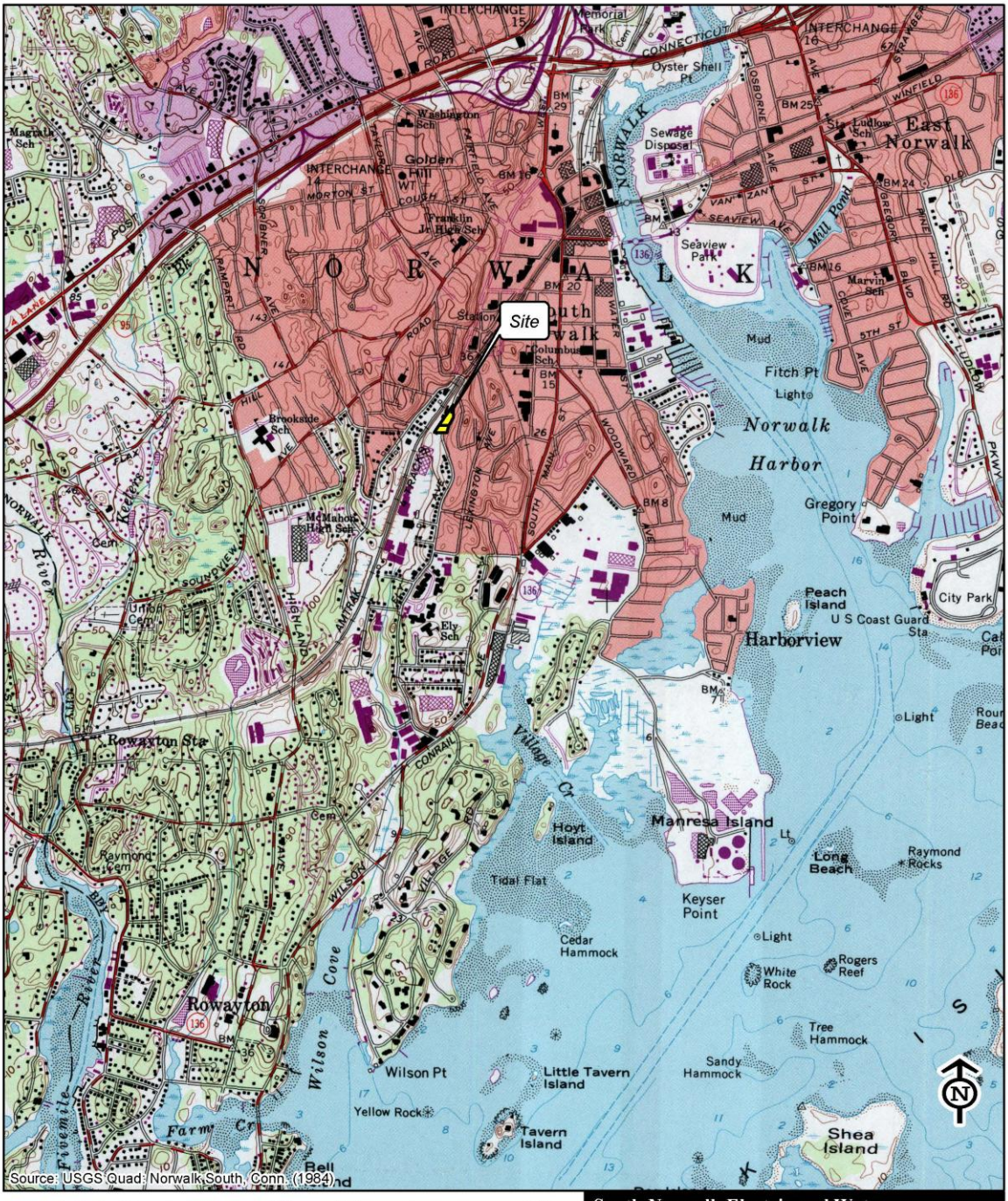


Figure 1
Site Location Map
180-184 Dr. Martin Luther King Jr. Drive
Norwalk, Connecticut

Appendix B: Plan Drawings – CL&P

RDC	REV	DWG #	DESCRIPTION
	A	20322-10000	SITE DEVELOPMENT – INDEX
	A	20322-10001	SITE DEVELOPMENT – LEGEND, NOTES & DETAILS
	A	20322-10002	SITE DEVELOPMENT – GRADING PLAN
	A	20322-10003	SITE DEVELOPMENT – PROFILES
	A	20322-10004	SITE DEVELOPMENT – EXISTING TOPOGRAPHY

PROJECT

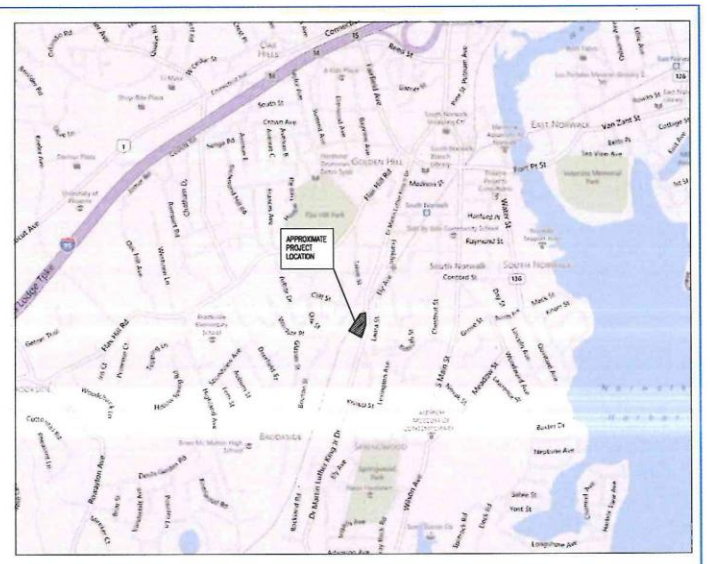
SONO 24P SUBSTATION
180 MARTIN LUTHER KING, JR. DR.
NORWALK, CT

OWNER:

THE CONNECTICUT LIGHT & POWER COMPANY
P.O. BOX 270
HARTFORD, CT 06141-270
(860) 605-5000

PREPARED BY:

COMMONWEALTH ASSOCIATES, INC.
P.O. BOX 1124
JACKSON, MI 49204-1124
(517) 788-3000



LOCUS MAP
1000 0 1000 2000
SCALE IN FEET

PROJECT DESCRIPTION:

THE PROPOSED PROJECT WILL CONSIST OF A NEW 115/13.8kV SUBSTATION CONSTRUCTED ON A CURRENTLY VACANT SITE. THE NEW YARD WILL BE UNDER 'DUAL OWNERSHIP', WITH THE 115kV PORTION BEING OWNED AND OPERATED BY CONNECTICUT LIGHT AND POWER (CL&P) AND THE 13.8kV PORTION BY SOUTH NORWALK ELECTRIC AND WATER (SNEW). THE PLANS, NOTES AND DETAILS CONTAINED HEREIN PERTAIN ONLY TO THE PORTION OWNED BY CL&P.

THE CL&P PORTION OF THE SITE IS ESTIMATED TO BE APPROXIMATELY 18,900 FT² WITH 100% OF THE AREA ANTICIPATED TO BE DISTURBED BY CONSTRUCTION ACTIVITIES. CURRENTLY, 30% OF THIS SURFACE IS CONSIDERED IMPERVIOUS (CONCRETE SLABS AND BITUMINOUS DRIVEWAYS), WITH THE REMAINDER CONSISTING OF AN ESTABLISHED LAWN, GRASSES, BRUSH AND TREES UP TO 20' DIAMETER. THE PROPOSED SUBSTATION LAYOUT WILL REDUCE THE IMPERVIOUS SURFACE AREA TO LESS THAN 10% AND PROVIDE A CRUSHED STONE SURFACE FOR THE REMAINDER. THIS DESIGN WILL RESULT IN A NET REDUCTION OF STORMWATER RUNOFF BEING DISCHARGED TO THE DRAINAGE SWALE ALONG THE METRO NORTH RAILWAY BEYOND THE WEST PROPERTY LINE.

PRIOR TO THE START OF CONSTRUCTION, IT IS SNEW'S RESPONSIBILITY TO CLEAR AND GRUB THE SITE AND REMEDIATE THE EXISTING CONTAMINATED SOILS. CL&P IS NOT RESPONSIBLE FOR ANY SOIL EROSION AND SEDIMENT CONTROL MEASURES DURING THIS INITIAL SITE PREPARATION. AFTER COMPLETING THE REMEDIATION, SNEW WILL THEN PREPARE THE SITE TO A ROUGH GRADE THAT IS ACCEPTABLE TO BOTH PARTIES. IT WILL BE CL&P'S RESPONSIBILITY TO INSTALL THE REQUIRED SOIL AND EROSION CONTROL MEASURES ON SITE AS SOON AS THE ROUGH GRADING IS COMPLETED.

THE MAIN AREA OF CONCERN DURING CONSTRUCTION WILL BE THE METRO NORTH EMBANKMENT AND DRAINAGE SWALE ALONG THE WEST PROPERTY LINE. A SILT FENCE/HAY BALE BARRIER SHALL BE INSTALLED AND MAINTAINED AT THE TOP OF THE EMBANKMENT AS SPECIFIED ON THE DRAWINGS TO FILTER THE RUNOFF UNTIL THE SITE IS STABILIZED. THE FINAL GRADING CONTOURS WERE DEVELOPED WITH THE INTENT OF REQUIRING MINIMAL DISTURBANCE TO THE EXISTING SLOPE. AREAS OF THE SLOPE THAT ARE AFFECTED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.

SITEWORK SCHEDULE:

(WEEK BEGINNING DATES AND DURATION OF ACTIVITIES ARE ESTIMATES AND SUBJECT TO CHANGE)

- XX/XXXX TO XX/XXXX- SITE DECONTAMINATION AND ROUGH GRADING
- XX/XXXX – INSTALLATION OF SOIL EROSION AND SEDIMENT CONTROL MEASURES
- XX/XXXX TO XX/XXXX – INSTALL FOUNDATIONS AND BELOW GRADE CONDUIT
- XX/XXXX TO XX/XXXX – FINISH GRADING
- XX/XXXX –FINAL SITE STABILIZATION

REV A - NEW DRAWING

REVISIONS DURING CONSTRUCTION

NO.	DATE	AS BUILT REVISIONS	BY	CK'D	APP'D	APP'D
A	04/13	NEW SUBSTATION CONSTRUCTION BY CM #0240344201	SWD	GTB	MLW	

Northeast Utilities Service Co.
THE CONNECTICUT LIGHT AND POWER COMPANY

SONO 24P
INDEX
SITE DEVELOPMENT
NORWALK, CT

DRN	SWD (CA)	CHKD	GTB (CA)	APP	MLW (CA)	APP	AK (NU)
DATE	06/28/12	DATE	07/06/12	DATE		DATE	
SCALE	N.T.S.	DES.	E	YOUR WORK IS PRICELESS			
H. SCALE	N.T.S.	V.S.		ALL DIMS.			
CAD PROG. NUMBER				NUMBER	20322-10000		

MAP REF

STA. 1569+49.28

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
METRO - NORTH RAILROAD

MONUMENTED RAILROAD CENTERLINE

CATENARY No. 51.3

CATENARY No. 51.3A

CATENARY No. 51.4

TOP OF CONC. PAD EL. 46.4'

TOP OF CONC. PAD EL. 44.9'

TOP OF CONC. PAD EL. 41.1'

TOP OF CONC. PAD EL. 42.4'

TOP OF CONC. PAD EL. 43.4'

A STRUCTURE

B BREAKER

C STRUCTURE

D STRUCTURE

19'-6"

46'-6"

APPROXIMATE LOCATION OF PROPOSED TRANSMISSION STRUCTURE AND FOUNDATION

APPROXIMATE LOCATION OF PROPOSED TRANSMISSION STRUCTURE AND FOUNDATION

10' REAR YARD SETBACK

20' SLIDING GATE

MONITOR WELL

1 STRUCTURE

2 STRUCTURE

BATTERY & CONTROL ENCLOSURE (WITH BASEMENT)

3 MONITOR WELL

NORWALK UTILITIES SERVICE CO. SOUTH NORWALK ELECTRIC & WATER (TOWN) (GAS NAME 2)

CONTINUATION BY OTHERS

PROPOSED 8' HIGH INTERIOR FENCE (BY N.U.) SEE DWG #20322-11001 FOR DETAILS

PROPOSED 3' WIDE 4" LAYER OF ¾" TRAP ROCK EXTERIOR PERIMETER GRAVEL BASE (TYP.)

PROPOSED WATER SERVICE

PROPOSED 8' HIGH CHAIN LINK PERIMETER FENCE. SEE DWG#20322-11001 FOR FENCE LAYOUT, DETAILS & NOTES.

UNITED PARCEL SERVICE, INC.

RESTRICT GATE SWING TO 90 DEGREES

PROPOSED 3' WIDE 4" LAYER OF ¾" TRAP ROCK GRAVEL SHOULDERS. (TYP.)

SEE NOTE #4

TRANSFORMER

LIGHT

ELEC. DOOR

C. BASIN GRATE ELEV.=28.96'

C. BASIN GRATE ELEV.=28.44'

PROPOSED 20' WIDE PAVED ACCESS DRIVE WITH 30' WIDE APRON.

10' REAR YARD SETBACK

30' FRONT YARD SETBACK

EAGLE

GUIDE RAIL

C. BASIN GRATE ELEV.=27.43'

L-POLE

DR. KING, MARTIN LUTHER, JR. DRIVE

60' R.O.W.

REFERENCE DRAWINGS:

SEE 20322-10000 FOR SITE DEVELOPMENT DRAWING INDEX

GENERAL NOTES (4/24/2012):

1. EXISTING FEATURES BASED ON TOPOGRAPHIC SURVEY BY RYAN AND FAULDS, LLC (REV. 12/22/11) DUE TO ONGOING SOIL REMEDIATION ON SITE, THE EXISTING TOPOGRAPHY IS SUBJECT TO CHANGE.
2. EQUIPMENT LAYOUT AND SITE DEVELOPMENT IN SNEW'S PORTION OF THE SITE BY OTHERS.
3. SITE DEVELOPMENT CONSTRUCTION SHALL CONFORM TO NU SUB 210 REV.2 (9/23/10)
4. WATER METER & VALVE TO BE RELOCATED OUT OF DRIVE ACCESS. LOCATION AND CONNECTION SHALL BE BY OTHERS.

REV A - NEW DRAWING

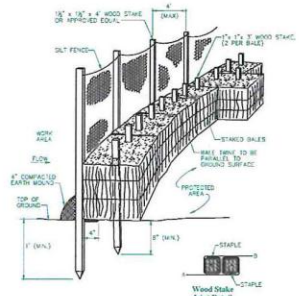
REVISIONS DURING CONSTRUCTION						
A	04/13	NEW SUBSTATION CONSTRUCTION BY CM W.O.#40384201	SWD	CTB	MJM	

Northeast Utilities Service Co.
THE CONNECTICUT LIGHT AND POWER COMPANY

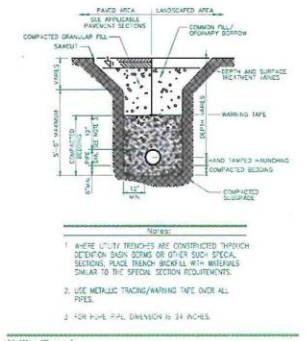
SONO 24P
GRADING PLAN
SITE DEVELOPMENT
NORWALK, CT

DSN	SWD (CA)	CHK	CTB (CA)	APP	MJM (CA)	APP	AR (NU)
DATE	06/18/12	DATE	07/06/12	DATE		DATE	
SCALE	1/32"=1'-0"	SIZE	E	DGN BOOK & PAGE			
H.SCALE	N/A	V.S.		ALL SHTS.			
C. FILE NUMBER				DRWG			20322-10002

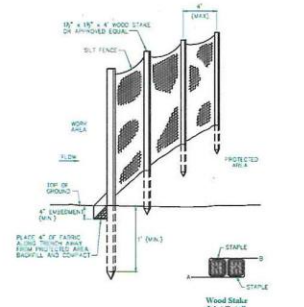
NO.	DATE	AS BUILT REVISIONS	BY	CHK	APP	APP



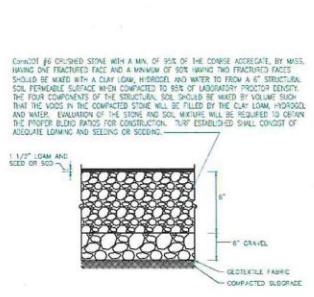
Silt Fence / Hay Bale Barrier
NTS



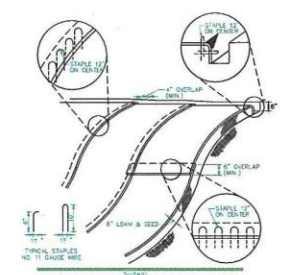
Utility Trench
NTS



Silt Fence Barrier
NTS



Structural Soil for Maintainence Access
NTS



Notes:
1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP MAKING 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN.) OVERLAP AND STAPLE BOTH TOGETHER
5. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
6. EROSION CONTROL BLANKETS SHALL BE USED IN ALL AREAS WHERE SLOPES EXCEED 3:1.

Erosion Control Blanket Slope Installation
NTS

Notes:

GENERAL

1. CONTRACTOR SHALL NOTIFY "CALL BEFORE YOU DIG" (1-800-922-4455) AT LEAST 72 HOURS BEFORE EXCAVATING.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
3. AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) SHALL RECEIVE 6 INCHES LOAM AND SEED.
4. WORK WITHIN THE LOCAL RIGHTS-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN STATE RIGHTS-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
5. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
6. TRAFFIC SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
7. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
8. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
9. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
10. REMOVE MATERIALS FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
11. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR FLOODING DAMAGES, IF ANY, AT NO COST TO OWNER.

UTILITIES

1. THE EXISTING UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR EXACT DATA CONCERNING THE UTILITIES. NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHTS OF WAY.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS DESIGNED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELIEVES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT.
3. SET CATCH BASIN RIMS, AND INVERTS OF SEWERS, DRAINS, AND DITCHES IN ACCORDANCE WITH ELEVATIONS ON THE GRADING AND UTILITY PLANS.
4. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRIC, WATER, FIRE ALARM, ETC.). FINAL DESIGN LOCKS AND LOCATIONS TO BE COORDINATED WITH OWNER AND ARCHITECT.
5. THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR AND SHALL BE RESPONSIBLE FOR PAYING FEES FOR POLE RELOCATION AND FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PRIVATE UTILITIES, WHETHER WORK IS PERFORMED BY CONTRACTOR OR BY THE UTILITIES COMPANY.
6. UTILITY PIPE MATERIALS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:
   A. WATER PIPES SHALL BE SPECIFIED BY THE WATER COMPANY.
   B. SANITARY SEWER PIPES SHALL BE POLYVINYL CHLORIDE (PVC) SEWER PIPE.
   C. STORM DRAINAGE PIPES SHALL BE H-20 LOADING HIGH DENSITY POLYETHELENE PIPE (HDPE), UNLESS OTHERWISE NOTED.
7. SITE CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND SHALL FURNISH EXCAVATION, INSTALLATION, AND BACKFILL OF ELECTRICAL PLANCHED SIDEWORK RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENCASEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.

LAYOUT AND MATERIALS

1. PROPOSED GRANITE BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.
2. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING PAVEMENT ELEVATIONS AT INTERFACE WITH PROPOSED PAVEMENTS, AND EXISTING GROUND ELEVATIONS ADJACENT TO DRAINAGE OUTLETS TO ASSURE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED FACILITIES.
3. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OF LOCATIONS ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
4. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS. AND SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.

DEMOLITION

1. THE CONTRACTOR TO REMOVE AND DISPOSE OF EXISTING MANMADE SURFACE FEATURES WITHIN THE LIMIT OF WORK INCLUDING BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, FENCES, UTILITY POLES, SIGNS, ETC. UNLESS INDICATED OTHERWISE ON THE DRAWINGS. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS, AND UNSUITABLE MATERIAL WITHIN THE PROPOSED BUILDING FOOTPRINT AND TEN FEET BEYOND AND BEYOND PROPOSED EXTERIOR COLUMNS, PER DRAWINGS AND SPECIFICATIONS.
2. EXISTING UTILITIES SHALL BE TERMINATED, IF NOTED ON THE DRAWINGS, IN CONFORMANCE WITH LOCAL, STATE, AND INDIVIDUAL UTILITY COMPANIES' STANDARDS SPECIFICATIONS, AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES.
3. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES, AND STATUTES.

EROSION CONTROL

1. THE EROSION AND SEDIMENT CONTROLS SHALL BE EMPLOYED BY THE CONTRACTOR DURING THE EARTH-WORK AND CONSTRUCTION PHASES OF THE PROJECT IN ACCORDANCE WITH THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION 2002 CONNECTICUT GUIDELINE FOR SOIL EROSION AND SEDIMENT CONTROL.
2. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
3. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
4. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
5. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
6. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.

EXISTING CONDITIONS INFORMATION

1. THE PROPERTY LINES SHOWN AND EXISTING CONDITIONS ARE BASED UPON TOPOGRAPHIC SURVEY PREPARED FOR THE SECOND TAXING DISTRICT AND CITY OF NORWALK PREPARED BY RYAN AND TALBOT, DATED: 10/22/11
2. EXISTING UNDERGROUND UTILITY LOCATIONS AND DETAILS SHALL BE PROVIDED BY THE LOCAL MUNICIPALITY. ONCE RECEIVED, THE RELEVANT INFORMATION SHALL BE INCLUDED ON THESE DRAWINGS.
3. PROPERTY LOCATED IN FLOOD ZONE X AS DEPICTED ON FEMA FLOOD INSURANCE RATE MAP EFFECTIVE JUNE 18, 2010 REFERENCE COMMUNITY #090013, PANEL #0033 F. THE NEAREST 100-YEAR FLOOD ZONE IS LOCATED APPROXIMATELY 0.4 MILES FROM THE PROJECT LOCATION.
4. THE PROJECT SITE IS NOT WITHIN A REGULATED WETLAND AREA AS DEPICTED ON THE INLAND WETLAND AND WATERCOURSES MAP FOR NORWALK, CONNECTICUT, EFFECTIVE FEBRUARY 1, 2013.

