

OCTOBER 3, 2019

NETWORK INFRASTRUCTURE UPGRADE FOR SECURITY
NEW HAVEN LINE
PHASE 3

STAMFORD TO WESTPORT

STATE PROJECT NO. 0300-0202

ADDENDUM NO. 1

This Addendum addresses the following questions and answers contained on the “CT DOT QUESTIONS AND ANSWERS WEBSITE FOR ADVERTISED CONSTRUCTION PROJECTS”:

Question and Answers Nos. 15b, 19, 40, 42, 43, 49, 50, 51, 53, 58, 59, 67, 68, 70, 71, 73

SPECIAL PROVISIONS
NEW SPECIAL PROVISIONS

The following Special Provision is hereby added to the Contract:

- NOTICE TO CONTRACTOR – HAZMAT MATERIALS INVESTIGATIONS
- ITEM #0000426A – ELECTRIC HANDHOLE
- ITEM #0020902A – LEAD COMPLIANCE FOR BUILDING DEMOLITION AND RENOVATION
- ITEM #0202317A – DISPOSAL OF HAZARDOUS MATERIALS
- ITEM #1008186A – 4" PVC COATED CONDUIT

REVISED SPECIAL PROVISIONS

The following Special Provisions are hereby deleted in their entirety and replaced with the attached like-named Special Provisions:

- NOTICE TO CONTRACTOR – UTILITY SERVICE CONNECTIONS
- SECTION 1.05 – CONTROL OF THE WORK
- ITEM #0150745A – SECURITY NODE HOUSE

The combined special provision for Item No. 0090696A – Grounding Detail G-1 and Item No. 0603431A – Steel (Miscellaneous) has been revised to show the deletion of Item No. 0090700A – Grounding Detail G-5

CONTRACT ITEMS**NEW CONTRACT ITEMS**

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>
0000426A	ELECTRIC HANDHOLE	EA.	2
0020902A	LEAD COMPLIANCE FOR BUILDING RENOVATION AND DEMOLITION	L.S.	1
0202317A	DISPOSAL OF HAZARDOUS MATERIALS	TON	2
0602006	DEFORMED STEEL BARS - EPOXY COATED	LB.	5,900
0602052	WELDED WIRE FABRIC - EPOXY COATED	S.Y.	30
1008142	4" PVC CONDUIT - UNDER ROADWAY	L.F.	590
1008186A	4" PVC COATED CONDUIT	L.F.	90
1008465	2" RIGID METAL CONDUIT	L.F.	100
1008468	4" RIGID METAL CONDUIT	L.F.	50
1112253A	CCTV POLE TYPE C – DUAL CAMERA MAST ARM	EA.	5
1220013A	CONSTRUCTION SIGNS – BRIGHT FLUORESCENT SHEETING	S.F.	150

REVISED CONTRACT ITEMS

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
0150840A	CCTV CABINET - BRIDGE	1 EA.	5 EA.
0728020A	STONE BALLAST	2 TON	67 TON
0821183	PRECAST CONCRETE BARRIER CURB (30" X 45")	20 L.F.	35 L.F.
1008124	1" POLYVINYL CHLORIDE CONDUIT IN TRENCH	560 L.F.	340 L.F.

1008127	2" POLYVINYL CHLORIDE CONDUIT IN TRENCH	40 L.F.	1,060 L.F.
1112241A	FIBER OPTIC CABLE SPLICE ENCLOSURE	14 EA.	12 EA.
1112254	CCTV POLE TYPE D – MAST ARM	48 EA.	46 EA.
1112263	CCTV POLE TYPE B - STRAIGHT POLE	65 EA.	29 EA.
1500123	CONCRETE DUCT BANK	68 L.F.	120 L.F.

DELETED CONTRACT ITEMS

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>UNIT</u>	<u>QUANTITY</u>
0090700A	GROUNDING DETAIL G-5	EA.	2
1112231	CCTV JUNCTION BOX	EA.	160
1112245	CCTV CABINET – PECK BRIDGE	EA.	2

PLANS

REVISED PLANS:

The following Plan Sheets are hereby deleted and replaced with the like-numbered Plan Sheets:

02.01.A1

03.36.A1

04.17.A1

04.21.A1

06.04.A1

06.015.A1

The Bid Proposal Form has been revised to reflect these changes.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

NOTICE TO CONTRACTOR – HAZARDOUS MATERIALS INVESTIGATIONS

Lead paint is presumed present on all painted building materials/bridge components scheduled for impact by the New Haven Line Network Infrastructure Upgrade Phase 3.

Any painted non-metallic debris and/or paint waste to be generated is presumed as RCRA/CTDEEP hazardous lead waste.

The Contractor is hereby notified that these hazardous materials requiring special management or disposal procedures will be encountered during various construction activities conducted within the project limits. The Contractor will be required to implement appropriate health and safety measures for all construction activities impacting these materials. These measures shall include, but are not limited to, air monitoring, engineering controls, personal protective equipment and decontamination, equipment decontamination and personnel training. **WORKER HEALTH AND SAFETY PROTOCOLS WHICH ADDRESS POTENTIAL AND/OR ACTUAL RISK OF EXPOSURE TO SITE SPECIFIC HAZARDS ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.**

The Department, as Generator, will provide an authorized representative to sign all manifests and waste profile documentation required by disposal facilities for disposal of hazardous materials.

The Sections which shall be reviewed by the Contractor include, but are not limited to, the following:

- Item No. 0020902A – Lead Compliance for Building Demolition & Renovation
- Item No. 0202317A – Disposal of Hazardous Materials (Pb Debris)

The Contractor is alerted to the fact that a Department environmental consultant may be on site for abatement and related activities, to collect environmental samples (if necessary), and to observe site conditions for the State.

NOTICE TO CONTRACTOR – UTILITY SERVICE CONNECTIONS

The electric, water, sewer, and gas services to the Project Site require service connections to the applicable utility company's facilities. Utility service connections and installations to the point of the utility service are included as shown and described within the Contract.

The Contractor is responsible for notifying the utility company prior to the need for the utility connection, and for coordinating the service connection and/or relocation requirements with the utility company. The Contractor shall coordinate with the following utility companies:

<u>Electric:</u>	Eversource Energy and Third Taxing District of Norwalk
<u>Water:</u>	Aquarion Water Company of Connecticut
<u>Sewer:</u>	City of Norwalk Water Pollution Control Authority
<u>Gas:</u>	Eversource Energy

Where known, utility company representatives are identified elsewhere within the Contract.

SECTION 1.05 - CONTROL OF THE WORK

Replace Article 1.05.02 with the following:

1.05.02—Contractor Submittals, Working Drawings, Shop Drawings, Product Data, Submittal Preparation and Processing - Review Timeframes, Department’s Action:

1. Contractor Submittals: The plans provided by the Department show the details necessary to give a comprehensive idea of the construction contemplated under the Contract. The plans will generally show the location, character, dimensions, and details necessary to complete the Project. If the plans do not show complete details, they will show the necessary dimensions and details, which when used along with the other Contract documents, will enable the Contractor to prepare working drawings, shop drawings or product data necessary to complete the Project.

The Contractor shall prepare submittals as Portable Document Format (PDF) files. The Contractor is also required to acquire, maintain access and use the Department’s document management system for delivery of submittals. The format, digital signing requirements, delivery processes and document tracking procedures shall be performed in accordance with this specification and the [Contractor’s Digital Submission Manual](#) (CDSM).

The submittals shall be sent to the Department’s reviewer(s), sufficiently in advance of the work detailed, to allow for their review in accordance with the review periods as specified herein (including any necessary revisions, resubmittal, and final review), and acquisition of materials, without causing a delay of the Project.

2. Working Drawings: When required by the Contract or when ordered to do so by the Engineer, the Contractor shall prepare and submit the working drawings, signed, sealed and dated by a qualified Professional Engineer licensed to practice in the State of Connecticut, for review. The drawings shall be delivered sufficiently in advance of the work detailed, to allow for their review in accordance with the review periods specified herein (including any necessary revisions, resubmittal, and final review).

There will be no direct payment for furnishing any working drawings, procedures or supporting calculations, but the cost thereof shall be considered as included in the general cost of the work.

a. Working Drawings for Permanent Construction: The Contractor shall supply to the Assistant District Engineer a certificate of insurance in accordance with 1.03.07 at the time that the working drawings for the Project are submitted.

The Contractor’s designer, who prepares the working drawings, shall secure and maintain at no direct cost to the State a Professional Liability Insurance Policy for errors and omissions in the minimum amount of \$2,000,000 per error or omission. The Contractor’s designer may elect to obtain a policy containing a maximum \$250,000 deductible clause, but if the Contractor’s designer should obtain a policy containing such a clause, they shall be liable to the extent of at

least the deductible amount. The Contractor's designer shall obtain the appropriate and proper endorsement of its Professional Liability Policy to cover the indemnification clause in this Contract, as the same relates to negligent acts, errors or omissions in the Project work performed by them. The Contractor's designer shall continue this liability insurance coverage for a period of

- (i) 3 years from the date of acceptance of the work by the Engineer, as evidenced by a State of Connecticut, Department of Transportation form entitled "Certificate of Acceptance of Work," issued to the Contractor; or
- (ii) 3 years after the termination of the Contract, whichever is earlier, subject to the continued commercial availability of such insurance.

b. Working Drawings for Temporary Construction: The Contractor shall submit drawings, calculations, procedures and other supporting data to the Assistant District Engineer.

3. Shop Drawings: When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and deliver shop drawings to the Designer for review. Review timeframes and submission locations are as specified herein.

There will be no direct payment for furnishing any shop drawings, but the cost thereof shall be considered as included in the general cost of the work.

4. Product Data: When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and deliver product data.

The Contractor shall submit the product data in a single submittal for each element or group of elements of construction.

The Contractor shall mark each copy of the product data submittal to show applicable choices and options. Where product data includes information on several products that are not required, copies shall be marked to indicate the applicable information. Product data shall include the following information and confirmation of conformance with the Contract to the extent applicable: manufacturer's printed recommendations, compliance with recognized trade association standards, compliance with recognized testing agency standards, application of testing agency labels and seals, notation of coordination requirements, Contract item number, and any other information required by the individual Contract provisions.

There will be no direct payment for furnishing any product data, but the cost thereof shall be considered as included in the general cost of the work.

5. Submittal Preparation and Processing – Review Timeframes: The Contractor shall allow 30 calendar days for submittal review by the Department, from the date receipt is acknowledged by the Department's reviewer. For any submittals marked with "Revise and Resubmit" or "Rejected," the Department is allowed an additional 20 calendar days for review of any resubmissions.

An extension of Contract time will not be authorized due to the Contractor's failure to transmit submittals sufficiently in advance of the work to permit processing.

The furnishing of shop drawings, working drawings or product data, or any comments or suggestions by the Designer or Engineer concerning shop drawings, working drawings or product data, shall not relieve the Contractor of any of its responsibility for claims by the State or by third parties, as per 1.07.10.

The furnishing of the shop drawings, working drawings and product data shall not serve to relieve the Contractor of any part of its responsibility for the safety or the successful completion of the Project construction.

- 6. Department's Action:** The Designer or Engineer will review each submittal, mark each with a self-explanatory action stamp, and return the stamped submittal promptly to the Contractor. The Contractor shall not proceed with the part of the Project covered by the submittal until the submittal is marked "No Exceptions Noted" or "Exceptions as Noted" by the Designer or Engineer. The Contractor shall retain sole responsibility for compliance with all Contract requirements. The stamp will be marked as follows to indicate the action taken:
- a. If submittals are marked "No Exceptions Noted," the Designer or Engineer has not observed any statement or feature that appears to deviate from the Contract requirements. This disposition is contingent on being able to execute any manufacturer's written warranty in compliance with the Contract provisions.
 - b. If submittals are marked "Exceptions as Noted" the considerations or changes noted by the Department's Action are necessary for the submittal to comply with Contract requirements. The Contractor shall review the required changes and inform the Designer or Engineer if they feel the changes violate a provision of the Contract or would lessen the warranty coverage.
 - c. If submittals are marked "Revise and Resubmit," the Contractor shall revise the submittals to address the deficiencies or provide additional information as noted by the Designer or Engineer. The Contractor shall allow an additional review period as specified in 1.05.02-5.
 - d. If submittals are marked "Rejected," the Contractor shall prepare and submit a new submittal in accordance with the Designer's or Engineer's notations. The resubmissions require an additional review and determination by the Designer or Engineer. The Contractor shall allow an additional review period as specified in 1.05.02-5.

Article 1.05.06—Cooperation with Utilities (Including Railroads) – is supplemented as follows:

Add the following after the last paragraph:

“Special Requirements Regarding Work in Metro-North territory:”

Description:

This section covers authority, definitions, regulatory requirements, traffic regulation and coordination of the Contractor’s work schedule with the operation of train service, construction equipment and safety requirements for working within railroad right-of-way, and provisions for storage of materials and equipment and worker safety rules. Subsequent to the Engineer’s Pre-construction meeting and prior to commencement to contract activities, a working on the railroad meeting will be held by the Engineer to emphasis these Specifications.

Permission to Enter Upon Railroad Property

Permission is hereby granted to the Contractor to enter property of the State, under the custody and control of the Department and managed by Metro-North Commuter Railroad Company (hereinafter called “Railroad”), a public benefit corporation and subsidiary of Metropolitan Transportation Authority (hereinafter called “MTA”). The purpose of this permission shall be solely for those outlined in this contract and under the following terms and conditions:

- I. Location and Access. Permission is hereby granted to the Contractor and its subcontractor(s), if any, to enter the property, given that they have the proper permission to enter, within the Project Limits identified on the Contract Plans of the New Haven Line, in the vicinity between Mileposts 33.4 (just East of Stamford Station) and 47.15 (just East of Green’s Farms Station), in the State of Connecticut (hereinafter called the “Property”).
- II. Liability. The Contractor covenants and agrees to at all times indemnify, protect and save harmless the “Additional Insureds” which includes MTA, Railroad, National Railroad Passenger Corporation (“AMTRAK”), Housatonic Railroad Company (“Housatonic”), Providence & Worcester Railroad Company (“P&W”), and CTDOT from and against any and all losses, damages, detriments, suits, claims, demands, costs, and charges which the “Additional Insureds” may directly or indirectly suffer, sustain, or be subjected to by or on account of Contractors entry upon, occupancy or use of the Property, or the conduct thereon of the Contractor, its subcontractors, officers, employees, agents or invitees, whether such loss or damage be suffered or sustained by the “Additional Insureds” directly or persons (including employees of the “Additional Insureds” or Corporations who may seek to hold the “Additional Insureds” liable therefore), and whether attributable to the fault, failure or negligence of the “Additional Insureds” or otherwise.

- III. Consideration. The Contractor will pay to the Railroad, the sum of Zero Dollars (\$0.00) for the right to enter upon the Property.
- IV. Terms of Permit. The Railroad reserves the right to revoke this permission at any time. Unless subsequently modified, this shall begin with Notice to Proceed and shall end at Contract Completion Date at which time it shall expire automatically. Under no circumstances shall this temporary permission be construed as granting the Contractor any rights, title or interest of any kind or character in, on, or about the land or premises of MTA or Railroad thereafter. The Permittee agrees to notify the Railroad when use of the Property or work is completed.
- V. Definitions of Terms and Permissible Abbreviations:

Authority of the Railroad Engineer – This supplements Form 817, Section 1.05.01 in that all contract work upon or affecting railroad property, right-of-way or facilities, shall also be subject to the approval of the Senior Director, Capital Programs of the Railroad or his duly authorized representative, through coordination with the Engineer.

