

MARCH 6, 2019
CONSTRUCTION OF A NEW EAST HAMPTON MAINTENANCE FACILITY AND
MARLBOROUGH RENOVATION
FEDERAL AID PROJECT NO. N/A
STATE PROJECT NO. 0041-0119
TOWNS OF EAST HAMPTON AND MARLBOROUGH

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 Answer Nos. 4, 11, 15, 19, & 21

SPECIAL PROVISIONS
NEW SPECIAL PROVISION

The following Special Provision is hereby added to the Contract:

- ITEM NO.0101117A – CONTROLLED MATERIAL HANDLING

REVISED SPECIAL PROVISIONS

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

- SECTION 146010 – HOISTS AND CRANES
- SECTION 260519 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PLANS
NEW PLAN

The following Plan Sheet is hereby added to the Contract:

11.09.A1

REVISED PLANS

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

02.01.A1

06.12.A1

06.13.A1

06.14.A1

The Bid Proposal Form is not affected by 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.

ITEM #0101117A – CONTROLLED MATERIALS HANDLING

Description:

Work under this Item is intended to provide specific procedural requirements to be followed by the Contractor during the excavation of Controlled Materials from within the Project limits at the East Hampton site, or soils related to UST removal at the Marlborough site, as shown on the Project Plans. This supplements Specification Sections 2.02, 2.03, 2.06, and 2.86, and Contract Special Provisions for excavation wherever contaminated materials are encountered. Work under this item shall include transporting and stockpiling materials at the WSA; and covering, securing, and maintaining the stockpiled materials throughout the duration of the Project. All materials, excluding the existing pavement structure (asphalt and subbase), rock, ledge, and concrete, excavated within the Project limits at the East Hampton site, or related to UST removal at the Marlborough site (as directed by the Engineer), are to be considered Controlled Materials.

Controlled Materials consisting of non-hazardous levels of regulated substances have been documented to exist within the Project limits at the E. Hampton site. Soils surrounding the USTs at the Marlborough site are considered suspect as a precaution. Such contamination is documented in the reports listed in the “Notice to Contractor – Environmental Investigations.” Where contaminated soils are excavated, such soil will not be reusable as backfill, unless authorized by the Engineer in writing, and will require special handling, disposal and documentation procedures. Controlled Materials excavated from within the SEH-AOEC cannot be directly reused.

Materials:

The required materials are detailed on the Project Plans. All materials shall conform to the requirements of the Contract.

Plastic Sheet: Polyethylene plastic sheeting for underlayment shall be at least 30 mil thick. Polyethylene plastic sheeting for covering excavated material shall be a thickness of 10 mil. Both shall be at least 10 feet wide.

Covers for roll-off/storage containers shall be made of polyethylene plastic, or similar water-tight material, that is of sufficient size to completely cover top opening and can be securely fastened to the container.

Sand Bags: Sandbags used to secure polyethylene covers shall be at least 30 pounds.

Sorbent Boom: Shall be 8 inches in diameter and 10 feet long and possess petrophilic and hydrophobic properties. Sorbent booms shall also have devices (i.e. clips, clasps, etc.) for connection to additional lengths of boom.

Construction Methods:

A. General

When Controlled Materials are encountered during the course of the work, health and safety provisions shall conform to the appropriate sections of the Contract. Provisions may include implementation of engineering controls, air and personal monitoring, the use of chemical protective clothing (CPC), personal protective equipment (PPE), implementation of engineering controls, air and personal monitoring, and decontamination procedures.

Unless otherwise directed by the Engineer, materials removed from any excavation within the Project limits at the East Hampton site (or soils related to UST removal at the Marlborough site) shall be transported directly from their point of origin on the Project to the WSA. The stockpiles of excavated Controlled Materials shall be maintained as shown on the Project Plans. The Contractor shall plan excavation activities within the Project limits at the East Hampton site (and soil excavation related to the UST removal as directed by the Engineer at Marlborough site) in consideration of the capacity of WSA, and the material testing and disposal requirements of the applicable Contract item. **No claims for delay shall be considered based on the Contractor's failure to coordinate excavation activities as specified herein.** Controlled materials generated from the SEH-AOEC shall not be brought directly to reuse areas, but must be staged within a bin at the WSA. Should analytical testing results of material generated from the SEH-AOEC be acceptable to the Engineer, the material may be reused as directed by the Engineer.