Legend

EXIST.	PROP.	
		PROPERTY LINE
		RIGHT-OF-WAY/PROPERTY LINE
		BUILDING SETBACK
10+00	10+00	BASELINE
•	•	BOLLARD
		WIRE FENCE
		STOCKADE FENCE
		STONE WALL
		HAY BALES
		SILT FENCE
4	4	MINOR CONTOUR
20	20	MAJOR CONTOUR
		CONCRETE
33.75	33.75	SPOT ELEVATION
	MW	MONITORING WELL
12"S	12"S	SEWER
6"W	6"W	WATER
CB	CB	CATCH BASIN
CO	CO	CLEANOUT
WV	WV	WATER VALVE & BOX
WM	WM	WATER METER
		TRANSFORMER PAD
		UTILITY POLE
		GUY POLE
		GUY WIRE & ANCHOR

Abbreviations

GENERAL

ABAN	ABANDON
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
BIT	BITUMINOUS
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
CONC	CONCRETE
DYCL	DOUBLE YELLOW CENTER LINE
EL	ELEVATION
ELEV	ELEVATION
EXIST	EXISTING
FDN	FOUNDATION
FFE	FIRST FLOOR ELEVATION
GRAN	GRANITE
GTD	GRADE TO DRAIN
LA	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PERM	PERFORATED
PROP	PROPOSED
REM	REMOVE
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE
TS	TOP OF SLOPE
TYP	TYPICAL

UTILITY

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
DCB	DOUBLE CATCH BASIN
DMH	DRAIN MANHOLE
DIP	DUCTILE IRON PIPE
CONDO	CONDUIT
EIP	ELECTILE IRON PIPE
FES	FLARED END SECTION
FM	FORCE MAIN
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
GI	GUTTER INLET
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT ELEVATION
I=	INVERT ELEVATION
LP	LIGHT POLE
MES	METAL END SECTION
PWW	PAVED WATER WAY
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
R=	RIM ELEVATION
SMH	SEWER MANHOLE
TV	TAPPING SLEEVE, VALVE AND BOX
UG	UNDERGROUND
UP	UTILITY POLE

REV A - NEW DRAWING

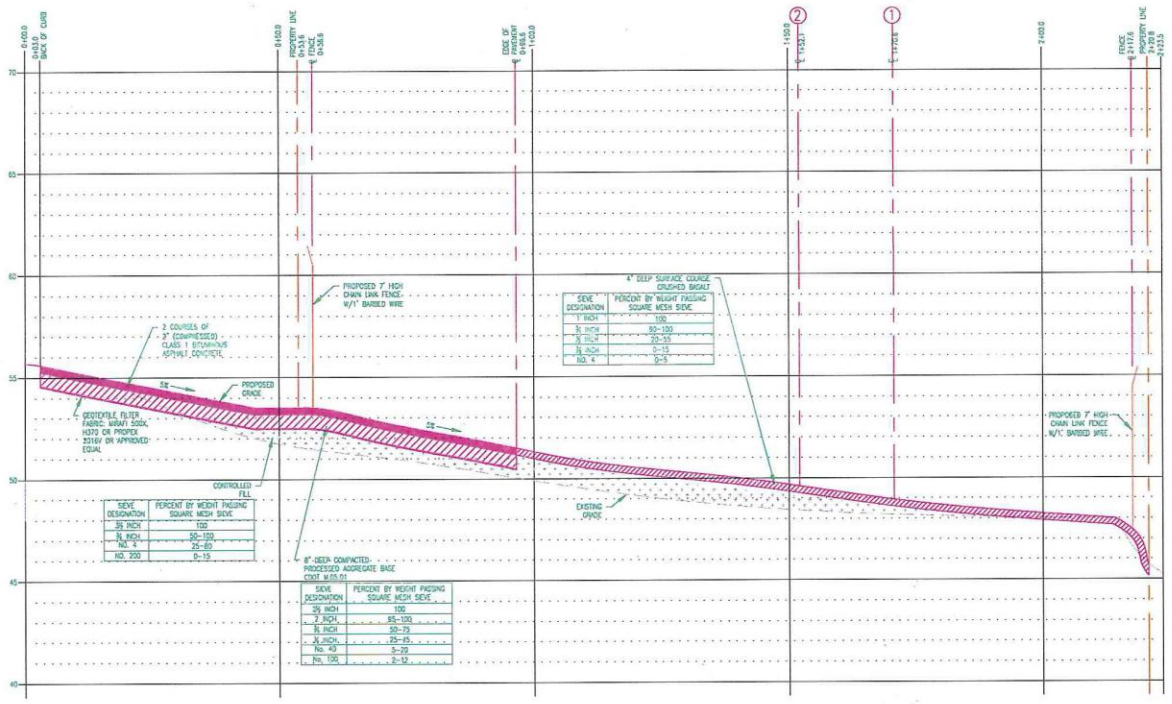
REVISIONS DURING CONSTRUCTION					
A	04/13	NEW SUBSTATION CONSTRUCTION BY CN W.O.#03361201	SMD	CTB	MJW

Northeast Utilities Service Co.
THE CONNECTICUT LIGHT AND POWER COMPANY

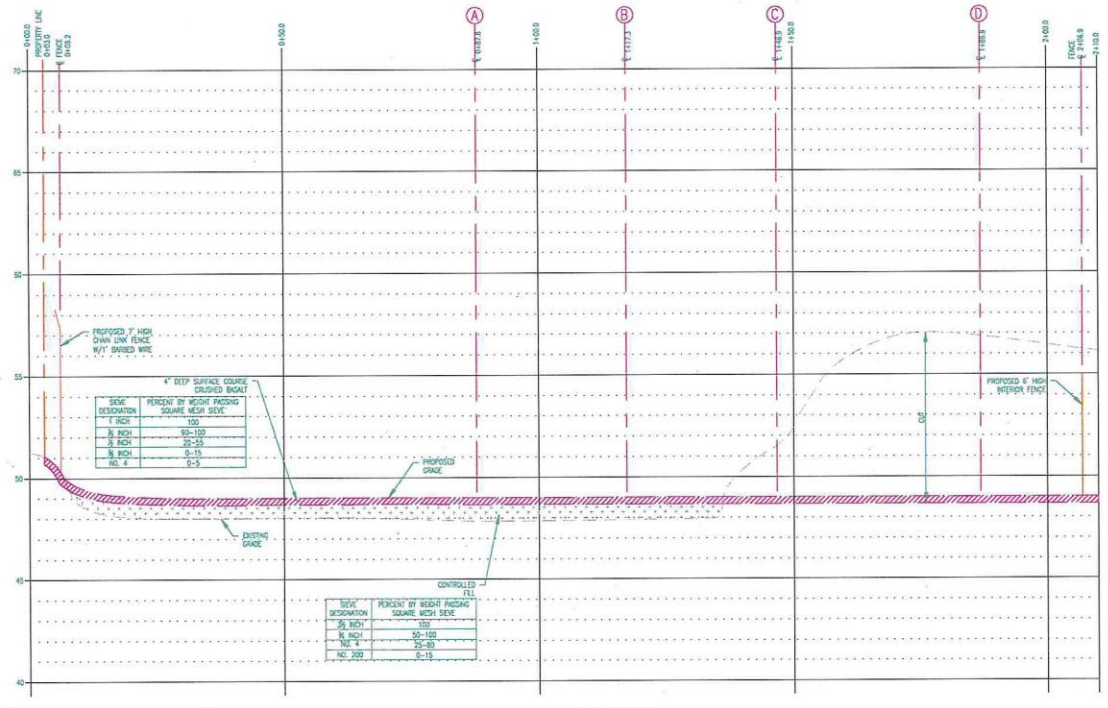
SONO 24P
LEGEND, NOTES & DETAILS
SITE DEVELOPMENT
NORWALK, CT

DES	SMD (DA)	DRN	CTB (DA)	CHK	MJW (DA)	APP	AK (NG)
DATE	06/11/12	DATE	07/09/12	DATE		DATE	
H SCALE	N.T.S.	SIZE	E	FILE NAME & PATH			
V SCALE	N.T.S.	SHT		ALL DWG			
NU PROJ NUMBER				PROJID	20322-10001		

REV	DATE	AS BUILT REVISIONS	BY	CHK	APP



PROFILE #1
ACCESS ROAD



PROFILE #2
YARD CUT

REFERENCE DRAWINGS:

SEE 20322-10000 FOR SITE DEVELOPMENT DRAWING INDEX

REV A - NEW DRAWING

REVISIONS DURING CONSTRUCTION					
A	04/13	NEW SUBSTATION CONSTRUCTION BY CM W.O.#43364201	SMD	GTB	MJM

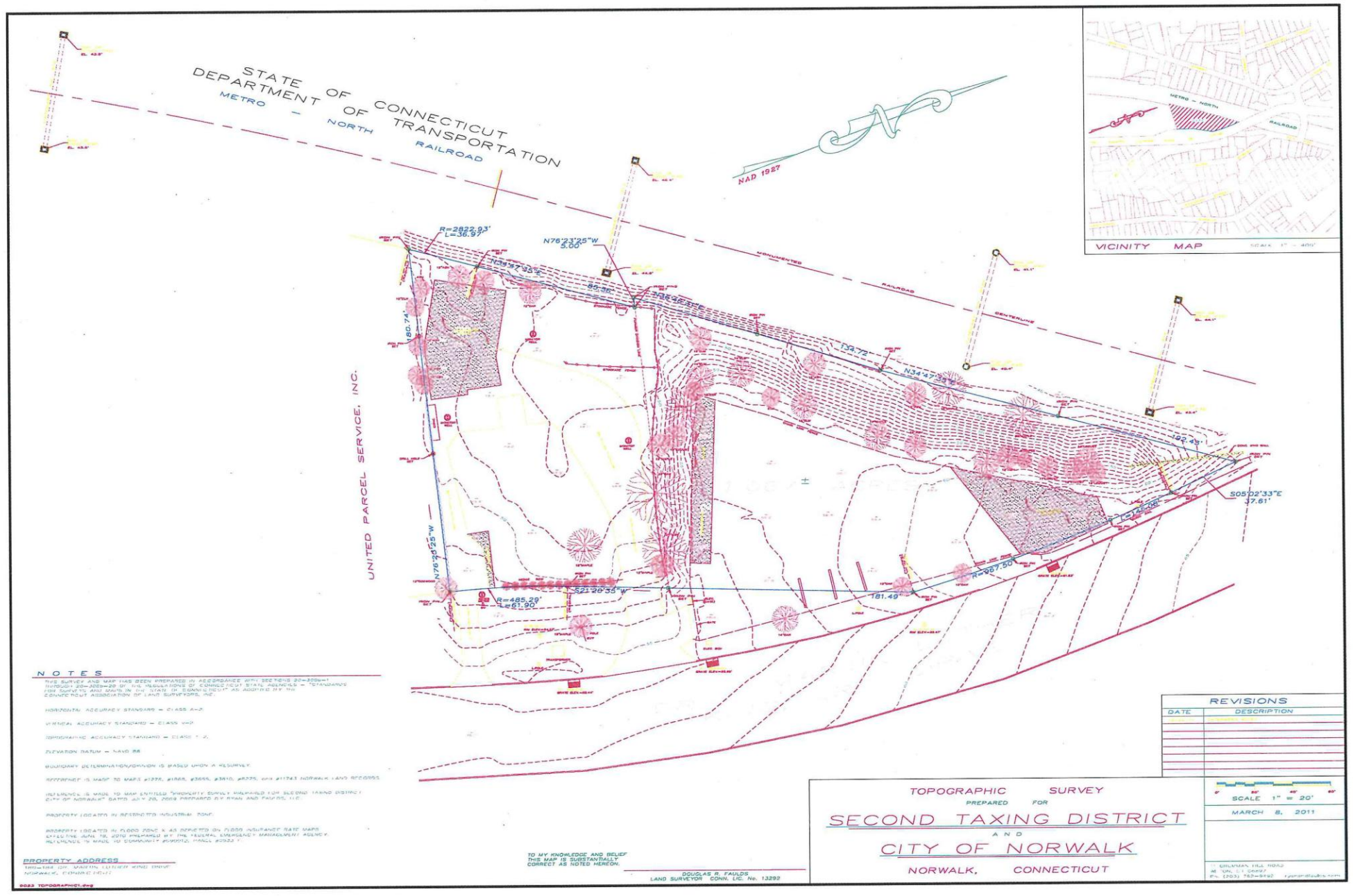
Northeast Utilities Service Co.
THE CONNECTICUT LIGHT AND POWER COMPANY

SONO 24P
PROFILES
SITE DEVELOPMENT
NORWALK, CT

BY	CHK	APP	BY	CHK	APP
MBP (DK)			CTB (DK)		
DES.			MJM (DK)		
DRN.			AK (NJ)		
CHK.					
APP.					
DATE	06/13/12		DATE	07/05/13	
SCALE	3/32" = 1'-0"		SHT.	E	
SCALE	3/8" = 1'-0"		TOTAL SHTS.		
ALL WELL NUMBERS			ALL DWG. NUMBER		

20322-10003

NO.	DATE	AS BUILT REVISIONS



NOTES

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THROUGH 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC.

HORIZONTAL ACCURACY STANDARD = CLASS A-2

VERTICAL ACCURACY STANDARD = CLASS VT-2

ORTHOMETRIC ACCURACY STANDARD = CLASS T-2

ELEVATION DATUM = NAVD 88

BOUNDARY DETERMINATION/OPINION IS BASED UPON A RESURVEY.

APPARENT IS MAP TO MAPS #1338, #1868, #3665, #3810, #8335, and #11743 NORWALK LAND RECORDS.

REFERENCE IS MADE TO MAP ENTITLED "PROPERTY SURVEY PREPARED FOR SECOND TAXING DISTRICT CITY OF NORWALK DATED JULY 28, 2008 PREPARED BY RYAN AND FAULDS, LLC

PROPERTY LOCATED IN RESTRICTED INDUSTRIAL ZONE.

PROPERTY LOCATED IN FLOOD ZONE X AS DEFINED ON FLOOD INSURANCE RATE MAPS EFFECTIVE JUNE 18, 2010 PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY. REFERENCE IS MADE TO COMMUNITY PANEL NO. 0252 F

PROPERTY ADDRESS

TRAFFIC DR. NORTH (LOWER END) DRIVE
NORWALK, CONNECTICUT

0223 TOPOGRAPHIC1.dwg

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

DOUGLAS R. FAULDS
LAND SURVEYOR CONN. LIC. No. 13292

REVISIONS

DATE	DESCRIPTION

TOPOGRAPHIC SURVEY
PREPARED FOR
SECOND TAXING DISTRICT
AND
CITY OF NORWALK
NORWALK, CONNECTICUT

SCALE 1" = 20'
MARCH 8, 2011

GRAHAM HILL ROAD
SUITE 1-1, SHARON, CT 06069
PH. (203) 797-8192 rfaulds@snet.net

REV A - NEW DRAWING

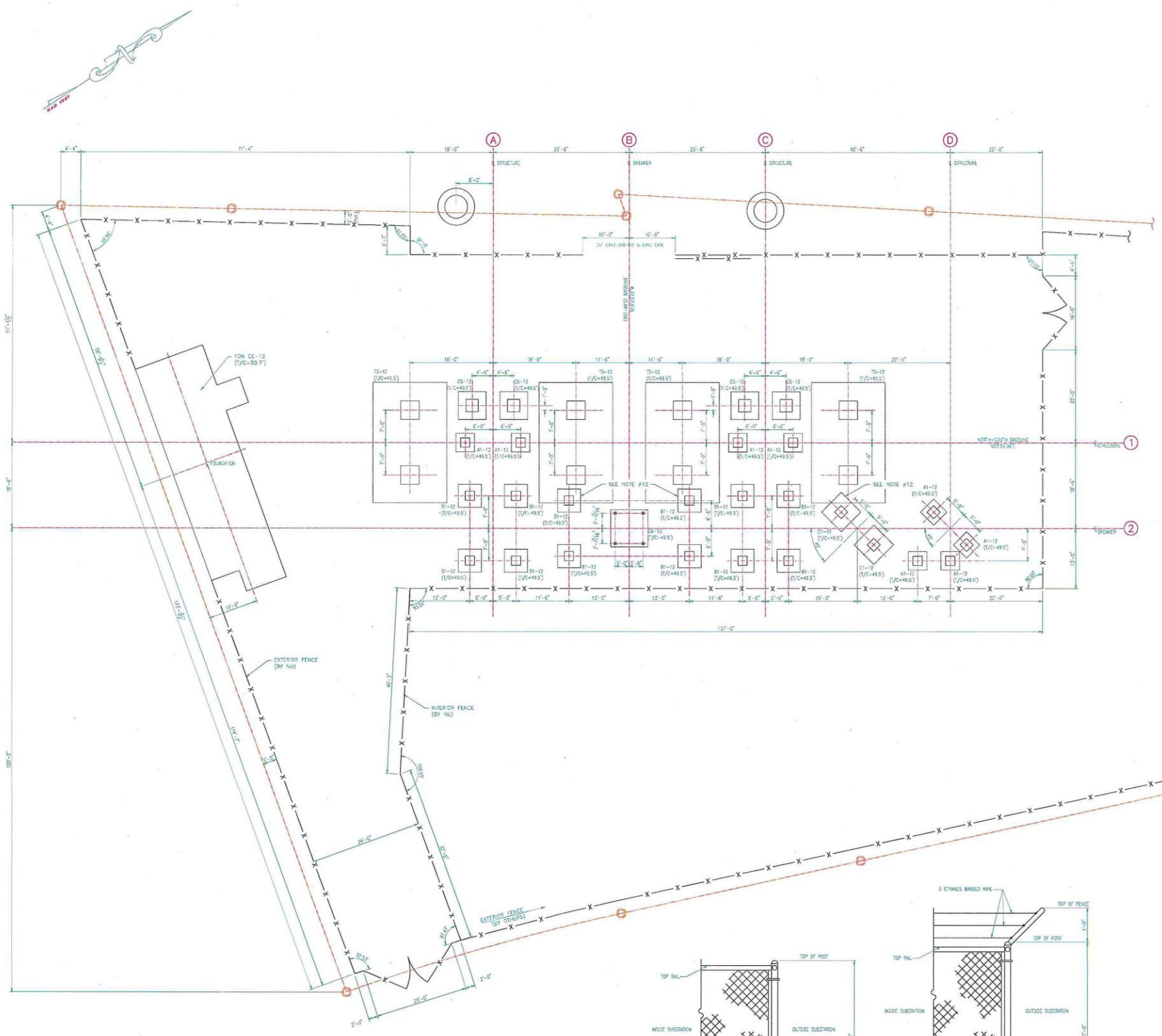
REVISIONS DURING CONSTRUCTION					
A	04/13	NEW SUBSTATION CONSTRUCTION BY CM W.O.#40394201	SNO	STB	MJK

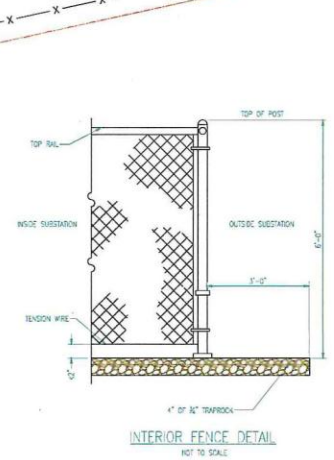
Northeast Utilities Service Co.
THE CONNECTICUT LIGHT AND POWER COMPANY

SONO 24P
EXISTING TOPOGRAPHY
SITE DEVELOPMENT
NORWALK, CT

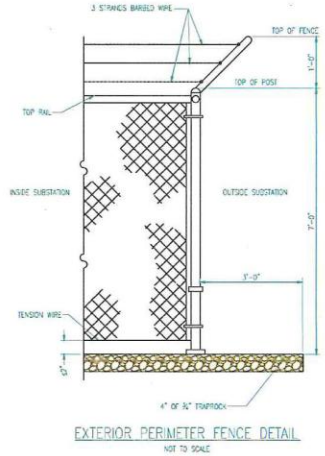
BY	SNO (CA)	CHKD	STB (CA)	APP	MJK (EA)	APP	AK (NU)
DATE	06/28/12	DATE	07/06/12	DATE		DATE	
D-SIZE	1" = 20'	REF	S	FILE NAME & PATH			
A-SIZE	N.T.S.	SCALE		ALT. SIZE			
ALT. PROJ. NUMBER				NUMBER	20322-10004		

NO.	DATE	AS BUILT REVISIONS	BY	CHK.	APP.	APP.





INTERIOR FENCE DETAIL
NOT TO SCALE



EXTERIOR PERIMETER FENCE DETAIL
NOT TO SCALE

GENERAL FOUNDATION NOTES:

1.) FOUNDATIONS SHALL BE BUILT IN ACCORDANCE WITH THE ACI STANDARD "SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301 EDITION IN EFFECT AT THE TIME OF REVISION)

2.) FOUNDATIONS DESIGNED IN ACCORDANCE WITH THE ACI STANDARD "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (LATEST ACI 318 EDITION IN EFFECT AT THE TIME OF REVISION)

3.) UNLESS NOTED OTHERWISE, CONCRETE SHALL DEVELOP MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI IN 28 DAYS AND SHALL CONTAIN 5%-7% AIR ENTRAINMENT.

4.) REINFORCING STEEL SHALL BE BILLET STEEL DEFORMED BARS CONFORMING TO ASTM A615-GRADE 60.

5.) PROVIDE 1/8" MINIMUM CHAMFER AT ALL HORIZONTAL EXPOSED EDGES.

6.) MINIMUM COVER FOR REINFORCING BARS:
   A) ADJACENT TO ALL FORMS EXCEPT TOP FORMS=2"
   B) ADJACENT TO EDF SURFACES FORMED ON NONFORMED=3"
   C) BOTTOM SURFACES=3"

7.) REINFORCING SHALL BE EQUALLY SPACED UNLESS SHOWN OR NOTED. MINIMUM CLEAR DISTANCE BETWEEN BARS = 1".

8.) EXCAVATE/REMOVE UNSUITABLE, UNSTABLE OR UNCONSOLIDATED MATERIALS AND COMPACT ANY ADDED FILL OR SUBGRADE AS NECESSARY. COMPACTION OF FILL IS TO BE PERFORMED IN 6" LIFTS.

9.) UNLESS NOTED OTHERWISE, FOOTINGS SHALL BE PLACED ON NATURAL INORGANIC SOILS OR ON CONTROLLED FILL TO OBTAIN A 4 KSF PSF BEARING CAPACITY. CONTROLLED FILL SHALL BE IN ACCORDANCE WITH NU SUB 215.

10.) SEE CALCULATION 20322-12-FDC-40380201-FDN-01-001 ADDITIONAL INFORMATION FOR W.O.#40380201(D).

11.) DRAWINGS ARE BASED UPON THE LATEST AVAILABLE INFORMATION SUPPLIED BY NU (THE OWNER) TO THE ENGINEER (CEA). IF NECESSARY, FINAL MANUFACTURER DRAWINGS/DATA ARE TO BE SUPPLIED BY THE OWNER TO, AND SUBSEQUENTLY EVALUATED BY, THE ENGINEER.

12.) OVERLAPPING FOUNDATIONS SHALL BE FORMED AND POURED MONOLITHICALLY WITH REINFORCEMENT PLACED AS SHOWN ON THE FOUNDATION DETAILS.

FENCE NOTES:

1.) FENCE POSTS SHALL BE SPACED NOT TO EXCEED 10'-0" ON CENTER, AS MEASURED AT THE FENCE LINE PARALLEL TO THE GROUND.

2.) FENCE POSTS SHALL BE OF SUFFICIENT LENGTH TO ENSURE A MINIMUM OF 36" EMBEDMENT INTO THE FOUNDATION.

3.) EACH GATE, CORNER, PULL AND END POST SHALL HAVE POST BRACES.

4.) CONCRETE SHALL DEVELOP MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI. ROPS SHALL BE CROWNED TO SHED WATER.

5.) FOUNDATIONS SHALL BE 42" DEEP EXCEPT FOR GATE POSTS WHICH WILL BE NO LESS THAN 54" DEEP.

6.) LINE POST FOUNDATIONS SHALL BE 9" IN DIAMETER.

7.) END AND CORNER POSTS FOUNDATIONS SHALL BE 12" IN DIAMETER.

8.) GATE POST FOUNDATIONS SHALL BE A MINIMUM OF THREE (3) TIMES THE OUTSIDE DIAMETER OF THE GATE POST. TWO POST FOUNDATIONS MAY BE COMBINED BETWEEN DOUBLE GATES.

9.) FENCE SHALL BE DESIGNED PER NU SUB 615 REV. 6. SEE NU SUB 115 REV. 2 FOR PROCUREMENT SPECIFICATIONS & NU SUB 215 REV. 1 FOR CONSTRUCTION SPECIFICATIONS.

REFERENCE:

- DWG# 20222-33002 - 115kV YARD ARRANGEMENT
- DWG# 20222-11002 - FOUNDATION DETAILS
- DWG# 20222-11003 - FOUNDATION DETAILS
- DWG# 20323-11004 - FOUNDATION DETAILS

REV A NEW DRAWING

REVISIONS DURING CONSTRUCTION					
A	04/13	NEW SUBSTATION CONSTRUCTION BY CN W.O.#40380201	MBP	GTB	MJW

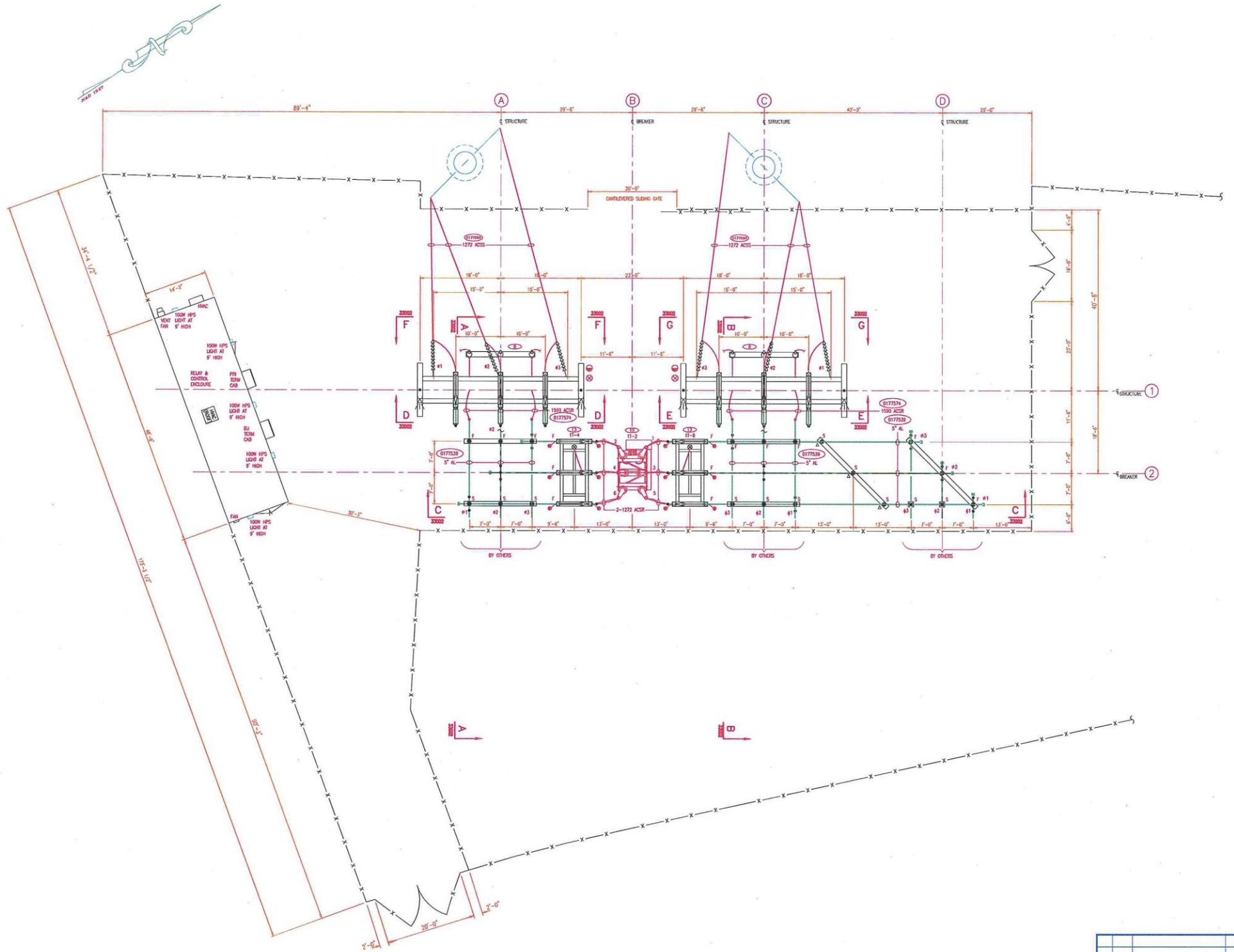
NO.	DATE	AS BUILT REVISIONS	BY	CHK	APP	APP

Northeast Utilities Service Co.
CONNECTICUT LIGHT & POWER COMPANY

SONO 24P
115kV YARD FOUNDATION PLAN
CIVIL PLAN & DETAILS
NORWALK, CT

BY	MBP (CA)	CHK	GTB (CA)	APP	MJW (CA)	APP	AK (NU)
DATE	02/12	DATE	02/12	DATE		DATE	
H-SCALE	1/8" = 1'-0"	DR	E	FIELD BOOK & PAGES			
V-SCALE	N/A	CK		A.C. DWG.			
U.G. DWG. NUMBER				NUMBER			20322-11001

PHASING KEY		
1	2	3
A	B	C
G	R	W



GENERAL NOTES:

1. USE STAINLESS STEEL HARDWARE ON ALL BOLTED ELECTRICAL CONNECTIONS.
2. USE GALVANIZED STEEL HARDWARE FOR ALL ELECTRICAL EQUIPMENT MOUNTING BOLTS.
3. ALL BOLTS SHALL ENGAGE A MINIMUM OF FOUR FULL THREADS FOR ELECTRICAL CONNECTIONS AND EQUIPMENT MOUNTING.
4. BOLTING HARDWARE SHALL BE TORQUED AS FOLLOWS:

DIA.	NON-LUBRICATED STEEL & BRONZE	LUBRICATED METALS & ALUMINUM
3/8"	20 FT-LBS	14 FT-LBS
1/2"	45	25
5/8"	55	40
3/4"	70	60

5. ALL BUS COUPLERS SHALL BE LOCATED THE MIDDLE 1/3 OF EACH SPAN.
6. ON ALL TWIN CABLES (1272 OR 954 ACSR, 8" CABLE SPACERS WILL BE USED EVERY 5'-6" TO 6'-6". WHERE A SHORT TWIN CABLED CONNECTION IS USED, ONE SPACER WILL BE PLACED AT THE MIDPOINT FOR CONNECTIONS TO BUSHINGS OF TRANSFORMER OR CIRCUIT BREAKER MAXIMUM LENGTH OF UNSUPPORTED CABLE WILL BE 12'-0".
7. FOR BUS LENGTHS EXCEEDING 25'-0" BETWEEN SUPPORTS, INSERT 795 ACSR IN 5" BUS AND 556.5 ACSR IN 4" BUS. SCRAP CABLE RECOMMENDED. TACK WELD AT LEAST ONE END OF TWIN CABLE TO THE INSIDE OF TWIN BUS.
8. FOR BUS LENGTHS EXCEEDING 15'-0" BETWEEN SUPPORTS, DRILL (3) 1/4" MTEP HOLES, MIDDLE HOLE DEAD CENTER BETWEEN SUPPORTS, ONE OTHER TWO HOLES 18" EACH SIDE OF THE CENTER HOLE.