Additional Insureds – Those individuals or entities appearing under Article 1.03.07, Paragraph 13 of the Specifications.

Conductor/Flagman – A Railroad employee qualified on the Rules of the Operating Department and qualified on the physical characteristics of the portion of the railroad involved. He/she is the contact employee qualified to obtain the use of track. Each conductor/flagman will have the proper flagging equipment, up-to-date Railroad Operating Rules, Timetables and Safety Rules.

Coordination of Work – This supplements Form 817, Section 1.05.06 in that the Contractor shall be responsible for the coordination of the work of his sub-contractors with respect to the railroad property, right-of-way or facilities.

Groundman – Class “A” employee of the Railroad’s Power Department authorized to de-energize/re-energize and ground high tension power lines.

Horizontal Clearance Point – A point 10 feet from the centerline of a track.

Obstruction – An entering of the traffic envelope, also referred to as fouling.

Occupancy – Any use of track other than direct crossing.

On or Adjacent to – shall be interpreted to include space on, above and below the railroad right-of-way operated by the Railroad, as well as space on, above, and below adjacent property which the Railroad determines to affect the safe operations of service.

Qualified Railroad Employee – For the purpose of these specifications, a Qualified Railroad Employee is a Railroad employee qualified to remove track or tracks from service.

Railroad – Whenever the term “Railroad” is used without further qualification, it shall be taken to mean Metro-North Commuter Railroad Company.

Right-of-Way – The limits of railroad property on either side of tracks.

The Safety Rules – All work shall be performed in accordance with rules, regulations, procedures, and safe practices of the Railroad, FRA, OSHA, NESC and all other government agencies having jurisdiction over this project.

Track – The space between the rails plus not less than 4 feet outside each rail.

Traffic Envelope – The area encompassed by the vertical and the horizontal clearance points.

Vertical Clearance Point – A point 22 feet and 6 inches above the top of a running rail unless otherwise authorized by the Railroad.

Use of Track – Obtaining permission from the proper authority of the Railroad for track occupancy.

1 – Requirements for Performing Work on or Adjacent to the Railroad Right-of-Way

(a) General

- (1) The Contractor should note that the proposed work involves construction operations on or adjacent to property owned by State and operated by the Railroad. In working near an operating railroad, great care must be exercised and the Railroad’s safety rules must be strictly observed.
- (2) If while completing the work covered by this contract, the tracks or other facilities of the Railroad are endangered, the Contractor shall immediately do such work as directed by the Railroad through the Engineer to restore safety. Upon failure of the Contractor to carry out such orders immediately, the Railroad may take whatever steps as are necessary to restore safe conditions. The cost and expense to the Railroad of restoring safe conditions, or of any damage to the Railroad’s trains, tracks or other facilities caused by the Contractor’s or subcontractor’s operations, shall be considered a charge against the Contractor and shall be paid for by him, or may be deducted from any monies due or that may become due to him under this contract.

(b) Rules and Regulations

- (1) Railroad traffic shall be maintained at all times, and the Contractor shall conduct all of his operations on or adjacent to the Railroad right-of-way fully within the rules, regulations, and requirements of the Railroad. The Contractor shall be responsible for acquainting himself with such requirements as the Railroad may demand. The Contractor shall include in his bid any expenses occasioned by delay or interruption of his work by reason of the operation or maintenance of the Railroad facilities.
- (2) The Contractor shall obtain verification of the time and schedule of track occupancy from the Railroad before proceeding with any construction or demolition work on or adjacent to the Railroad right-of-way.
- (3) All work to be done on or adjacent to the Railroad right-of-way shall be performed by the Contractor in a manner satisfactory to the Railroad and shall be performed at such times and in such manner as not to interfere with the movement of trains or traffic upon the tracks of the Railroad. The Contractor shall use all necessary care to avoid accidents, damage, delay or interference with the Railroad's trains or property.
- (4) If deemed necessary by the Railroad, it may furnish or assign an inspector who will be placed in the work area during the time the Contractor or any subcontractor is performing work under the contract on Railroad property.
- (5) Before proceeding with any construction or demolition work on or adjacent to the Railroad Right-of-Way, a pre-construction meeting shall be held at which time the Contractor shall submit for approval of the Railroad, plans, computations, and a detailed description of his method and procedure for accomplishing the specific construction work required under this contract, including methods of protecting Railroad traffic. Such approval shall not serve, in any way, to relieve the Contractor of his responsibility for the adequacy and safety of his methods and procedures for conducting the work.
- (6) The Contractor shall conduct his work and handle his equipment and materials in such manner that neither fouls a live track or wire line without the written permission of the Railroad.
- (7) Equipment shall be considered to be potentially fouling the track when located in such a position that its failure, with or without load, brings the equipment within the traffic envelope. No equipment shall be placed in this position without prior approval of the Railroad.

(8) Equipment of the Contractor to be used:

- (A) Equipment of the Contractor to be used adjacent to the tracks shall be in first-class condition so as to fully prevent failures of defective equipment that might cause delay in the operations of trains or damage to Railroad facilities. His equipment shall not be placed or put into operation adjacent to tracks without first obtaining permission from the Railroad. Under no circumstances shall any equipment or materials be placed or stored within 25 feet from the near rail of a track in operation, unless approved, in advance, by the Railroad.
 - (B) High rail equipment of the Contractor to be used on the tracks shall be subject to prior approval of the Railroad. The equipment must be inspected and approved in advance at the Railroad's facility by Railroad inspectors. The equipment inspection must be renewed every three months.
 - (C) On track vehicles shall be equipped with a Railroad approved tow bar and coupler. Multiple vehicles shall move in tandem and coupled when directed by the Railroad. Movement of on track vehicles shall proceed only under the direct supervision of a Qualified Railroad Employee.
- (9) Materials and equipment belonging to the Contractor shall not be stored on Railroad property without first having obtained permission from the Engineer and Railroad. Such permission will be on the condition that the Engineer and Railroad will not be liable for damage to such materials and equipment from any cause. The Contractor shall keep the tracks adjacent to the site clear of all refuse and debris that may accumulate from his operations and shall leave the Railroad property in the condition existing before the start of his operations.
- (10) The Contractor shall coordinate with the Engineer and the Railroad in order to determine the type of protection required to insure safety and continuity of Railroad traffic incidental to the particular methods of operation and equipment to be used on the work.
- (11) The Railroad will require protection during all periods when the Contractor is working on, or over, the right-of-way of the Railroad, or as may be found necessary in the opinion of the Railroad. When protection is required, refer to Paragraph 1(g).
- (12) It shall be expressly understood that this contract includes no work for which the Railroad is to be billed by the Contractor, and it shall be further understood that the Contractor is not to bill the Railroad for any work which he may perform, unless the Railroad gives a written request that such work be performed at its expense.

(13) Upon completion of the work, and before final payment is made, the Contractor shall remove from within the limits of the Railroad's right-of-way, all machinery, equipment, surplus materials, falsework, rubbish and temporary buildings, and other property of the Contractor/sub-contractor, and shall leave the right-of-way in a condition satisfactory to the Railroad.

- (c) **Railroad Protective Services** – will be provided in accordance with the Roadway Worker's Protective Act, Title 49, Part 214, Sub-part C. Railroad protective services will also be performed to insure safe operations of trains when construction work would, in the Railroad's opinion, be a hazard to Railroad operations.
- (d) **Definition of Hazard** – the Railroad has furnished the statements quoted below, explaining when they consider a hazard to operations exists:

“Protective services will be required whenever the Contractor is performing work on or adjacent to the Railroad tracks or right-of-way, such as excavating, sheeting, shoring, erection and removal of forms, handling materials, using equipment which by swinging or by failure could foul the track, and when any other type of work being performed, in the opinion of the Railroad, requires such service.”

(e) **Contractor Requirements for Work Affecting the Railroad**

- (1) All matters requiring Railroad Company approval or coordination shall be directed to the Engineer or a duly authorized representative thereof, for forwarding to the Railroad Engineer.
- (2) Detailed plans and appurtenant data and calculations for any operation which, in the opinion of the Railroad, affect the Railroad, must be submitted to the Engineer or a duly authorized representative thereof, for forwarding to the Railroad Engineer for approval prior to commencement of the work. All plans and calculations submitted must be stamped by a Connecticut registered Professional Engineer.
- (3) Permissible Track Outages - are identified in the NOTICE TO CONTRACTOR – WORK ON RAILROAD PROPERTY contained within the Provisions of the Contract. The times identified are the times that the track may be removed from service. **If power outages are required, the de-energizing/re-energizing and grounding of the wires will subtract approximately forty-five minutes from the start and forty-five minutes at the end of the indicated outage period for a total of up to ninety minutes. Where a substation or anchor bridge outage is required, the de-energizing/re-energizing and grounding will subtract an additional thirty minutes from the start and thirty minutes from the end of the indicated outage period for a total of up to one hundred fifty minutes.**
- (4) The Contractor shall maintain a minimum of 1 foot level shoulder from ends of ties to maintain lateral track support for all excavations and shall not excavate any slope steeper than 1 (vertical) on 2 (horizontal) from the edge of the shoulder. Sheeting

shall be required on all excavations where the side of the excavation is intercepted by the Railroad live load influence line. The live load influence line is defined as a line originating at the bottom edge of tie and extending downward at a slope of 1 (vertical) on 1½ (horizontal). Such excavations must be designed to withstand, in addition to all common loads such as soil pressure and hydrostatic pressure, a railroad live load of Cooper E-80.

- (5) The Contractor shall be required to design and install protective scaffolding over the right-of-way where, at the sole discretion of the Railroad, such scaffolding is necessary to protect the Railroad from possible falling debris; paint or other materials; to protect personnel working about the right-of-way or to provide a platform for personnel, materials and/or equipment. Said scaffolding shall be designed for live load of 200 pounds per square foot applied uniformly over the entire structure and a 2 kips concentrated load placed anywhere on the structure. The two loads are not to be applied simultaneously for design purposes.
 - (6) All excavation area shall be located by the Contractor and inspected by the Railroad for the purpose of determining conflicts with underground facilities. Exploratory trenches, a minimum of 3 feet deep and 15 inches wide in the form of an “H” with outside dimensions matching and outside of sheeting dimensions are to be hand dug, as directed by the railroad. In some locations, excavations may exceed 3 feet in depth. Specialty excavations such as screw anchors, cat pole foundations, etc will require additional trenching to ensure all possible conflicts are located. These trenches are for exploratory purposes only and are to be backfilled and compacted immediately. All work outlined above must be done in the presence of a Railroad inspector.
 - (7) Cavities adjacent to sheet piling, created by driving of sheet piling, shall be filled with sand and any distributed ballast must be restored and tampered immediately.
 - (8) Sheet piling shall be cut off at top of tie during construction and at 3 feet below bottom of tie after construction just prior to completion of back filling.
 - (9) Plans and calculations for sheeting and scaffolding must be submitted to the Engineer for forwarding to the Railroad for approval prior to construction. Further, plans and calculations must be stamped by a Connecticut registered Professional Engineer.
- (f) **Requirements for Erection, Demolition and Other Rigging Operations On or Adjacent to Railroad Right-of-Way**

The Contractor will be required to furnish the following information to the Engineer or a duly authorized representative thereof, for forwarding to the Railroad Engineer for approval prior to the start of any rigging operation over or adjacent to the Railroad right-of-way:

- (1) Plan view showing locations of cranes, boom length and rigging operating radii, with delivery or disposal locations shown.
- (2) Crane rating sheets showing crane(s) to be adequate for 150% of the lift. Crane and boom nomenclature is to be indicated.
- (3) Plans and computations showing weight of pick.
- (4) Location plan showing obstructions, indicating that the proposed swing is possible.
- (5) Plans showing locations and details of mats, planking or special decking as may be required by the Railroad.
- (6) Written statement from crane owner giving the date of last crane condition and safety inspection and the results of said inspection.
- (7) Data sheet listing number, type, size and arrangement of slings, spreader bars or other connecting equipment. Include copies of catalog or information sheets of specialized equipment. All such equipment shall be shown adequate to safely carry 150% of the calculated loading.
- (8) A complete procedure is to be included, indicating the order of lifts and repositioning or rehitching of the crane or cranes.
- (9) Temporary support of any components or intermediate stages is to be shown.
- (10) A time schedule of the various stages must be shown, as well as a schedule for the entire lifting procedure.
- (11) All erection, demolition and rigging plans and calculations submitted to the Railroad must be stamped by a Connecticut licensed Professional Engineer.
- (12) Operations directly on or adjacent to the operating right-of-way will be performed only at times and under conditions specified by the Railroad's representative.

(g) Ordering Protective Personnel

The Railroad will furnish Protective Service Personnel (conductors, flagmen, groundmen, inspectors, maintenance and/or other railroad personnel deemed necessary) to protect the operation of train traffic during the Contractor's construction activities. Railroad Protective Services will also be provided in conformance with the Roadway Worker's Protective Act as stated in Paragraph 1(c). There will be no charge to the Contractor for Railroad Protective Services provided. The providing or failing to provide Protective Services shall not relieve the Contractor from liability or payment for any damage caused by his or his subcontractor's operations conducted in their absence.

- (1) The Contractor must obey all instructions from Railroad representatives on the job site

promptly. Failure to follow instructions shall be deemed sufficient cause for closing the job site to the Contractor and its employees.

- (2) The Railroad will, at its sole discretion, determine the need for and the availability of protective personnel. The Railroad will provide protective personnel to the extent possible considering its operational and maintenance priorities. The Railroad does not guarantee that protective personnel will be available to meet the Contractor's preferred schedule. Further, no work will commence until the assigned Railroad representative affirmatively advises the Contractor that the necessary protective personnel are stationed and that he may proceed.
- (3) The assessment of the need for protective services will be based upon a weekly Railroad Construction Coordination Meeting. At these meetings, the Contractor shall provide a Bi-weekly Schedule that will begin on the following Saturday. Based on that schedule, the Railroad will determine the Protective Services required for the two-week period. Protective Services will be reserved for the following week beginning on the Saturday and ordered for the second week of the schedule. It will be the Contractor's responsibility to perform work in accordance with the submitted schedule. Variations from the submitted schedule may result in additional and unnecessary costs to the Engineer, Railroad and Contractor.
 - (A) The Contractor shall base his operations on a 5 consecutive day work week. The hours of operation during this time shall remain constant. Multiple shifts may be worked.
 - (B) The Contractor must demonstrate maximum use of Protective Service Personnel ordered. Failure to do so may result in the inability to consistently obtain services.
 - (C) The Contractor shall be responsible for forwarding all Protective Service requests from his subcontractors and suppliers in his Bi-weekly schedule submittal.
- (4) Requests to cancel construction activities, and subsequently the scheduled Protective Service Personnel, will be also submitted at the weekly Railroad Construction Coordination Meeting. At these meetings, the previously scheduled Protective Services for the week beginning on the following Saturday may be cancelled. This will be the only time for cancellation. Once cancelled, no re-ordering of Protective Services for the following week will be allowed.
- (5) Weather conditions will be considered the only basis upon which the Railroad will accept the Contractor's cancellation of scheduled work and will only be recognized on items of work which have been clearly identified and determined to be weather dependent in the Contractor's schedule. Activities not presented on the Bi-weekly schedule at the weekly Railroad Construction Coordination Meeting will not be able to commence until it has been inserted into the schedule and presented at the next meeting.