The Engineer will sample the stockpiled Controlled Materials at a frequency and for the constituents to meet the acceptance criteria of the treatment/recycling/disposal facilities submitted by the Contractor. 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 notifies the Engineer which facility it intends to use and that the stockpile is ready for sampling and ending with the Contractor's receipt of the laboratory analytical results. Any change of intended treatment/recycling/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.**

B. Transportation and Stockpiling

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

- Transported Controlled Materials are to be covered prior to leaving the point of generation and are to remain covered until the arrival at the WSA;

- All vehicles departing the site are properly logged to show the vehicle identification, driver's name, time of departure, destination, and approximate volume and content of materials carried;
- All vehicles shall have secure, watertight containers free of defects for material transportation;
- No material shall leave the site until there is adequate lay down area prepared in the WSA; and,
- Documentation must be maintained indicating that all applicable laws have been satisfied and that the materials have been successfully transported and received at the WSA.

Construction of the WSA shall be completed prior to the initiation of construction activities generating Controlled Materials. Plastic polyethylene sheeting shall underlay all excavated Controlled Materials. Measures shall be implemented to divert rainfall away from the WSA.

Placement of sorbent boom along the perimeter of the WSA shall be conducted when soil is saturated with petroleum product.

Excavated materials shall be staged as shown on the Project Plans or as directed by the Engineer.

C. WSA Maintenance

The Contractor shall provide all necessary materials, equipment, tools and labor for anticipated activities within the WSA. Such activities include, but are not limited to, handling and management of stockpiles and drummed CPC/PPE; uncovering and recovering stockpiles; maintenance of WSA; replacement of damaged components (i.e. sand bags, plastic polyethylene sheeting, etc.); and waste inventory record management. The Contractor shall manage all materials in the WSA in such a way as to minimize tracking of potential contaminated materials across the site and off-site, and minimize dust generation.

Each stockpile shall be securely covered when not in active use with a cover of sufficient size to prevent generation of dust and infiltration of precipitation. The cover shall be to prevent wind erosion.

The staged stockpiles shall be inspected at least daily by the Contractor to ensure that the cover and containment have not been damaged and that there is no apparent leakage from the pile. If the cover has been damaged, or there is evidence of leakage from the piles, the Contractor shall immediately replace the cover or containment as needed to prevent the release of materials to the environment from the piles.

An inventory of stockpiled materials and drummed CPC/PPE shall be conducted on a daily basis. Inventory records shall indicate the approximate volume of material/drums stockpiled per day; the approximate volume of material/drums stockpiled to date; material/drums loaded and transported off-site for disposal; any materials loaded and transported for on-site reuse; and identification of stockpiles relative to their points of generation.

Following the removal of all stockpiled Controlled Materials, residuals shall be removed from surfaces of the WSA as directed by the Engineer. This operation shall be accomplished using dry methods such as shovels, brooms, mechanical sweepers or a combination thereof. Residuals shall be disposed of as Controlled Materials.

D. Dewatering

Dewatering activities shall conform to Items in pertinent articles of the Contract.

E. Decontamination

All equipment shall be provided to the work site free of 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 Controlled Materials. Decontamination shall be conducted at an area designated by the Engineer and may be required prior to equipment and supplies leaving each site of the Project, between stages of the work, or between work in different AOECs.

Dry decontamination procedures are recommended. Residuals from dry decontamination activities shall be collected and managed as Controlled Materials. If dry methods are unsatisfactory as determined by the Engineer, the Contractor shall modify decontamination procedures as required subject to the Engineer's approval.

F. Dust Control

The Contractor shall implement a fugitive dust suppression program in accordance with the Contract to prevent the off-site migration of particulate matter and/or dust resulting from excavation, loading and operations associated with Controlled Materials. It shall be the Contractor's responsibility to supervise fugitive dust control measures and to monitor airborne particulate matter. The Contractor shall:

1. Employ reasonable fugitive dust suppression techniques.
2. Visually observe the amounts of particulate and/or fugitive dust generated during the handling of Controlled Materials. If the apparent amount of fugitive dust and/or

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particulate matter is not acceptable to the Engineer, the Engineer may direct the Contractor to implement corrective measures at his discretion, including, but not limited to, the following:

- (a) apply water to pavement surfaces
- (b) apply water to equipment and excavation faces; and
- (c) apply water during excavation, loading and dumping.