LEGEND

- F,R — FIXED CONNECTION OR RIGID BUS SUPPORT
- S — SLIP BUS SUPPORT
- DISCONNECT SWITCH MANUAL OPERATING MECHANISM
- DISCONNECT SWITCH GROUND SWITCH MANUAL OPERATING MECHANISM
- HIGH STRENGTH INSULATOR
- OUTDOOR LIGHT, 100W HPS
- OUTDOOR LIGHT, 100W HPS OR 100W QUARTZ
- 250W YARD LIGHT
- GROUND STUD
- XXXX — ITEM NUMBER
- 33000 (SEE 3) — DRAWING NUMBER AND DETAIL NUMBER

REFERENCE:
- BINDI 20322-33002 - 115KV YARD ARRANGEMENT

REV A - NEW DRAWING

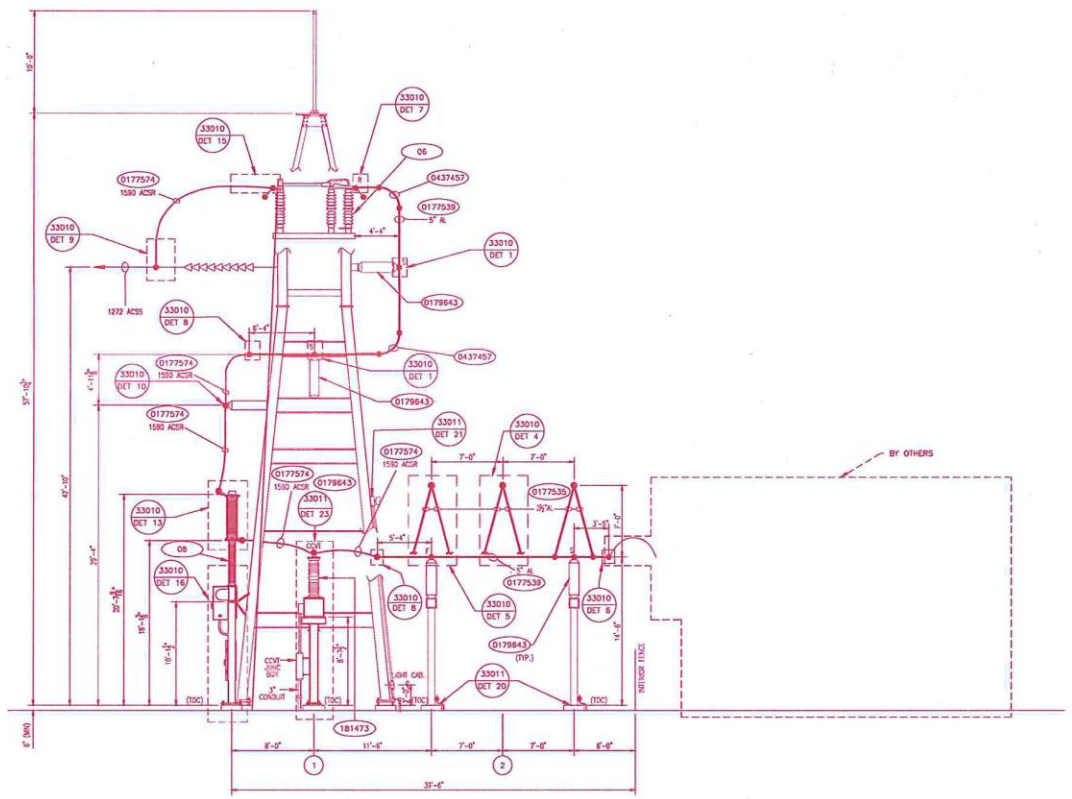
REVISIONS DURING CONSTRUCTION					
A	06/12	NEW SUBSTATION CONSTRUCTION BY CHL NO.#20394201			JEK/DAH/DW/CH/ DSL/CH

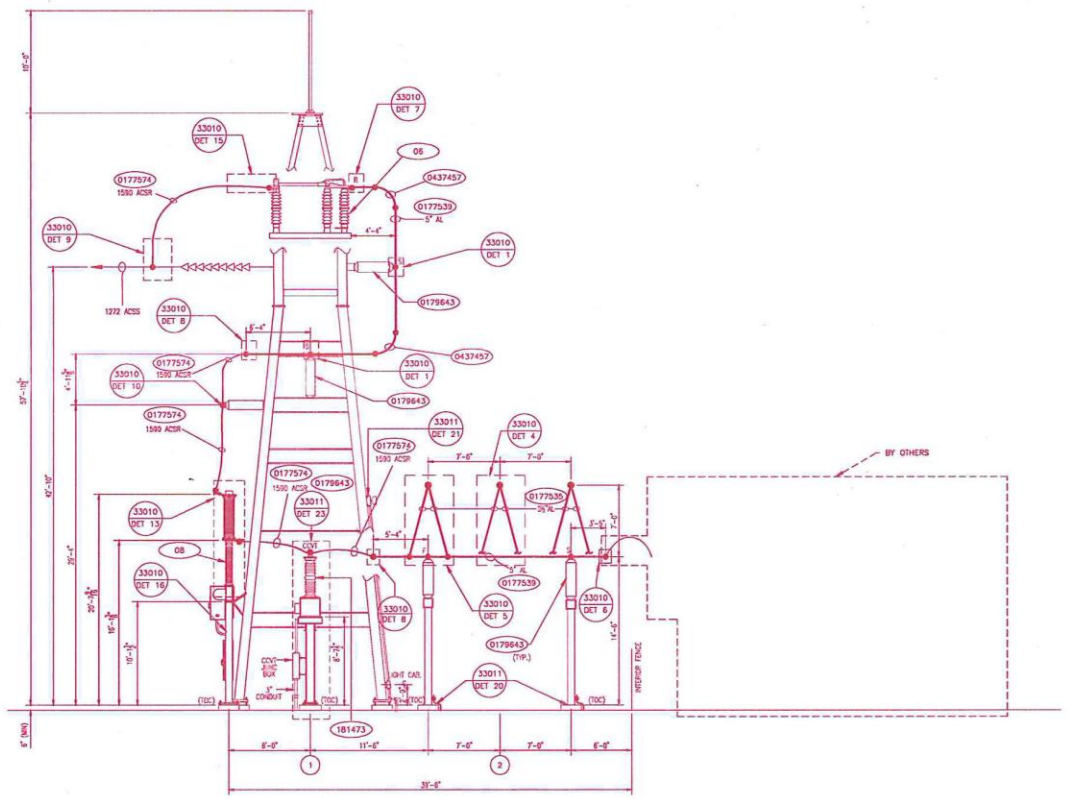
Northeast Utilities Service Co.
CONNECTICUT LIGHT & POWER COMPANY

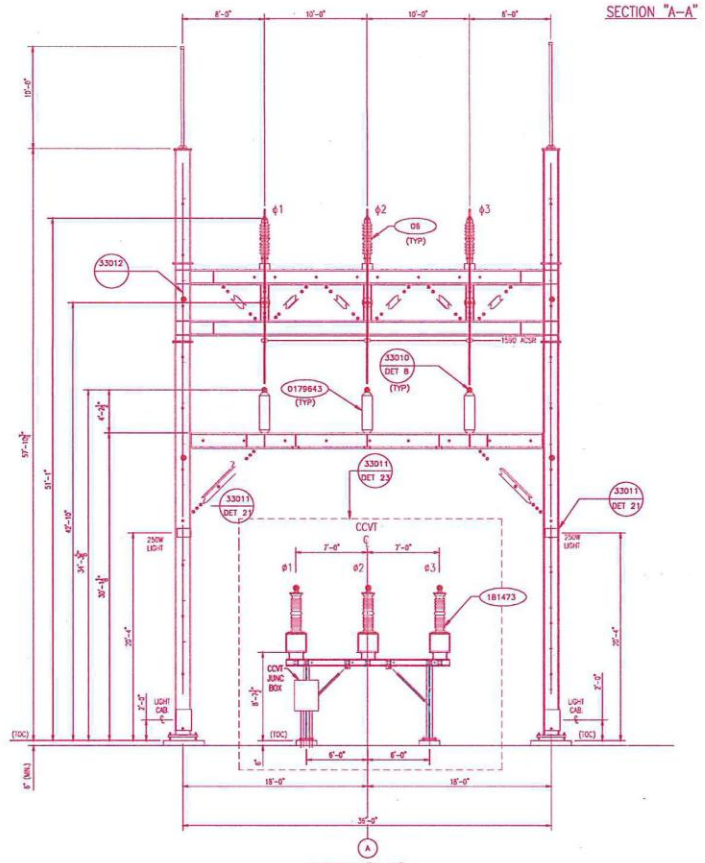
SONO 24P
115kV YARD ARRANGEMENT PLAN VIEW
PLAN VIEW
NORWALK, CT

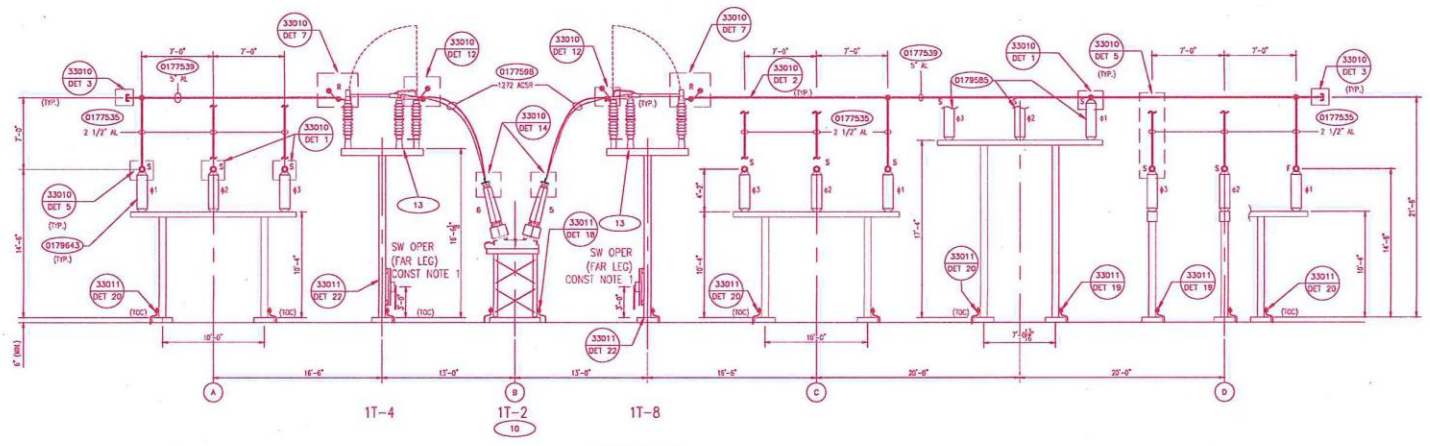
BY	JEK/CH	DWG/CH	APP	DSL	APP
DATE	05/22/12	DATE 07/06/12	DATE	06/01/12	DATE
SCALE	1/8" = 1'-0"	SIZE E	FILE NAME & PATH		
SCALE	1/8" = 1'-0"	SIZE	ELEC. DWG. NO.		
ALL PROJ. NUMBERS				20322-33001	

REV #	REV DATE	ASSIGNABILITY #1 / ASSIGNABILITY #2	REV BRIEF DESCRIPTION	APPR
001	06/12	AS BUILT REVISIONS	JEK / DAH / JEK	JEK









REFERENCE:
- DWG# 20322-33001 – 115kV YARD ARRANGEMENT PLAN VIEW
- DWG# 20322-33010 – ELECTRICAL DETAILS 1-16
- DWG# 20322-33011 – ELECTRICAL DETAILS 17-23

REVISIONS DURING CONSTRUCTION					
DOC#	DOC DATE	TITLE '#0		DOC#	DOC APP'D

Northeast Utilities Service Co.
CONNECTICUT LIGHT & POWER COMPANY

SONO 24P
115kV YARD ARRANGEMENT SECTIONS A-A TO C-C
SECTION VIEW
NORWALK CT

BY	AE/EJA	CHK'D	DWG/CH	APP	DSL	APP
DATE	05/22/12	DATE	07/06/12	DATE	08/09/12	DATE
1=30SC	N.T.S.	SIZE	E	FILE SIZE & PAGES		
1=10SC	N.T.S.	ALT.		ALL SHT.		
ALL FILL NUMBERS				DRAWING	20322-33002	

REV #	REV DATE	AS-BUILT TITLE #1 AS-BUILT TITLE #2 AS BUILT INFORMATION	REV BY	CHK'D	APP'D	APP'D
NO.	DATE		BY	CHK	APP	APP

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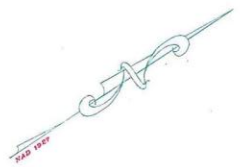
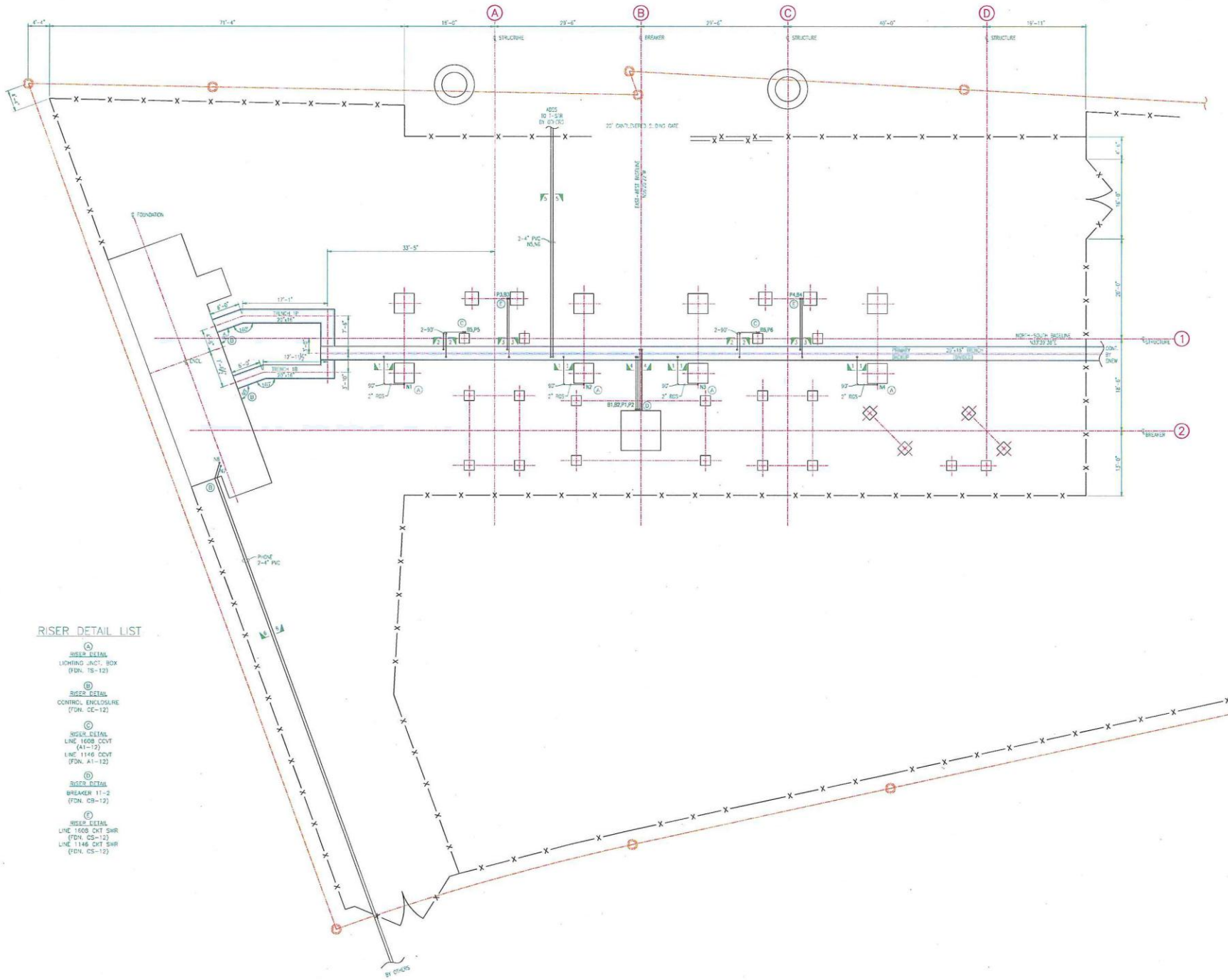




NU VER 02/2012

RISER DETAIL LIST

Ⓐ
RISER DETAIL
LIGHTING JNCT. BOX
(FDN. TS-12)

Ⓑ
RISER DETAIL
CONTROL ENCLOSURE
(FDN. CE-12)

Ⓒ
RISER DETAIL
LINE 1608 CCVT
(A1-12)
LINE 1146 CCVT
(FDN. A1-12)

Ⓓ
RISER DETAIL
BREAKER 11-2
(FDN. CB-12)

Ⓔ
RISER DETAIL
LINE 1608 CKT SWR
(FDN. CS-12)
LINE 1146 CKT SWR
(FDN. CS-12)

NOTES:

1) ALL TRENCH IS HS20 ROAD RATED TRENCH UNLESS OTHERWISE NOTED. NOMINAL INTERIOR DIMENSIONS SHALL BE 20" WIDE x 16" HIGH.
2) TRENCH DIVIDER, WHERE SPECIFIED, SHALL PROVIDE PHYSICAL, ELECTRICAL & FIRE SEPARATION BETWEEN PRIMARY & BACKUP CABLES.
3) ALL CONDUIT IS TO BE BURIED A MINIMUM OF 24" BELOW FINISHED GRADE UNLESS OTHERWISE NOTED.
4) ALL CONDUIT IS TO BE HOT DIP GALVANIZED RIGID STEEL CONDUIT PER NU STANDARDS UNLESS OTHERWISE NOTED.
5) ALL CONDUIT TO BE 3"ø CONDUIT UNLESS OTHERWISE NOTED.
6) ALL RISERS TO EQUIPMENT SHALL BE A 90° STEEL BEND AND TO EXTEND 6" ABOVE GRADE WITH STEEL UNLESS OTHERWISE NOTED.
7) THIS DRAWING IS BASED UPON THE LATEST AVAILABLE INFORMATION SUPPLIED BY NU (THE OWNER) TO THE ENGINEER (CAI). FINAL MANUFACTURERS DRAWINGS/DATA ARE TO BE SUPPLIED BY THE OWNER TO, AND SUBSEQUENTLY EVALUATED BY, THE ENGINEER. THEREFORE THIS DRAWING MAY BE SUBJECT TO CHANGE BEFORE "HOLDS" CAN BE REMOVED BY THE ENGINEER, AS APPLICABLE.

REFERENCE:

- DWG# 20322-11001 - 115kV FOUNDATION PLAN
- DWG# 20322-33007 - CONDUIT SECTIONS & DETAILS
- DWG# 20322-33009 - TERMINATION CABINET TO TRENCH SLEEVES
- DWG# 20322-37001 - CONDUIT & CABLE SCHEDULES

REV A NEW DRAWING

REVISIONS DURING CONSTRUCTION

A	04/13	NEW SUBSTATION CONSTRUCTION BY CAI W.O.#40384201	MBP	DSL	MLM

NO.	DATE	AS BUILT REVISIONS	BY	CHK	APP	APP

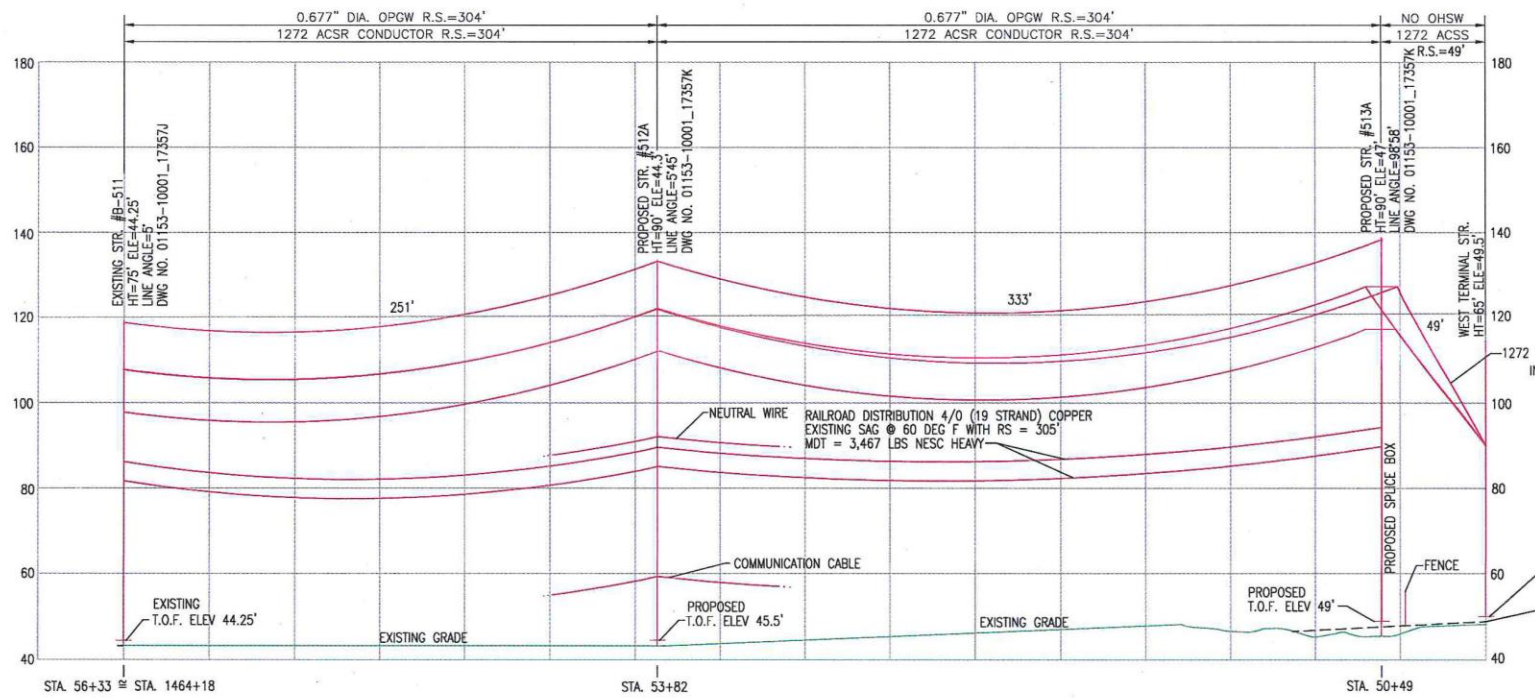
Northeast Utilities Service Co.