- (6) Work that requires the support of Railroad personnel shall not be scheduled on the following days, unless the work is of an emergency nature:

Holiday's Observed:	*Independence Day	*Christmas Day
*New Year's Day	*Labor Day	*New Years Eve
*President's Day	*Thanksgiving Day	
*Good Friday	*Day Following Thanksgiving Day	
*Memorial Day	*Christmas Eve	
*The Saturday and Sunday preceding a Monday holiday.		
*The Saturday and Sunday following a Friday holiday.		
*The Friday and Monday preceding and following a weekend holiday.		

(h) Requirements for Requesting Track Outages

Track outages as described in the plans and specifications must be requested at the weekly Railroad Construction Coordination Meeting.

- (1) All procedures, material and equipment must be approved and on site prior to the Railroad accepting the track outage request(s). This applies to all track outage requests.
- (2) Track outages will be granted based on need for constructability not for convenience.
- (3) The Contractor must demonstrate the maximum use of track outages by coordinating his activities and work so that various elements and multiple activities are performed during approved outages. Failure to consistently utilize track outages may cause the inability to gain approval of future requests for outages.
- (4) No new track outages may be initiated the weekend preceding or following these holidays:

Thanksgiving, Christmas and New Years Day.

However, long-term continuous outages may extend through these periods.

(i) Catenary and Transmission Systems/Power Outages

- (1) Catenary and Transmission Systems - The Contractor shall assume that all the wires on the Railroad Company are energized at all times and must be governed by the restrictions imposed by the Railroad with respect to such electrical circuits. Should it become necessary, in the opinion of the Railroad Engineer to de-energize any wire or wires to insure safety of operation, such wires will be de-energized by the Railroad only during such period that will not interfere with the Railroad's operation. When the de-energizing and re-energizing of wires is deemed necessary, a representative of the Power Department of the Railroad must be on duty and

present to arrange for the same. He will notify the Contractor in writing when the wires have been de-energized and also when said wires are to be re-energized.

- (A) The Contractor is advised that the overhead electrification will remain in place for the duration of the entire project, except where called for on the drawings and in the specifications.
- (B) Track rails of the Railroad are energized. Particular care must be taken to see that no contact is made between adjoining rails with any material, which is a good conductor of electricity when dry, or material of any nature when wet. Particular care is necessary when any work involving the use of chains, steel rods, cables, pipes, etc., is done. Since the Contractor shall assume the wires and rails of the Railroad will be energized at all times, the Contractor shall require all of his employees, sub-contractors, and others to sign a form similar to the form shown in the NOTICE TO CONTRACTOR – WORK ON RAILROAD PROPERTY contained within the Provisions of the Contract.

(2) Power Outages

- (A) **Catenary Power Outages** - A catenary power outage must be scheduled concurrently with a track outage for the track and is restricted to the same periods as specified in the plans and specifications.
- (B) **Railroad Power and Signal Distribution Feeder Outages** - Outages for feeders can be allowed only during off-peak hours. These outages should be requested at the weekly Railroad Construction Coordination Meeting. One set of power and signal feeders, either the north or south side of the railroad, must remain energized at all times.

NOTE: During peak hours (5:00 a.m. to 10:00 a.m. and 3:30 p.m. to 10:00 p.m., Monday through Friday) of railroad traffic, both the north and south sets of power and signal feeders must be energized.

(j) Safety for Contractor's Employees Working on or Adjacent to the Right-of-Way of the Railroad

(1) Personal Protection Equipment

- (A) Approved hard hats, reflectorized vest and clothing must be worn by all Contractor employees while on the Right-of-Way, in yard, shop facilities, and construction and/or work sites. Approved safety eyewear must be worn by all Contractor employees while on Right-of-Way, in yard, shop facilities and construction and/or work sites and in the operating control cab of a moving locomotive or train. Any exclusion must be jointly approved by Railroad's department head and Director of Safety.

- (B) Other protective equipment such as goggles, face shields, safety belts, floatation vests, gloves and respirators shall be issued by the Contractor when required. Protection devices for hearing conservation may be used when determined necessary and safe to do so.

(2) Possession or Use of Intoxicants and Illegal Substances

The use of intoxicants, alcohol, narcotics, marijuana, amphetamines, hallucinogens or other illegal substances while working within the Railroad Right-of-Way, is prohibited and is sufficient cause for immediate removal from the Railroad property. Contractor employees under medication before or while on duty, must be certain that such use will not affect the safe performance of their duties.

(3) Surveying Equipment

- (A) Measuring tape must be non-metallic to avoid shunting the signal system electric circuits. This will occur when a metallic object is laid across the top of two rails of any track.
- (B) Electrically rated fiberglass elevation rods must be used to avoid injury in the event contact is made with energized catenary or signal/communication lines. Elevations of catenary wires must be obtained by or under direct supervision of a qualified Railroad Groundman.

(4) Conduct On or About Track

- (A) Contractor employees must not enter the track envelope unless it is absolutely necessary in performance of their duty. If it is deemed necessary, than the Contractor employees must walk on tracks or cross tracks only when accompanied by or with permission from a Qualified Railroad Employee of the Railroad. Always use approved walkways when available; otherwise identify and take the shortest safe route after looking in both directions. If more than one track is to be crossed, stop and look before crossing each track.
- (B) The possession of an umbrella on or about tracks is prohibited.
- (C) Do not rest any object on your shoulder while in close proximity to a moving train or high-rail equipment.
- (D) Expect equipment to move on any track, in any direction, at any time. Contractor employees must look in both directions and have permission from a Qualified Railroad Employee before:
 1. Fouling track
 2. Crossing track

3. Going between or around end of equipment or structure
4. Moving out from between or under equipment of structure
5. Getting on or off equipment
6. Performing any other applicable operation

(E) When required by a conductor/flagman or other Qualified Railroad Employee to vacate tracks, the Contractor employees must comply immediately.

(5) Catenary Electric Systems

(A) All overhead wires must be considered energized (LIVE) at all times except when it is known they have been de-energized and properly grounded.

(B) Until the wires are de-energized, properly grounded, and a Groundman has notified that the overhead wires are such, all Contractor employees must not approach within 10 feet of transmission systems wires, catenary system or signal power wires.

(C) At the beginning of each tour of duty, the Groundman will instruct the Contractor foreman and each Contractor employee, in the crew, of the dangers surrounding them, calling their particular attention to any hazards to be avoided in performance of the work.

(D) Whether due to inadequate knowledge of the English language or for any other reason, a Contractor employee who, in the opinion of the Groundman, does not understand the instructions given, shall not be permitted to work or observe.

(E) When clearances have been obtained and the wires, equipment or apparatus properly grounded, the Groundman will indicate to the Contractor foreman and the crew the location of wires, equipment or apparatus from which power has been removed and the location of the grounding devices applied. The Groundman must obtain on standard form, the signature of the Contractor foreman indicating that he and the crew have been so instructed, and will confine their work within the limits as outlined to them by the Groundman.

(F) When the Groundman leaves his crew for any reason, he must notify the Contractor foreman and each person in the crew to stop all work in the vicinity of the wires, personally assuring himself that all persons have moved to a safe distance away from the work area before his departure. The Groundman will obtain the signature of the Contractor foreman on standard form, that he and the crew have been informed that the Groundman is leaving the gang and they will not resume work until advised to do so on return of the Groundman.

(G) When the clearances are to be released, the Groundman will inform the Contractor foreman and each person in the crew and will personally observe that all persons have moved to a safe distance from the wires, equipment or apparatus

to be energized, before removing the grounding devices. The Groundman will obtain the signature of the Contractor foreman, on a standard form, stating that he and the gang have been advised that the wires, equipment or apparatus have been energized, and that they will remain at a safe distance from them until informed otherwise by the Groundman.

- (H) The Groundman will inform the Contractor foreman if any Contractor employee on the job is unsafe and will not comply with instructions. If trouble is experienced with the Contractor foreman in maintaining safe working conditions, the Groundman will immediately notify his supervisor.

(6) Aerial Catenary Construction by Qualified Contractor Employees

No Catenary Construction is included in State Project No. 300-0202.

(7) Safety Program and Plan

- (A) Prior to the commencement of work the Contractor shall submit a “Working on the Railroad Safety Plan” that will include a Program which implements the plan. The submission shall be made to the Engineer or a duly authorized representative and forwarded to the Railroad for compliance with this specification. This plan is separate to the Health and Safety Plan required for other aspects of the project (i.e., lead, excavations, etc.).
- (B) Each employee of the Contractor, subcontractor or others on site must undergo a Railroad safety training class, of approximately one hour, offered online by Metro-North Railroad (<https://contractororientation.com>). The Contractor is responsible for arranging for the class and is responsible for ensuring that all employees on the jobsite have been trained. No additional compensation will be allowed to the Contractor for employee’s time for attending these classes. All employees receiving this training will receive a Registered Hard Hat sticker that will identify them as a trained employees. No Contractor employees are permitted on the Railroad Right-of-Way without evidence of this training. Contractor employees shall renew this training annually. In addition to the online safety training class, the following will be furnished by the Railroad to the employee:
 1. Safety Orientation for Contractor Employees Working on Railroad Property produced by the Safety Engineer of the Railroad.
 2. Safety Inspection Checklist
 3. List of the applicable publications referenced in these specifications with respect to safety and where they are located for review if necessary. The list shall include, but not be limited to, such regulatory standards and mandates, i.e., OSHA, NIOSH, DOL, NFPA, EPA, FRA, MSDS, etc.
 4. Copy of the applicable corporate safety plan.
 5. Copy of the project Railroad Safety Plan or other project related plans.

NOTE: The employee shall sign the standard form for acknowledgement of the above-noted documents.

- (C) All contractor employees entering the railroad right-of-way must attend and acknowledge the daily job briefings prior to commencing any work. The qualified railroad employees will conduct the job briefings.
- (D) The Contractor shall hold “TOOL BOX” safety meetings for their employees at least once a week that will be documented and attendees listed.
- (E) The Contractor supervisor shall attend a monthly Railroad Safety Meeting.

ITEM #0000426A – ELECTRIC HANDHOLES

Description:

This item shall consist of furnishing and installing Polymer Concrete Handholes Type I (24”x36”) called for at the location shown on the plans, or as ordered by the Engineer and in conformity with these specifications.

Required Submittals:

Shop Drawings:

Submit 5 copies of shop drawings for handholes and covers in accordance with the contract general requirements.

Material Certificate of Compliance:

Submit 5 copies of material certificate of compliance for handholes and covers in accordance with the contract general requirements.

Materials:

The materials for this work shall conform to the following specifications:

Precast Polymer Concrete Handhole: These handholes shall be manufactured by “Quazite” or City approved equal. Enclosures, covers and extensions shall be of monolithic material construction; components of dissimilar materials shall not be used. All products shall conform to all test provisions of ANSI/SCTE 77 “Specification for Underground Enclosures Integrity” for Tier15 (heavy duty) applications (Design Test Load = 22,500/33,750 lbs). The following requirements shall apply:

All components in an assembly (box & cover) shall be manufactured using matched surface tooling. All covers are required to have a minimum coefficient of friction of 0.50 in accordance with ASTM C 1028. Enclosures are to be UL listed.

- Covers for Type I and Type III shall be Heavy Duty two (2) piece style for ease of opening.
- Covers for all handhole types shall have Extra Large Pull Slots (1”x4”) with “TRAFFIC” Logo.
- For each Project The Manufacturer shall supply two(2) Pull Hooks with extra wide handle (close to 12 inch wide) to accommodate both hands. (a shop drawing shall be submitted for this hook)

Covers (Design Test Load = 16,000/22,500 lbs) shall be secured with two stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft. lbs. torque and have a minimum 750 lbs. pull out strength. Nuts shall be floating and shall provide a minimum of ½” movement from the center of the nut.

Construction Methods:

Precast Polymer Concrete Handhole: Excavation shall be 12 inches deeper than finished grade level. With the box set in place, crushed rock or gravel shall be installed in the excavation to a depth of 12 inches and with cover installed, soil is to be back filled and compacted around the box. At final installation the box and cover shall be flush with finished grade. When the handhole is placed in the sidewalk the back fill shall be replaced with the trap-rock as fill material.

The areas disturbed by the excavation for the handholes shall be neatly graded to conform to the adjacent surface and contours. Where topsoil has been removed, it shall be replaced to its original depth (except that in no case shall this depth be less than four inches) and the area shall be fertilized, seeded and mulched.

Where handholes are shown in sidewalk or paved areas, the concrete handhole shall be set flush and the surrounding area shall be replaced with the same type of material as removed.

All conduits entering the handhole shall be bonded together by means of a jumper running from ground bushings on the conduit ends. All open conduit entrances in the walls of precast handhole shall be grouted to prevent the surrounding sand or dirt entering into the handhole.

When handhole is placed in sidewalk areas, the sidewalk shall be sawcut at the nearest joint and the complete slab(s) of sidewalk shall be removed and replaced. When handhole is placed in brick sidewalk areas, the sidewalk shall be restored matching the existing patten.

Method of Measurement:

This work will be measured for payment by the number of handholes of the type specified, complete and accepted in-place.

Basis of Payment:

This work will be paid for at the contract price each for "ELECTRIC HANDHOLES", complete in-place, which price shall include a precast polymer concrete handhole, cover, crushed stone, excavating, backfilling and replacement of all surrounding areas including sidewalk, pavement, grading and placing topsoil, seeding, fertilizing, mulching and equipment, tools, labor and work incidental thereto. The contract unit price shall also include locating and intercepting existing conduit at those locations shown on the plans, and cutting exiting conduit and installing copper bonding jumpers in accordance with the details.

Pay Item

Electric Handholes

Pay Unit

EA.

ITEM #0020902A – LEAD COMPLIANCE FOR BUILDING DEMOLITION AND RENOVATION

Description:

Work under this item shall include activities impacting various materials containing or covered by lead paint and associated work by persons who are knowledgeable, qualified, and trained in the removal, treatment and handling of lead contaminated materials, including the transportation and disposal of non-hazardous lead construction and demolition solid waste containing or contaminated with lead, the recycling of metallic components covered with lead paint, and the subsequent cleaning of the affected environment. Lead paint includes paint found to contain **any** detectable amount of lead by Atomic Absorption Spectrophotometry (AAS) or X-Ray Fluorescence (XRF).

All activities shall be performed in accordance with, but not limited to, the current revision of the OSHA Lead in Construction Regulations (29 CFR 1926.62), the USEPA RCRA Hazardous Waste Regulations (40 CFR Parts 260 through 274), and the CTDEEP Hazardous Waste Regulations (22a-209-1 and 22a-449(c)).

The lead paint activity shall include the demolition/renovation, removal and/or disposal of building components coated with lead painted surfaces as identified on the Contract Plans and Specifications.

Deviations from these Specifications require the written approval of the Engineer.

Materials:

All materials shall be delivered to the job site in the original packages, containers, or bundles bearing the name of the manufacturer, the brand name and product technical description.

No damaged or deteriorating materials shall be used. If material becomes contaminated with lead, the material shall be decontaminated or disposed of as lead-containing waste material. The cost to decontaminate and dispose of this material shall be at the expense of the Contractor.

Fire retardant polyethylene sheet shall be in roll size to minimize the frequency of joints, with factory label indicating four (4) or six (6) mil thickness.