G. Permit Compliance

The Contractor shall comply with the terms and conditions of the CTDEEP “General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer),” including the General Operating Conditions and the Specific Operating Conditions, except that the Engineer will conduct all soil/sediment characterization and perform all record keeping. In particular, the Contractor shall:

1. Operate, maintain and repair the WSA in conformance with the requirements of the General Permit.
2. Maintain a communications system capable of summoning fire, police, and/or other emergency service personnel.
3. Prevent unauthorized entry onto the stockpiles by the use of fences, gates, or other natural or artificial barriers.
4. Separate incidental excavation waste to the satisfaction of the receiving facility or to an extent that renders the contaminated soil and/or sediment suitable for its intended reuse.
5. Isolate and temporarily store incidental waste in a safe manner prior to off-site transport to a facility lawfully authorized to accept such waste.
6. Not store more that 100 cubic yards of incidental waste at any one time.
7. Sort, separate and isolate all hazardous waste from contaminated soil and/or sediment.
8. Prevent or minimize the transfer or infiltration of contaminants from the stockpiles to the ground as detailed in “B. Transportation and Stockpiling” above.
9. Securely cover each stockpile of soil as detailed in “C. WSA Maintenance” above.
10. Minimize wind erosion and dust transport as detailed in “F. Dust Control” above.
11. Use anti-tracking measures at the WSA to ensure the vehicles do not track soil from the WSA onto a public roadway at any time.
12. Instruct the transporters of contaminated soil and/or sediment of best management practices for the transportation of such soil (properly covered loads, removing loose material from dump body, etc.).
13. Control all traffic related to the operation of the facility in such a way as to mitigate the queuing of vehicles off-site and excessive or unsafe traffic impact in the area where the facility is located.
14. Ensure that except as allowed in section 22a-174-18(b)(3)(C) of the Regulations of Connecticut State Agencies, trucks are not left idling for more than three (3) consecutive minutes.

Method of Measurement:

The work of Controlled Material Handling will be measured for payment by the number of cubic yards of controlled material excavated and taken to the WSA. This measurement shall be in accordance with and in addition to the quantity measured for payment of the applicable excavation item in Specification Sections 2.02, 2.03, 2.06, and 2.86, or the Contract Special Provisions, as applicable. Excess excavations made by the Contractor beyond the payment limits specified in the Contract will not be measured for payment and the Contractor assumes all costs associated with the appropriate handling, management and disposal of this material.

Equipment decontamination, the collection of residuals, and the collection and disposal of liquids generated during equipment decontamination activities will not be measured separately for payment.

Basis of Payment:

This work shall be paid for at the Contract unit price, which shall include all transportation from the excavation site to the final WSA, including any intermediate handling steps; stockpiling Controlled Materials at the WSA; covering, securing, and maintaining the individual stockpiles within the WSA throughout the duration of the Project; and all tools, equipment, material and labor incidental to this work.

This price shall also include equipment decontamination; the collection of residuals generated during decontamination and placement of such material in the WSA; and the collection and disposal of liquids generated during equipment decontamination activities.

All materials, labor and equipment associated with compliance with the General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) will not be measured separately, but will be considered incidental to the item "Controlled Materials Handling."

Securing, construction and dismantling of the WSA shall be paid for under Item 0101128A. Payment for dust control activities shall be made under the appropriate Contract items.

Pay Item

Pay Unit

Controlled Materials Handling

Cubic Yard

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SECTION 260519 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY:

- A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.
- B. Related CSI Sections: The following sections contain requirements that relate to this Section:
 - 1. Division 26 Section 260526, “Grounding and Bonding for Electrical Systems.”
 - 2. Division 26 Section 260533, “Raceway and Boxes for Electrical Systems.”
 - 3. Division 26 Section 260543, “Underground Ducts and Raceways for Electrical Systems.”
 - 4. Division 26 Section 260544, “Sleeve and Sleeve Seals for Electrical Raceways and Cabling.”
 - 5. Division 27 Section 270000, “Premises Telephone Wiring” for cabling used for voice and data circuits.
 - 6. Division 27 Section 275116, “Public Address Systems”
 - 7. Division 27 Section 282300, “Video Surveillance”
 - 8. Division 28 Section 283111, “Digital, Addressable Fire-Alarm System.”

1.2 SUBMITTALS:

- A. Submit the following in accordance with Form 817 Article 1.20 – 1.05.02 and NOTICE TO CONTRACTOR – SUBMITTALS.
- B. Product Data: For the following products:
 - 1. 600 volt insulated wires and cables, all sizes
 - 2. All terminals, lugs and wire connectors
 - 3. Specialty cable including but not limited to fire alarm systems, PA system, telephone/data systems, and cable TV.
- C. Quality Assurance Submittals
 - 1. Manufacturer Certification Letter in accordance with NOTICE TO CONTRACTOR – POTENTIAL FOR ASBESTOS CONTAINING MATERIALS.

1.3 QUALITY ASSURANCE:

- A. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the NETA and that is acceptable to authorities having jurisdiction. Testing shall be performed by an independent testing agency.
 - 1. Testing Agency's Field Supervisor: Person currently certified by the NETA or the NICET to supervise on-site testing specified in Part 3.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

1.4 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver wires and cables according to NEMA WC 26.