FOR CONNECTICUT LIGHT & POWER COMPANY

SONO 24P
CONDUIT PLAN
PLAN VIEW
NORWALK, CT

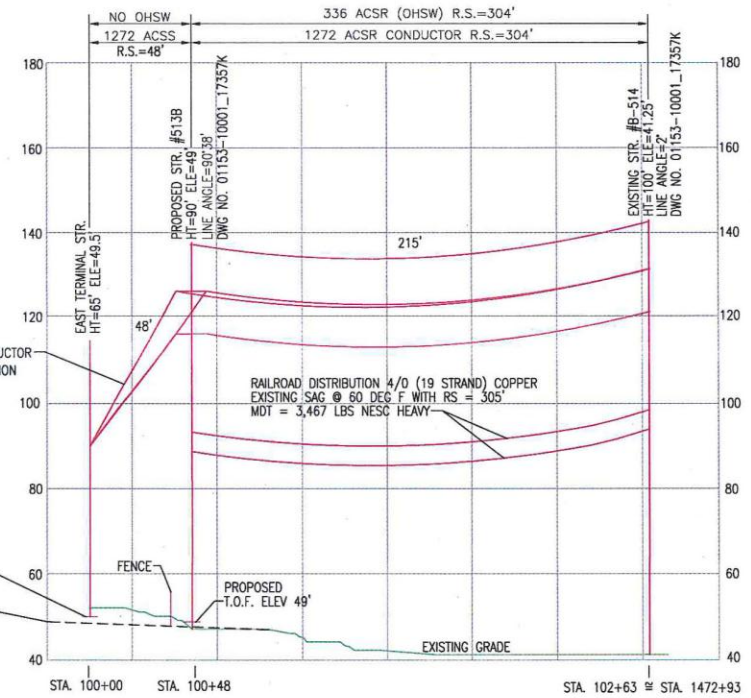
BY MBP (CAI)	CHKD DSL (CAI)	APP MLM (CAI)	APP AK (NU)
DATE 07/12	DATE 07/12	DATE	DATE
H-SCALE 1/8" = 1'-0"	SIZE E	FIELD BOOK & PAGES	
V-SCALE N/A	V.S.	R.E. DWG	
R.E. PROJ. NUMBER		NUSCO 20322-33005	

8/5/2013 3:56 PM - nmcnamara - C:\Users\NMcnamara\Desktop\PDFConversion\20322-33005.dwg - REV A Additions



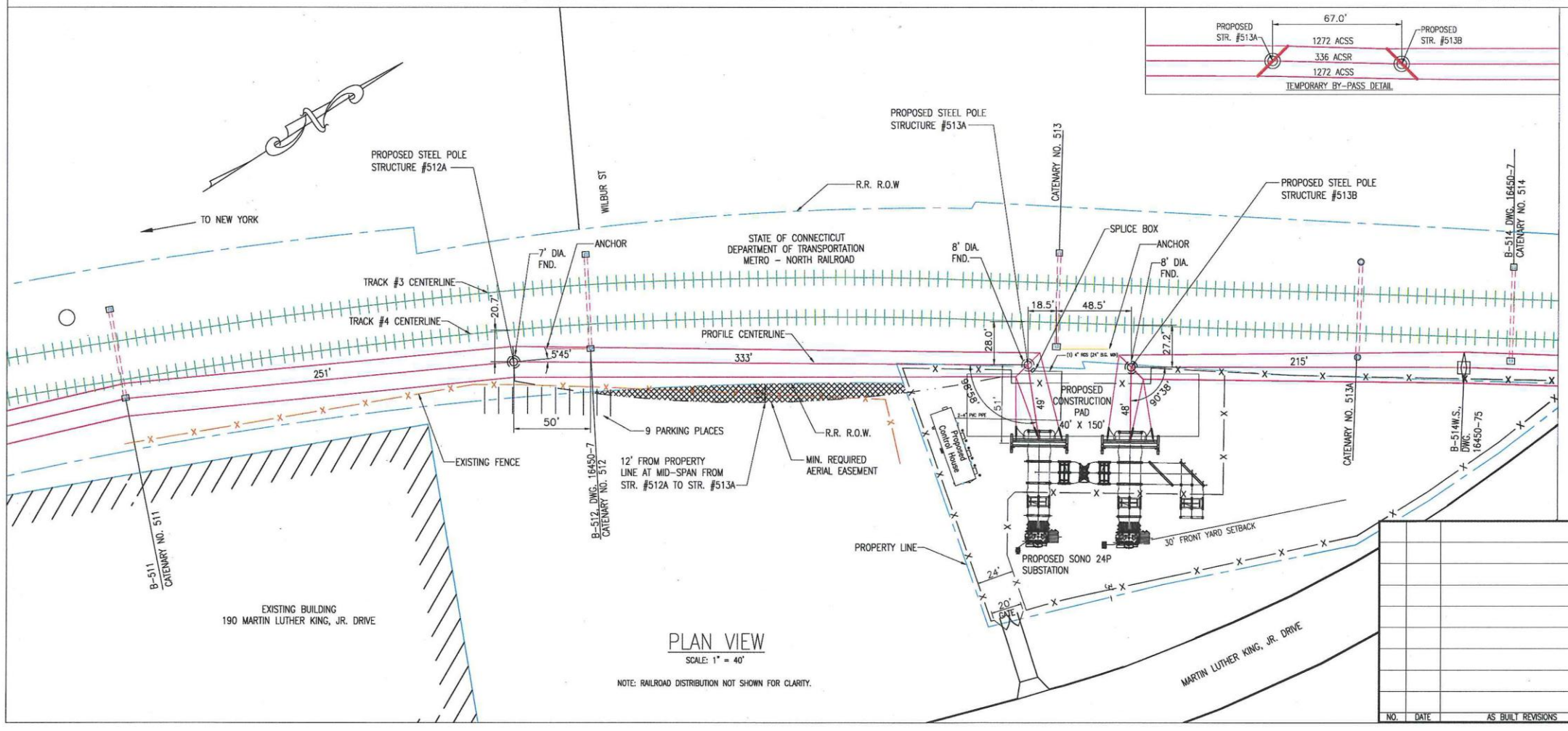
1608 LINE HEADING SOUTH PROFILE

V-SCALE: 1" = 20' H-SCALE: 1" = 40'



1146 LINE HEADING NORTH PROFILE

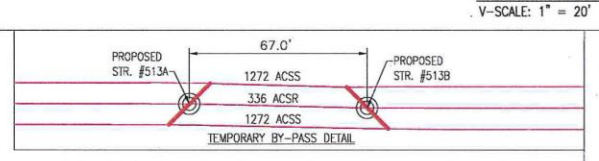
V-SCALE: 1" = 20' H-SCALE: 1" = 40'



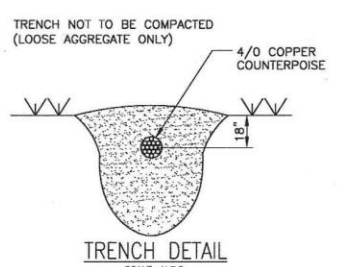
PLAN VIEW

SCALE: 1" = 40'

NOTE: RAILROAD DISTRIBUTION NOT SHOWN FOR CLARITY.

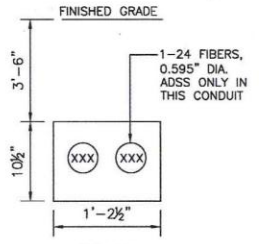


TEMPORARY BY-PASS DETAIL



TRENCH DETAIL

SCALE: N.T.S.



57-57

(2-4" PVC CONDUITS)

(NOT TO SCALE)

NOTES FOR NUSCO SPEC T13-6

1. OVERHEAD SHIELD WIRE (OHSW) (336 ACSR) REPLACED WITH OPTICAL GROUND WIRE (OPGW) FROM STR. #512A TO STR. #513A. OPGW RULING SPAN = 315'. 1-24 FIBERS – OPGW – **DNO** 8363, DIA.=0.677", WT.=0,455 LBS./FT, RBS=19,919 LBS., MDT=4,000 LBS. NESC HEAVY, 222 (KA^2) SEC. SHORT CIRCUIT RATING.
2. FROM STR. #513A TO THE WEST TERMINAL STRUCTURE 1272 KCMIL 54/19 STRANDING (PHEASANT) ACSS CONDUCTOR INSTALLED AT A REDUCED TENSION (1500 LBS. NESC HEAVY).
3. FROM STR. #513B TO THE EAST TERMINAL STRUCTURE 1272 KCMIL 54/19 STRANDING (PHEASANT) ACSS CONDUCTOR INSTALLED AT A REDUCED TENSION (1500 LBS. NESC HEAVY).
4. 1-24 FIBERS-ADSS-**OFS**-AT-XXX27D6-024-TNGE, DIA.=0.595", WT=0.133 LBS./FT., RBS= 9,948 LBS., UNDERGROUND INSTALLATION OF ADSS AT SONO 24P SUB CONTROL HOUSE TO STR. #513A.
5. TEMPORARY BY-PASS
   5A. 336 ACSR OHSW 513A TO 513B AT MDT = 500 LBS. NESC HEAVY.
   5B. 54/19 1272 ACSS AT MDT = 2000 LBS. NESC HEAVY.

REVISIONS DURING CONSTRUCTION					
A	5/13	WO# 403842LN	CEC	GTB	JFAP

NO.	DATE	AS BUILT REVISIONS	BY	CHK	APP	APP

Northeast Utilities Service Co.

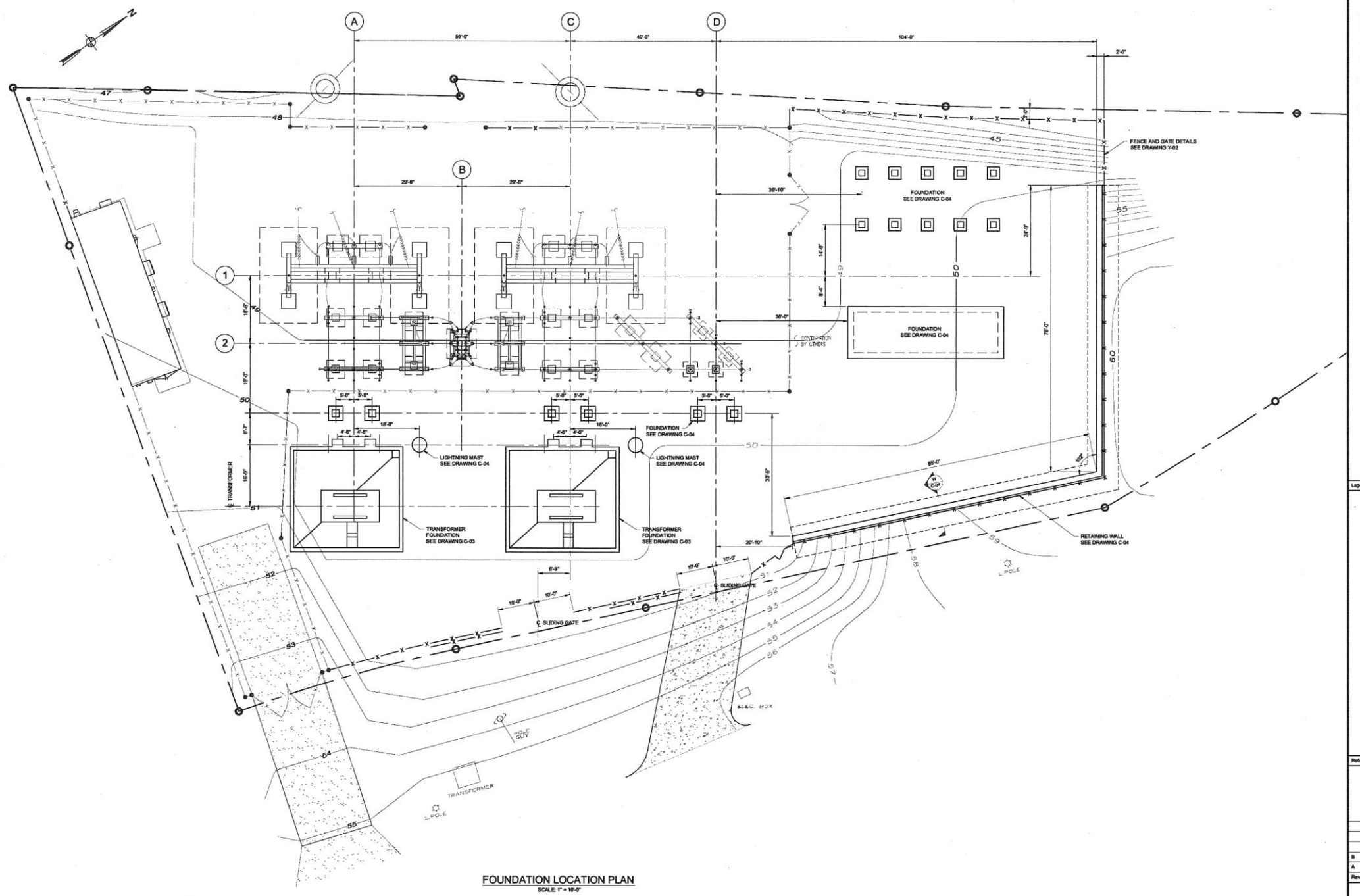
FOR CONNECTICUT LIGHT & POWER COMPANY

TITLE

PROPOSED SONO 24P SUBSTATION
115 kV TRANSMISSION LINE
PLAN & PROFILE
NORWALK, CT

BY	CEC/CAI	CHKD	SWF/CAI	APP	APP
DATE	8/02/12	DATE	8/02/12	DATE	DATE
H-SCALE	AS NOTED	SIZE	D	FIELD BOOK & PAGES	
V-SCALE	AS NOTED	V.S.		R.E.DWG.	
R.E. PROJ. NUMBER				NUSCO	01153-10002p001

Appendix C: Plan Drawings – SNEW



FOUNDATION LOCATION PLAN
SCALE: 1" = 10'-0"

0' 10' 20' 30'

Notes

NOTES:

1. FOR CONTROL POINT COORDINATE LOCATION OF NEW FOUNDATIONS SHOWN HEREIN, SEE ELECTRICAL GENERAL ARRANGEMENT.
2. FOR GENERAL NOTES, SEE DRAWING C-02.
3. FOR CONCRETE NOTES, SEE DRAWING C-02.
4. FOR STRUCTURAL NOTES, SEE DRAWING S-01.
5. FOR EMBEDDED PIPING AND/OR PIPE SLEEVES, SEE MECHANICAL DRAWINGS.
6. FOR EMBEDDED ELECTRICAL CONDUIT AND/OR GROUNDING, SEE ELECTRICAL DRAWINGS.
7. TOP OF TRANSFORMER PAD SHALL HAVE A STEEL TROWEL FINISH TO PROVIDE A DENSE UNIFORM SURFACE, LEVELED TO LIMIT IRREGULARITIES TO 1/8 OF AN INCH PER 10 FOOT LENGTH.
8. CONTRACTOR SHALL COORDINATE FOUNDATION CONSTRUCTION WITH MECHANICAL UNDERGROUND PIPING AND ELECTRICAL BURIED DUCT BANKS.
9. STONE FILL FOR CONTAINMENT SHALL BE CRUSHED STONE OR GRAVEL, WASHED, AND FREE OF ORGANIC IMPURITIES. STONE FILL SHALL BE OF A UNIFORM PARTICLE SIZE TO PROVIDE 35% VOIDS, ON FILTER FABRIC. SUBMIT LABORATORY TEST TO CERTIFY 35% VOIDS TO ENGINEER.
10. ELEVATIONS SHOWN ARE BASED ON THE DATUM TOP OF CONCRETE PEDESTAL ELEVATION AT 0'-0"

Legend

Reference Drawings

Rev	Date	Drawn	Description	CK'd	Appr'd
B	07/30/13	DBP	ISSUED FOR BID	CK	CD
A	06/19/13	DBP	ISSUED FOR PERMIT	CK	CD

Mott MacDonald
400 Blue Hill Drive
Suite 101, North Lobby
Westwood, MA 02090
United States
t +1 (781) 910-0815
f +1 (781) 910-0921
w www.mottmac.com

Client
South Norwalk Electric and Water
(SNEW)
164 Water Street
Norwalk CT 06856

Title
FOUNDATION LOCATION PLAN

PRELIMINARY
NOT FOR
CONSTRUCTION
REPLACE WITH ENGINEER'S STAMP AT CONSTRUCTION AND/OR FABRICATION ISSUE IF REQUIRED BY PROJECT ADMINISTRATION MANUAL

Designed	DBP	Eng check	CK
Drawn	DBP	Approved	CD
Dwg check	CK	Project Mngr	CD
Scale at ANSI E		Date	Rev
NOTED		08-14-13	B

Drawing Number
312307-C-01

P:\312307 SNEW SUB\Structural (working files only)\Drawings\312307-C-01.dwg Jul 31, 2013 - 1:41 PM KORS6128

ANCHOR BOLTS AND EMBEDMENTS:

1. FABRICATE ANCHOR BOLTS AS SHOWN ON THE DRAWINGS.
2. FABRICATE EMBEDMENTS AS SHOWN ON THE DRAWINGS.
3. PROTECT ALL ANCHOR BOLTS DURING SHIPMENT AND STORAGE TO PREVENT RUST.
4. POSITION ANCHOR BOLTS AND OTHER STEEL EMBEDMENTS AS SHOWN ON THE DRAWINGS.
5. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ANCHOR BOLT SLEEVES FROM FILLING WITH WATER AND DEBRIS DURING CONSTRUCTION. FILL ANCHOR BOLT SLEEVE WITH NON-SHRINK GROUT AFTER EQUIPMENT IS IN PLACE AND ALIGNED.
6. ANCHOR BOLTS FOR A COMMON SUPPORT MAY BE COMBINED ON A COMMON ANCHOR PLATE FOR ANCHOR BOLT SPACING 6 INCHES OR LESS. FOR ANCHOR BOLT SPACING GREATER THAN 6 INCHES, COMMON ANCHOR PLATES MAY BE USED WITH PRIOR RESIDENT ENGINEER APPROVAL.
7. PRIOR TO PLACEMENT OF CONCRETE, ADJUST LOCATION OF REINFORCING STEEL TO AVOID CUTTING LATER BY THE INSTALLATION OF DRILLED-IN ANCHORS. DO NOT CUT REBAR LARGER THAN #5 FOR DRILLED-IN ANCHOR INSTALLATION WITHOUT PRIOR ENGINEER APPROVAL.
8. UNLESS NOTED OTHERWISE ALL EXPOSED SURFACES OF EMBEDDED ITEMS TO BE HOT DIP GALVANIZED.
9. FOR EQUIPMENT INSTALLATION REQUIREMENTS, SEE APPROPRIATE VENDOR EQUIPMENT DRAWINGS AND SPECIFICATIONS.
10. WHERE SPECIFIED ON THE DRAWINGS, POST INSTALLED ANCHORS SHALL BE FIELD DRILLED EPOXY TYPE, HILTI HIT-RE 500-SD, ICC-ES-ESR-2322.

ANCHOR MATERIAL:

1. DIAMETER AND EMBEDMENT SHALL BE AS SHOWN ON THE DRAWINGS. ANCHORS SHALL BE INSTALLED IN PROPERLY SIZED HOLES, DRY CLEANED, AND FREE OF DUST OR MOISTURE, IN ACCORDANCE WITH ALL MANUFACTURER'S REQUIREMENTS AND INSPECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS.

SPECIAL INSPECTION:

1. SPECIAL INSPECTION FOR CONCRETE SHALL BE PERFORMED PER THE REQUIREMENTS OF CHAPTER 17 OF 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS.
2. STRUCTURAL OBSERVATIONS SHALL BE PERFORMED PER THE REQUIREMENTS OF CHAPTER 17, 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS.

VERIFICATION & INSPECTION	CONTINUOUS	PERIODIC
VERIFICATION OF MATERIALS BELOW FOOTINGS TO ACHIEVE THE DESIGN BEARING CAPACITY		X
VERIFICATION OF EXCAVATION FOR PROPER DEPTH AND MATERIAL		X
CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS		X
VERIFICATION OF USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF CONTROLLED FILL	X	
VERIFICATION OF SITE AND SUBGRADE PREPARATION PRIOR TO PLACEMENT OF CONTROLLED FILL		X

UNLESS OTHERWISE INDICATED ON DRAWINGS, THE FOLLOWING VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION SHALL BE PERFORMED:

VERIFICATION & INSPECTION	CONTINUOUS	PERIODIC
INSPECTION OF REINFORCING STEEL AND PLACEMENT		X
INSPECTION OF ANCHOR BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE	X	
VERIFY USE OF REQUIRED MIX		X
DURING CONCRETE SAMPLE COLLECTION TO FABRICATE SPECIMENS FOR STRENGTH TEST, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE CONCRETE TEMPERATURE	X	
INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPRATURE AND TECHNIQUES		X
INSPECTION OF FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED		X
INSPECTION OF POST INSTALLED ANCHOR BOLTS PER APPLICABLE ICC (ESR) REPORT		X

GENERAL CONCRETE NOTES:

1. ALL CONCRETE WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
   a.) 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS.
   b.) THE AMERICAN CONCRETE INSTITUTE (ACI) "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" ACI 318.
   c.) THE AMERICAN CONCRETE INSTITUTE (ACI) "GUIDE FOR FLOOR AND SLAB CONSTRUCTION" ACI 302.1R.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS UNLESS OTHERWISE NOTED.
3. ALL CONCRETE SHALL HAVE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150.
4. REINFORCING STEEL SHALL BE STANDARD DEFORMED BARS AND SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE.
5. REINFORCING BARS SHALL BE FABRICATED IN ACCORDANCE WITH THE STANDARD FABRICATED TOLERANCES IN CHAPTER 4 OF ACI 315.
6. FIELD WELDING OF CROSSING BARS BY TACK WELDING IS STRICTLY PROHIBITED.
7. WELDED WIRE REINFORCEMENT (WWR) SHALL CONFORM TO ASTM A185, HAVE A MINIMUM ULTIMATE TENSILE STRENGTH OF 70,000 PSI, AND BE FURNISHED IN FLAT SHEETS. WELDED WIRE REINFORCEMENT SHEETS TO BE LAPPED TWO SQUARES AT EACH SPLICE.
8. ALL FOUNDATIONS, WALLS, PIERS AND EQUIPMENT PADS SHALL BE PLACED MONOLITHICALLY.
9. ALL REINFORCING SHALL HAVE A PROTECTION OF CONCRETE (COVER) AS FOLLOWS:
   a.) SIDES AND BOTTOM OF FOOTINGS ———— 3"
   b.) WHERE CONCRETE WILL BE EXPOSED TO EARTH OR WEATHER AFTER FORM REMOVAL:
   #6 THROUGH #18 BARS ———— 2"
   #5 BARS, W31 OR D31 WIRE AND SMALLER ———— 1½"
   c.) CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND.
   1.) SLAB, WALLS, JOISTS
   #11 BARS AND SMALLER ———— ¾"
   2.) BEAMS, COLUMNS
   PRIMARY REINFORCEMENT,
   TIES, STIRRUPS, SPIRALS ———— 1½"
10. NO HORIZONTAL JOINTS WILL BE PERMITTED IN FOUNDATIONS, WALLS, GRADE BEAMS, OR SLABS, UNLESS OTHERWISE NOTED.
11. CONTINUOUS REINFORCEMENT SHALL BE LAP SPLICED OR EMBEDDED TO DEVELOP THE FULL TENSILE STRENGTH (LAP SPLICE B) IN ACCORDANCE WITH ACI 318-08 CHAPTER 12. THERE SHALL BE NO MORE THAN 50% OF THE STEEL SPLICED AT ONE POINT. THE LENGTH OF THE LAP SPLICE OR EMBEDMENT SHALL BE INCREASED AS REQUIRED FOR TOP BARS. LAP TOP BARS AT MID-SPAN AND BOTTOM BARS AT SUPPORTS UNLESS NOTED OTHERWISE.
12. EXPOSED CONCRETE FLOOR SLABS AND EQUIPMENT FOUNDATIONS AND PADS SHALL RECEIVE A STEEL TROWEL FINISH UNLESS NOTED.
13. IF CONFLICTING CONCRETE REQUIREMENTS OCCUR, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
14. ALL EMBEDDED ITEMS, INCLUDING SLOTS, SLEEVES, PIPING, DRAINS, ELECTRICAL CONDUIT, GROUNDING, AND BOX OUTS SHALL BE SET PRIOR TO CONCRETE PLACEMENT. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND VENDOR DRAWINGS FOR NUMBER, SIZE, AND LOCATIONS.
15. CHAMFER ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH ¾" x 45° CHAMFER, UNLESS OTHERWISE NOTED.
16. THE CONTRACTOR SHALL BE RESPONSIBLE TO FULFILL THE SPECIAL TESTING REQUIREMENTS FOR ALL CONCRETE IN ACCORDANCE WITH PROJECT SPECIFICATIONS, AND SPECIFIED ON THIS DRAWING AND AS NOTED BELOW.
   a.) FOR EACH SAMPLE A MINIMUM OF FOUR COMPRESSION TEST CYLINDERS SHALL BE MOLDED AND CURED IN ACCORDANCE WITH ASTM C31 AND AS BEST DUPLICATES THE CURING PROCESS OF THE PLACEMENT. TEST ONE CYLINDER AT 7 DAYS AND TWO AT 28 DAYS. THE FOURTH CYLINDER SHALL BE HELD IN RESERVE.
   b.) THE TESTING AGENCY SHALL REPORT ALL RESULTS. THE RESULTS SHALL BE SUBMITTED TO THE RESIDENT ENGINEER.
16. CEMENTITIOUS GROUT SHALL BE "FIVE STAR GROUT" OR ENGINEER APPROVED EQUAL. GROUT SHALL MEET THE LATEST VERSION OF ASTM C1107 AT A FLOWABLE, A PLASTIC AND A STIFF CONSISTENCY. GROUT SHALL NOT BE TYPE "A" (GAS GENERATED EXPANSION). CURING SHALL CONFORM TO THE MANUFACTURER'S WRITTEN RECOMMENDATIONS. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 3 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM C109 AT A FLUID CONSISTENCY PER ASTM C939.
17. WATERSTOP SHALL BE PVC MATERIAL WITH MULTIPLE RIBBED CROSS SECTION AND DUMBELL TYPE. WATERSTOP SHALL BE INSTALLED IN THE POSITION SHOWN ON THE DRAWINGS WITH SUFFICIENT SPACE ALLOWED BETWEEN REINFORCING AND WATERSTOP TO ENSURE ADEQUATE CONCRETE PLACEMENT. APPLICATION, INCLUDING MITERING AND WELDING AT CORNERS, AND FUSING AT SPLICES AND CROSSINGS, SHALL BE IN STRICT COMPLIANCE WITH MANUFACTURER'S RECOMMENDATION.
18. ISOLATION AND EXPANSION JOINTS AND JOINT SEALERS.
   a.) EXPANSION JOINT MATERIAL SHALL BE PREFORMED, NON-EXTRUDING RESILIENT FILLER, BITUMINOUS TYPE, PER ASTM D1751.
   b.) UNLESS OTHERWISE NOTED ON THE DRAWINGS, JOINT SEALER SHALL BE EITHER HOT POURED ELASTIC TYPE AS PER ASTM D1190 OR COLD APPLIED ELASTOMERIC TYPE AS PER ASTM C920.
19. FREE FALL OF CONCRETE SHALL NOT EXCEED 60 INCHES. A TREMIE TUBE SHALL BE USED TO AVOID SEGREGATION OF AGGREGATE.
20. MASS CONCRETE FOUNDATION FOR CTG AND EXHAUST STACK EQUIPMENT SHALL BE WET CURED CONTINUOUSLY FOR 7 DAYS WHEN TEMPERATURES ALLOW FOR THE WET CURING METHOD. MEMBRANE FORMING CURING COMPOUNDS WILL BE USED OTHERWISE.
21. CONCRETE FOUNDATIONS SHALL ONLY BE PLACED ON COMPACTED BACKFILL, WHICH HAS BEEN INSPECTED AND APPROVED.