Six (6) mil polyethylene disposable bags shall have pre-printed OSHA/EPA/DOT labels and shall be transparent.

Tape (or equivalent) capable of sealing joints in adjacent polyethylene sheets and for the attachment of polyethylene sheets to finished or unfinished surfaces must be capable of adhering under both dry and wet conditions.

The cleaning agent detergent shall be lead specific, such as TriSodium Phosphate (TSP).

Chemical strippers and chemical neutralizers shall be compatible with the substrate as well as with each other. Such chemical stripper shall contain less than 50% Volatile Organic Compounds (VOCs) by weight in accordance with RCSA 22a-174-40 Table 40-3. VOC Content Limits for Listed Product Categories, manufactured on or after May 1, 2018.

Labels and warning signs shall conform to OSHA 29 CFR 1926.62, USEPA 40 CFR 260 through 274 and USDOT 49 CFR 172 as appropriate.

Any planking, bracing, shoring, barricades and/or temporary sheet piling, necessary to appropriately perform work activities shall conform to all applicable federal, state and local regulations.

Air filtration devices and vacuum units shall be equipped with HEPA filters.

Construction Methods:

(1) Pre-Abatement Submittals and Notices

A. Prior to the start of **any** work on a contiguous per site basis that will generate hazardous lead waste above conditionally exempt small quantities (greater than 100 kg/month or greater than 1000 kg at any time), the Contractor shall obtain from the Engineer on a contiguous per site basis a temporary EPA Hazardous Waste Generators ID number, in accordance with Item 0202317A – Disposal of Hazardous Materials, unless otherwise directed by the Engineer.

B. Fifteen (15) working days prior to beginning work that impacts lead paint, the Contractor shall submit the following to the Engineer:

1. Copies of all employee certificates, dated within the previous twelve (12) months, relating to OSHA lead awareness and hazard communication training and training in the use of lead-safe work practices.
2. Documentation from the Contractor, typed on company letterhead and signed by the Contractor, certifying that all employees listed therein have received the following:
 - a. medical monitoring within the previous twelve (12) months, as required in 29 CFR 1926.62;
 - b. biological monitoring within the previous six (6) months, as required in 29 CFR 1926.62;
 - c. respirator fit testing within the previous twelve (12) months, as required in 29 CFR 1910.134 (for those who don a tight-fitting face piece respirator).

3. Copies of state-approved certificates for the proposed non-hazardous construction and demolition (C&D) lead debris disposal facility and any concrete/wood or scrap metal recycling facilities.

No activity shall commence until a copy of all required submittals have been received and found acceptable to the Engineer. Those employees added to the Contractor's original list will be allowed to perform work only upon submittal of all required paperwork to, and review by, the Engineer.

Contractor shall provide the Engineer with a minimum of 48 hours notice in advance of scheduling, changing or canceling work activities.

(2) Lead Abatement Provisions

(a) General Requirements:

All employees of the Contractor who perform work impacting lead paint shall be properly trained to perform such duties.

All labor, materials, tools, equipment, services, testing, insurance (with specific coverage for work on lead), and incidentals which are necessary or required to perform the work in accordance with applicable governmental regulations, industry standards and codes, and these Specifications shall be provided by the Contractor. The Contractor shall be prepared to work all shifts and weekends throughout the course of this project.

Prior to beginning work, the Engineer and Contractor shall perform a visual survey of each work area and review conditions at the site for safety reasons. In addition, the Contractor shall instruct all workers in all aspects of personnel protection, work procedures, emergency evacuation procedures and use of equipment including procedures unique to this project.

The Contractor shall:

Shutdown and isolate heating, cooling, and ventilating air systems to prevent contamination and particulate dispersal to the other areas of the building.

Shut down and lock out electrical power, including all receptacles and light fixtures, when feasible. The use or isolation of electrical power will be coordinated with all other ongoing uses of electrical power at the site.

Coordinate all power and fire alarm isolation with the appropriate representatives.

When necessary, provide temporary power and adequate lighting and ensure safe installation of electrical equipment, including ground fault protection and power cables, in compliance with applicable electrical codes and OSHA requirements. The Contractor is responsible for proper connection and installation of electrical wiring.

Ladders and/or scaffolds to be utilized throughout this project shall be in compliance with OSHA requirements, and of adequate length, strength and sufficient quantity to support the scope of work. Use of ladders/scaffolds shall be in conformance with OSHA 29 CFR 1926 Subpart L and X requirements.

Work performed at heights exceeding six feet (6') shall be performed in accordance with the OSHA Fall Protection Standard 29 CFR 1926 Subpart M including the use of fall arrest systems as applicable.

Electrical service may not be available at the site. Costs for supplying electrical service shall be the responsibility of the Contractor.

Water service may not be available at the site. The Contractor shall supply sufficient water for each shift to operate the wash facility/decontamination shower units in addition to the water needed at the work area.

Data for random lead testing conducted on surfaces throughout the buildings as well as hazardous waste characterization results are available from the Engineer for informational purposes only. Under no circumstances shall this information be the sole means used by the Contractor for determining the extent of lead painted materials. The Contractor shall be responsible for verification of all field conditions affecting performance of the work as described in these Specifications in accordance with OSHA, USEPA, USDOT and CTDEEP standards. Compliance with the applicable requirements is solely the responsibility of the Contractor.

Activity impacting lead painted surfaces shall be performed in a manner which minimizes the spread of lead dust contamination and generation of airborne lead.

The Engineer will provide a Project Monitor to oversee the activities of the Contractor. No activity impacting lead paint shall be performed until the Project Monitor is on-site. Environmental sampling, including ambient air sampling, TCLP waste stream sampling and/or dust wipe sampling, shall be conducted throughout the project as deemed necessary.

(b) Set-Up

The Contractor shall prepare a Regulated Area as follows:

In all areas where airborne exposures may exceed the OSHA PEL, post warning signs meeting the requirements of OSHA 29 CFR 1926.62 at each regulated area.

In addition, signs shall be posted at all approaches to regulated areas so that an employee may read the sign and take the necessary protective steps before entering the area. These signs shall read:

DANGER
LEAD WORK AREA
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM
DO NOT EAT, DRINK, OR SMOKE IN THIS AREA

Establish a Regulated Area, through the use of appropriate barrier tape, etc. and control unauthorized access into the area throughout the lead paint related activity.

Implement appropriate engineering controls such as critical barriers, poly drop cloths, negative pressure, local exhaust ventilation, wet dust suppression methods, etc. to prevent the spread of lead contamination from the Regulated Area.

For exterior work areas, the Contractor shall use a High Efficiency Particulate Air (HEPA) filtered vacuum dust collection system to remove any visible existing paint chips from the ground to a distance of 20' out from the base of the exterior surface scheduled for lead paint activity prior to commencement of work and extend a 6 mil polyethylene sheet drop cloth on the ground adjacent to the exterior surface scheduled for lead paint activity to contain debris/contamination.

The Contractor shall provide handwash facilities in compliance with 29 CFR 1926.51(f) and 29 CFR 1926.62 regardless of airborne lead exposure. This wash facility will consist, at least, of potable water, towels, soap, and a HEPA vacuum.

If air monitoring data by the Contractor or Project Monitor shows that employee exposure to airborne lead exceeds the OSHA PEL ($50 \mu\text{g}/\text{m}^3$), shower rooms must be utilized. The Shower Room shall be of sufficient capacity to accommodate the number of workers. One shower stall shall be provided for each eight (8) workers. Showers shall be equipped with hot and cold or warm running water through the use of electric hot water heaters supplied by the Contractor. Shower water shall be collected and filtered using best available technology and dumped down an approved sanitary drain. Shower stalls and plumbing shall include sufficient hose length and drain system or an acceptable alternate.

(c) Personal Protection:

The Contractor shall initially determine if any employee performing construction tasks impacting lead paint may be exposed to lead at or above the OSHA Action Level of 30 micrograms per cubic meter ($30 \mu\text{g}/\text{m}^3$). Assessments shall be based on initial air monitoring results as well as other relevant information. The Contractor may rely on historical air monitoring data obtained within the past 12 months under workplace conditions closely resembling the process, type of material, control methods, work practices and environmental conditions used and prevailing in the Contractors current operations to satisfy the exposure assessment requirements. Monitoring shall continue as specified in the OSHA standard until a negative exposure assessment is developed.

Until a negative exposure assessment is developed for the required tasks impacting lead paint, the Contractor shall ensure that all workers and authorized person entering the Regulated Area wear protective clothing and respirators in accordance with OSHA 29 CFR 1926.62. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings. Sufficient quantities shall be provided to last throughout the duration of the project.

Protective clothing provided by the Contractor and used during chemical removal operations shall be impervious to caustic materials. Gloves provided by the Contractor and used during chemical removal shall be of neoprene composition with glove extenders.

Respiratory protective equipment shall be provided and selection shall conform to 30 CFR Part 11, 29 CFR Part 1910.134, and 29 CFR Part 1926.62. A formal respiratory protection program must be implemented in accordance with 29 CFR Part 1926.62 and Part 1910.134.

(d) Lead Abatement Procedures

Ensure that the Competent Person is on the job at all times.

Do not begin abatement work until authorized by the Engineer, following a pre-abatement visual inspection by the Project Monitor.

The Contractor shall ensure proper entry and exit procedures for workers and authorized persons who enter and leave the Regulated Area. All workers and authorized persons shall leave the Regulated Area and proceed directly to the wash or shower facilities where they will HEPA vacuum gross debris from work suit, remove and dispose of work suit, wash and dry face and hands, and vacuum clothes. Do not remove lead chips or dust by blowing or shaking of clothing. Wash water shall be collected, filtered, and disposed of in accordance with federal, state and local water discharge standards.

No one shall eat, drink, smoke, chew gum or tobacco, or apply cosmetics while in the Regulated Area.

The following details the extent of each phase of operation designated for this project. Phase areas may be combined or divided at the direction of the Engineer. Proceed through the sequencing of the work phases under the direction of the Engineer.

NEW HAVEN LINE NETWORK INFRASTRUCTURE UPGRADE PHASE 3

Phase 1 – Non-metallic Components To Be Impacted

- **Lead paint is presumed present on all painted building materials/bridge components scheduled for impact by the New Haven Line Network Infrastructure Upgrade at the following Sites:**

- **Green's Farms Railroad Station**
- **Westport Railroad Station**
- **East Norwalk Railroad Station**
- **South Norwalk Railroad Station**
- **Rowayton Railroad Station**
- **Darien Railroad Station**
- **Noroton Heights Railroad Station**
- **SAGA Moveable Bridge (Westport)**
- **Node House – 334 (Mile Point 33.40)**
- **Node House – 414 (Mile Point 41.40)**
- **Node House – 473 (Mile Point 47.30)**
- **CCO Shop, Room 442, New Haven, CT**

Any renovation/demolition work impacting lead painted building materials/bridge components shall be conducted within an established lead control (regulated) area with a remote handwash facility/decontamination system in accordance with OSHA Lead in Construction Standards. Engineering controls and work practices shall be utilized to prevent the spread of lead dust and debris beyond the work area and limit the generation of airborne lead.

- **Any painted non-metallic debris and/or paint waste to be generated at the above Sites is presumed as RCRA/CTDEEP hazardous waste and shall be handled and disposed of in accordance with USEPA/CTDEEP Hazardous Waste Regulations, these Specifications and Item 0020317A – Disposal of Hazardous Materials.**
- **All steel and metal generated from the demolition/renovation of the structure shall be segregated and recycled as scrap metal at an approved facility. The recycling of scrap metal (regardless of lead paint concentration) is exempt from USEPA RCRA and CTDEEP Hazardous Waste Regulation.**

The Contractor shall conduct exposure assessments for the tasks required which impact lead paint in accordance with OSHA 29 CFR 1926.62(d) and shall implement appropriate personal protective equipment until negative exposure assessments are developed.

Utilize appropriate engineering controls (e.g. wet methods) as directed by 29 CFR 1926.62 to control lead emissions and contamination.

Properly contain wastes containing lead paint for appropriate transport/disposal.

Stop all work in the regulated area and take steps to decontaminate non-work areas and eliminate causes of such contamination should lead contamination be discovered in areas outside of the regulated area.

Special Requirements:

1. Demolition:

- a. Demolish in a manner which minimizes the spread of lead contamination and generation of lead dust.
- b. Implement dust suppression controls, such as misters, local exhausts ventilation, etc. to minimize the generation of airborne lead dust.
- c. Segregate work areas from non-work areas through the use of barrier tape, poly criticals, etc.
- d. Clean up immediately after renovation/demolition has been completed

(e) Prohibited Removal Methods:

The use of heat guns in excess of 700 degrees Fahrenheit to remove lead paint is prohibited.

The use of sand, steel grit, water, air, CO₂, baking soda, or any other blasting media to remove lead or lead paint without the use of a HEPA ventilated contained negative pressure enclosure is prohibited.

Power tool assisted grinding, sanding, cutting, or wire brushing of lead paint without the use of cowled HEPA vacuum dust collection systems is prohibited.

Lead paint burning, busting of rivets painted with lead paint, welding of materials painted with lead paint, and torch cutting of materials painted with lead paint is prohibited. Where cutting, welding, busting, or torch cutting of materials is required, pre-remove the lead paint in the area affected.

Use of chemical strippers containing Methylene Chloride is prohibited.

Compressed air shall not be utilized to remove lead paint.

(f) Air Monitoring Requirements

1. The Contractor shall:

- a. Provide air monitoring equipment including sample filter cassettes of the type and quantity required to properly monitor operations and personnel exposure surveillance throughout the duration of the project.
- b. Conduct initial exposure monitoring to determine if any employee performing construction tasks impacting lead paint may be exposed to lead

at or above the OSHA Action Level of 30 micrograms per cubic meter. Monitoring shall continue as specified in the OSHA standard until a negative exposure assessment is developed.

- c. Conduct personnel exposure assessment air sampling, as necessary, to assure that workers are using appropriate respiratory protection in accordance with OSHA Standard 1926.62. Documentation of air sampling results must be recorded at the work site within twenty-four (24) hours and shall be available for review until the job is complete.

2. The Project Monitor will:

- a. Collect air samples in accordance with the current revision of the NIOSH 7082 or 7702 Method of Air Sampling for Airborne Lead while overseeing the activities of the Contractor. Frequency and duration of the air sampling during abatement will be representative of the actual conditions at the site. The size and configuration of the project will be a factor in the number of samples required to monitor the activities and shall be determined by the Project Monitor.

As determined by AAS, XRF, or equivalent analysis, if air samples collected outside of the Regulated Area during abatement activities indicate airborne lead concentrations greater than original background levels or greater than 30 ug/m³, whichever is larger, an examination of the Regulated Area perimeter shall be conducted and the integrity of barriers shall be restored. Cleanup of surfaces outside the Regulated Area using HEPA vacuum equipment or wet cleaning techniques shall be done prior to resuming abatement activities.

Abatement outside the initial designated work area(s) will not be paid for by the Engineer. The Contractor will be responsible for all costs incurred from these abatement activities.

(g) Clean-up and Visual Inspection:

Remove and containerize all lead waste material and visible accumulations of debris, paint chips and associated items.

During clean up the Contractor shall utilize rags and sponges wetted with lead-specific detergent and water as well as HEPA filtered vacuum equipment.