1.5 COORDINATION:

- A. Coordinate layout and installation of cables with other installations.
- B. Revise locations and elevations from those indicated, as required to suit field conditions and as approved by Engineer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Wires and Cables:
 - a. Alcan Aluminum Corporation; Alcan Cable Div.
 - b. American Insulated Wire Corp.; Leviton Manufacturing Co.
 - c. Southwire Company
 - d. Carol Cable Co., Inc.

2. Connectors for Wires and Cables:

- a. Hubbell Power Systems, Inc.
- b. 3M; Electrical Products Division
- c. Monogram Co.; AFC.
- d. Square D Co.; Anderson.

2.2 BUILDING WIRES AND CABLES:

- A. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3.2 "Wire and Insulation Applications".
- B. Rubber Insulation Material: Comply with NEMA WC 3.
- C. Thermoplastic Insulation Material: Comply with NEMA WC 5.
- D. Conductor Material: Copper.
- E. Stranding: All wires shall be stranded.
- F. General:
 1. The Contract Plans show the locations, type, size and number of wires and cables to be used for this Contract. Each type shall comply with the Specifications contained herein.
 2. Cables which have been manufactured more than two years prior to installation will not be accepted.
 3. The conductors, unless otherwise noted, shall be soft or annealed copper conforming to ANSI/ASTM B 33 if coated, ANSI/ASTM B 3 if uncoated. In addition, unless otherwise specified, stranded conductors shall have concentric stranding as per ANSI/ASTM B 8.
 4. Cables shall be supplied with both ends of each length sealed against the entry of moisture.
- G. 600 Volt Insulated Wires and Cables:
 1. General:
 - a. Power, instrumentation, lighting, grounding, and control cable shall be approved for use in wet or dry locations, indoors or outdoors in raceway, wireways, trenches, conduits, underground ducts.
 - b. Asbestos, in any form, is prohibited from the cable. This prohibition includes such items as fillers and binding tapes even though the item is encapsulated, or the asbestos fibers are impregnated with binder material.

- c. All conductors shall be copper, insulated, 600 Volt, unless otherwise noted. Wire size No.8 and smaller shall be type THHN-2/THWN-2, unless otherwise noted or shown; wire size No. 6 AWG and larger shall be type THWN-2 or XHHW-2. Type SF-1 or SF-2 shall be used for connections to lighting fixtures.
- d. Conductors with higher insulation temperature rating shall be provided as required. Wiring run through continuous LED fixtures shall be rated 90°C, 194°F. Conductors shall be rated and of a type approved for the specific application.
- e. All conductors shall be installed in raceways (except as stated in the next paragraph). Refer to CSI Division 26 Section 260533 "Raceways and Boxes for Electrical Systems" and CSI Division 26 Section 260543 "Underground Ducts and Raceways for Electrical Systems."
- f. Metal-clad cable (MC) shall only be used in lieu of metallic raceways for troffer lighting fixtures from the fixture to the junction box in the office area only unless otherwise noted on plans. MC cable shall be fully sized, fully rated 600V and shall include a green insulated copper grounding conductor above ceiling to lighting fixtures. MC cable outer jacket shall be steel. An appropriate anti-short device shall be installed at all termination points.
- g. Conductor and conduit sizes shown on the drawings are based on copper conductors with Type THHN-2/THWN-2 or XHHW-2 insulation, unless otherwise noted. Increase conductor and conduit sizes as necessary for other approved insulation types.
- h. Aluminum is not approved for conductors or wire.
- i. Power conductors shall be a minimum of No. 12 AWG stranded unless otherwise noted. All wire shall be stranded unless otherwise noted. Control conductors shall be a minimum of No. 14 AWG stranded, unless otherwise noted and specified by the different building systems.
- j. When the distance from the panel to the first outlet on a 20 Amp 120 Volt circuit exceeds 100 feet and on a 20 Amp 208 Volt circuit exceeds 200 feet, the conductor shall be increased to No. 10 AWG.
- k. Wires, conductors, and cables shall be single conductor, except as otherwise specified or indicated on drawings.
- l. Building BAS system conductors shall be per manufacturer's requirements.
- m. Cable meeting special requirements such as twisted pairs, triads, or individual shielding shall be provided where recommended by the system manufacturer.
- n. Conductor insulation shall be color coded.