GENERAL NOTES: CONSTRUCTION

1. CONTRACTOR SHALL PROVIDE ALL MATERIAL, LABOR, EQUIPMENT, CONSUMABLES, AND ALL OTHER ITEMS REQUIRED TO COMPLETE THE WORK AS NOTED IN THE SPECIFICATIONS, SHOWN ON THE DRAWINGS, AND AS EVIDENTLY NECESSARY TO COMPLETE THE WORK.
2. PROJECT ENGINEERING DRAWINGS ARE BASED UPON REVIEW OF AVAILABLE REFERENCE DRAWINGS PROVIDED BY OWNER. CONTRACTOR TO VERIFY EXISTING CONDITIONS BY FORMAL FIELD SURVEY PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCY BETWEEN INFORMATION SHOWN ON THE ENGINEERING DRAWINGS AND ACTUAL SITE CONDITIONS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE RESIDENT ENGINEER FOR RESOLUTION.
3. CONTRACTOR SHALL VISIT THE SITE AND OBSERVE CONDITIONS FOR THE PROPOSED CONSTRUCTION. NOTIFY RESIDENT ENGINEER OF ANY SITE CONDITION THAT WOULD NOT ALLOW EXECUTION OF CONSTRUCTION AS SHOWN ON THE ENGINEERING DRAWINGS.
4. COMPLETED SHOP DRAWINGS FOR ALL WORK SHALL BE SUBMITTED BY THE CONTRACTOR TO THE RESIDENT ENGINEER FOR REVIEW PRIOR TO THE START OF CONSTRUCTION ACTIVITIES.
5. A PROGRAM OF SPECIAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704 SPECIAL INSPECTIONS 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS IS REQUIRED FOR THIS PROJECT. THIS PROGRAM SHALL INCLUDE STEEL AND CONCRETE CONSTRUCTION.
6. UNLESS NOTED OTHERWISE (UNO) ON THE DRAWINGS, ALL DESIGN, MATERIALS, FABRICATION, TESTING, AND CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING NOTES, REFERENCED CODES, SPECIFICATIONS AND STANDARDS. SHOULD THESE NOTES, CODES, SPECIFICATIONS, OR STANDARDS CONFLICT, THE STRICTEST PROVISION SHALL GOVERN.

STRUCTURAL DESIGN CRITERIA

1. THE FOLLOWING CODES, STANDARDS, AND REGULATIONS ARE APPLICABLE TO THE DESIGN:
   - 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS.
   - ASCE (AMERICAN SOCIETY OF CIVIL ENGINEERS) 7-05, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES".
2. WIND LOADS SHALL BE DETERMINED PER ASCE 7-05 AND 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS AND SHALL BE BASED ON THE FOLLOWING CRITERIA:
   a. BASIC WIND SPEED SHALL BE 140 MILES PER HOUR (CORRESPONDING TO A 3-SECOND GUST SPEED).
   b. EXPOSURE CATEGORY SHALL BE "B".
   c. BUILDINGS ARE CONSIDERED RISK CATEGORY III.
3. SNOW LOAD
   a. GROUND SNOW LOADS SHALL BE DETERMINED PER ASCE 7-05 AND 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS AND SHALL BE BASED ON THE FOLLOWING CRITERIA:
   b. GROUND SNOW LOAD = 30 PSF.
4. EARTHQUAKE LOAD
   a. ALL STRUCTURES, EQUIPMENT AND COMPONENTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS AND SHALL USE THE FOLLOWING FACTORS:
   - MAPPED MCE SPECTRAL SHORT PERIOD ACCELERATION Ss =0.20 FOR SITE CLASS D.
   - MAPPED MCE SPECTRAL ONE-SECOND ACCELERATION S1 =0.073 FOR SITE CLASS D.
   - OCCUPANCY CATEGORY III (POWER GENERATING STATION, NOT REQUIRED FOR EMERGENCY BACKUP)
   - SEISMIC USE GROUP II WITH AN OCCUPANCY IMPORTANCE FACTOR, I EQUAL TO 1.25.
   - SITE CLASS D
   - SITE CLASS D COEFFICIENT, Fa=1.6; SITE CLASS D COEFFICIENT, FV=2.4 [ASCE TABLES 11.4-1 AND 11.4-2]
   - SMS =0.32 AND SM1=0.18 [ASCE FORMULAS 11.4-3 AND 11.4-4]
   - SDS= 2/3 X SMS=0.21 AND SD1= 2/3 X SM1=0.12 [ASCE FORMULAS 11.4-3 AND 11.4-4]
   - SEISMIC DESIGN CATEGORY = B [ASCE TABLES 11.4-1]

ABBREVIATION / DEFINITION

ABBREVIATION	DEFINITION
A	AXIAL MEMBER (FORCE IN KIPS)
ACI	AMERICAN CONCRETE INSTITUTE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ELEV, ELV OR EL	ELEVATION
LP	LOW POINT
HP	HIGH POINT
OC	ON CENTER
U.N.O.	UNLESS NOTED OTHERWISE
PSF OR LBS/FT²	POUNDS PER SQUARE FOOT
PSI OR LBS/IN²	POUNDS PER SQUARE INCH
K	KIPS (1 KIP = 1,000 POUNDS)
FT-K	MOMENT IN FOOT KIPS
KPS OR KIPT²	KIPS PER SQUARE FOOT
FIN FL OR F.F.	FINISHED FLOOR
PROJ	PROJECTION
TYP	TYPICAL
DO	DITTO (REPEAT)
CL	CLEARANCE, OR CLEAR
CONT	CONTINUOUS
COL	COLUMN
℄	CENTER LINE
IN OR "	INCH
FT OR '	FOOT (FEET)
DIA OR Ø	DIAMETER
EXIST	EXISTING
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
R	VERTICAL BEAM REACTION AT CONNECTION (IN KIPS)
T/STEEL	TOP OF STEEL
WP	WORKING POINT
PL	PLATE
KB	KNEE BRACE
WF	WIDE FLANGE
BKT, OR BRKT	BRACKET
C	STEEL CHANNEL MEMBER
MC	MOMENT CONNECTION
L	ANGLE
Fy	MINIMUM STEEL YIELD STRENGTH IN LBS/IN²
TC/CNC OR TOC	TOP OF CONCRETE
F'c	MINIMUM CONCRETE COMPRESSIVE STRESSES AT 28 DAYS IN LBS/IN
EO	EDGE OF
VB	VERTICAL BRACING
TF/DW OR TOF	TOP OF FOUNDATION
SS	STAINLESS STEEL
VIF	VERIFY IN FIELD
RD	ROOF DRAIN
CONT.	CONTINUOUS
CANTIL	CANTILEVER RIGHT END
	DENOTES DIRECTION FOR GRATING SPAN.
KB	KNEE BRACE

Notes

Legend

Reference Drawings

Rev	Date	Drawn	Description	Ck'k'd	Appr'd
A	7/30/13	DSP	ISSUED FOR BID	CK	CD

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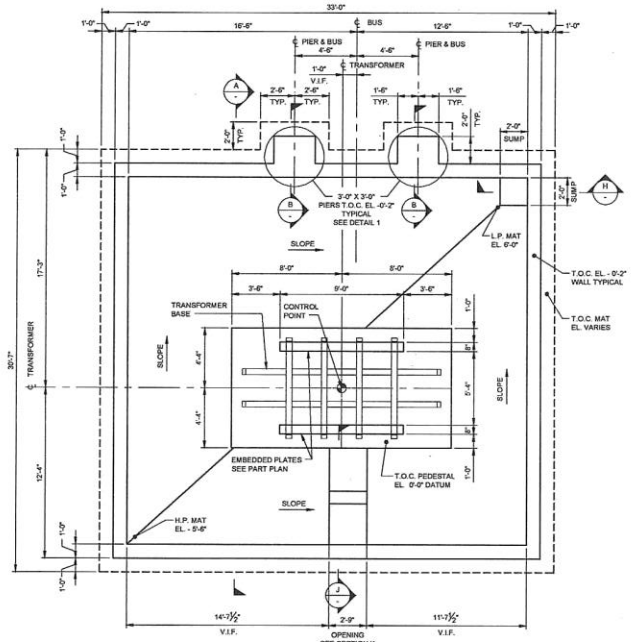
Title
FOUNDATION GENERAL NOTES

PRELIMINARY NOT FOR CONSTRUCTION
REPLACE WITH ENGINEERS' STAMP AT CONSTRUCTION AND/OR FABRICATION ISSUE IF REQUIRED BY PROJECT ADMINISTRATION MANUAL

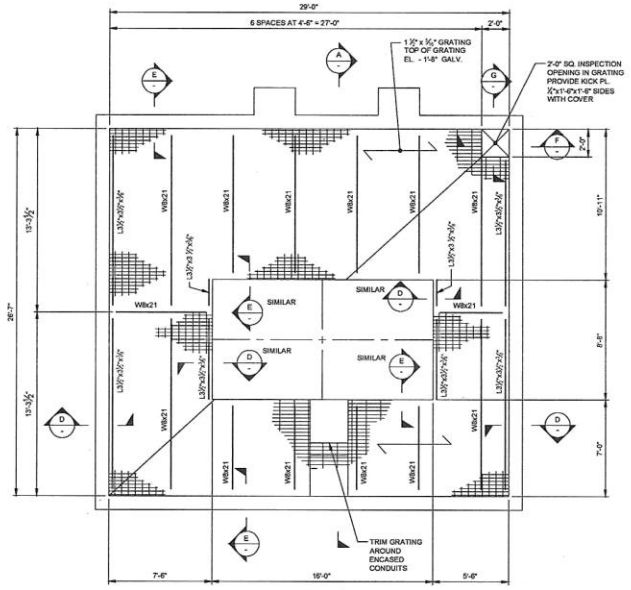
Designed	DSP	Eng check	CK
Drawn	DSP	Approved	CD
Dwg check	CK	Project Mngr	CD
Scale at ANSI E	NOTED	Date	7/30/13
		Rev	A

Drawing Number
312307-C-02



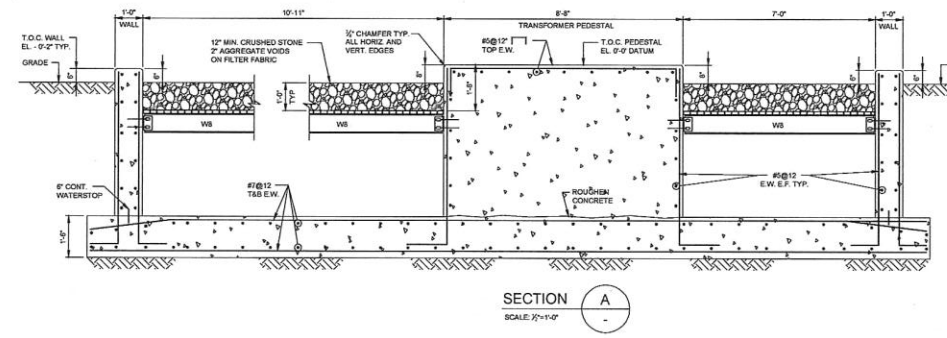
FOUNDATION PLAN

SCALE: ⅜"=1'-0"
TYPICAL 2 PLACES



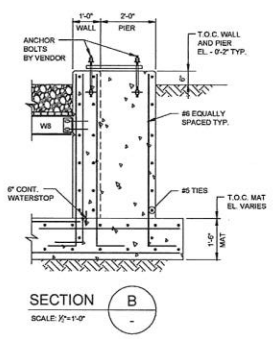
COVER FRAMING PLAN

SCALE: ½"=1'-0"
TOP OF 1 ½" GRADING EL. - 1'-4"
TYPICAL 2 PLACES



SECTION A

SCALE: ½"=1'-0"



SECTION B

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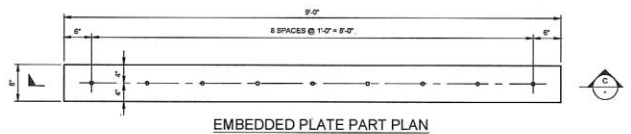
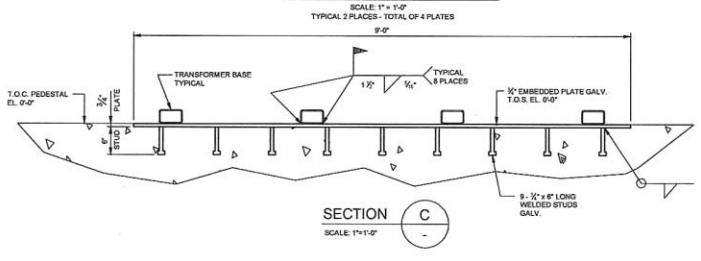


EMBEDDED PLATE PART PLAN

SCALE: 1" = 1'-0"
TYPICAL 2 PLACES - TOTAL OF 4 PLATES



SECTION C

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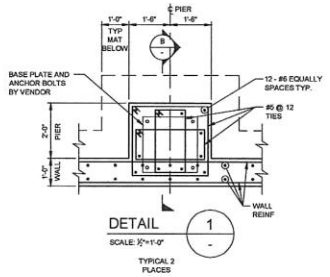
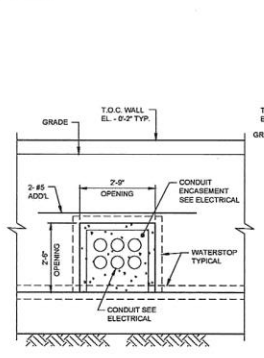


DETAIL 1

SCALE: ½"=1'-0"
TYPICAL 2 PLACES



SECTION K

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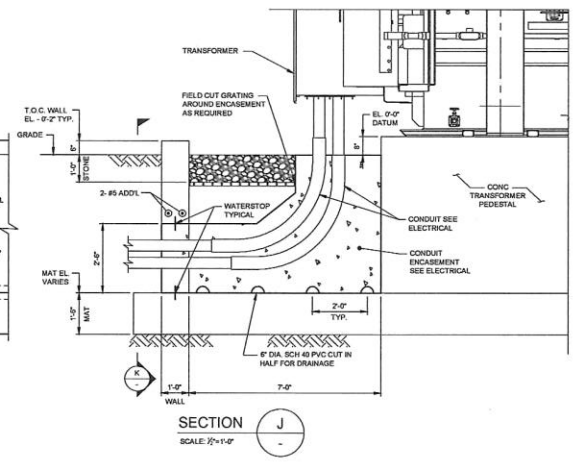

SECTION J

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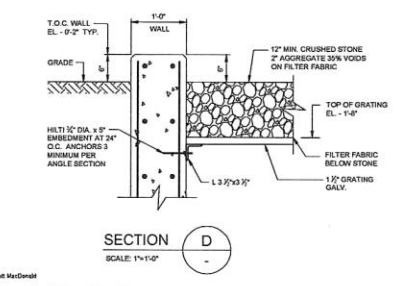

SECTION D

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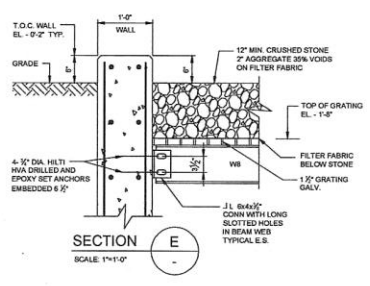

SECTION E

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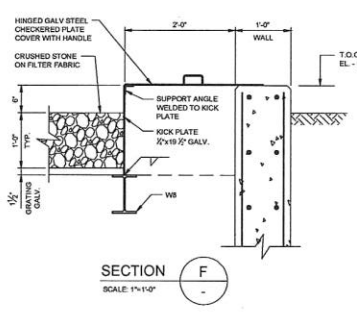

SECTION F

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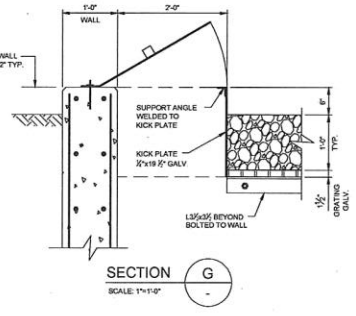
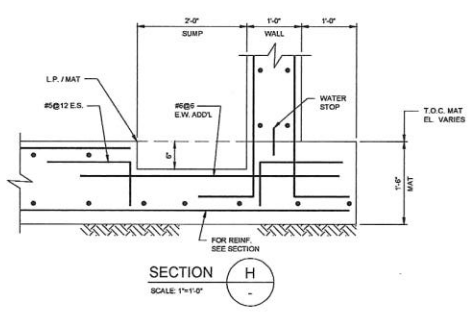


SECTION G

SCALE: 1"=1'-0"



SECTION H

SCALE: 1"=1'-0"

P:\312307 SNEW SUB\Structural (working files only)\Drawings\03 2307-C-03.dwg Jul 31, 2013 - 2:24PM pam8804

Notes

NOTES:

1. FOR FOUNDATION LOCATION PLAN, SEE DRAWING C-01.
2. FOR GENERAL NOTES, SEE DRAWING C-02.
3. FOR CONCRETE NOTES, SEE DRAWING C-02.
4. FOR STRUCTURAL NOTES, SEE DRAWING S-01.

Legend

Reference Drawings

Rev	Date	Drawn	Description	Ck'd	Appl'd
A	7/30/13	DBP	ISSUED FOR BID	CK	CD

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400 Blue Hill Drive
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F +1 (781) 905-0001
W www.mottmac.com

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South Norwalk Electric and Water (SNEW)
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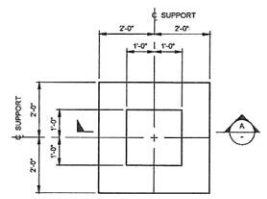
Norwalk CT 06856

Title
TRANSFORMER PLAN SECTIONS AND DETAILS

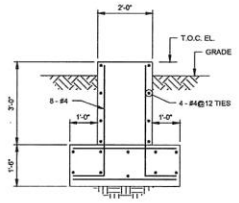
PRELIMINARY NOT FOR CONSTRUCTION
REPLACE WITH ENGINEER'S STAMP AT CONSTRUCTION AND/OR FABRICATION ISSUE IF REQUIRED BY PROJECT ADMINISTRATION MANUAL

Designed	DBP	Eng check	CK
Drawn	DBP	Approved	CD
Dwg check	CK	Project Mngr	CD
Scale at ANSI E	NOTED	Date	7/30/13
Rev	A		

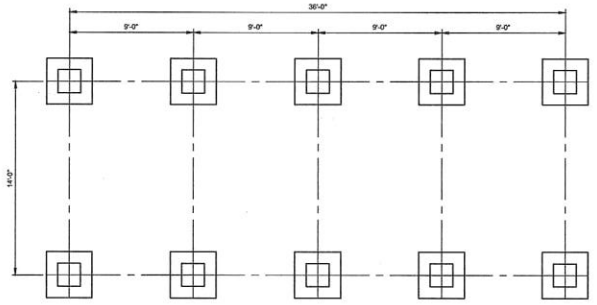
Drawing Number
312307-C-03



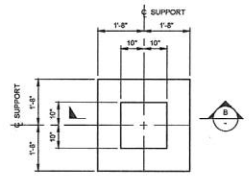
DISCONNECT SWITCH
FOUNDATION PLAN
SCALE: 3/4" = 1'-0"



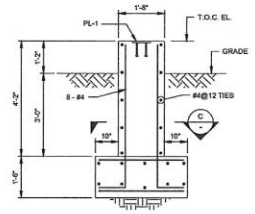
SECTION A
SCALE: 3/4"=1'-0"



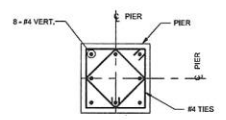
CONTROL BUILDING
FOUNDATION PLAN
SCALE: 3/4" = 1'-0"



CONTROL BUILDING
PIER PLAN
SCALE: 3/4" = 1'-0"
TYPICAL 6 PLACES



SECTION B
SCALE: 3/4"=1'-0"



SECTION C
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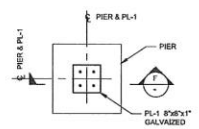
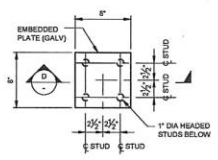
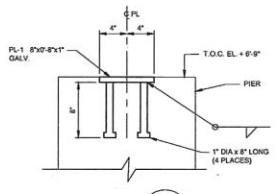


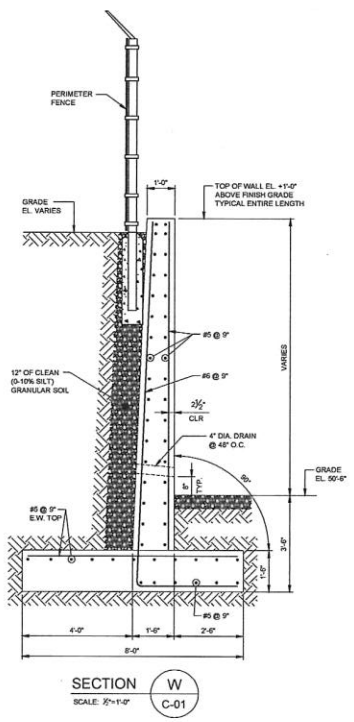
DETAIL 1
SCALE: 1/2"=1'-0"



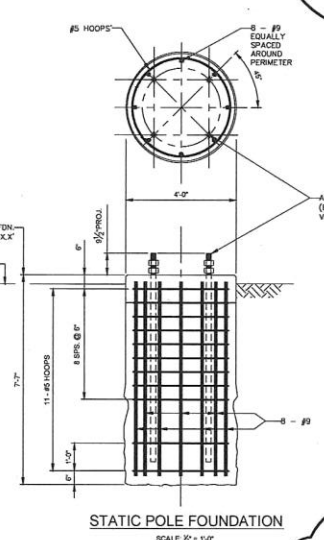
EMBEDDED PLATE
DETAIL PL-1
SCALE: 1/2"=1'-0"



SECTION D
SCALE: 1/2"=1'-0"



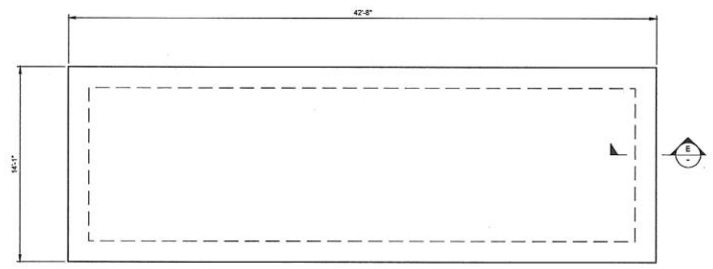
SECTION W
C-01
SCALE: 3/4"=1'-0"



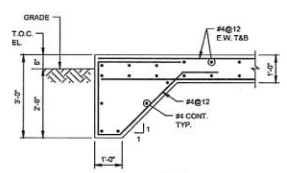
STATIC POLE FOUNDATION
SCALE: 3/4" = 1'-0"

HOLD PENDING
VENDOR DATA

HOLD PENDING
VENDOR DATA



SWITCHGEAR
FOUNDATION PLAN
SCALE: 3/4" = 1'-0"



SECTION E
SCALE: 3/4"=1'-0"

Notes

NOTES:

1. FOR FOUNDATION LOCATION PLAN, SEE DRAWING C-01.
2. FOR GENERAL NOTES, SEE DRAWING C-02.
3. FOR CONCRETE NOTES, SEE DRAWING C-02.
4. FOR STRUCTURAL NOTES, SEE DRAWING S-01.