The Engineer will conduct a visual inspection of the work areas in order to document that all surfaces have been maintained as free as practicable of accumulations of lead in accordance with OSHA 29 CFR 1926.62(h). If visible accumulations of waste, debris, lead paint chips or dust are found in the work area, the Contractor shall repeat the cleaning, at the Contractor's expense, until the area is in compliance. The visual inspection will detect incomplete work, damage caused by the abatement activity, and inadequate clean up of the work site.

(h) Post-Abatement Work Area Deregulation:

Following the visual inspection, (and clearance testing if appropriate,) any engineering controls implemented may be removed and the Work Area deregulated.

A final visual inspection of the work area shall be conducted by the Competent Person and the Project Monitor to ensure that all visible accumulations of suspect materials have been removed and that no equipment or materials associated with the abatement project remain.

The Contractor shall restore all work areas and auxiliary areas utilized during work to conditions equal to or better than original. Any damage caused during the performance of the work activity shall be repaired by the Contractor at no additional expense to the Engineer.

(I) Waste Disposal/Recycling:

Non-metallic building debris waste materials tested and found to be non-hazardous Construction and Demolition (C&D) solid waste shall be disposed of properly at a CTDEEP approved Solid Waste landfill.

Metallic debris shall be segregated and recycled as scrap metal at an approved metal recycling facility. The Contractor shall submit to the Engineer all documentation necessary to demonstrate the selected recycling facility is able to accept lead-painted scrap metal.

Concrete, brick, etc. coated with any amount of lead paint cannot be crushed, recycled or buried on-site to minimize waste disposal unless tested and found to meet the CT RSR standards as “clean fill”. Only CTDEEP defined “clean fill” can be recycled on-site or sent to a recycling facility.

Hazardous lead debris shall be disposed of in accordance with Item 0202317A “Disposal of Hazardous Material”.

(j) Project Closeout Data:

1. Provide the Engineer, within thirty (30) days of completion of the project site work, a compliance package; which shall include, but not be limited to, the following:
 - a. Competent persons (supervisor) job log;
 - b. OSHA-compliant personnel air sampling data;
 - c. Completed waste shipment papers for non-hazardous lead construction and demolition (C&D) solid waste and/or concrete/wood/scrap metal recycling.

Method of Measurement:

No measurement will be made for the work in this Section. The completed work shall be paid as a lump sum.

Basis of Payment:

The lump sum price bid for this item shall include: services, materials, equipment, insurance, all permits, notifications, submittals, personal air sampling, personal protection equipment, temporary enclosures, incidentals, fees and labor incidental to activities impacting lead removal, treatment and handling of lead contaminated materials, and the transport and disposal of any non-hazardous lead construction and demolition (C&D) solid waste.

Final payment for lead abatement will not be made until all project closeout data submittals have been completed and provided to the Engineer. Once the completed package has been received in its entirety and accepted by the Engineer, final payment will be made to the Contractor.

Pay Item

Pay Unit

Lead Compliance

Lump Sum

ITEM #0090696A – GROUNDING DETAIL G-1

ITEM #0603431A – STEEL (MISCELLANEOUS)

Description:

Work under these items consist of furnishing, fabrication and erection of STEEL (MISCELLANEOUS) for support of Figure 8 aerial duct, down guys, messenger wires, ground wires including their grounding systems, and galvanized steel wire, fittings and guy safety covers for down guys (guy assemblies), as well as for the installation of guy bracket assemblies, as shown in the plans and listed Table 1:

STEEL (MISCELLANEOUS) includes, but is not limited to, the furnishing, fabrication and installation of bracket assemblies, drop post supports, dead end supports, wall mounted brackets, pole extension post connection, cable support 3-bolts clamp assembly and aerial innerduct support.

The work under this item also includes the relocation of existing down guys, the removal of existing down guys, and the installation of aerial guy wires.

The Contractor shall be responsible for coordinating the installation of STEEL (MISCELLANEOUS) with Railroad and the requirements set forth in the Special Provisions, obtaining necessary outages for conducting work, as well as coordinating necessary power outages with Eversource Energy and United Illuminating.

TABLE 1

Attachment	Description
TYPE B-1	Typ. Lattice/Fig.8 Aerial Duct Support
TYPE D-3	Typ. Dead End Bracket
TYPE D-3B	Typ. Aerial Cable
TYPE D-8	Typ. Guy Dead End
TYPE X-1	Typ. Lattice Catenary Structure Cable Crossing in Aerial Duct
TYPE X-2	Typ. Catenary Structure Cable Crossing in Conduit

Applicable Standards:

Pertinent provisions of the following listed and other relevant standards shall apply to the work of this Section, except as they may be modified herein:

American Society for Testing and Materials (ASTM):
A475 Zinc-Coated Steel Wire Strand

Materials:

Structural shapes, plates and rods shall conform to Form 817, Section M.06.02 unless noted otherwise in the contract documents. The material for rolled sections, plates and rods shall be a minimum grade ASTM A36 and ASTM A500 Grade B for structural tubes.

Size of bolt holes shall be 1/16" larger than bolt diameter unless specified otherwise.

All field connections shall be bolted, except as noted.
All connection bolts shall be 5/8" diameter except as noted.
All bolts to have hex heads and nuts and washers.

High strength bolts, nuts and washers shall conform to Article M.06.02.3 and shall meet ASMTM F3125 Grade A325. Other connectors, where noted, shall be ASTM A307.

All material provided under this section shall be galvanized after fabrication in conformance with Article M.06.03. Fabricator to provide adequate vent holes to all enclosed areas prior to galvanizing.

All stainless steel shall be grade 316L.

Filler material for welding shall conform to Article M.06.04.

Polyurethane Sealant shall conform to Federal Specifications TT-S00227E, Type I, or II (Class A or B).

Base plates may be fabricated from material conforming to ASTM A537 or A633 in addition to the steel material listed above. Miscellaneous bolts, nuts and washers shall conform to ASTM A325.

Guy Bracket Assemblies shall be as specified under M.06.02 Structural Steel and M.06.03 Galvanizing or as called for on the plans.

The material used for stranded zinc-coated steel wire rope, shall be as specified for GALVANIZED EXTRA HIGH STRENGTH STEEL WIRE under A475 zinc-coated steel wire strand.

Fittings shall be as specified in the Contract Documents.

Submittals for Down Guys:

Relevant reports for wire to be used containing the physical and mechanical properties of all components described in this Section shall be submitted. Include the following as a minimum.

- Size
- Type
- Material
- Number of and diameter of individual wires
- Overall diameter
- Cross section area
- Weight per foot
- Rated breaking load

The Contractor shall provide certification that the zinc-coated steel wire has been designated, fabricated, rated and tested in compliance with the applicable provisions of the standards referenced in these Specifications.

Shop drawings of structural and miscellaneous steel.

Working drawings showing procedures how existing down guys will be relocated and removed, including required temporary supports and back guying.

Submittals for STEEL (MISCELLANEOUS):

Shop drawings.

Mill certificates for structural/ miscellaneous steel and proof of US origin.

Charpy V-notch test certificates.

Certificate for high strength bolts (See Section M.06 in the Special Conditions).

Proposed erection procedure to demonstrate compliance with “Requirements for Erection, Demolition, or other Rigging operations over or Adjacent to Railroad Right-of-Way”, See Special Conditions.

Construction Methods:

The installation of new bracket assemblies, drop posts, dead end brackets, and other steel assemblies will occur in the vicinity of electrical energized facilities. De-energizing of the Railroad’s, the Eversource Energy and the United Illuminating Company’s (UI) electric lines may be required to perform work. The Contractor shall perform the work in accordance with the following:

1. During the installation of structural and miscellaneous steel, all equipment and persons will at all times, remain at least 15 feet clear of Utility Company's existing 115 kV overhead transmission lines, installed on catenary or pole structures along the railroad's mainline right-of-way. When approach closer than the specified distance is required, the Contractor will request in writing, with 90 working days notice, the de-energizing of the utility lines or equipment. De-energizing of the utility power line is contingent on power demand and economic dispatch and shall be coordinated with Eversource Energy and/or UI. The Contractor will assume any risk involved in the reasonable denial of a request to de-energize Eversource Energy and UI's transmission line and the last-minute cancellation of an approved request to de-energize the transmission lines. If so ordered by the Engineer, the Contractor will immediately cease all activity in the areas where Eversource Energy and UI transmission lines are to be re-energized.
2. The Contractor and Eversource Energy and/or UI must cooperate fully in order to avoid damage to the conductors, and to ensure that no delays will occur in the progress of the work. Therefore, the Contractor shall furnish Eversource Energy and UI with a schedule for this work, which is to include starting and completion dates and, shall notify Eversource Energy and UI 48 hours in advance of the commencement of construction work.

All applicable portions of Article 6.03.03 shall apply.

The Contractor shall not fabricate steel attachments intended for existing structures until he has verified in the field the pertinent dimensions of the structures.

All shop connections shall be welded but subject to the Engineer's approval. Any field modification of truss details shall be approved by the Engineer and MNR. All splices shall be full strength bolted splices as defined in AISC Manual of Steel Construction. Gusset plates may be required.

Field welding of galvanized members will not be permitted, except as noted below:

When steel spacers are required for attachment to existing riveted lattice structures, they shall be welded directly to the support brackets. The joining surfaces of the members shall be properly prepared for welding, including removing the initial galvanized coating from the contact surface. After welding, the contact areas shall be treated with touch up cold galvanizing compound, which shall be approved by the Engineer before use.

The Railroad's safety procedures require that, as soon as structural and miscellaneous steel has been set in place and before power is restored, temporary grounding must be connected to the aerial ground wire system.

Temporary grounds must be at least equal to one 4/0 cable placed in a position protected from damage and vandalism. Permanent grounding (aerial and ground rod) shall be connected as soon as possible following steel erection.

Before erecting a drop post, dead end bracket, post extension or stringing a messenger wire the Contractor shall ascertain that no energized wires will come into contact with or within 3 feet of a new post, truss, post extension messenger or ground wire. Should energized feeders or catenaries of the existing system be within 3 feet of a structure or ground wire, then the Contractor shall consult the Engineer about protective measures before proceeding with erection.

In certain locations there are signal cables, signal boxes and/or ladders attached to the structures. Should the Contractor have to temporarily relocate these in order to proceed with the installation of steel, the Contractor must obtain prior permission from the Railroad to do so.

Down Guys:

Zinc-coated steel wire rope shall be cut and installed using tools and methods specified by the manufacturer.

Down guys shall be installed before loading the structures. They shall be pulled taut and secured in place with provisions for future adjustment as required to hold the structure in proper alignment after wires are pulled to correct tension. Expanding anchor as specified on the drawing shall be employed for the down guy into the soil.

At locations where existing down guys are being relocated or removed, or replaced with an aerial guy wire, the Contractor is to provide temporary back guying and down guy anchoring, as required, to support the existing down guy loads, and the transfer of loads to the new down guys and/or anchors.

Down guy attachments shall be installed as recommended by the manufacturer.

Down guys shall be installed on any existing un-guyed wood poles supporting new attachments.

Down guys shall be installed at a minimum angle of 30 degrees from the pole. If limited clearance or other restrictions may require installation at an angle less than 30 degrees, the proposed down guy location shall be brought to the attention of the Engineer for review and approval.

Down guys anchored to the base of structures shall be installed before encasing the structure base in concrete.

The Contractor shall make final adjustments to the down guys as required to compensate for initial stretch.

Yellow guy safety covers guards shall be installed as specified on the drawing.

In certain locations there are signal cables, signal boxes and/or ladders attached to the structures. Should the Contractor have to temporarily relocate these in order to proceed with the installation of steel, the Contractor must obtain prior permission from the Railroad to do so.

Splicing of the galvanized steel wire shall not be permitted.

Overgrown vegetation shall be selectively removed in order to provide a minimum of five feet clearance around the installed down guy and attachments.

Method of Measurement:

Steel used for support of Figure 8 Aerial Duct will not be measured and paid for separately but included in the unit price (CWT) for the STEEL (MISCELLANEOUS) pay item.

No direct payment will be made for galvanizing, but the cost thereof shall be included in the unit price (CWT) of the STEEL (MISCELLANEOUS) pay item.

No direct payment will be made for temporary grounds required by railroad for steel erection, but the cost thereof shall be included in the unit price (CWT) for the STEEL (MISCELLANEOUS) pay item.

Measurements for Type B-1 through Type X-2 Attachments shall be based on the net mass of metal in the fabricated attachment including tubes, angles, bolts, nuts, spacers, washers, 3 bolt clamp, J hooks, shackles and wire mesh complete. This net weight (mass) shall be determined by computation as described in Sub-article 6.03.04.

Grounding Details G-1 will be measured for payment by the actual number of accepted attachments of each type installed in accordance with these Contract Documents. This item shall include, for payment purposes, bracket assemblies, drop post supports, dead end supports, guy assembly, guy assembly anchoring, wall mounted brackets, pole extension detail, conduit supports, pole extension connection, 3-bolts clamp assembly and aerial innerduct support, ground wires and ground rods complete including other small steel parts and assemblies.

Guy Bracket Assemblies where installed in conjunction with Down Guys, are not measured for payment, but shall be included for payment under the STEEL (MISCELLANEOUS) pay item.

No separate payment will be made for the temporary (or permanent) support, relocation or removal of existing communication, signal, or ground wires, equipment, or any other obstructions that may interfere with the installation of new steel, but the cost thereof shall be included in the unit price of the STEEL (MISCELLANEOUS) pay item.

The temporary (or permanent) removal, relocation, or restoration, if any, of a member of the structure or of signal cables, signal cases, ladders, platforms or other impediment attached to the structure, in order to facilitate the installation of steel shall not be paid for separately, but the cost thereof shall be included in the unit price of the STEEL (MISCELLANEOUS) pay item.

The guy assemblies will not be measured or paid for separately but included in the unit price of the STEEL (MISCELLANEOUS) pay item. It shall include the complete guy assembly installed, regardless of their length, including guy bracket assemblies and cover guards

There will be no separate payment for excavation, concrete, steel, guy safety covers, but the cost thereof shall be included in the unit prices for the STEEL (MISCELLANEOUS) pay item.

There shall be no separate measurement and payment for the removal of existing down guys, or the installation of temporary back guying and anchors, but the cost thereof shall be included in the unit prices for the STEEL (MISCELLANEOUS) pay item.

Procurement and installation of guy attachment(s) to poles, such as guy bracket assemblies and swivel bracket assemblies shall be included in unit price of the STEEL (MISCELLANEOUS) pay item.

The temporary removal and restoration, if any, of a member of the structure, including truss to post knee brace, or signal cables, signal cases, ladders, platforms or other impediment attached to the structure, in order to facilitate the installation of down guy assemblies shall not be measured and paid for separately, but the cost thereof shall be included in the unit price of the STEEL (MISCELLANEOUS) pay item.

Basis of Payment:

The work for Grounding Details shall be paid for at the contract unit price per each for the following pay items complete, which prices shall include all transportation, materials, equipment, tools and labor incidental thereto.

The work for Type B-1 through Type X-2 attachments shall be paid for at the Contract unit price per hundred weight for the STEEL (MISCELLANEOUS) pay item. Payment under this item shall be for miscellaneous steel, complete in place, which price shall include furnishing, fabricating, transporting, erecting, galvanizing and all materials, equipment, tools and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
GROUNDING DETAIL G-1	Each
STEEL (MISCELLANEOUS)	CWT

ITEM #0150745A – SECURITY NODE HOUSE

Description:

Fabricate, deliver and install a pre-engineered rigid steel frame building assembly over foundation by the Contractor as shown on the plans. Provide all utility and electric connections. Foundation and slab work will not be included in this item. FRP railing system 42” high, along the edge of the concrete walkway as indicated on the plans. Timber stairs leading from the parking lot up to the concrete walkway as well as the required foundation shall be designed and erected in the location as indicated on the plans.