208Y/120 Volt (3-Phase)

Phase A	Black
Phase B	Red
Phase C	Blue
Neutral	White
Ground	Green

240/120 Volt (Single Phase)

Phase A	Black
Phase B	Red
Neutral	White
Ground	Green

- o. Switch leg wiring shall be of the same color code as the corresponding phase.
- p. System color coding shall be in accordance with color code furnished by system manufacturer and shown on wiring diagrams.
- q. Colors, except colors for conductors No. 4 AWG and larger, shall be factory applied the entire length of the conductors by solid color compound, solid color coating, or colored striping or bands, 2 sets 180° apart. Onsite coloring shall not be done, except color coding by means of paint or tapes is approved only for conductors No. 4 AWG and larger.
- r. Voltage rating, manufacturer, type and conductor AWG size indication shall be continuous, factory applied the entire length of each conductor.
- s. Joints and splices shall be made in a manner equivalent electrically and mechanically to the conductor itself. Connections shall be of the pressure or compression type.
- t. All lugs terminating feeder conductors shall be of the solderless type UL listed for use with copper wire. All lugs and terminals shall be UL listed for 90°C application.
- u. Branch circuit connections or joints shall have an approved type solderless connector suitable for copper conductors.
- v. Wire connectors shall consist of a phenolic compound body with a cone-shaped coil spring insert and threaded skirt. Outer shell shall be knurled for each grip and capable of use with a wrench or pliers.

H. Fire Alarm Signal Cable:

1. General:

- a. Conductors shall be UL listed.
- b. Individual conductor color coded with a red identifying stripe colored Fire Department Red. Comply with UL 969 for a system of labeling materials.
- c. Size of conductors and number of pairs shall be as shown on the Contract Plans and per the system manufacturer's requirements.
- d. All fire alarm cable shall be installed in conduit.
- e. In addition to manufacturer requirements, underground conductors shall be rated for underground use.

2. Construction Details:

- a. Conductors shall be twisted unshielded pair NFPA 262 (UL 910) Flame Test Compliant Cable.
- b. Voltage Rating: 300 volts for power limited conductors and 600V for non-power limited conductors.
- c. Stranded conductors shall have seven strands.
- d. Smoke Detector Wires: Conductors shall be twisted, paired, unshielded.

I. Voice/Data Cable:

1. General:

- a. Cabling between Communication Outlets and the patch panel in the Communication Room shall be as follows:
 - 1) Voice Cable shall be yellow, Category 6 certified cable. Homerun shall be with no splices. Cable shall be four (4) pair, 100 Ohms unshielded twisted pair.
 - 2) Data cable shall be yellow, Category 6 certified cable. Homerun shall be with no splices. Cable shall be four (4) pair, 100 Ohms unshielded twisted pair.
 - 3) Cable for wireless access points shall be Purple Category 6A certified cable. Homerun shall be with no splices. Cable shall be four (4) pair, 100 Ohms unshielded twisted pair.
- b. All cabling shall be in full compliance with EIA/TIA-568B Commercial Building Telecommunications Standard. Installation shall be in full compliance with EIA/TIA-569B Commercial Building Standard for Telecommunications Pathways and Spaces.
- c. Size of conductors and number of pairs shall be as shown on the Contract Plans and per the system manufacturer's requirements.
- d. In addition to manufacturer requirements, underground conductors shall be rated for underground use.

2. Construction Details:

- a. Conductors shall be twisted unshielded pair.
- b. Communication conductors shall comply with UL 1666.

J. Fuel Island Communication Cable:

- 1. Cable between Tank Monitoring System (TMS) and Fuel Mast Unit (FMU) shall be shielded twisted pair cable, 4-conductor, #24 AWG., or per the manufacturer's recommendation.
- 2. Cabling between the patch panel and the emergency telephone located on the exterior of the building. The cable shall be unshielded twisted pair cable, Category 6.
- 3. Cabling between Fuel Master Unit and Data Panel shall be Category 6.

4. Cabling between the Tank Monitoring System and the Data Panel shall be Category 6.

K. PA System Cable:

1. General:
 - a. Conductors shall be copper. Conductor size and insulation shall be per manufacturer's requirements.

L. Camera System Cable:

1. General:
 - a. Cable shall be yellow, Category 6 certified cable. Homerun shall be with no splices. Cable shall be four (4) pair, 100 Ohms unshielded twisted pair.

M. Cable TV:

1. General: RG-6/U: NFPA 70, Type CATV:
 - a. No. 18 AWG, solid, copper-covered steel conductor; gas-injected, foam-PE insulation.
 - b. Double shielded with 100 percent aluminum-foil shield and 60 percent aluminum braid.
 - c. Jacketed with black PVC or PE.
 - d. Suitable for indoor installations.

N. Well Pump Cable :

1. Submersible Pump Cable For wiring between equipment located at water wellheads and motors of submersible pumps:
 - a. UL Spec. No. 493
 - b. Rated for well depth.