Legend

Reference Drawings

Rev	Date	Drawn	Description	Ck'd	App'd
A	7/30/13	DBP	ISSUED FOR BID	CK	CD

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(SNEW)
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Norwalk CT 06856

Title
FOUNDATION PLANS
PLANS, SECTIONS AND DETAILS

PRELIMINARY
NOT FOR
CONSTRUCTION
REPLACE WITH ENGINEER'S STAMP AT CONSTRUCTION AND/OR FABRICATION ISSUE IF REQUIRED BY PROJECT ADMINISTRATION MANUAL

Designed	DBP	Eng check	CK
Drawn	DBP	Approved	CD
Dwg check	CK	Project Mngr	CD
Scale at ANSI E		Date	Rev
NOTED		7/30/13	A

Drawing Number
312307-C-04

SPECIAL INSPECTION:

1. SPECIAL INSPECTION FOR STEEL SHALL BE PERFORMED PER THE REQUIREMENTS OF CHAPTER 17 OF 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS.

2. STRUCTURAL OBSERVATIONS SHALL BE PERFORMED PER THE REQUIREMENTS OF CHAPTER 17, 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS.

VERIFICATION & INSPECTION	CONTINUOUS	PERIODIC
1. MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS:		
A. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.		X
B.MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.		X
2. INSPECTION OF HIGH-STRENGTH BOLTING:		
A. BEARING-TYPE CONNECTIONS		X
B. SLIP-CRITICAL CONNECTIONS.	X	X
3. MATERIAL VERIFICATION OF STRUCTURAL STEEL:		
A. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.		
B. MANUFACTURERS' CERTIFIED MILL TEST REPORTS		
4. MATERIAL VERIFICATION OF WELD FILLER MATERIALS:		
A. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.		
B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.		
5. INSPECTION OF WELDING:		
A. STRUCTURAL STEEL:		
1) COMPLETE AND PARTIAL PENETRATION GROOVE WELDS.	X	
2) MULTIPASS FILLET WELDS.	X	
3) SINGLE-PASS FILLET WELDS > 5/16	X	
4) SINGLE-PASS FILLET WELDS ≤ 5/16		X
5) FLOOR AND ROOF DECK WELDS.		X
B. REINFORCING STEEL:		
1) VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.		X
2) REINFORCING STEEL-RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL REINFORCED CONCRETE SHEAR WALLS AND SHEAR REINFORCEMENT.	X	
3) SHEAR REINFORCEMENT.	X	
4) OTHER REINFORCING STEEL		X
6. INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS:		X
A. DETAILS SUCH AS BRACING AND STIFFENING.		
B. MEMBER LOCATIONS.		
C. APPLICATION OF JOINT DETAILS AT EACH CONNECTION.		

GENERAL NOTES: STEEL

1. DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
   - A: THE 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS.
   - B: THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
   - C: THE AMERICAN WELDING SOCIETY (AWS) "STRUCTURAL WELDING CODE STEEL" D1.1 LATEST EDITION.
   - D: CT-OSHA STANDARDS
2. ALL STRUCTURAL STEEL SHALL BE NEW AND SHALL CONFORM TO THE FOLLOWING:
   - A: WIDE FLANGE MEMBERS & STRUCTURAL TEES ---- ASTM A992
   - F: ANGLES, PLATES & CHANNELS ---------- ASTM A36
   - G: ROUND, SQUARE & RECTANGULAR HOLLOW STRUCTURAL SECTIONS (HSS) --- ASTM A500, GRADE B
3. WELDING SHALL BE PERFORMED IN ACCORDANCE WITH AWS D1.1. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS. WELDED CONNECTIONS SHALL BE MADE UTILIZING E70XX ELECTRODES, UNLESS OTHERWISE NOTED.
4. ALL SHOP CONNECTIONS MAY BE WELDED OR BOLTED UNLESS OTHERWISE SPECIFICALLY SHOWN OR SPECIFIED.
5. UNLESS NOTED OTHERWISE, FIELD CONNECTIONS SHALL BE BEARING-TYPE BOLTED CONNECTIONS USING ASTM A325-N TYPE 1 GALVANIZED HIGH STRENGTH BOLTS. BOLT DIAMETER SHALL BE ¾ INCH, UNLESS OTHERWISE NOTED.
6. STANDARD FRAME BEAM CONNECTIONS SHALL BE USED. THESE CONNECTIONS SHALL BE SELECTED TO SUPPORT ONE-HALF OF THE TOTAL UNIFORM LOAD CAPACITY SHOWN IN THE TABLES OF UNIFORM LOAD CONSTANTS, PART 2 OF MANUAL OF STEEL CONSTRUCTION, FOR GIVEN BEAM, SPAN, AND GRADE OF STEEL SPECIFIED.
7. WORKING POINTS FOR VERTICAL BRACING SHALL INTERSECT AT CENTER LINE OF COLUMN AND CENTER LINE OF BEAMS, UNLESS OTHERWISE NOTED.
8. ALL BRACING CONNECTIONS AND CONNECTIONS FOR BEAMS WITH POSTED LOADS SHALL DEVELOP 100% OF THE FORCE IN THE MEMBER WITHOUT THE ⅓ INCREASE IN ALLOWABLE STRESS.
9. NO OPENINGS SHALL BE CUT IN STRUCTURAL STEEL MEMBERS UNLESS SHOWN ON DRAWINGS OR APPROVAL IS RECEIVED FROM ENGINEER IN WRITING IN ADVANCE.
10. BEARING ENDS OF ALL COLUMNS SHALL BE MILLED.
11. ALL BUTT WELDS AND GROOVE WELDS SHALL BE 100% PENETRATION WELDS. FILLET WELDS SHALL BE ⅜ INCH MINIMUM WELDS UNLESS OTHERWISE NOTED.
12. ALL CONNECTIONS FOR WB BEAMS AND LARGER SHALL BE DOUBLE ANGLES WITH A MINIMUM OF TWO BOLTS ACTING IN DOUBLE SHEAR, UNLESS OTHERWISE NOTED.
13. GUSSET PLATES SHALL BE A MINIMUM OF ½ INCH THICK, UNLESS A GREATER THICKNESS IS REQUIRED TO SATISFY THE POSTED LOAD.
14. ALL HORIZONTAL AND VERTICAL BRACING CONNECTIONS SHALL HAVE A MINIMUM OF TWO BOLTS.
15. ALL DOUBLE ANGLE HORIZONTAL AND VERTICAL BRACING MEMBERS SHALL HAVE LONG LEGS BACK TO BACK UNLESS OTHERWISE NOTED.
16. UNLESS NOTED, GRATING SHALL BE RECTANGULAR WELDED STEEL WITH 1 1/2 INCH x 3/16 INCH BEARING BARS SPACED 1 1/2 INCH ON CENTERS AND SPACER BARS SPACED NOT MORE THAN 4 INCHES ON CENTERS. GRATING SHALL BE SECURELY FASTEN TO SUPPORTING STEEL WITH POWDER ACTUATED, GALVANIZED FASTENERS. ALL GRATING TO BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123.
17. ALL ASSEMBLY TIGHTENING AND INSPECTION FOR HIGH STRENGTH BOLTING SHALL BE IN ACCORDANCE WITH THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS. TIGHTENING SHALL BE DONE BY TURN-OF-NUT METHOD. ALL BOLTS FOR END CONNECTIONS OF BEAMS AND BRACING SHALL BE FULLY TENSIONED.
18. EXTERIOR STEEL FRAMING, LADDERS, AND HANDRAIL SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
19. STEEL SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BRACING REQUIRED TO MAINTAIN STABILITY OF THE STRUCTURAL SYSTEM DURING ERECTION.
20. THE DETAILER SHALL BE RESPONSIBLE TO PREPARE CALCULATIONS FOR ALL STRUCTURAL STEEL FRAMING CONNECTIONS, DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS, PREPARED AND STAMPED BY A REGISTERED ENGINEER IN THE STATE OF CONNECTICUT, AND SUBMIT THEM TO THE DESIGNATED RESPONSIBLE PROJECT ENGINEER. THE DESIGNATED RESPONSIBLE PROJECT ENGINEER SHALL BE RESPONSIBLE TO REVIEW, ACCEPT, AND SUBMIT THE DETAILER CALCULATIONS TO THE BUILDING OFFICIAL IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS, SECTION 106.

GENERAL NOTES: CONSTRUCTION

1. CONTRACTOR SHALL PROVIDE ALL MATERIAL, LABOR, EQUIPMENT, CONSUMABLES, AND ALL OTHER ITEMS REQUIRED TO COMPLETE THE WORK AS NOTED IN THE SPECIFICATIONS, SHOWN ON THE DRAWINGS, AND AS EVIDENTLY NECESSARY TO COMPLETE THE WORK.
2. PROJECT ENGINEERING DRAWINGS ARE BASED UPON REVIEW OF AVAILABLE REFERENCE DRAWINGS PROVIDED BY OWNER. CONTRACTOR TO VERIFY EXISTING CONDITIONS BY FORMAL FIELD SURVEY PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCY BETWEEN INFORMATION SHOWN ON THE ENGINEERING DRAWINGS AND ACTUAL SITE CONDITIONS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE RESIDENT ENGINEER FOR RESOLUTION.
3. CONTRACTOR SHALL VISIT THE SITE AND OBSERVE CONDITIONS FOR THE PROPOSED CONSTRUCTION. NOTIFY RESIDENT ENGINEER OF ANY SITE CONDITION THAT WOULD NOT ALLOW EXECUTION OF CONSTRUCTION AS SHOWN ON THE ENGINEERING DRAWINGS.
4. COMPLETED SHOP DRAWINGS FOR ALL WORK SHALL BE SUBMITTED BY THE CONTRACTOR TO THE RESIDENT ENGINEER FOR REVIEW PRIOR TO THE START OF CONSTRUCTION ACTIVITIES.
5. A PROGRAM OF SPECIAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704 SPECIAL INSPECTIONS 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS IS REQUIRED FOR THIS PROJECT. THIS PROGRAM SHALL INCLUDE STEEL AND CONCRETE CONSTRUCTION.
6. UNLESS NOTED OTHERWISE (UNO) ON THE DRAWINGS, ALL DESIGN, MATERIALS, FABRICATION, TESTING, AND CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING NOTES, REFERENCED CODES, SPECIFICATIONS AND STANDARDS. SHOULD THESE NOTES, CODES, SPECIFICATIONS, OR STANDARDS CONFLICT, THE STRICTEST PROVISION SHALL GOVERN.

STRUCTURAL DESIGN CRITERIA

1. THE FOLLOWING CODES, STANDARDS, AND REGULATIONS ARE APPLICABLE TO THE DESIGN:
   - 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS
   - ASCE (AMERICAN SOCIETY OF CIVIL ENGINEERS) 7-05, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES".
2. WIND LOADS SHALL BE DETERMINED PER ASCE 7-05 AND 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS AND SHALL BE BASED ON THE FOLLOWING CRITERIA:
   a. BASIC WIND SPEED SHALL BE 140 MILES PER HOUR (CORRESPONDING TO A 3-SECOND GUST SPEED).
   b. EXPOSURE CATEGORY SHALL BE "B".
   c. BUILDINGS ARE CONSIDERED RISK CATEGORY III.
3. SNOW LOAD
   a. GROUND SNOW LOADS SHALL BE DETERMINED PER ASCE 7-05 AND 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS AND SHALL BE BASED ON THE FOLLOWING CRITERIA:
   b. GROUND SNOW LOAD = 30 PSF.
4. EARTHQUAKE LOAD
   a. ALL STRUCTURES, EQUIPMENT AND COMPONENTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE, WITH ALL APPROVED CONNECTICUT AMENDMENTS AND SHALL USE THE FOLLOWING FACTORS:
   - MAPPED MCE SPECTRAL SHORT PERIOD ACCELERATION Ss =0.20 FOR SITE CLASS D.
   - MAPPED MCE SPECTRAL ONE-SECOND ACCELERATION S1 =0.073 FOR SITE CLASS D
   - OCCUPANCY CATEGORY III [POWER GENERATING STATION, NOT REQUIRED FOR EMERGENCY BACKUP]
   - SEISMIC USE GROUP II WITH AN OCCUPANCY IMPORTANCE FACTOR, I EQUAL TO 1.25.
   - SITE CLASS D.
   - SITE CLASS D COEFFICIENT, Fa=1.6; SITE CLASS D COEFFICIENT, Fv=2.4 [ASCE TABLES 11.4-1 AND 11.4-2]
   - SMS =0.32 AND SM1=0.18 [ASCE FORMULAS 11.4-1 AND 11.4-2]
   - SDS= 2/3 X SMS=0.21 AND SD1= 2/3 X SM1=0.12 [ASCE FORMULAS 11.4-3 AND 11.4-4]
   - SEISMIC DESIGN CATEGORY = B [ASCE TABLES 11.4-1]

ABBREVIATION DEFINITION

A	AXIAL MEMBER (FORCE IN KIPS)
ACI	AMERICAN CONCRETE INSTITUTE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ELEV. ELV OR EL	ELEVATION
LP	LOW POINT
HP	HIGH POINT
OC	ON CENTER
U.N.O	UNLESS NOTED OTHERWISE
PSF OR LBS/FT²	POUNDS PER SQUARE FOOT
PSI OR LBS/IN²	POUNDS PER SQUARE INCH
K	KIPS (1 KIP = 1,000 POUNDS)
FT-K	FOOT-POUND EXCEPT KIPS
KPS OR K/FT²	KIPS PER SQUARE FOOT
FIN FL OR F.F.	FINISHED FLOOR
PROJ	PROJECTION
TYP	TYPICAL
DO	DITTO (REPEAT)
CL	CLEARANCE, OR CLEAR
CONT	CONTINUOUS
COL	COLUMN
℄	CENTER LINE
IN OR "	INCH
FT OR '	FOOT (FEET)
DIA OR Ø	DIAMETER
EXIST	EXISTING
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
R	VERTICAL BEAM REACTION AT CONNECTION (IN KIPS)
T/STEEL	TOP OF STEEL
WP	WORKING POINT
PL	PLATE
KB	KNEE BRACE
W	WIDE FLANGE
BKT, OR BRKT	BRACKET
C	STEEL CHANNEL MEMBER
MC	MOMENT CONNECTION
L	ANGLE
Fy	MINIMUM STEEL YIELD STRENGTH IN LBS/IN²
T/CONC OR TOC	TOP OF CONCRETE
Fc	MINIMUM CONCRETE COMPRESSIVE STRESSES AT 28 DAYS IN LBS/IN
ED	EDGE OF
VB	VERTICAL BRACING
T/FDN OR TOF	TOP OF FOUNDATION
SS	STAINLESS STEEL
VIF	VERIFY IN FIELD
RD	ROOF DRAIN
CONT.	CONTINUOUS
CANTIL	CANTILEVER RIGHT END
	DENOTES DIRECTION FOR GRATING SPAN
KB	KNEE BRACE

Notes

Legend

Reference Drawings

Rev	Date	Drawn	Description	Ck'd/	Appl'd
A	7/30/13	DBP	ISSUED FOR BID	CK	CD

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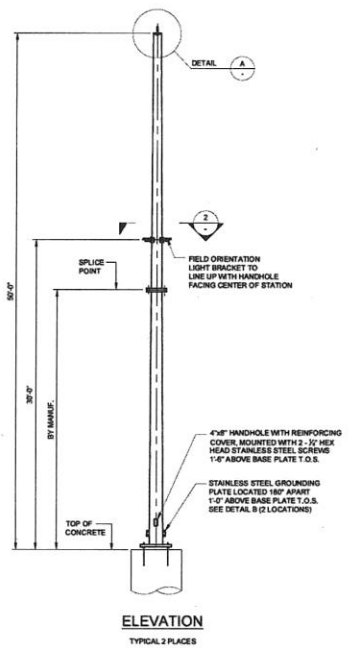
Title
STRUCTURAL STEEL
GENERAL NOTES

PRELIMINARY
NOT FOR CONSTRUCTION
REPLACE WITH ENGINEERS STAMP AT CONSTRUCTION AND/OR FABRICATION ISSUE IF REQUIRED BY PROJECT ADMINISTRATION MANUAL

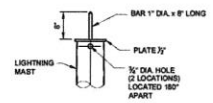
Designed	DBP	Eng check	CK
Drawn	DBP	Approved	CD
Dwg check	CK	Project Mngr	CD
Scale at ANSI E	NOTED	Date	7/30/13
		Rev	A

Drawing Number
312307-S-01

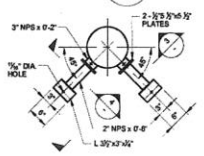


ELEVATION

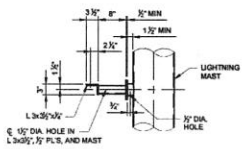
TYPICAL 2 PLACES



DETAIL A
N.T.S.



SECTION 2
N.T.S.



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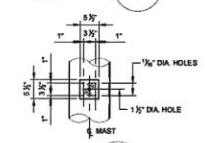
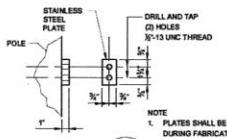


SECTION 4
N.T.S.

NOTES:

1. REFER TO TECHNICAL SPECIFICATION FOR STRUCTURE CONNECTION, TYPE AND FINISH, STRUCTURE QUANTITIES, HEIGHTS AND TYPES, AND OTHER PROJECT SPECIFIC INFORMATION
2. STRUCTURE IS SYMMETRICAL ABOUT CENTERLINE UNLESS OTHERWISE NOTED



DETAIL B
N.T.S.

NOTE

1. PLATES SHALL BE PROTECTED DURING FABRICATION AND SHIPPING TO PREVENT THE INTRUSION OF DEBRIS, COATING, ETC.INTO THE THREADS.

GROUNDING PLATE - 2 REQ'D.

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Notes

NOTES:

1. FOR FOUNDATION LOCATION PLAN, SEE DRAWING C-01.
2. FOR GENERAL NOTES, SEE DRAWING S-01.
3. FOR STRUCTURAL NOTES, SEE DRAWING S-01.
4. FOR CONCRETE NOTES, SEE DRAWING C-02

Legend

Reference Drawings

Rev	Date	Drawn	Description	Ck'd	Appr'd
A	7/30/13	DBP	ISSUED FOR BID	CK	CD

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Title
STATIC POLE DETAILS

PRELIMINARY
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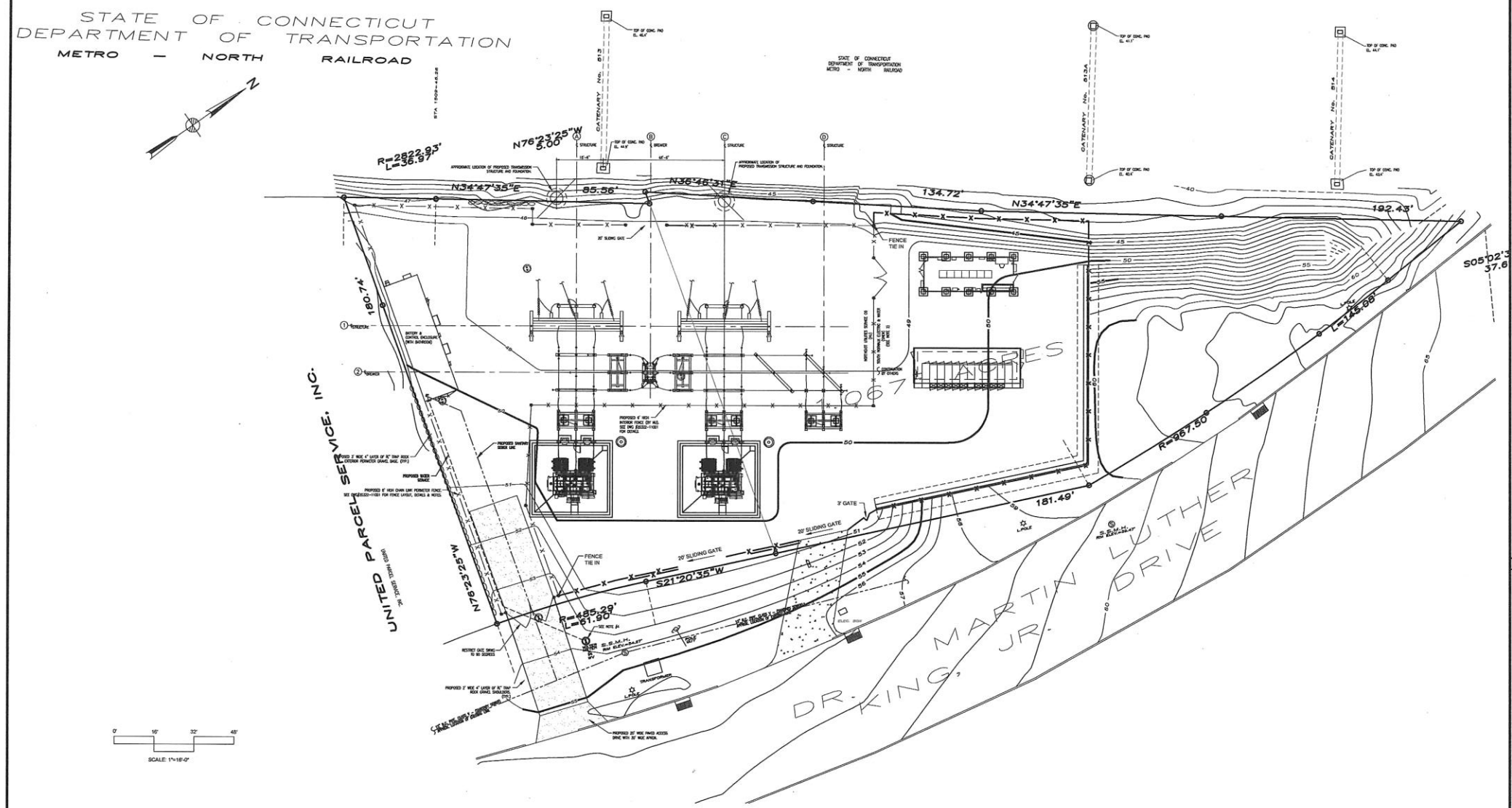
REPLACE WITH ENGINEERS STAMP AT CONSTRUCTION AND/OR FABRICATION ISSUE IF REQUIRED BY PROJECT ADMINISTRATION MANUAL

Designed	DBP	Eng check	CK
Drawn	DBP	Approved	CD
Dwg check	CK	Project Mngr	CD
Scale at ANSI E: NOTED		Date 7/30/13	Rev A

Drawing Number
312307-S-02

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
METRO — NORTH RAILROAD



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Notes

Legend

Reference Drawings

NUSCO DRAWING 20322-10002 "GRADING PLAN SITE DEVELOPMENT"

Rev	Date	Drawn	Description	Ch'k'd	App'd
C	07-30-13	DSP	ISSUED FOR BID	CD	CD
B	06-19-13	DSP	ISSUED FOR PERMIT	CD	CD
A	05-09-13	DSP	ISSUED FOR REVIEW	CD	CD

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Norwalk, CT. 06856
MM_CLIENT5

Title
SITE GRADING PLAN

PRELIMINARY
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REPLACE WITH ENGINEERS STAMP AT CONSTRUCTION AND/OR FABRICATION ISSUE IF REQUIRED BY PROJECT ADMINISTRATION MANUAL