Building dimensions and floor layouts are as shown on the plans. The roof shall have a monoslope of ¼” per foot, sloping towards the north with a minimum 2’ overhang on all sides. The minimum eaves height is 9’-8”.

The building shall incorporate the following:

The building shall be painted white.

Building shall have insulation R rating: Walls R-21, Ceiling R-38, slab-mass floor R-12.5

- 2- 3'-0" x 7'-0", 16 gauge, single door, dead bolt, hydraulic closer, weather stripping, door sweep, open and close latch and 3" drip cap.
- 3 - Forced hot and cold air, vertical cabinet style, Heat Pump; 51K BTU of heat, 5.0 ton of AC and 1750 CFM min; motorized outside air damper via HRV, thermostat controlled, fan motor with 208 volt three phase, 60 hertz operation, typical, or equals; Marvair Model: HVPSA60HP1 or approved equal.
- 1- 208V AC, 400 amp, Three phase electrical distribution system.
- 1- 400 amp main breaker.
- 13- 120 Volt duplex power outlets.
- 8- 2 bulb 4' LED interior lights and lens, support these pendant hung fixtures from approved and listed for use Unistrut or B-line type channel, spanning and secured to structural roof framing. Fixtures would then be hung from the channel in locations as shown on the lighting plan on an approved and listed for use chain or cable system to a mounting height of 9' AFF.
- 9- LED wallpack exterior lights with photo cell operator.
- 1- Standby generator, commercial series 125kW natural gas – 60Hz, 208V three phase, 434A maximum capacity; 6.8L engine, size 142”L x 60”W x 70”H, 3409lbs. empty weight; complete with compatible ATS/controller/genset.
- 3- Photo electric smoke detector – Ceiling mounted

- 3- Photo electric smoke detectors – in HP return ducts
- 3- Heat detectors – Ceiling mounted
- 2- Fire Extinguishers UL rated – 10 B:C
- 2- Horn and strobe fire protection system with pull stations, FACP and annunciator.
- 3- Horn and strobe fire protection system – On external wall rated for outdoor use.
- 3- Exit LED Signs – Lithonia or approved equal.
- 1- New clean agent fire suppression system, CACP with interconnection to building FACP, and annunciator.
- 1- Fire alarm control system, digital addressable system with interface to master FA system.
- 1- 42” High, FRP Railing system (SAFRAIL as manufactured by STRONGWELL or approved equal).
- 1- Cable Tray System – Seismically designed, fully grounding, suspended from ceiling
- 1- Timber Stairs.

Design Loads:

Snow Loads

- Ground Snow Load P_g = 30 PSF
- Snow Importance Factor, I_s 1.0
- Thermal Coefficient factor, C_t 1.0
- Snow Exposure Factor, C_e 1.1

Wind

- Basic Wind Speed (3 second gust) 110 MPH
- Wind Importance Factor, I_w 1.15
- Wind Exposure Category C

Seismic

- Occupancy Category II
- Seismic Importance Factor 1.5
- Site Class E
- Seismic Design Category D
- Short Period Spectral Acceleration, S_s 0.243
- 1-Second Period Spectral Acceleration, S₁ 0.062

The structure shall be designed to conform to, but not limited to the following codes:

- Connecticut State Building Code 2016 or Latest Edition with supplements
- ASCE 7, American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures, Latest Edition
- AISC 360, American Institute of Steel Construction Specification for Structural Steel Buildings, Latest Edition
- AISC 341, American Institute of Steel Construction Seismic Provisions for Structural Steel Buildings including Supplement No. 1 dated 2006.
- ACI 318, American Concrete Institute Building Code Requirements for Structural Concrete 2014 or Latest Edition
- ACI 530/530.1, American Concrete Institute Building Code Requirements & Specifications for Masonry Structures 2013 or Latest Edition
- AWS D1.1-04 American Welding Society Structures Welding Code – Steel
- 2015 International Building Code
- 2015 International Energy Conservation Code
- 2015 International Fire Code (Part III)
- 2015 International Plumbing Code
- 2012 International Mechanical Code
- 2015 NFPA 101, Life Safety Code (Part IV)
- 2015 NFPA 1 – Fire Code
- 2017 NFPA 70, National Electrical Code
- 2001 NFPA Standard for Clean Agent Fire Extinguishing system units
- NFPA 72 National Fire Alarm Code
- OSHA 1910.23 with a minimum factor of safety of 2 for the FRP railing
- OSHA 3124 for Stairways and Ladders
- 2018 National Design Specification for Wood Construction

Certification:

Submit written certification and design calculations prepared and signed by a Professional Engineer, registered to practice in the State of Connecticut verifying that the building design meets indicated loading requirements and codes of authorities having jurisdiction. The certification must reference specific dead loads, live loads, snow loads, wind loads/speeds, tributary area load reductions (if applicable), concentrated loads, collateral loads, seismic loads, end use categories, governing code bodies including year and load applications.

Material Testing:

In addition to mill certifications of structural steel, the manufacturer shall provide, upon request, evidence of compliance with specifications through testing independent of the manufacturer's suppliers. The quality assurance testing to include structural bolts, nuts, screw fasteners, mastic and metal coatings (primary, metallic coated products and painted coil products).

Warranties:

Building Structure

1. Provide manufacturer's written weather tightness warranty for a maximum of twenty (20) years against leaks in roof panels arising out of or caused by ordinary wear and tear under normal weather and atmospheric conditions. Warranty shall be signed by both the metal roofing system manufacturer and metal roofing system contractor. Maximum liability of warranty shall be no less than \$ 1.00 per square foot of roof area.
2. Provide manufacturer's standard written warranty for twenty (20) years against perforation of metal roof panels due to corrosion under normal weather and atmospheric conditions. Warranty shall be signed by metal roofing system manufacturer.
3. Provide manufacturer's standard paint film written warranty for twenty (20) years against cracking, peeling, chalking and fading of the coating on painted wall panels, painted roof panels and soffit panels. Warranty shall be signed by the building system or roof system manufacturer. Manufacturer warrants that coating shall not blister, peel, crack, chip or experience material rust through for 20 years. For a period of 20 years chalking shall not exceed #8 – ASTM and fading shall be 5ΔE Hunter units or less.
4. Inspection and Report Services: Metal roof system manufacturer or his authorized agent shall perform inspection of the entire roof system and shall submit a written report to the Owner detailing all conditions requiring maintenance and repair by parties under the above warranties. Inspections and reports shall be performed once every other year over the twenty (20) year weather tightness warranty period. Cost of inspection and Report services shall be included in the contract amount.
5. Manufacturer's Certification: Submit written Certification, by the signed manufacturer one week prior to bid date stating that the metal roof system manufacturer will provide warranties and Inspection and Report service specified herein. NOTE: Warranty terms shall be submitted with the bid. Also included in this submittal will be certification of the manufacturer's compliance with AISC-MB category.

Natural Gas fired Backup Generator

1. The generator manufacturer shall have a local authorized dealer who can provide factory trained servicemen, the required stock of replacement parts, technical assistance, and warranty administration.
2. The manufacturer's authorized dealer shall have a parts and service facility within 130 miles of the jobsite.
3. The generator set supplier shall have factory trained service representatives and tooling necessary to install, test, maintain, and repair all provided equipment.
4. The manufacturer's authorized dealer shall be capable of administering the manufacturer's

and dealer's warranty for all components supplied by the selling dealer (who may or may not be the same as the servicing dealer).

5. The manufacturer's and dealer's extended warranty shall in no event be for a period of less than five (5) years from date of initial start-up of the system or 2500 operating hours, whichever comes first. It shall include repair parts, labor, reasonable travel expense necessary for repairs at the jobsite, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Applicable deductible costs shall be specified in the manufacturer's warranty. Submittals received without written warranties as specified will be rejected in their entirety.

Clean Agent Fire Protection System

1. The manufacturer shall warrant the system equipment for 36-months from the date of shipment from the factory.
2. The contractor shall warrant the installation for 12-months from time of customer acceptance or commissioning.

Heat Pumps

1. The complete package shall be ETL Listed and tested to UL Standard 1995, 2nd Edition and CAN/CSA-C22.2 No. 236-95 2nd Edition for safety. The unit shall be certified to the current version of the Air Conditioning and Refrigeration Institute (ARI) Standard 390. The manufacturer of the heat pump shall be ISO 9001 2000 certified.

ATS – Automatic Transfer Switch

1. The transfer switch, complete with all timers, relays, and accessories, shall be UL-listed under Standard UL-1008 and approved for use on emergency systems. The UL listing shall include the specific amperage ratings that are called for on the drawings.
2. Contain a short circuit withstand capability and closing ratings when coordinated with circuit breakers in excess of the UL minimum requirement of 42,000 RMS amperes symmetrical.
3. Completely wired, assembled, and tested by the manufacturer at the factory to ensure compatibility and to completely test the assembly.
4. Provide the transfer switch as shown on the drawings with full load current rating of amperes at 208/120V, 3-phase, 4-wire, 60 Hertz AC normal and emergency.
5. Capable of switching all classes of load and rated for continuous duty when installed in non-ventilated enclosures.
6. Provide exercise timer, automatically actuated, to permit weekly programming of engine generator test runs under load. If the emergency source should fail during the exercise period, and if normal power is available, the switch shall immediately restore to normal.

7. Auxiliary contacts shall be provided to monitor the status of the ATS.
8. Microprocessor controlled with front accessible HMI interface.

Submittals:

1. Building structure: Submit design calculations and working design drawings for the building structure prepared by a professional engineer licensed in the State of Connecticut.
2. Timber stair structure: Submit design calculations and working design drawings for the timber stairs with foundation details prepared by a professional engineer licensed in the State of Connecticut.
3. Product Data: Submit manufacturer's product information, specifications and installation instructions for building components and accessories.
4. Erection Drawings: Submit complete erection drawings showing roof framing, transverse cross sections, penetrations, covering and trim details and accessory installation details to clearly indicate proper assembly of building components.
5. Submit certification verifying that the metal roofing system has been tested and approved by Underwriter's Laboratory as Class 90. Submit certification that the metal roofing system, has been tested and approved by the US Army Corps of Engineers Guide Specification 07146 (Test Method for Structural Performance of Standing Seam Metal Roof Systems by Uniform Static Air Pressure) (MR-24®, CMR-24® and VSR™).
6. Dealers Certification: Submit certification that the building component system supplier and/or the metal roofing system supplier is a manufacturer's authorized and franchised dealer of the system to be furnished. Certification shall state date on which authorization was granted.
7. Installer Certification: Submit certificate that the building roof system installer has regularly engaged in the installation of building systems of the same or equal construction of the system specified.
8. Samples: Submit samples, two (2) each of the following for Engineer's review. Samples will be used as basis for evaluating quality of finished roof and wall systems.
 - a. Twelve inch long by actual width of roofing, liner panel and siding panels with required finishes.
 - b. Fasteners (including standing seam roof clips) for application of roofing, sliding and soffit panels.
 - c. Twelve (12) inch long (min.) x twelve (12) inch wide (min.) of actual standing seam side lap seams for both sides of a typical panel including sealants and closures.
9. Design calculations and shop drawings as well as flow calculation reports for the Clean agent fire extinguishing system as per NFPA 2001.

10. Shop drawings and product data sheets for the Fire alarm system as per NFPA 2001.
11. Product data sheets and installation details for the items specified for the electrical distribution panel, electrical and light fixtures as indicated on the drawings.
12. Product data sheets and installation details for the heat pumps.
13. Component List - A breakdown of all components and options including switch gear.
14. Technical Data - Manufacturer produced generator set specification or data sheet identifying make and model of engine and generator including relevant component design and performance data. Transient response of frequency and voltage for the generator set:
 - a. Auxiliary Equipment - Specification or data sheets, including switchgear, spring type vibration isolators.
 - b. Drawings - General dimensions drawings showing overall generator set measurements, mounting location, and interconnect points for load leads, fuel, exhaust, cooling and drain lines.
 - c. Wiring Diagrams - Wiring diagrams, schematics and control panel outline drawings published by the manufacturer in Joint Industrial Council (JIC) format for controls and switchgear showing interconnected points and logic diagrams for use by contractor and owner.
 - d. Warranty Statements - Warranty verification published by the manufacturer.
 - e. Service - Location and description of supplier's parts and service facility including parts inventory and number of qualified generator set service personnel.
15. Product data sheets including seismic design data and installation details for the ceiling suspended Cable Tray System.

Materials:

Structural Steel Design:

All structural mill sections or welded plate sections shall be designed in accordance with the latest edition of ASIC "Specifications for Design, Fabrication and Erection of Structural Steel Buildings," and all cold formed steel members shall be designed in accordance with the latest edition of AISI "Specification for the Design of Cold-Formed Steel Structural Members."

Primary Framing:

Rigid Frames: Frame shall consist of welded-up plate section or rolled section columns and roof

beams complete with necessary splice plates for bolted field assembly. All bolts for field assembly of frame members shall be high strength bolts as indicated on the erection drawings.

Endwall Structurals: The endwall structural shall be cold-formed channel members designed in accordance with the latest edition of AISI Specifications or welded-up plates sections designed in accordance with the latest edition AISC Specifications. Endwall frames shall consist of endwall corner posts, endwall roof beams and endwall posts as required by design criteria.

Secondary Structural Members:

Purlins and Girts: Purlins and Girts shall be “Z” shaped, precision roll formed.

Eave Strut: Eave Struts shall be factory pre-punched “C” sections.

Bracing: Bracing shall be located as indicated on the drawings.

Structural Painting:

1. Prior to painting all steel shall be cleaned of loose rust, loose mill scale, dirt and other foreign material. Unless otherwise specified, the fabricator shall not sand blast, flame clean or pickle prior to painting.
2. Factory cover all steel with one coat of red oxide primer paint formulated to equal or exceed the performance of Federal Specification TT-P-636D, TT-P-664C and SSPC Paint-25.

Primary Frames:

1. Clean all steel per SSPC-SP2.
2. Apply one coat of water reducible alkyd primer by spray or dip method to a minimum coating thickness of 1.0 mil.

Secondary Structurals:

1. Clean all steel per SSPC-SP8.
2. Apply one coat of coil applied polyester primer to a minimum coating thickness of 0.5 mil (Purlins and Girts).

Roof:

The roof shall be covered with a roof system furnished by the manufacturer and installed in accordance with the manufacturer’s instructions.

Component Description:

Roof Panels:

Roof panels shall be roll formed panels 24” wide, with 2 major corrugation, 2” high (2-3/4” including seam) 24” on center. The flat of the panel shall contain cross flutes 6” on center perpendicular to the major corrugations the entire length of the panel to reduce wind noise and improve workability.

Panel material as specified shall be 24 gauge steel coated both sides with a layer of aluminum zinc alloy (approximately 55% aluminum and 45% zinc) applied by the continuous hot dip method. Minimum 0.55 ounce coated weight per square foot as determined by the triple spot test per ASTM Specification A792.

System Design:

All components for the roof paneling system shall be designed in accordance with sound engineering methods and practices.

Roof panels shall be designed in accordance with the latest edition of AISI “Specifications for the Design of Light-Gage, Cold Formed Steel Structural Members.”

