

**SECTION 16540
ATHLETIC FIELD ELECTRICAL CONDUITS**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and these specifications, apply to this Section.

1.2 SECTION INCLUDES

- A. Installing of underground conduit.

1.3 RELATED SECTIONS

- A. Section 02200 - General Earthwork For Athletic and Baseball Fields
- B. Section 03300 - Cast-In-Place Concrete
- C. Construction Drawings

1.4 REFERENCE STANDARDS

- A. National Fire Protection Agency (NFPA) latest edition
70 National Electrical Code

1.5 QUALITY ASSURANCE

- A. Codes and Standards: Comply with applicable portions of Electrical and Building Code requirements pertaining to selection and installation of electrical system materials and products. Comply with the National Electrical Code, Connecticut State Electrical Code and standards of Underwriters Laboratories, Inc., National Electrical Contractors Association, and National Electrical Manufacturers Association.

1.6 SUBMITTALS

When required by Owner, each submittal transmitted for approval shall contain:

- A. Catalog cuts proving complete conformance to this Section.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Electrical Conduit: High density polyethylene (HDPE), schedule 40, rigid heavy wall complying with all requirements of Underwriters Laboratories Standards and stamped "UL Approved:
- B. Non-Shrink Grout: Conforming to ASTM C827 allowing 3 percent expansion, compressive strength of 4,500 psi.

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PHASE II
CONSTRUCTION OF BASEBALL FIELD**

- C. Pull Boxes: For conduit installation shall be cast heavy wall PVC for exterior installation 5 inches by 6 inches and larger or not less than the minimum size required by the National Electric Code with screw fastened gasketed covers to ensure watertight fit and with cover legend, "ELECTRIC".
- D. Power Distribution Box (Where Required): Power distribution box shall be NEMA 3R rated and hot-dipped galvanized. It shall contain power distribution blocks and grounding lugs rated for 600 volts. Box shall be mounted on mounting structure assemblies.

PART 3 EXECUTION

3.1 INSTALLATION OF CONDUIT AND FITTINGS

- A. General: During backfilling or top soiling of electric conduits, install continuous underground type plastic line marker located directly over buried line at 6 to 8 inches below finished grade or as indicated on Contract Drawings. Install conduit in accordance with governing authorities having jurisdiction, except where more stringent requirements are indicated.

Installation shall comply with the National Electric Code, all applicable local, State and Federal Regulations, Ordinances and Statutes and Requirements of the authority having jurisdiction. All materials shall be new and listed for their application. Installation shall be accomplished in a neat and workmanlike manner.

Trenching and backfilling shall be in accordance with Section 02200 of these specifications.

- B. Inspect Conduit before installation to detect apparent defects. Mark defective materials with white paint and promptly remove from site.
- C. Lay Conduit beginning at low point of system, true to grades and alignment indicated, with unbroken continuity of invert. Maintain offsets required by utility companies or by code from water, electric, gas, and other utilities.
- D. Place bell ends or groove ends of conduit facing towards advancing direction of laying, predominantly uphill.
- E. Install gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements.
- F. Plastic Conduit: Install in accordance with manufacturer's recommendations, and in accordance with ASTM D2321.
- G. Cleaning Conduit: Clear interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed.

Place plugs in ends of uncompleted conduit at end of the day or whenever work stops.

Flush lines between manholes or conduit ends if required to remove collected debris.
- H. Joint Adapters: Make joints between different types of conduit with standard manufactured adapters and fittings intended for that purpose if required.

- I. Close open ends of Conduit with threaded metal caps, plastic plugs, or other acceptable methods for size and type material being closed. Wood plugs are not acceptable.
- J. Interior Inspection: Inspect conduit to determine whether line displacement or other damage has occurred.

Make inspections after lines between manholes, or conduit ends have been installed and approximately 2-ft of backfill is in place, and again at completion of project.

If inspection indicates poor alignment, debris, displaced conduit or other defects, correct such defects and re-inspect.

- K. Conduit Laying - All conduits shall be laid true to line and grade with bells or grooves upgrade. The sections of the conduit shall be so laid and fitted together, that when complete the conduit will have a smooth uniform invert. The conduit shall be kept thoroughly clean so that jointing compounds will adhere. Each conduit shall be inspected for defects before being lowered into the trench. Avoid creating low spots in conduit runs that will collect water and debris. Pitch conduits back to pull boxes, etc. to promote positive drainage.

At any time during conduit-laying operations, if the occasion arises, when instruction or advice is required from a utility representative, he shall be notified and shall come to the site of conduit-laying operations for consultation before any further conduit is laid involving any such problems. Under such conditions the Contractor shall have no claim for delays.

Not more than 100 feet of trench shall be opened in advance of conduit laying unless permitted by the Engineer. The excavation of trenches shall be fully completed a sufficient distance in advance of laying of the conduit, and the exposed end of conduits shall be fully protected with a board or other approved stopper to prevent earth or other substances from entering the conduit.

Any conduit delivered to the site in a damaged condition shall be removed from the job site immediately.

Any fitting showing a crack and any fitting or conduit which has received a blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the site.

PVC conduit shall be installed in accordance with the manufacturer's recommendations. Particular care should be taken to keep fine materials from interfering with proper joint assembly. Mating surfaces of a joint shall be wiped clean. The surfaces shall then be coated with a lubricating material prescribed by the manufacturer to overcome the frictional resistance encountered when shoving the conduit home. Conduit that is not marked with a depth mark shall be marked before assembly to assure that the spigot end is inserted to the full depth of the joint.

Except as otherwise approved, all cutting of conduit shall be done with an approved power driven cutter or pipe cutter.

A thin film of gasket lubricant shall be applied to either the inside surface of the gasket or the spigot end of the conduit or both. Gasket lubricant shall be supplied by the conduit

manufacturer and approved by the Engineer.

- L. Dewatering - The Contractor shall provide all necessary pumps, dams, drains, ditches, flumes, well points and other means for excluding and removing water from trenches and other parts of the work. Water shall not be allowed to rise around the joint until it has set.
- M. Foundations - The conduit shall be laid on a foundation and backfilled where shown on the Contract Drawings.
- N. Manufactured Plugs - Manufactured watertight plugs shall be used. The material of the plug shall be compatible with the conduit. Conduit shall be closed with the plug having a gasket set into the bell of the conduit in accordance with the manufacturer's recommended installation procedures and as approved by the Engineer.
- O. Pull boxes shall be furnished and installed under this Section of the Specifications where indicated on the Contract Documents and wherever else such a box may be deemed necessary to facilitate the pulling or splicing of future wire.

All such boxes must be made accessible and shall be built in locations approved by the Engineer in off road and off sidewalk areas. Conduits shall enter these boxes through tight fitting clearance holes grouted as necessary. The covers shall be designed for quick removal. Provide markers at each pull box for determining as-built location.

- P. Install conduits in accordance with the details at conduit locations as shown on the Construction Drawings as part of the light pole installation work.

END OF SECTION 16540