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Drawn	DSP	Approved	CD
Dwg check	CK	Project Mngr	CD
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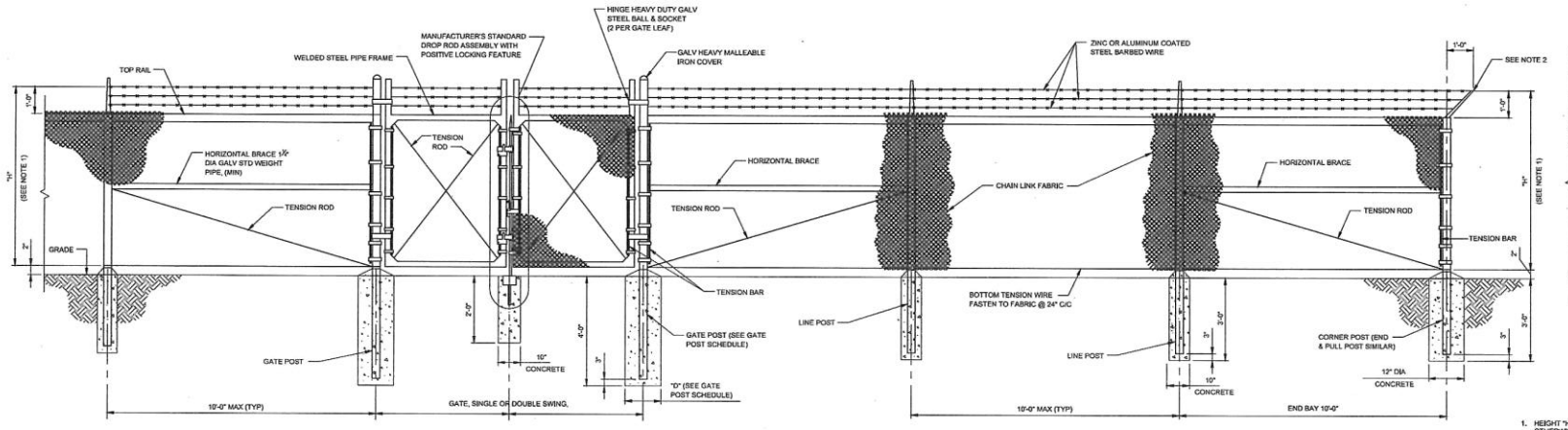
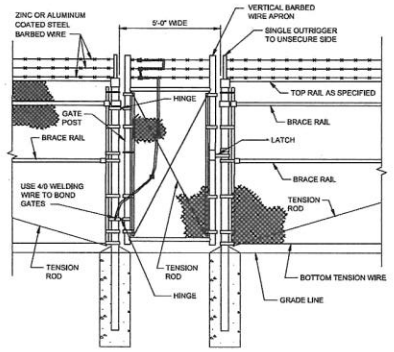
		Rev	C

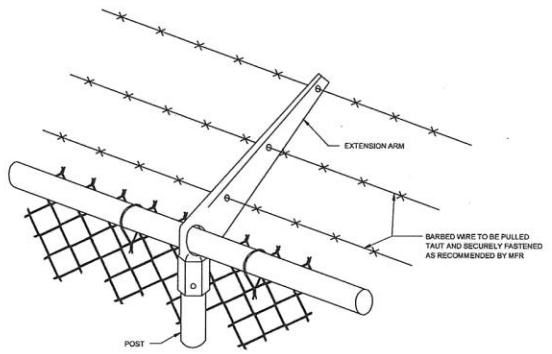
Drawing Number
312307-Y-01



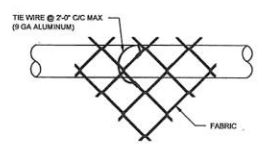
CHAIN LINK FABRIC FENCE ELEVATION



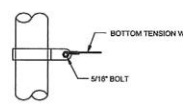
PERSONNEL GATE



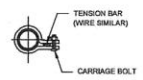
EXTENSION ARM FOR BARBED WIRE



WIRE TIES FOR TOP OR BRACE RAIL



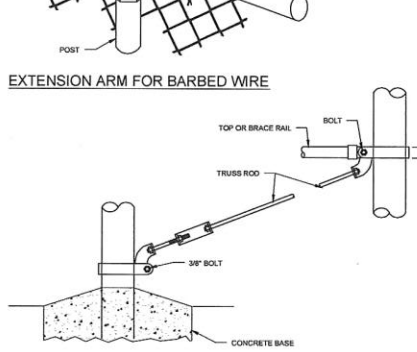
BAND FOR WIRE STRETCHING



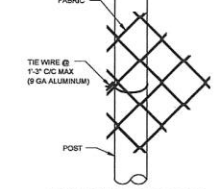
PLAN AT BANDS

GATE POST SCHEDULE SWING GATE			
NOMINAL SCH 40 PIPE SIZE	SINGLE GATE OPENING SIZE	DOUBLE GATE OPENING SIZE	POST HOLE DIAMETER "D"
2 1/2"	UP TO 6'-0"	UP TO 12'-0"	12"
3 1/2"	6'-0" TO 13'-0"	12'-0" TO 26'-0"	16"
8"	13'-0" TO 18'-0"	26'-0" TO 36'-0"	24"

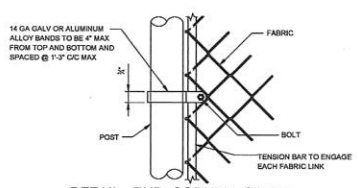
1. HEIGHT "H" OF FENCE SHALL BE 6'-0" UNLESS OTHERWISE NOTED, WITH 3 STRANDS OF 4 POINT BARBED WIRE SECURELY ATTACHED TO SINGLE EXTENSION ARMS ALONG TOP OF FENCE.
2. SINGLE EXTENSION ARMS SHALL POINT OUTWARD AT ANGLE OF 45 DEGREES.
3. PROVIDE ONE GATE KEEPER (TO HOLD GATE OPEN) PER SINGLE GATE, ANCHOR IN CONCRETE.
4. SEE CHAIN LINK FENCE TECHNICAL SPECIFICATION 288457-CSA-00821.
5. PROVIDE ELECTRICAL ISOLATION FOR FENCE SECTIONS IMMEDIATELY BELOW OVERHEAD POWER LINES.
6. MOTOR OPERATED GATE OPENING DETAILS SHALL BE IN ACCORDANCE WITH MANUFACTURERS DETAILS AND IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.



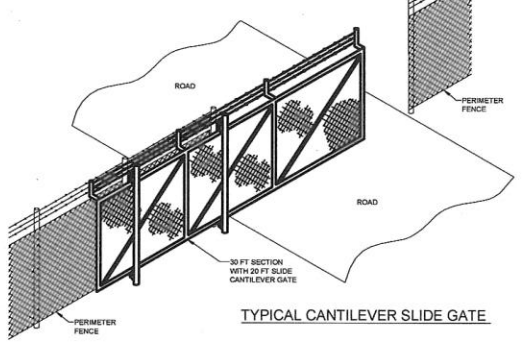
TRUSS ROD AND BAND



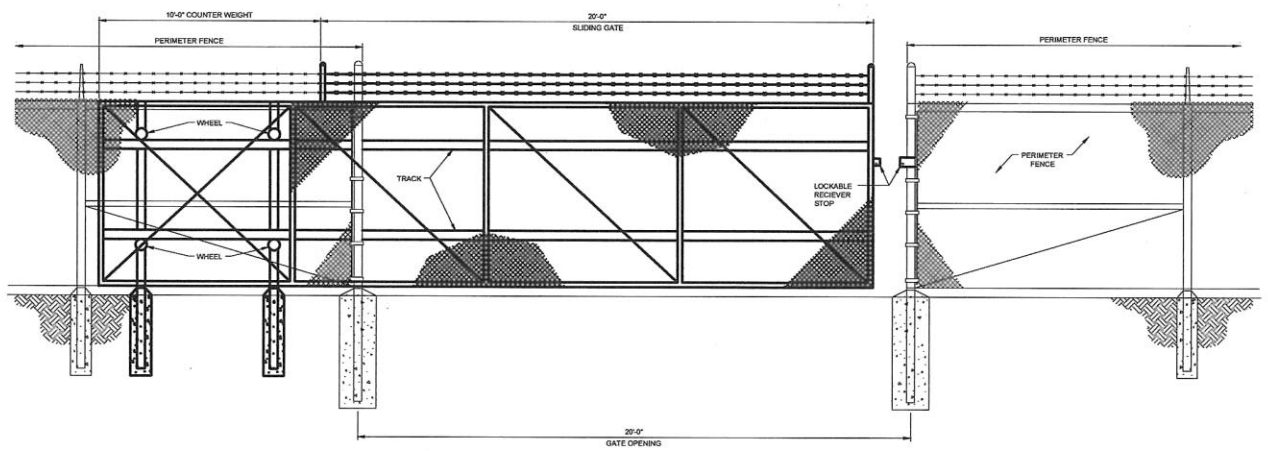
WIRE TIES FOR POST



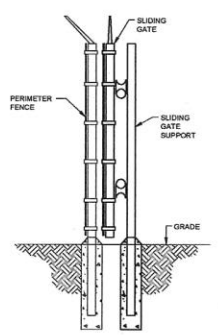
DETAIL - END, CORNER, GATE AND PULL POSTS



TYPICAL CANTILEVER SLIDE GATE



SLIDING GATE ELEVATION



SLIDING GATE SECTION

Notes

NOTES:

1. FOR FENCE LOCATION PLAN, SEE DRAWING C-01.
2. FOR GENERAL NOTES, SEE DRAWING C-01.
3. FOR STRUCTURAL NOTES, SEE DRAWING S-01.
4. FOR CONCRETE NOTES, SEE DRAWING C-02

Legend

Reference Drawings

Rev	Date	Drawn	Description	CH'k'd	App'd
A	7/30/13	DSP	ISSUED FOR BID	CMK	CD

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Title
FENCE AND GATE DETAILS

PRELIMINARY NOT FOR CONSTRUCTION
REPLACE WITH ENGINEERS STAMP AT CONSTRUCTION AND/OR FABRICATION ISSUE IF REQUIRED BY PROJECT ADMINISTRATION MANUAL

Designed	DSP	Eng check	CK
Drawn	DSP	Approved	CD
Dwg check	CK	Project Mngr	CD
Scale at ANSI E	NOTED	Date	7/30/13
		Rev	A

Drawing Number
312307-Y-02

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UNITED PARCEL SERVICE, INC.

DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY

MARTIN LUTHER KING DRIVE

CATENARY NO. 313A

CATENARY NO. 314

PLANT LIST

QTY	LATIN NAME	COMMON NAME	SIZE	SPACING
(5)	15 PRUNUS SERRULATA 'KWANZAN'	JAPANESE FLOWERING CHERRY	4.0" BBB	25'OC
(6)	46 TSUGA FUGIFOLIA X STANDISHII	GREEN GIANT ARBORVITAE	7-8' BBB	9'OC

*NO SUBSTITUTIONS OF SPECIES AND/OR QUALITY MAY BE MADE WITHOUT APPROVAL BY LANDSCAPE ARCHITECT

LEGEND

- PROPOSED RETAINING WALL
- PROPOSED CONTOUR
- PROPOSED CONTOUR 1' INTERVAL
- PROPOSED CONTOUR 5' INDEX
- PROPOSED PROPERTY SETBACK LINE
- PROPOSED FENCE
- PROPOSED SUBSTATION EQUIPMENT
- EXISTING STONE WALL
- EXISTING CONTOUR
- EXISTING CONTOUR 1' INTERVAL
- EXISTING CONTOUR 5' INDEX
- PROPERTY LINE
- EXISTING FENCE
- EXISTING CONCRETE SLAB

GRAPHIC SCALE IN FEET 10 0 20

PERMIT - NOT FOR CONSTRUCTION

DRAWING NUMBER:	1
SHEET NUMBER:	
REVISION	0

PROPOSED PLANTING PLAN

PROPOSED SUBSTATION

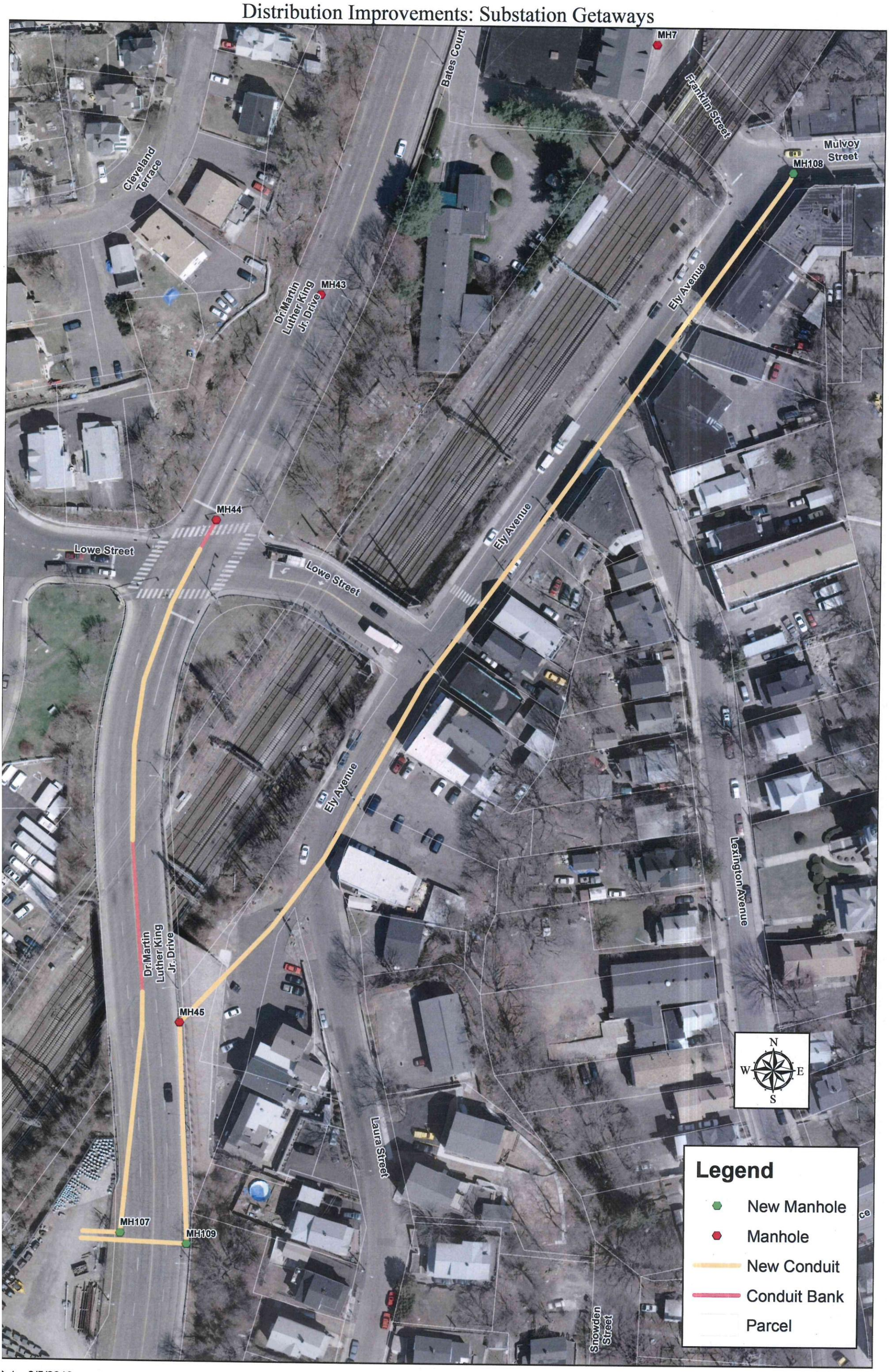
SOUTH NORWALK ELECTRIC & WATER
180-184 MARTIN LUTHER KING DRIVE
NORWALK, CT

PROJ. NO.: 60158889-001A DATE: 04/2012

DAVID G. WESTMORELAND
LANDSCAPE ARCHITECT
50 ELMWOOD AVE
NORWALK, CT 06854

NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
7							
6							
5							
4							
3							
2							
1							
0							

Distribution Improvements: Substation Getaways



Appendix D: Stormwater Best Management

STORMWATER BEST MANAGEMENT PRACTICES
SOUTH NORWALK ELECTRIC AND WATER SUBSTATION
180-184 DR. MARTIN LUTHER KING JR. DRIVE
NORWALK, CONNECTICUT

Prepared For:

South Norwalk Electric and Water

August 2013

Prepared By:

LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Groundwater and Environmental Engineering Services
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Shelton, CT 06484

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-DRAFT-
STORMWATER
BEST MANAGEMENT PRACTICES
SOUTH NORWALK ELECTRIC AND WATER SUB-STATION
180-184 DR. MARTIN LUTHER KING JR. DRIVE
NORWALK, CONNECTICUT

1.0 INTRODUCTION

This Stormwater Best Management Practices (BMP) Document shall be used after construction activities have been completed for the proposed new electric substation by South Norwalk Electric and Water Company (SNEW). The Property is comprised of two parcels of land, which together occupy 1.07 acres of land that is triangular in shape and is located at 180-184 on Dr. Martin Luther King Jr. Drive, Norwalk, CT (Property, Figure 1). The substation shall be used to reduce the incoming electric voltage and distribute the electricity to the surrounding area. SNEW owns the Property, however, the operation of the northern and eastern portion (0.75 acres) of the Property shall be managed by SNEW (Site) while the operation of the southern and western portion (0.45 acres) of the Property shall be managed by Northeast Utilities Service Co (NUS Site) (Plate 1). This BMP incorporates applicable and appropriate portions of the Connecticut Department of Energy and Environmental Protection (CTDEEP) "General Permit for the Discharge of Stormwater Associated with Industrial Activities" (Permit). The Property falls under Standard Industrial Classification Code 4911 (Definition No. 7 for "Industrial Activity" in the Permit), which is defined as "Electrical Services". As such, the Property would normally be subject to the requirements of Sector F (Steam Electric Power Generation) and the baseline requirements of the Permit. However, because there is no active generation of electricity or active steam generating units, the Property is not subject to the Permit unless CTDEEP specifically instructs otherwise.

The Property is subject to the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities because more than one (1) acre of land is proposed to be disturbed during construction activities. Registration of the aforementioned permit to CTDEEP is not required for construction activities that disturb between one and five acres of land if SNEW receives written approval of the Soil Erosion and Sediment Control (SESC) plan from the City of Norwalk and the SESC plan is prepared in accordance with the Connecticut 2002 Guidelines for Soil Erosion and Sediment Control. If a review of the SESC Plan is not conducted by the City of Norwalk, then SNEW must register and

comply with Section 6 of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities.

1.1 Objective and Scope

The objective of this BMP document is to identify possible pollutant sources to stormwater and to identify control measures that, when implemented, will reduce or eliminate any possible water-quality impacts once substation operations have begun. Control measures are physical, structural and/or managerial practices that, when used singly or in combination, prevent or reduce pollution of stormwater.

This BMP document shall focus on the control measures that SNEW will implement for the operation of their portion of the Property. NUS shall be responsible for developing their own Stormwater BMPs, however, NUS can use this document as general guidance for their stormwater management practices if they wish.

This BMP document contains an inventory of materials exposed to stormwater on SNEW's portion of the Property and outlines stormwater pollution prevention measures, inspection protocols, employee training, and reporting responsibilities. This BMP document provides a means for organizing related activities and records.

1.2 General Responsibilities

As the Owner and Operator of the SNEW portion of the property, SNEW has overall management responsibility for maintaining the Stormwater BMP Document. The Manager of Technical Services (MTS) has the general responsibility of conducting activities in a way that is consistent with this BMP document and each designated employee of SNEW is responsible for conducting daily activities in a way that is consistent with this BMP document.

2.0 FACILITY INFORMATION

2.1 Physical Description

An eight-foot high security fence is planned for construction to enclose both SNEW's and NUS's electric equipment. A six-foot high interior security fence shall be used as a boundary to separate the SNEW and NUS operations. The Site will contain transformers, circuit breakers and control houses.

2.2 Pollution Prevention Team

The SNEW Pollution Prevention Team has one environmental consultant, one Administrator and the staff at the Technical Services Department, who will perform the work necessary to implement the stormwater management practices described in this document. The titles and/or departments presently assigned to the team, and the activities for which they are responsible, are listed in Table 1.

2.3 Potential Pollutant Sources

A Property inspection was completed on May 2, 2013 to:

- identify stormwater drainage areas; and
- assess Property conditions prior to construction activities.

2.3.1 Surface Drainage

The surface-water drainage on the property is shown on Plate 1 and all surface water exits via sheetflow to the northwest in the direction of the railroad tracks as shown on Plate 2. A point source surface water discharge does not exist at the Property nor are there plans to construct a stormwater management structure that would create a point source discharge. Three (3) catch basins, which are connected to the municipal separate storm sewer system (MS4), are located on Dr. Martin Luther King Jr. Drive in close proximity to the Property. However, the planned elevation of the substation will be lower than the three catch basin grates, therefore, surface water drainage from the Site is not expected to impact these catch basins. The MS4 ultimately discharges to the Norwalk Harbor.

2.3.2 Inventory of Exposed Materials

Table 2 is a list of materials that can be exposed and potentially introduced to the stormwater onsite. The list of exposed materials in Table 2 includes the materials in the bulleted list provided below that may be exposed to stormwater once operations begin:

- storage and transfer of transformer oil in tanks; loading and unloading operations; and
- storage and loading/unloading of batteries.

2.3.3 Materials Management Practices for Potential Pollutants

This section presents a narrative summary of the materials management practices for the inventory of exposed materials listed in Table 2 and discusses:

1. a method and location of onsite storage or disposal;
2. materials management practices;
3. the location and a description of existing structural and non-structural control measures to reduce pollutants in the stormwater runoff; and
4. a description of any treatment the stormwater receives.

With the exposed materials described below, the non-structural control measures will include the use of spill supplies in the event of a minor spill and an inspection and training program to reduce the potential for adverse impacts to stormwater quality. The locations of the items described below are shown on Plate 1.

1. Routine Sampling and Storing Transformer Oil to Tanks 1 and 2

Once constructed, the Site will contain two non-bulk power transformers that use non-polychlorinated biphenyl (PCB) mineral insulating oil having a storage capacity of 5,038 gallons in three areas within the transformer; the main tank (4,341 gallons), the load tap changer (LTC) compartment (270 gallons) and the radiator (427 gallons).. The mineral insulating oil contains less than 1 ppm of polychlorinated biphenyls (PCBs) at the time of manufacture. Each transformer will be resting on a concrete pad. The transformer main tank and LTC chamber are integral to the transformer housing the transformer core/coils and LTC mechanism respectively, and will be constructed of single-walled steel. The area around the transformer pads will be designed with secondary containment that has a sufficient storage capacity to contain at least 110% of the total oil storage capacity of each transformer. The final design of the secondary containment has not been finalized and once a design is selected, this Stormwater BMP document can be amended to describe the secondary containment design. A Supervisory Control and Data Acquisition (SCADA) monitoring system is planned for use to monitor key parameters for the proper operation of the substation. If parameters become out-of-tolerance compared to desired operating conditions, then the monitoring system shall alert staff at SNEW's Technical Services Department. A trained SNEW employee will evaluate the Site condition that triggered the alarm and will subsequently determine the appropriate course of action.

2. Transfer and Storage of Lead-Acid Batteries

Lead-acid batteries are used for the substation operations and are stored in a dedicated location in the SNEW control house. The stored batteries will be inspected periodically for leaks or damage as described in Section 5.0 of this BMP document.

3.0 CONTROL MEASURES

The control measures described in this section are used to assist with the prevention of non-stormwater discharges at the Site.

3.1 Good Housekeeping

Each designated employee who has duties at the substation involving maintenance, solid or hazardous waste handling, or movement of maintenance materials outdoors is to conduct work activities in such a way that:

- no drums or pails are left anywhere outside unless they are empty and properly stored with the tops securely fastened;
- storage areas and work areas in the yard or building exteriors are kept neat and picked up on a regular basis (i.e. litter, debris, and miscellaneous materials shall be removed and disposed of properly and in a timely manner);
- stored materials shall not obstruct normal pathways for people or vehicles;
- no change-outs of vehicle or equipment fluids (crankcase, transmission, radiator, hydraulic systems) are conducted at the Site;
- no chemicals, fuels, oils, solvents, paints or similar substances are poured onto the ground or into catch basins; and
- employees are to be instructed to store and dispose of chemicals properly. Good labeling practices and Material Safety Data Sheets (MSDS) for chemicals shall be maintained at the Site.

3.2 Vehicle and Equipment Washing

Vehicle and equipment washing is not conducted at the Site and shall not be permitted.

3.3 Floor Drains and Roof Areas

Floor drains do not exist at the Site nor are there any floor drains planned for the construction of the substation. Stormwater drainage from the roof of the control house is not anticipated to cause adverse impacts to stormwater quality.

3.4 Minimize Exposure

SNEW shall make every effort to effectively minimize stormwater pollution by inspecting and maintaining transformers, materials and equipment which are exposed to rain, snow, snowmelt and runoff. As eluded to in Section 2.3.3, the transformers shall be equipped with secondary containment to contain the mineral oil in the event of a spill.

3.5 Sediment and Erosion Control

Surfaces with low permeability and minimal chance for erosion include the paved portions of the maintenance access roads, the footprint of the control houses and locations where electric equipment is resting on concrete pads. A majority of the Site will have a four-inch layer of crushed stone on the surface, which is underlain by a controlled fill layer on top of native soil. This area of the Site will be relatively flat and has no exposed soil; therefore, the chances for soil erosion are low. However, as part of the inspection program, the yard will be inspected for signs of erosion, subsidence or sediment deposits. In the event that erosion, subsidence or sediment deposition is observed during routine inspections, then this condition shall be reported to SNEW trained staff in the Technical Services Department, who will evaluate the situation and determine the best course of action. In addition, a retaining wall is planned for construction on the northern and eastern portion of the Site and this wall shall be inspected for damage or deterioration as part of the inspection program described in Section 5 of this BMP document.