2.3 CONNECTORS AND SPLICES:

- A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3.2 "Wire and Insulation Applications".

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Examine raceways and building finishes receiving wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRE AND INSULATION APPLICATIONS:

- A. Service Entrance: Type RHW or THWN, in raceway.
- B. Underground Conductors: XHHW in raceway.
- C. Feeders: Type THHN/THWN, in raceway.
- D. Branch Circuits: Type THHN/THWN, in raceway.
- E. Fire Alarm Circuits: Power-limited, fire-protective, signaling circuit cable.
- F. Class 1 Control Circuits: Type THHN/THWN, in raceway.
- G. Class 2 Control Circuits: Power-limited cable, concealed in building finishes.

3.3 INSTALLATION:

- A. All conductors shall be installed in concealed metal raceways, RGSC, PVC Coated RGSC, PVC, and EMT, in accordance with the NEC except where specifically noted otherwise.
- B. Terminals shall be arranged phase A-B-C or 1-2-3 from left to right, top to bottom, and front to back.
- C. Branch circuit phase wires shall be connected to separate phases of supply mains to assure balanced condition in that circuit and proper load balance on the panel. Circuit numbers assigned on drawings are used for convenience and need not necessarily designate the circuit on the panel to which that circuit may be connected. Actual circuiting shall suit job conditions.
- D. Equipment requiring electric service is also named on the plans or schedules of other disciplines, or in other Sections. Where receptacles or convenience outlets are specified to serve named equipment, the Contractor shall provide approved receptacle, plug, connection, and/or liquid-tight flexible conduit to equipment.
- E. Plans do not necessarily indicate the required number of conductors in each raceway. Unless it is specifically noted that raceways are empty by the word "spare", the Contractor shall provide all required conductors, power, control, supervisory, alarm, or

branch circuits. The Contractor shall make all final connections, flexible or fixed, as required, to all equipment requiring final electrical connections.

- F. Regardless of the number of conductors shown, each circuit (conductors No. 8 and smaller) to panels or equipment shall contain a full size neutral conductor, which, if not used, shall be taped and insulated at the final point of connection to equipment.
- G. All grounding conductors shall have green color coded insulation and shall be sized in accordance with the NEC.
- H. Install wires and cables as indicated, according to manufacturer's written instructions and NECA's "Standard of Installation."
- I. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- J. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- K. Cables shall be in conduit except where specifically noted otherwise and shall be supported according to CSI Division 26 Section 260529, "Hangers and Supports for Electrical Systems."
- L. Identify wires and cables according to CSI Division 26 Section 260553, "Identification for Electrical Systems."

3.4 CONNECTIONS:

- A. Conductor Splices: Keep to minimum.
- B. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than conductors are being spliced.
- C. Use splice and tap connectors compatible with conductor material.
- D. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.
- E. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.
- F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL:

- A. Testing: Agency: An independent qualified testing agency to perform tests and inspections.
- B. Testing: On installation of all wires, feeders, branch circuit conductors, including conductors of all systems, and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
 - 1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.
 - a. Check for electrical continuity of circuits and for short circuits.
 - b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
 - 3. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.
 - a. Verify grounding connections.
 - 4. Test and Inspection Reports to be Submitted: Prepare a written report to record the following:
 - a. Procedures used
 - b. Results that comply with requirements.
 - c. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
 - 5. Cables will be considered defective if they do not pass tests and inspections.
- C. Correct malfunctioning conductors and cables at Project Site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new conductors and retest.

END OF SECTION 260519

SECTION 146010 – HOISTS AND CRANES

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes:

1. Monorail type hoist systems.

B. Related CSI Section:

1. Division 05 Section 051200, “Structural Steel Framing.” for coordination with steel to which the suspended overhead track system shall be attached.

1.2 SUBMITTALS:

A. Submit the following in accordance with Form 817 Article 1.20-1.05.02 and NOTICE TO CONTRACTOR – SUBMITTALS.

B. Product Data: Include rated capacities of selected model clearly indicated, furnished specialties and accessories, wiring diagrams and installation instructions.

1. Spare Parts: Include name, address, and telephone number of in-state supplier of spare parts. No out-of-state suppliers shall be permitted.

C. Shop Drawings: Include construction details of the hoist and crane system and the crane support structure showing plan, elevation and sectional views along with other pertinent data as detailed by the manufacturer.

D. Quality Assurance Submittals:

1. Design data, including safety factor of materials
2. Certificate and Test report of each hoist and crane
3. Test reports of the hoists
4. Test reports of the crane system.