Paneling system shall be designed to support design live loads.

All endwall trims and roof transition flashings shall allow the roof panel to move relative to the wall panels and/or parapets as the roof expands and contracts with temperature change.

Fasteners:

All connections of panels to structural members, except at eaves, shall be made with clips with moveable tabs that are seamed into the standing seam sidelap.

Panel clips shall be fastened to structural members with fasteners as per manufacturer’s erection drawings, using factory pre-punched holes in structural members. Scrubolts™ or approved equal, shall contain a metal backed rubber washer which serves as a torque indicator.

Panel to panel connections shall be made with a positive, field formed standing double lock seam, formed by a special seaming machine. The machine field forms the final 180° of a 360° Pittsburgh double-lock standing seam; all sidelap sealant shall be factory applied.

Fasteners penetrating the metal membrane at the following locations must not exceed the frequency listed:

Basic Panel System	0 per sq. ft.	High Eave (no parapet)	2 per lin. Ft.
Exterior Eave Gutter	2 per sq. ft.	Panel Splices	2 per lin. Ft.
Gable Trim (no parapet)	2 per lin. ft.	High Side Transition	1 per lin. Ft.
Ridge	1 per lin. Ft.		

In lieu of pre-punched secondaries and panels, pre-drilling of the structural members is mandatory in order to maintain proper alignment of the roof system.

Accessories:

The building shall have gutters, downspout, gable trim and eave trim.

Performance Testing:

Underwriters Laboratories – UL Class 90 Rating (UL Test 580)

The roof system shall carry a UL wind uplift classification Class 90 rating to ensure structural integrity.

Provision for Expansion/Contraction:

Provision for thermal expansion movement of the panels shall be accomplished by the use of clips with a moveable tab. The stainless steel tab shall be factory centered on the roof clip when installed to assure full movement in either direction. A force of no more than 8 pounds will be required to initiate tab movement. Each clip shall accommodate a minimum of 1¼” in either direction.

Exterior Wall:

Exterior walls shall be covered with precision roll-formed panels.

Panel Description:

Panel shall be 3’ wide with four major corrugations, 1½” high, and 12” on center with two minor corrugations between each of the major corrugations the entire length of the panel.

Panels shall be one piece from base to building eave.

The upper end of panels shall be fabricated with mitered cut to match corrugations of roof panels.

The bottom end of panels shall be straight cut.

Panel Design:

Panel design shall be in accordance with the latest edition of AISI “Specifications for the Design of Light-Gage, Cold-Formed Steel Structural Members,” and in accordance with sound engineering methods and practices.

Panel Material and Finish:

26 gage galvanized, per ASTM A525 and painted with exterior color of the manufacturer’s finish system, a full strength fluoropolymer coating. Manufacturer warrants that coating shall not blister, peel, crack, chip or experience material rust through for 20 years. For a period of 20 years chalking shall not exceed #8 – ASTM and fading shall be 5ΔE Hunter units or less.

Panels shall be sealed at the base with foam or rubber closures.

Trim material shall be as follows:

All exterior trim shall be of the same finish as the exterior color of the wall panel except the following:

1. All gutters, downspouts, eave trim, gable trim, door side flashings to be pre-painted galvanized steel with fluoropolymer coating.
2. All gutter, downspouts, eave trim and gable trim shall be Charcoal.
3. Door side flashing and door header flashing shall be in Charcoal.

All interior trim shall be painted.

All flashings, trims, closures and similar items shall be detailed on drawings as supplied by the manufacturer of the panel.

Fasteners:

Wall panel to structural connections shall be made with Torx® head fasteners, Torx® head self-drilling screws or Lock-Rivet™ fasteners or approved equal. Panel to Panel connections shall be made with Torx® heads self-drilling screws, or Lock-Rivet™ fasteners or approved equal.

All exposed fasteners shall be pre-painted to match wall color or shall be covered with plastic color caps to match wall color.

Insulation:

The roof and exterior walls shall be made with faced fiberglass insulation blanket with a minimum R-value of 38 and 21 respectively. The insulation facing shall be foil reinforced kraft, 0.00035” minimum thick aluminum foil laminated to kraft paper, reinforced with fiberglass scrim, which is adhered to the blanket insulation. The assembly of blanket and facing shall have a flame spread rating of 25 and U/L label shall be furnished upon request.

Deadbolt Lock:

The door hardware shall have a removable core. Metro-North shall determine the exact brand and model that will be used.

Floor Finish:

The structure shall have a bare concrete floor finish.

Mechanical:

- All materials and equipment provided under this section shall be new, first grade, best of their section and shall meet the requirements of all standards set up to govern the manufacture of mechanical components and comply with all applicable codes and standards.
- Heat pump systems, models and capacities shall be as shown on the drawings or approved equal.

- Duct tape shall not be permitted as sealant.
- Grille sizes indicated on the drawings are inner clear dimensions.
- Diffuser neck size shall be same as flexible duct size, unless noted otherwise.
- Heat pumps shall not be run for temporary heating, ventilation testing or otherwise without filter in place. Supply such filters until the system is handed over to Metro North at which time new filter shall be installed.
- Heat Pump shall operate in accordance with an integral time clock. Supply air duct mounted temperature sensor shall control cooling by staging the compressors and control heating by staging unit's heater. Duct mounted return air thermostat and humidistat shall control unit operation to maintain temperature and humidity (dehumidification) setpoints.

Accessories:

- Class 1A fast action dampers shall comply with SMACNA. Provide damper on supply air and return airwall grills interlocked with the clean agent controller to close on delayed action of clean agent. Dampers shall operate with spring return to fail close with power failure.
- Provide staples, bands, wires, tape, anchors, corner angles and similar accessories as recommended by the insulation manufacturer for the application indicated.
- Diffusers shall be Titus model TMSA of steel construction with model AG-75 opposed blade damper and adjustable louver vanes. Size and capacity as noted on the drawings or approved equal.
- Return air grilles shall be Titus model 50F Egg-crate type with 1/2" aluminum grid and opposed blade damper. Size and capacity as noted on the drawings or equal.
- Motorized damper shall be Ruskin model CD-40, of all with 120V operator or approved equal. Provide with thermostat.
- Electronic controls shall include thermostats, control panels, relays, transformers, sensors and accessories as required to perform the sequences as described below.

Electrical:

- All materials and equipment provided under this section shall be new, first grade, best of their section and shall meet the requirements of all standards set up to govern the manufacture of electrical materials and comply with all applicable codes and standards.
- All equipment and materials shall be specification grade and bear underwriter's (U.L.) label.
- Conductors shall be U.L. listed, 600 Volts, 90 Deg. C. Single Conductor type THWN/THHN. 98% conductivity annealed uncoated cooper with PVC insulation covered with nylon sheath jacket. Tested in accordance with the requirements of the underwriter's laboratories standard 83. Wire shall be identified by surface marking indicating manufacturer's identification, conductor size and metal, voltage rating, UL symbol and type

designation. Conductors shall be stranded. Minimum size shall be #12awg unless otherwise indicated as manufactured by Essex, Rome cable, Triangle cable or General cable.

- Electric metallic tubing (EMT) shall be zinc coated steel.
- Armored cable shall be of galvanized steel interlocking armor construction, color coded thermoplastic insulated copper conductors, 90 deg. C, 600 volts. Conductor sizes shall be as indicated on the drawings. If not indicated, the sizes of power and lighting conductors shall not be less than size #12awg as manufactured by American flexible conduit, Triangle or Southwire. Connectors shall be squeeze type, die cast zinc, or malleable iron - cadmium plated as manufactured by Z Gedney, Appleton or Thomas-Betts.
- Conduit straps shall be snap-type, double ribbed steel - zinc plated. Metal clad cable and flexible metallic conduit connectors shall be malleable iron-zinc plated, male hub threads with locknut.
- Recessed outlet boxes shall be drawn steel, galvanized with a minimum depth of 1-1/2inches. Minimum size shall be 4 inch x 4 inch square. Provide and install plaster rings as required.
- Outlet boxes for surface mounted switches and receptacles shall be type FD, cast ferroalloy with threaded hubs. Provide gasketed cover as required.
- Switches shall be 120-277VAC 20 amp, single pole. Color shall be Ivory.
- Receptacle and switch cover plates shall be smooth thermoplastic Ivory.
- Panelboards shall be NEMA PB 1, circuit breaker type.
- Provide and install markers for all conduits. Markers shall be “Brady” type adhesive-backed, plastic-faced of suitable color. Marker shall identify system and electrical characteristics. Install markers at point of origin, termination, adjacent to each intermediate splice, and all boxes in run.
- Identify all conductors at origin, termination and at intermediate boxes by means of “Brady” type, pressure sensitive, plastic coated face, stick-on labels except feeders shall have phenolic tags engraved with circuit designations and attached with plastic tie-wraps.

Natural Gas Powered Generator:

1. Engine-Genset: Factory-assembled and -tested, engine-generator set. Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.
2. Capacities and Characteristics: Nominal ratings as indicated, with capacity as required to operate as a unit as evidenced by records of prototype testing.
3. Output connections: Three-phase, four wire.

4. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
5. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.
6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
7. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to winding insulation or other generator system components.
8. Engine:
 - A. Fuel: Natural gas.
 - B. Rated Engine Speed: 1200 rpm.
 - C. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm.
 - D. Lubrication System: The following items are mounted on engine or skid:
 - Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
 - Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
 - Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.
9. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity.
10. Governor: Adjustable isochronous, with speed sensing.
11. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine generator-set mounting frame and integral engine-driven coolant pump.
12. Muffler/Silencer: Sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure

requirements. Minimum sound attenuation of 18 dB at 500 Hz. Sound level measured at a distance of 10 feet from exhaust discharge after installation is complete shall be 95dBA or less.

13. Air-Intake Filter: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.
14. Starting System: 24-V electric, with negative ground.
 - Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.
 - Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
 - Cranking Cycle: As required by NFPA 110 for system level specified.
 - Battery: Adequate capacity within ambient temperature range specified in Part 1 "Project Conditions" Article to provide specified cranking cycle at least three times without recharging.
 - Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
15. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater shall be arranged to maintain battery above 10 deg C regardless of external ambient temperature within range specified. Include accessories required to support and fasten batteries in place.
16. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
17. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set.
18. Indicating and Protective Devices and Controls: As required by NFPA 110 for Level 1 system, and the following:
 - AC voltmeter.
 - AC ammeter.
 - AC frequency meter.
 - DC voltmeter (alternator battery charging).

- Engine-coolant temperature gage.
 - Engine lubricating-oil pressure gage.
 - Running-time meter.
 - Ammeter-voltmeter, phase-selector switch(es).
 - Generator-voltage adjusting rheostat.
 - Start-stop switch.
 - Overspeed shutdown device.
 - Coolant high-temperature shutdown device.
 - Coolant low-level shutdown device.
 - Oil low-pressure shutdown device.
19. Connection to Data Link: A separate terminal block, factory wired to Form C dry contacts, for each alarm and status indication is reserved for connections for data-link transmission of indications to remote data terminals.
20. Common Remote Audible Alarm: Comply with NFPA 110 requirements for Level 1 systems.
- Engine high-temperature shutdown.
 - Lube-oil, low-pressure shutdown.
 - Overspeed shutdown.
 - Remote emergency-stop shutdown.
 - Engine high-temperature pre alarm.
 - Lube-oil, low-pressure pre alarm.
 - Low coolant level.
21. Remote Alarm Annunciator: Comply with NFPA 99. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush mounting type to suit mounting conditions indicated.
22. Remote Emergency-Stop Switch; also known as Remote Manual Stop Station: Surface, water proof and exterior; wall mounted, unless otherwise indicated; and labeled per NFPA 110 5.6.5.6. Push or pull button shall be protected from accidental operation.
23. Generator Circuit Breaker: Molded-case, electronic-trip type; 100 percent rated; complying with UL 489.
24. Ground-Fault Indication: Comply with NFPA 70, "Emergency System" signals for ground fault. Integrate ground-fault alarm indication with other generator-set alarm indications.
25. Outdoor Generator set enclosure: Vandal-resistant, weatherproof steel housing, wind resistant up to 100 mph. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Panels shall be removable by one person without tools.

Instruments and control shall be mounted within enclosure. Structural Design and Anchorage shall comply with ASCE 7 for wind loads.

26. Vibration Isolation Devices: Elastomeric Isolator Pads - Oil and water-resistant elastomer or natural rubber, arranged in single or multiple layers, molded with a non-slip pattern and galvanized-steel base plates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment.
27. Finishes - Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.

Fire Alarm and Firefighting system:

- All materials and equipment provided under this section shall be new, first grade, best of their section and shall meet the requirements of all standards set up to govern the manufacture of fire alarm and firefighting systems and comply with all applicable codes and standards. The fire alarm system shall have the capability of informing Norwalk Fire department and Metro North Railroad in the event of fire.
- All equipment and materials shall be specification grade and bear underwriter's (U.L.) label.
- Non-coded, UL listed addressable system with multiplexed signal transmission and horn/strobe evacuation.
- Fire alarm system shall initiate the following actions:
 1. Continuously operate the alarm notification system
 2. Identify alarm and specific initiating device at fire alarm control panel and remote annunciator.
 3. Transmit alarm signal to Norwalk Fire department and Metro North Railroad
 4. Switch heat pumps to fire alarm mode.
 5. Activate emergency lighting control
 6. Close dampers in the heat pumps.
 7. Activate emergency shutoffs for gas and fuel supplies.
- Fire alarm control panel shall be as manufactured by Tyco, Honeywell, Gamewell or approved equal.
- Automatic sensitivity control for smoke detectors complying with requirements of UL217. The smoke detector shall have the capability of informing Norwalk Fire department and Metro North Railroad in the event of smoke detection.

- Heat detectors shall comply with requirements of UL 521. The heat detector shall have the capability of communicating with Metro North Railroad if the internal temperature rises above 80 degrees and the heat pumps stop working.
- Manual fire alarm boxes complying with requirements of UL 38.
- Total flooding, FM-200 fire suppression system, super-pressurized with dry nitrogen shall be installed to meet a minimum design concentration of 7%, by volume in all designated spaces to be protected.
- FM-200, fire suppression equipment and accessories shall be as be manufactured by, Kidde Fire Systems or approved equal.
- The total flooding system shall consist of a Kidde FM-200 agent storage cylinder, Kidde actuation hardware and Kidde ECS series system distribution nozzles attached to a pipe network or approved equal.

Construction Methods:

The Contractor shall erect the structure, seal the building after installation of electrical, mechanical and firefighting systems, to form a weather tight enclosure and tie in to existing external utilities.

Method of Measurement:

“Security Node House” will be paid on a lump sum basis and will not be measured for payment. The limits of all underground utilities, to be included in the lump sum price for “Security Node House”, shall be 5’ from the outside faces of the supporting concrete structure. Foundation and Concrete slab work will not be included in this item.

Basis of Payment:

Payment for this work will be at the contract lump sum price for “Security Node House” complete in place which shall include all work necessary and incidental to fabricate and install the building including all Electrical, Mechanical, FRP Railing, Cable Tray System, Timber stairs, 36” Concrete splash block and Fire protection system and all appurtenances mentioned in these specifications and drawings and or as needed per building code requirements. Foundation and Concrete slab work shall be paid under “Structure Excavation – Earth (Complete)”, “Class “F” Concrete”, “Deformed Steel Bars- Epoxy Coated” “Drilled Shaft”, and “Welded Wire Fabric – Epoxy Coated” items.