3.6 Management of Runoff

As discussed previously, all surface water runoff will exit the Property via sheetflow and no plans for stormwater structures, other than the items discussed in Section 2.3.3 and Table 2, are being constructed for the substation.

During snow removal activities in the winter, snow will be plowed and moved to locations that will not be near electrical structures/wires or block maintenance access roads.

3.7 Preventative Maintenance

The preventative maintenance program consists of inspection and maintenance that is designed to identify and remove potential sources of pollution that may impact stormwater quality. The inspection of areas at the Site that are prone to pollution or require periodic assessment are discussed in Section 5 (inspections) and include the following:

- substation transformers and electrical equipment;
- lead-acid battery storage area; and
- fence, retaining wall and yard;

Any issues or problems identified in the preventative maintenance program will be promptly addressed.

3.8 Spill Prevention and Response

SNEW maintains a SPCC Plan pursuant to 40 CFR 112, which includes Emergency Spill Response Procedures that identify and minimize the risk of spills. The Emergency Spill Response Procedures are presented in Appendix I. The Emergency Spill Response Procedures are in place to insure that SNEW is capable of dealing with leaks or spills in an effective manner that is also protective of surface waters. When the construction of the substation is completed, the SPCC Plan shall be amended accordingly.

3.8.1 Stationary Above-Ground Storage Tank Secondary Containment

Following construction activities, above-ground storage tanks (ASTs) at the Site will consist of two transformers each containing 5,038-gallons of oil. As discussed in Section 2.3.3, secondary containment shall be designed to accommodate at least 110% of the total oil storage capacity of the tanks (5,550 gallons) and will be sufficiently impervious.

The secondary containment structure will be exposed to stormwater, therefore, inspections and maintenance of this structure will be required as part of the BMPs. If oil is detected in any quantity within secondary containment or more than three inches of stormwater accumulates inside the secondary containment structure during routine inspections, then these conditions shall be reported to trained SNEW Technical Services Department employees immediately. Any oil, oily water or liquid with an oil sheen detected within secondary containment shall be containerized and disposed of off-site according to applicable CTDEEP and Resource Conservation and Recovery Act (RCRA) regulations. If inspections reveal that there is

no oil, oily water or liquid with an oil sheen inside secondary containment, then this accumulated water may be discharged to the ground surface.

3.8.2 Portable Container Secondary Containment

Drums and portable containers of liquids are not planned for storage at the substation. If this condition should change, then this BMP document shall be amended accordingly.

3.8.3 Dumpsters and Waste Disposal

Dumpsters will not be stored on-site.

3.8.4 Loading Docks

The Site does not have loading docks, however, loading/off-loading of batteries or other supplies will be conducted at a dedicated location on-site. Training is provided to personnel so that proper loading/off-loading of supplies is practiced to minimize the likelihood of spills. The loading/off-loading area will be monitored for spills as part of the inspection program.

3.9 Employee Training

A large part of the success of the Stormwater BMP document is the capability and interest of personnel responsible for implementing and maintaining the BMP document. Personnel need to understand the importance of the program and the goals of the Stormwater BMP document. Personnel will be trained in the techniques of response, removal and documentation.

Each person whose activities may affect stormwater quality will receive training within 90 days of employment and at least once per year thereafter to make them familiar with the components and goals of the pollution control measures outlined in this BMP document. Annual personnel training workshops will be implemented, at which time participation and input should be encouraged. Training will be conducted by a member of the Stormwater Pollution Prevention Team or other qualified person. Training activities will be recorded in Table 3 and retained with the Stormwater BMP document. Training topics should include:

- knowing how to respond to and clean up spills;
- emergency equipment location and use;
- stormwater pollution control measures;
- inspection requirements;
- good housekeeping; and

- materials management practices.

The SNEW inspectors used to conduct inspections will be trained according to the requirements discussed in Sections 5 of this BMP document.

3.10 Non-Stormwater Discharges

Based on inspections and discussions with the SNEW representative, no non-stormwater discharges are present at the Site nor are there any non-stormwater discharges expected during the operation of the substation.

3.11 Solid De-icing Material Storage

Solid de-icing material is not stored at the Site.

4.0 FUTURE CONSTRUCTION

Future activity to construct a new substation is planned. The construction activities may disturb greater than one acre of land, therefore, these construction activities may be subject to the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. All construction activities, regardless of the amount of disturbed area, must comply with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control during construction and the 2004 Connecticut Stormwater Quality Manual for the design and implementation of post-construction stormwater management measures.

5.0 INSPECTIONS

An inspection and preventive maintenance program is to be followed to assure that all outdoor equipment and materials at the Site are properly stored and maintained. The purpose of this program is to reduce the potential for release of pollutants onto the railroad tracks, into the adjacent MS4 catch basins, or infiltration to the groundwater. The inspection and preventive maintenance program consists of routine (monthly) inspections and semi-annual reporting to document its implementation and findings.

The SNEW Technical Services Department is responsible for implementing the preventive maintenance program for the items discussed below. The SNEW Technical Services Department may delegate some of this responsibility to a trained SNEW employee familiar with this Stormwater BMP document. If conditions are observed during inspections that warrant

attention, then trained SNEW employees will address these situations and take appropriate actions in a timely manner. The monthly inspection checklist is included as Table 4. This inspection and maintenance program constitutes an ongoing and reasonably comprehensive compliance evaluation of the Site.

5.1 Routine (Monthly) Inspections

SNEW shall conduct routine inspections of the Site for potential pollutant discharges to stormwater on a monthly basis. The inspection form provided in Table 4 shall be used to document the monthly inspection and shall include the listed items:

- the Maintenance Access Road for erosion or damage;
- the tanks for the transformer oil and their associated secondary containment structures for leaks, spills or damage;
- spill supplies are intact and do not need to be replenished;
- the fence, gate and retaining wall for damage;
- the yard for good housekeeping and erosion/subsidence or excessive sediment deposits; and
- the lead-acid batteries for leaks or damage.

5.2 Inspection Reports and Recordkeeping

A semi-annual inspection report shall be prepared by a trained SNEW Technical Services Department employee or designated alternate that documents the implementation of the inspection program and, its findings, and that comment about the effectiveness of the stormwater management practices. The report shall include identification of the personnel conducting the inspections, the dates of the inspections, a summary of major observations and findings, actions taken, and updates made to the Stormwater BMP document as a result of any observations or actions taken.

All records, including inspection documents, reports, training documents and maintenance records associated with this Stormwater BMP document shall be retained onsite for a minimum of five years following the date a particular document was prepared.

6.0 STORMWATER BMP AMENDMENTS

The Stormwater BMP is to be amended when there is an operational change that alters the potential for stormwater pollution, when the actions specified herein fail to protect against pollution, or when the results of inspections indicate changes are necessary. Minor amendments to the Stormwater BMP pages are to be indicated by a letter after the revision number (e.g., Revision 2a), with the date of change. Major amendments of the entire document are to be given the next sequential revision number. The basis for each amendment is to be documented and kept in the stormwater folder. Outdated revisions of the Stormwater BMP document also are to be retained in the stormwater folder for five years following the date of issuance of the revised Stormwater BMP.

TABLE 1

STORMWATER BEST MANAGEMENT PRACTICES
SOUTH NORWALK ELECTRIC AND WATER SUBSTATION
180-184 DR. MARTIN LUTHER KING DRIVE
NORWALK, CONNECTICUT

Pollution Prevention Team

Position	Company Name Contact Name and Title	Phone Numbers	Responsibilities
Environmental Consultant	Leggette, Brashears & Graham, Inc.	(203) 929-8555 (W)	• Developing the Stormwater Best Management Practices (BMP) Document • Amending the Stormwater BMP when necessary
Administrator	SNEW General Manager	(203) 866-4446 (W)	• Overall management responsibility for the SNEW portion of the Site
Owner and Operator	SNEW Technical Services Department	(203) 866-4446 (W)	• Reviewing Stormwater BMP periodically for currency • Reporting spills to appropriate agencies and spill response contractors • Acting as spill incident commander unless or until other authorized agencies arrive on the scene. • Reporting any errors to agencies • Filing records and documents appropriately to the appropriate regulatory agencies • Managing inspections and training • Conduct Routine (Monthly) Inspections • Spill Response • Addressing any concerns as a result of routine inspections

W=Work Phone

TABLE 2

STORMWATER BEST MANAGEMENT PRACTICES
SOUTH NORWALK ELECTRIC AND WATER SUBSTATION
180-184 DR. MARTIN LUTHER KING DRIVE
NORWALK, CONNECTICUT

Inventory of Exposed Materials

ID No.	Activity/Exposed Materials [1/]	Onsite Location of Activity/Material	Potential Pollutants Associated with Exposed Materials	Description of Storage Tank or Container (Tank type, size, AST, UST, etc.)	Structural Control Measures used to Minimize Exposure	Non-structural Control Measures used to Minimize Exposure
1.	Routine Sampling and storing dielectric oil in transformers 1 and 2	Outdoors within fenced Substation	Non-PCB dielectric oil	Two transformers that contain single-walled steel tanks with a storage capacity of 5,038 gallons each meeting IEEE enclosure integrity Standards	Concrete dike wall and floor that is sufficient to contain at least 110% of the storage capacity of each transformer	Spill supplies; proper loading and unloading procedures followed; inspections and training
2.	Transport and storage of lead-acid batteries	Inside SNEW control house	Lead and acid	N/A	Batteries stored in a dedicated storage area indoors	Spill supplies; proper loading and unloading procedures followed; inspections and training

Note: 1. Refer to Plate 1 for locations of exposed materials.

TABLE 3

STORMWATER BEST MANAGEMENT PRACTICES
SOUTH NORWALK ELECTRIC AND WATER SUBSTATION
180-184 DR. MARTIN LUTHER KING DRIVE
NORWALK, CONNECTICUT

Annual Training Agenda and Roster

Synopsis of Stormwater BMP Material Covered in the Annual Training:

- What are Stormwater Best Management Practices?
- Goals of the Stormwater Best Management Practices Document.
- Stormwater pollution control measures
- General employee responsibilities for keeping a clean yard.
- Inspection requirements.
- Responses to leaks and spills inside and outside.
- Emergency procedures.
- Spill equipment locations.
- Other: _____
  _____
  _____

Attendance:

Name (Print)	**Signature**	**Worker ID Number**

Instructor:_____ Date:____/____/____ Time:_____

TABLE 4

STORMWATER BEST MANAGEMENT PRACTICES
SOUTH NORWALK ELECTRIC AND WATER SUBSTATION
180-184 DR. MARTIN LUTHER KING DRIVE
NORWALK, CONNECTICUT

Checklist/Report for Routine (Monthly)

Maintenance Inspections

Inspection Area	Inspection Item	Check	Possible Follow-Up Action Required if "*" follows answer
Transformers 1 and 2	Any leaks, spills or stains?	[ ]*YES [ ]NO	_____
	Any damage to transformer?	[ ]*YES [ ]NO	_____
	Any oil, oily water or sheen inside secondary containment?	[ ]*YES [ ]NO	_____
	Are there more than three (3) inches of liquid in secondary containment?	[ ]*YES [ ]NO	_____
Maintenance Road and Yard	Any signs of erosion or damage to access road or retaining wall?	[ ]*YES [ ]NO	_____
	Good housekeeping maintained at the Site?	[ ]YES [ ]*NO	_____
	Any leaks or spills in loading/unloading area?	[ ]*YES [ ]NO	_____
Control House	Lead-Acid batteries leaking or damaged?	[ ]*YES [ ]NO	_____
	Any replenishment of spill supplies required?	[ ]*YES [ ]NO	_____
	Good housekeeping maintained?	[ ]YES [ ]*NO	_____
	Does SCADA monitoring system indicate operational issues?	[ ]*YES [ ]NO	_____
Fence and Gate	Any Damage to Fence or Gate?	[ ]*YES [ ]NO	_____

Inspector:(Print)_____(Sign)_____Date:___/___/___

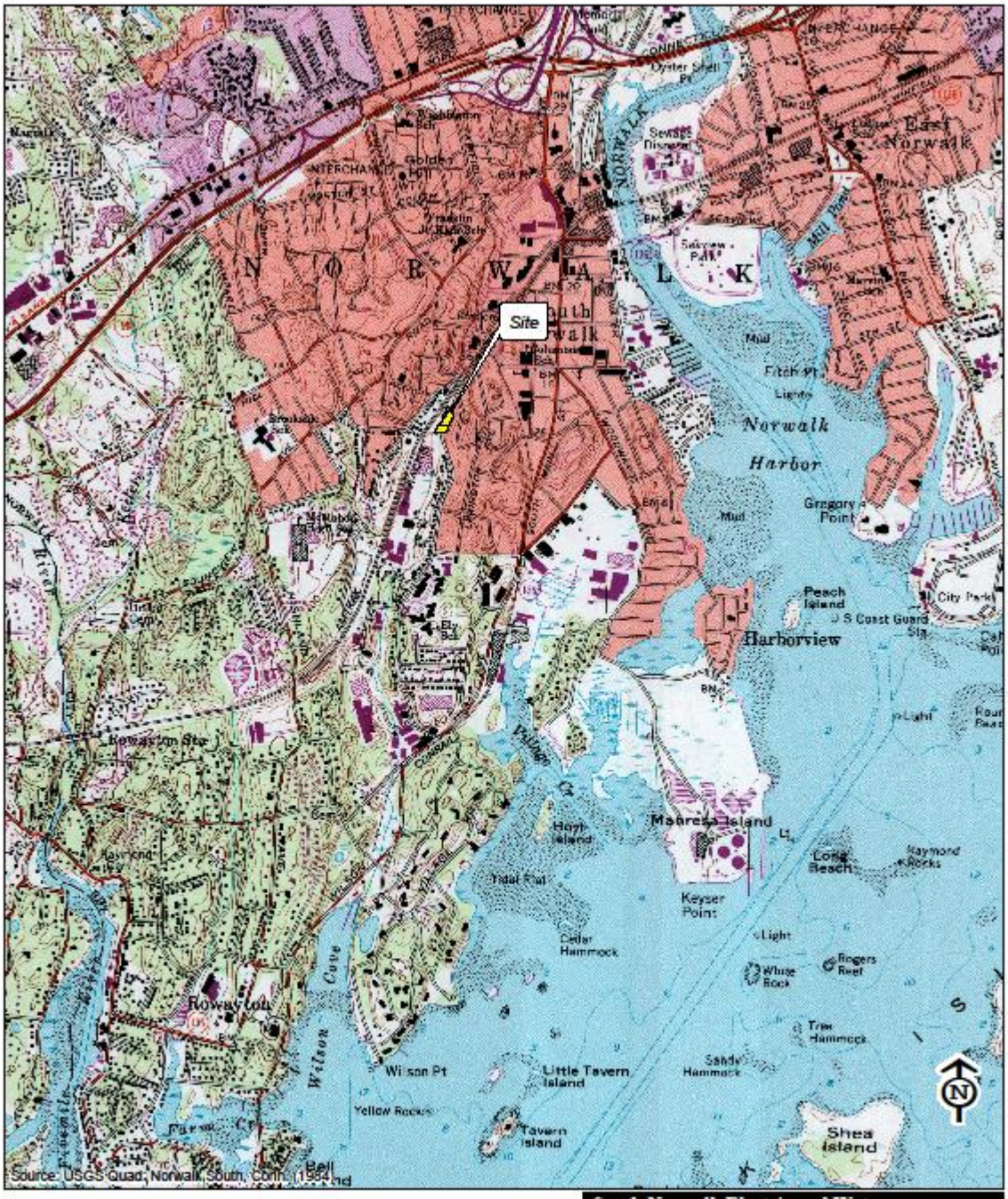


Figure 1
Site Location Map
180-184 Dr. Martin Luther King Jr. Drive
Norwalk, Connecticut

APPENDIX I

EMERGENCY SPILL RESPONSE PROCEDURES

LEGGETTE, BRASHEARS & GRAHAM, INC.

EMERGENCY SPILL RESPONSE PROCEDURES

(SNEW)

This section presents a set of procedures to be followed in the event of a spill. These procedures are not intended to encompass all aspects of any spill that could possibly occur; rather, they have been developed for use as a guide for persons involved in control and countermeasures operations. In the event of a release, a quick response is important to the protection of employees and the environment. However, the responsibility of employees to respond to a spill is based on multiple factors consisting of:

- the level of employee training;
- the nature of the spill;
- the quantity of material spilled;
- the type of material spilled;
- the location of employees relative to the immediate release area; and
- other safety considerations that could put employees at risk of injury during spill response activities.

Before describing the procedures to be taken in response to a spill, the following definitions must be understood. These definitions are an integral part of the spill response procedures.

- Release: Any spill, discharge or leak of a substance from its assigned container or storage unit.

- Immediate Release Area: A 50-foot radius around the release.

- Significant Release: A release that meets any one of the following criteria:

    - a spill in excess of 5 gallons
    - a spill of any size that employees cannot reach safely because of another hazard (fire, explosion, electrical, chemical, physical, etc.)

- Incidental (Minor) Release: A release that is not considered a significant release based on the criteria stated above.

PROCEDURES

In the event of a release, employees who first notice the release must evaluate the nature and extent of the release to determine if the release is “incidental (minor)” or “significant” and immediately notify the Technical Services Department Manager or designated alternate.

Incidental (Minor) Release Response Procedures

For any incidental (minor) release, trained employees will undertake the following procedures:

- Absorb, neutralize, or otherwise control the release using the available solid absorbent materials. This includes placing catch basin mats and orange cones over catch basins as needed.

- Determine if additional response help is necessary.

- Collect and use absorbent material and place the collected material in the dedicated container adjacent to the absorbent materials.

Incidental (Minor) Release Procedures for the Technical Services Department Manager or Designated Representative

- Act as the SNEW spill Incident Commander (IC).

- If additional incidental (minor) release response help is deemed necessary, contact a licensed spill response company (i.e., Moran Environmental).

- Instruct untrained employees **not** to enter the immediate release area.

- Document the release and the release response. The spill response document should contain the following: the date, time, location, material spilled, quantity spilled, source, cleanup methods, name of contractor responding to the spill (if applicable), corrective actions taken, injuries sustained (if applicable) and damage estimate.

- As part of the spill response notification procedures, the Technical Services will notify the CTDEEP – Oil and Chemical Spill Response Division (860) 484-3338.

- When the release response is complete, make the necessary arrangements to have the waste material transported and disposed of by an authorized waste handler in accordance with federal, state and local regulations.

Significant Release Response Procedure

For an uncontrolled release, employees will take **no response action beyond the following**:

- Notify employees in the immediate area (loud voice) and initiate evacuation procedures in accordance with the SNEW emergency evacuation plan.

- Activate the alarms and secure the area if it is safe to do so.

- Follow the instructions of Technical Services.

- If possible and safe, place catch basin mats over catch basins close to and/or downgradient of the release and have the mats held in place with orange safety cones.

Depending on the location of the release, Technical Services will designate a Spill Incident Commander.

- From a safe area, notify the following companies or agencies:
    - Spill Response Contractor (Moran Environmental): (800) 562-7611
    - CTDEEP: Oil and Spill Response Division (860) 424-3338
    - Norwalk Fire and Police Departments: 911
    -
    - If the spill impacts the metro-north train tracks, then notify MTA metro-north: (212) 340-2050
    - If the spill reaches stormwater catch basins, then notify the NRC: (800) 424-8802

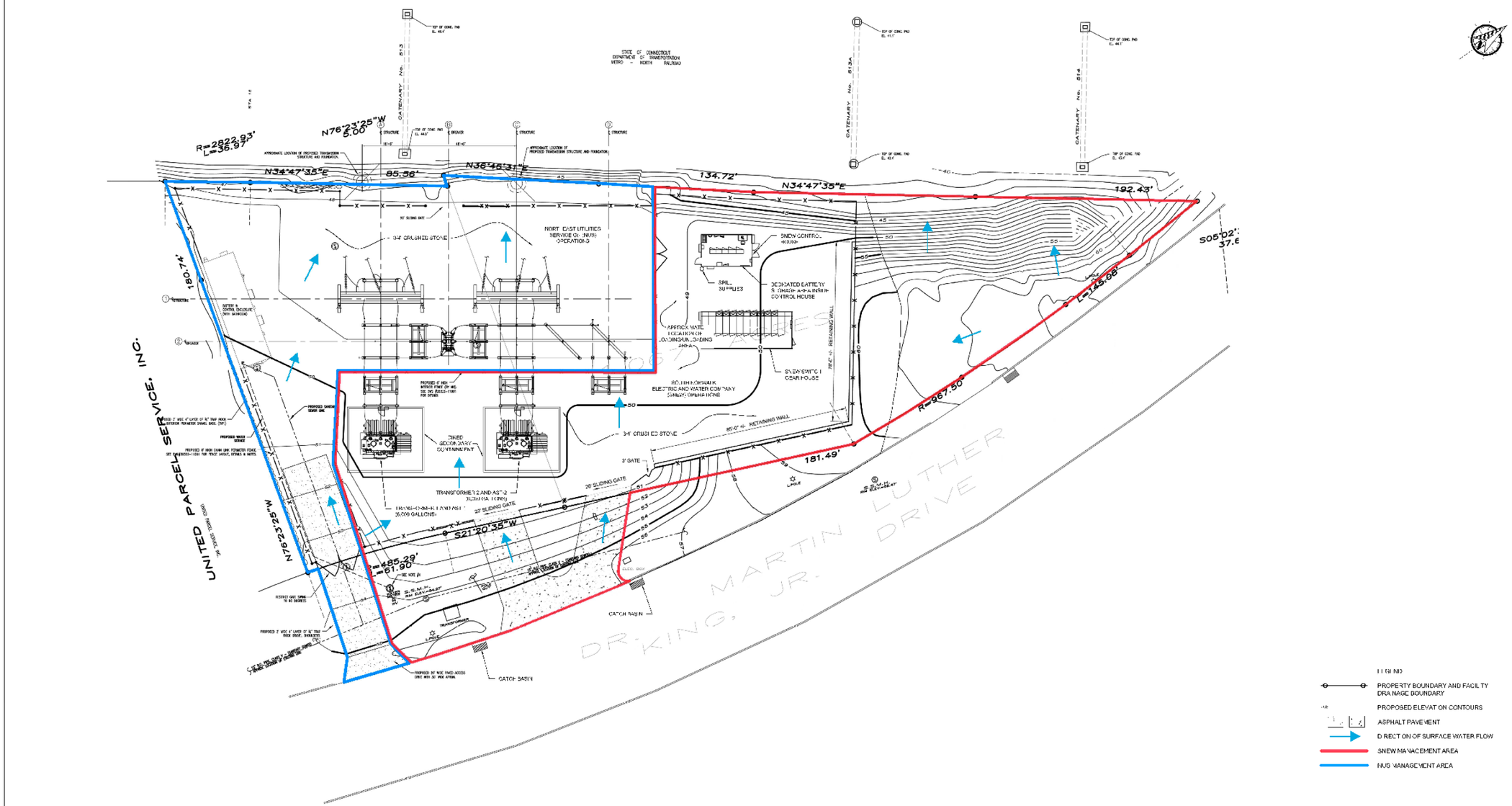
- Have the following information compiled and available upon request:
    - Where the spill occurred;
    - When the spill occurred;
    - The type and amount of material spilled;
    - The cause of the incident; and
    - The corrective action being taken.

- Update local, state and federal responders on the status of all employees and site conditions when they arrive.

- Document the release and the release response.

RELEASE DOCUMENTATION

Unless specifically requested by CTDEEP, a written submission of a spill incident report is not required. If such documentation is requested by CTDEEP, then this report shall be sent to CTDEEP within the timeframe they specify and one copy will be retained at the Site.



LEGEND

- PROPERTY BOUNDARY AND FACILITY DRAINAGE BOUNDARY
- PROPOSED ELEVATION CONTOURS
- ASPHALT PAVEMENT
- DIRECTION OF SURFACE WATER FLOW
- SNEW MANAGEMENT AREA
- NUS MANAGEMENT AREA

SOURCES:
BASE MAP: "SOUTH NORWALK ELECTRIC & WATER PLANT NO. 1 & 2 SUBSTATIONS, ELECTRIC AND WATER (SNEW) UTILITY DEPT., DATED MAY 19, 2011 (REV.)
CONTOURS - "NORTHEAST UTILITIES SERVICE CO." SCALE 1"=40' SAVE 'N' PLAN SITE DEVELOPMENT FOR CONNECTICUT LIGHT AND POWER COMPANY, 27252-11012, DATED JUNE 28, 2012, REV. APRIL 2013, (AUTOCAD FILE).

SCALE IN FEET

SOUTH NORWALK ELECTRIC AND WATER
SECOND TAXING DISTRICT
CITY OF NORWALK, CONNECTICUT

SITE PLAN WITH FACILITY DRAINAGE

DATE	REVISED

PREPARED BY:
LEIGHTON, BRASHEARS & GRAHAM, INC.
Professional Groundwater and Environmental Engineering Services
4 Research Drive
Suite 301
Shelton, Connecticut 06484
(203) 929-8555

DRAWN:	RAC	CHECKED:	MG	DATE:	05/21/13	PLATE:	1