E. Maintenance Data: Include complete operating and maintenance instructions for each component of the crane system specified in Form 817 Article 1.20-1.08.14 subsection 4 and described in NOTICE TO CONTRACTOR – CLOSEOUT DOCUMENTS.

F. Warranties: As specified within this Section.

1.3 REFERENCES:

- A. ANSI MH 27.1, Specifications for Underhung Cranes and Monorail Systems.
- B. ANSI B30.16 Safety Standard for Overhead Hoists.
- C. ASME HST-4M, Performance Standard for Overhead Electric Wire Rope Hoists.
- D. ANSI B30.11 Safety Standards for Monorails and Underhung Cranes.
- E. AWS D1.1, Code for Welding in Building Construction.
- F. OSHA 29 CFR 1910.179, Overhead and Gantry Cranes.
- G. CMAA No. 74 - Crane Manufacturers Association of America.
- H. NEMA - National Electrical Manufacturers Association.
- I. NEC - National Electrical Code.

1.4 QUALITY ASSURANCE:

- A. Service Class; Equipment shall be meet the requirements for Class C in accordance with CMAA standards, under operation in normal ambient temperatures and normal indoor conditions, free from excessive dust, moisture and corrosive fumes.
- B. Clearly label monorails to indicate maximum capacity. Letter crane rated capacities on the bridge rail and on the control box.
- C. System Marking: Major components of the system shall be marked at the factory to assure prompt and proper field identification.
- D. Secure the services of a factory-authorized service representative for the following:
 - 1. Render advice regarding installation of the hoist and crane system.
 - 2. Witness final system test and then certify with an affidavit that the hoist and crane system is installed in accordance with the Contract and is operating properly.

1.5 DELIVERY, STORAGE AND HANDLING:

- A. Refer to Form 817 Article 1.06.03 and Form 817 Article 1.20-1.06.03 for additional information.
- B. Equipment shall be protected against damage during shipment.
 - 1. Store products in manufacturer's packaging until ready for installation.

1.6 WARRANTY:

- A. Refer to Form 817 Article 1.20-1.06.08 and NOTICE TO CONTRACTOR – CLOSEOUT DOCUMENTS for additional information.
- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of hoists and cranes that fails in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from the issuance of the Certificate of Compliance.

1.7 SPARE PARTS:

- A. Furnish to the Engineer spare parts described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Spare parts shall be furnished as recommended by the equipment manufacturer.

PART 2 - PRODUCTS

2.1 MONORAILS:

- A. Monorail system capacity shall be a minimum of 3 tons. Wire rope shall have 3 ton weight limit.
 - 1. Basis of Design: Product – Speedway, The New Century Series, Series 31 monorail hoist, Model # C1W03D021-15*2DO as supplied by Wright, Acco, or an approved equal.
- B. Track shall be a specially fabricated section with a special rolled bottom section having a raised flat tread with a minimum bottom flange width of 3 inches. Bottom flange shall have a minimum ultimate tensile strength of 125,000 psi with a minimum Briell hardness of 225. Track shall be straight, with factory prepared ends. No rough-cut ends will be permitted. Holes shall be factory punched or drilled.
 - 1. Basis of Design: Product – SUPERTRACK as supplied by Louden (Wright, Acco), or an approved equal.
 - 2. Track size based on the load positioned on the track system to produce the most severe conditions of stress and deflection.
 - 3. The total track deflection shall not exceed 1/450 of the span or 1-1/4 inch, whichever is the least.
 - 4. Track sections shall be installed with bolted type splice plates to provide flush and level connections at the operating tread of the track. The maximum gap between the adjacent ends of the load carrying flange not to exceed 1/16 inch.