<u>Pay Item</u>	<u>Pay Unit</u>
Security Node House	Lump Sum

ITEM #0202317A – DISPOSAL OF HAZARDOUS MATERIALS

Description:

Work under this item shall include the loading, transportation and final off-site disposal of hazardous lead painted debris which has been generated in conjunction with work conducted under Item #0020902A – Lead Compliance for Building Demolition and Renovation.

NEW HAVEN LINE NETWORK INFRASTRUCTURE UPGRADE PHASE 3

- **Green’s Farms Railroad Station**
- **Westport Railroad Station**
- **East Norwalk Railroad Station**
- **South Norwalk Railroad Station**
- **Rowayton Railroad Station**
- **Darien Railroad Station**
- **Noroton Heights Railroad Station**
- **SAGA Moveable Bridge (Westport)**
- **Node House – 334 (Mile Point 33.40)**
- **Node House – 414 (Mile Point 41.40)**
- **Node House – 473 (Mile Point 47.30)**
- **CCO Shop, Room 442, New Haven, CT**

The painted non-metallic debris and/or paint waste to be generated at the above Sites are presumed as RCRA/CTDEEP hazardous waste. This material shall be transported from the Project by a licensed hazardous waste transporter approved by the Department and disposed of at an EPA-permitted and Department-approved hazardous waste landfill within 90 days from the date of generation. Exact dimensions of lead painted materials to be demolished/removed should be confirmed by the Contractor to obtain accurate volumes and tonnage of potentially hazardous material to be generated for the purpose of calculating potential disposal costs.

The Contractor must use one or more of the following Department-approved disposal facilities for the disposal of hazardous waste:

<p>Clean Earth of North Jersey, Inc., (CENJ) 115 Jacobus Avenue, South Kearny, NJ 07105 Phone: (973) 344-4004; Fax: (973) 344-8652</p>	<p>Clean Harbors Environmental Services, Inc. 2247 South Highway 71, Kimball, NE 69145 Phone: (308) 235-8212; Fax: (308) 235-4307</p>
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Clean Harbors of Braintree, Inc. 1 Hill Avenue, Braintree, MA 02184 Phone: (781) 380-7134; Fax: (781) 380-7193	ACV Enviro(CycleChem)(General Chem Co) 217 South First Street, Elizabeth, NJ 07206 Phone: (908) 355-5800; Fax (908) 355-0562
Triumverate (EnviroSafe Corp Northeast) (Jones Environmental Services (NE), Inc.) 263 Howard Street, Lowell, MA 01852 Phone: (978) 453-7772; Fax: (978) 453-7775	US Ecology Environmental Quality Detroit, Inc. 1923 Frederick Street, Detroit, MI 48211 Phone: (800) 495-6059; Fax: (313) 923-3375
Stericycle (Republic Environmental Systems) 2869 Sandstone Drive, Hatfield, PA 19440 Phone: (215) 822-8995; Fax: (215) 997-1293	Clean Harbors – Spring Grove Facility 4879 Spring Grove Ave, Cincinnati OH 45322 Phone: (513) 681-6242; Fax: (513) 681-0869
Envirite of PA (US Ecology) 730 Vogelsong Road, York, PA 17404 Phone: (717) 846-1900; Fax: (717) 854-6757	Stablex, Canada, Inc. 760 Industrial Bl, Blainville Quebec J7C3V4 Phone: (451) 430-9230; Fax: (451) 430-4642
Environmental Quality Company: Wayne Disposal Facility 49350 North I-94 Service Drive Belleville, MI 48111 Phone: (800) 592-5489; Fax: (800) 592-5329	Stericycle (Northland Environmental, Inc.) (PSC Environmental Systems) 275 Allens Avenue, Providence, RI 02905 Phone: (401) 781-6340; Fax: (401) 781-9710

Materials:

Not used

Construction Methods:

A. Submittals

Prior the generation any hazardous waste, the Contractor shall notify the Engineer of its selected hazardous waste transporter and disposal facility. The Contractor must submit to the Engineer the following documentation:

1. USDOT Certificate of Registration for Hazardous Materials Transport;
2. Transporter's current Hazardous Waste Transporter Permits for the State of Connecticut, the hazardous waste destination state and any other applicable states.

The Engineer will then obtain a temporary EPA Hazardous Waste Generators ID number on a contiguous per site basis, that he/she will forward to the Contractor. Any changes in transporter or facility shall be immediately forwarded to the Engineer for review.

B. General:

Handling, transportation and disposal of hazardous waste materials generated as a result of execution of this project shall comply with all Federal, State and Local regulations including the USEPA RCRA Hazardous Waste Regulations (40 CFR Parts 260-271), the CTDEEP Hazardous Waste Regulations (22a-209 and 22a-449(c)), and the USDOT Hazardous Materials Regulations (49 CFR Part 171-180).

The Engineer will sample materials of lead painted waste stream debris for final waste characterization at a frequency established by the selected disposal facilities. The Contractor shall designate to the Engineer which facility it intends to use prior to samples being taken. The Contractor is hereby notified that laboratory turnaround time is expected to be fifteen (15) working days. Turnaround time is the period of time beginning when the Contractor has completed generating the building material debris with lead paint and notifies the Engineer which facility it intends to use and that the material ready for sampling. The turnaround time ends with the Contractor's receipt of the laboratory analytical results. Any change of intended disposal facility may prompt the need to resample and will therefore restart the time required for laboratory turnaround. The laboratory will furnish such results to the Engineer. Upon receipt, the Engineer will make available to the Contractor the results of the final waste characterization determinations. **No delay claim will be considered based upon the Contractor's failure to accommodate the laboratory turnaround time as identified above.**

The Contractor shall obtain and complete all paperwork necessary to arrange for material disposal, including disposal facility waste profile sheets. It is solely the Contractor's responsibility to co-ordinate the disposal of hazardous materials with its selected treatment/recycling/disposal facility(s). Upon receipt of the final approval from the facility, the Contractor shall arrange for the loading, transport and treatment/recycling/disposal of the materials in accordance with all Federal and State regulations. **No claim will be considered based on the failure of the Contractor's disposal facility(s) to meet the Contractor's production rate or for the Contractor's failure to select sufficient facilities to meet its production rate.**

The Contractor shall process the hazardous waste such that the material conforms with the requirements of the selected treatment/disposal facility, including but not limited to specified size and dimension. Refusal on the part of the treatment/disposal facility to accept said material solely on the basis of non-conformance of the material to the facility's physical requirements is the responsibility of the Contractor and no claim for extra work shall be accepted for reprocessing of said materials to meet these requirements.

Hazardous waste materials are to be properly packed and labeled for transport by the Contractor in accordance with EPA, CTDEEP and USDOT regulations.

All hazardous waste manifests utilized to accompany the transportation of the waste material shall be prepared by the Contractor and signed by an authorized agent representing ConnDOT, as Generator, for each load of material that is packed to leave the site. The Contractor shall forward the appropriate original copies of all manifests to the Engineer the same day the material leaves the Project site.

A load-specific certificate of disposal (i.e. completed uniform hazardous waste manifest) signed by the authorized agent representing the waste disposal facility, shall be obtained by the Contractor and promptly delivered to the Engineer for each load.

C. Material Transportation

Materials determined to be hazardous shall be transported in compliance with the applicable federal/state regulations. Transport vehicles shall not have any indentations or damage and must be free from leaks, and discharge openings must be securely closed during transportation.

In addition to all pertinent Federal, State and local laws or regulatory agency polices, the Contractor shall adhere to the following precautions during the transport of hazardous materials off-site:

- All vehicles departing the site are to be properly logged to show the vehicle identification, driver's name, time of departure, destination, and approximate volume, and contents of materials carried. Vehicles shall display the proper USDOT placards for the type and quantity of waste;
- No materials shall leave the site unless a disposal facility willing to accept all of the material being transported has agreed to accept the type and quantity of waste;
- Documentation must be maintained indicating that all applicable laws have been satisfied and that the materials have been successfully transported and received at the disposal facility; and,
- The Contractor shall segregate the waste streams (i.e. concrete, wood, etc.) as directed by the receiving disposal facility.

D. Equipment Decontamination:

All equipment shall be provided to the work site free of gross contamination. The Engineer may prohibit from the site any equipment that in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of the Contractor's equipment prior to arrival at the site shall be at the expense of the Contractor. The Contractor is prohibited from decontaminating equipment on the Project that has not been thoroughly decontaminated prior to arrival.

The Contractor shall furnish labor, materials, tools and equipment for decontamination of all equipment and supplies that are used to handle Hazardous Materials. Decontamination shall be conducted at an area designated by the Engineer and shall be required prior to equipment and supplies leaving the Project, between stages of the work, and between work in different AOEC's.

The Contractor shall use dry decontamination procedures. Residuals from dry decontamination activities shall be collected and managed as Hazardous Materials. If the results from dry methods are unsatisfactory to the Engineer, the Contractor shall modify decontamination procedures as required.

The Contractor shall be responsible for the collection and treatment/recycling/disposal of any liquid wastes that may be generated by its decontamination activities in accordance with applicable regulations.

E. Project Closeout Documents:

The Contractor shall provide the Engineer, within 30 days of completion of the work, a compliance package; which shall include, but not be limited to, the following:

1. Completed Hazardous Waste Manifests (signed by authorized disposal facility representative)
2. Completed Waste Shipment Records/Bills of Lading (signed by authorized disposal facility representative)
3. Completed Weigh Bills (indicating each loads net weight).

Method of Measurement:

The work of "DISPOSAL OF HAZARDOUS MATERIALS" shall be measured for payment as the actual net weight in tons of material delivered to the treatment/disposal facility. Such determinations shall be made by measuring each hauling vehicle on the certified permanent scales at the treatment/recycling facility. Total weight shall be the summation of weigh bills issued by the facility specific to this project and waste stream.

The disposal of lead painted debris, originally anticipated to be hazardous, but determined by characterization sampling not to contain hazardous concentrations of lead will not be measured for payment under this Item. Disposal of these materials will be handled in accordance with the provisions of Item 0020902A – Lead Compliance for Building Demolition and Renovation.

The collection and treatment/disposal of materials and liquids generated during equipment decontamination activities or personal protective equipment (PPE) shall be considered incidental to work under this Item and will not be measured for separate payment.

Basis of Payment:

This work shall be paid for at the contract unit price per ton, which price shall include the processing, loading and transportation of said materials from the waste stockpile area to the treatment/disposal facility; the treatment/disposal or recycling of said materials; the preparation of manifests and fees paid; and all equipment, materials, tools, and labor incidental to loading, transporting, treating/recycling and disposal of materials.

No separate payment shall be made under this Item for the on-site processing, transportation and treatment/disposal of materials not found to be hazardous based upon characterization sampling results.

No separate payment shall be made for the disposal of wastes generated in conjunction with equipment decontamination or the disposal of personal protective equipment (PPE). The cost of such disposal shall be considered incidental to the work under this Item.

Final payment will not be made until completed copies of all Manifest(s) and Bills of Lading signed by an authorized disposal facility representative and all associated weigh bills indicating each load's net weight have been provided to the Engineer. Once completed and facility-signed copies of all Manifest(s), Bills of Lading, and associated weigh bills have been received in their entirety, the Engineer will review and make the final payment to the Contractor.

<u>Pay Item</u>	<u>Pay Unit</u>
Disposal of Hazardous Material	Ton

ITEM #1008186A – 4” PVC COATED CONDUIT

Description:

This item consists of furnishing and installing CCTV poles on the Saga Bridge fenders as shown in the plans. The poles shall be constructed of 4” PVC Coated Conduit. The poles shall be designed as shown in the Plans and as described in these Specifications.

The plans indicate the extent and the general location of the work. The Contractor shall study the plans and details so that the work will be properly located and readily accessible. Make field inspections necessary in order to prepare accurate shop drawings in accordance with existing conditions.

Submittals

Product Data: Submit Manufacturer’s literature and catalog cuts for all products/materials to the Engineer for review and approval.

Shop Drawings: Submit shop drawings coordinated with existing conditions and all other work for approval prior to performing any installation. Include plans, elevations, sections, details, and attachments as needed. The material, construction, color, and all details of the poles construction must be approved by the Engineer.

Materials:

Pole Material

The camera support pole shall be constructed of 4” PVC Coated Conduit. The conduit shall be rigid steel, hot dip galvanized inside and out with hot dipped galvanized threads. The interior galvanizing shall be listed per UL 6. The exterior galvanizing shall be listed per UL 6 as primary corrosion protection. Thread protectors shall be used on the exposed threads of the PVC coated conduit.

The PVC coating, in compliance with NEMA RN-1, shall be nominal 40 mils in thickness continuous over the entire length of the conduit except at the threads, and be free of blisters, bubbles or pinholes. PVC shall be UL listed as a primary corrosion protection.

A urethane coating shall be uniformly and consistently applied to the interior of conduit. This internal coating shall be a nominal 2-mil thickness. All male threads on elbows and nipples shall be protected by this same application of urethane coating.

Couplings and end caps shall be used with coated conduit. The thickness of the coating on couplings shall be at least equal to the thickness of the coating on the conduit.

Timber Braces

Timber bracing shall be No. 2 or better Pressure Treated Southern Yellow Pine rough cut or dressed. Sawn lumber shall comply with the requirements of AASHTO M168. Pressure treatment shall be CAA in accordance with AWWA P-5, 40.1 kg/m³ and shall comply with the requirements of AASHTO M133. All cut surfaces and holes made subsequent to the pressure treatment shall be treated in accordance with AWWA Standard M4.

Hardware

Conduit straps and clamps used with PVC coated conduit shall also be PVC coated. Where conduit is installed on strut channel, the channel shall be PVC coated or 316 stainless steel unless otherwise noted on the Plans. 316 stainless steel straps may be used with stainless steel channel but shall not be used with PVC coated strut channel.

Threaded bolts, lag bolts, and associated hardware shall be galvanized in accordance with the Plans.

Construction Methods:

Contractor shall coordinate devices to be mounted on the poles with surrounding area and requirements of other sections of the Contract Documents. Coordinate with the pre-installation camera surveys and shop drawing requirements of the CCTV cameras.

All poles shall be grounded in accordance with other sections of these Specifications.

It shall be the responsibility of the Contractor to ensure the PVC coating remains intact on all conduits. Should any of the PVC coating be nicked, scratched or otherwise damaged where the RGS becomes exposed, the Contractor shall be responsible at his expense to repair and restore the PVC coating using a manufacturer approved repair kit and procedure.

To minimize installation damage to the PVC coatings, use tools specially designed for PVC coated conduit or standard tools that have been appropriately modified for installing PVC coated conduit. Standard tools which have not been modified could damage the coatings and shall not be used to install PVC coated conduit. Follow all manufacturer's recommendations and instructions.

Method of Measurement:

This work shall be measured for payment by the actual number of "linear feet" of conduit installed, inspected, and accepted in accordance with the Plans, specifications, and/or as ordered by Engineer. Measurement shall be along the centerline of the conduit.

Basis of Payment:

The work under this item shall be paid for at the contract unit price per linear feet for “ 4” PVC Coated Conduit size specified” furnished and installed, which price shall include the cost of all labor, material (including fittings, hardware, and timber bracing), and equipment necessary to complete the work.

<u>Pay Item</u>	<u>Pay Unit</u>
4” PVC Coated Conduit	Linear Foot