5. Rigid track support shall be accomplished by bolting the runway track to the supporting structure.
 6. Track Suspension: All necessary clamps, hanger rods, bolts, and other fittings from which the track system is suspended shall be provided as a part of the overhead track system. Track hanger supports shall be spaced as shown on the Shop Drawings.
- C. Hoists, trolleys, track switches, track and suspension fittings shall be painted one shop coat of manufacturer's standard finish; color to be selected by the Designer.
 - D. Bolts or hanger rods shall be painted after the installation of the monorail system is complete with a compatible paint coat. Paint shall also be used for touch up work for the monorail system.
 - E. Hoists and appurtenances shall be engineered to withstand stresses imposed under safe operating conditions while handling load with the rated capacity. Load bearing parts shall be designed such that the static stress, calculated for rated load, shall not exceed 20 percent of the ultimate strength of the material.
 - F. Electric hoists are to be furnished complete with a suitable pushbutton. Control station. Pushbutton arrangement is to be supplied with strain relief protection. Control actuators shall be dead-man type with speed adjustment of multi-speed control obtainable by progressive depression of the pushbutton elements to increase lift speed and spring return to off position.
 - G. Braking system shall be capable under normal operating conditions with rated load to stop and hold the load when controls are released. Controlled lowering shall be lifted to 120 percent of rated lowering speed. In the event of complete power failure; the load shall be stopped and held.
 - H. Bearings shall be heavy duty, anti-friction type with a minimum B-10 life of 5,000 hours. Where applicable, motor bearing shall be lifetime lubricated, sealed ball bearings.
 - I. Gears shall be forged heat treated alloy steel machined for smooth quiet operation. Gears shall meet AGMA qualify specifications. No cast gears shall be permitted.
 - J. Bottom block shall be completely shrouded for safety and fabricated from steel. Sheaves must be forged or rolled steel, running on anti-friction bearings. Hooks are to be forged steel supported by anti-friction thrust bearings and permit 360 degree rotation. Hooks shall be equipped with latches unless the application makes the use of the latch impractical.
 - K. When required, a latch shall be provided to bridge the opening of the hook for underslack conditions.

- L. Motors shall be totally enclosed specifically designed for hoist service capable of stag and operating under any condition with the designed capacity and provided with thermal overload protection.
 - 1. Electric hoists shall incorporate an upper plugging type limit switch automatically stopping the hoist motion when the block reaches its highest position. Excessive hook drift shall cause the block to be momentarily reversed.
- M. Electric hoist controls shall comply with NEC requirements for the application being considered and shall include control circuit and contactors mechanically and electrically interlocked.
- N. Provide double reeved electric wire rope hoist capable of lifting a minimum of 3 tons.
- O. Hoists are to be furnished with a suitable push button control station. Push button arrangement is to be supplied with strain relief protection.
- P. Hoist shall be reeved to allow true vertical lift.
- Q. Hoist shall be capable of two lift speeds, the greater of which shall not exceed 21 feet per minute. A three to one reduction ratio shall be used.
- R. Rigid enclosed conductor bar system may be web mounted or downturned, as applicable. Power circuits must have individual conductor bars and collectors shall conform to the description listed in Part 2.3.
- S. Push button pendent shall be suspended from an independent trolley track to allow the operator to move away from the load being lifted. The pendent station shall be able to travel freely across the trolley track.
- T. Motorized trolley shall be an integral part of the hoist system. Trolley shall have a single speed and be capable of traveling at a rate of 50 fpm.

2.2 ELECTRICAL REQUIREMENTS:

- A. Conductor bar shall be UL approved, roll formed electro-galvanized steel sections, rated 100 amps continuous. Insulation cover shall be rigid bright red PVC, self-extinguishing, with an operating temperature of 1500 F.
- B. Conductors shall be complete with mounting clips, end caps, splices with covers and power feeds.
- C. Current collectors shall be the sliding shoe type; spring loaded and designed that sparking and loss of contact will be minimized.
- D. Separate conductors shall be provided for each phase. More than one conductor in a single enclosure will not be permitted.

- E. Furnish, mount and wire fused, manual disconnect switch with a lockable handle mounted through the panel door; including wiring from disconnect switch to the conductor bars. Location shall be as directed by the Engineer.
- F. Equipment shall be able to operate from 208V, 3 phase, 60 Hz power source.
- G. Motors equipped with magnetic contactors operated with ON-OFF push button station pendant suspended 4'-0" above the floor, from the hoist trolley unit tors equipped with magnetic contactors operated with ON-OFF push button station pendant suspended 4'-0" above the floor, from the hoist trolley unit
- H. Electrical equipment shall meet NEMA 1 requirements.
- I. Control circuits: Maximum 120 volts.
- J. Provide Interlocks where necessary for proper operation:
- K. The interlock mechanism shall be manually operated, cross-connected, double locking pin type so designed that they will not operate until the crane is in proper alignment with the connecting crossover or spur rail.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Material shall be cleaned of loose rust, mill scale and foreign matter prior to shop painting.
- B. Verify that conditions are in accordance with manufacturer's requirement prior to installation.

3.2 INSTALLATION:

- A. Install hoists and cranes in accordance with manufacturer's instructions.

3.3 FIELD QUALITY CONTROL:

- A. Hoists and cranes shall be load tested in accordance with manufacturer's requirements.
- B. Operate each hoist and crane and demonstrate procedure for starting and stopping prior to its acceptance.

3.4 TRAINING:

- A. Refer to Form 817 Article 1.20-1.08.14 subsection 5 for additional information.
- B. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable accessories.

END OF SECTION 146010