

## SECTION 26 05 43 – UNDERGROUND RACEWAY SYSTEMS

### PART 1 - GENERAL

#### 1.1 THE REQUIREMENT

- A. The CONTRACTOR shall provide underground raceway systems, including trenching, backfill, compaction, and restoration, complete and in place, in accordance with the Contract Documents.

#### 1.2 CONTRACTOR SUBMITTALS

- A. Furnish submittals in accordance with MASS Section 10.05 Article 5.6, and 26 05 00 – Electrical Work, General.
- B. Shop Drawings
  - 1. Complete catalog cuts of all conduit, fittings, and pullboxes, marked where applicable to show proposed materials and finishes.
- C. Record Drawings
  - 1. Show routings, burial depths, and pullbox locations and sizes.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. Pullboxes, and fittings that are dedicated to the underground raceway system shall comply with the requirements of this Section.

#### 2.2 PULLBOXES

- A. Shall be precast with construction and load rating as indicated.
  - 1. Covers shall be traffic type, H-20 loading, except as indicated otherwise.
  - 2. Pullbox covers shall be identified as "Electric" by raised letters cast into the covers.
- B. Shall have frost-proof and water-tight grey iron frames and covers with solid lids and inner lids with 28-inch clear openings. Covers and lids shall be bolted to cast-in-place steel frames with corrosion resistant hardware. Frames shall be factory-primed; covers shall be cast-iron and shall have pick-holes.
- C. Shall be equipped with pulling-in irons opposite and below each raceway entrance.
- D. Unless noted otherwise, pull boxes shall have closed bottoms. Open bottom pullboxes will not be accepted.

- E. Precast pullboxes shall be **Jensen Precast, Mack, Quikset, U.S. Precast**, or equal. Cast-iron covers shall be by **U.S. Foundry**, or equal.

## 2.3 UNDERGROUND CONDUITS

- A. Underground raceways shall be:
  - 1. Schedule 80 PVC conduit as indicated, sunlight resistant. Conduit shall be manufactured in accordance with NEMA TC-2 - Electrical Plastic Tubing and Conduit, and UL-651 - Standard for Rigid Non-metallic Conduit. or where called for on the Drawings,
  - 2. HDPE for buried horizontal runs shall be Listed. Compliant with NEC articles 300 and 353 and Listed to UL 651 A&B.
- B. Identification Tape: Continuous lengths of underground warning tapes shall be installed 12-inches above and parallel to conduits. Tape shall be 6-inches wide polyethylene film imprinted "CAUTION - ELECTRIC UTILITIES BELOW." Tape shall have non-ferrous metal foil conductor sandwiched in the tape for detection purposes. Tape shall be as manufactured by **Brady**, or equal.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Underground raceways shall be installed between structures and pullboxes as indicated. Raceway systems shall be electrically and mechanically complete before conductors are installed. Bends and offsets shall be smooth and symmetrical, and shall be fabricated with tools designed for this purpose. Factory elbows shall be utilized wherever possible. Unless otherwise noted provide plastic coated RSC for vertical sweeps and risers.
- B. Raceway routing shall be adjusted to avoid obstructions.

### 3.2 INSTALLATION

- A. Raceways shall be installed in accordance with the criteria below:
  - 1. Raceway shall be laid on a grade line of at least 3-inches per 100-feet, sloping towards pullboxes or structures. Conduit shall be installed and pullbox depths adjusted so that the top of the conduit is a minimum of 24-inches below grade and a minimum of 24-inches below roadways, driveways, and bike trails.
  - 2. Changes in direction of the duct envelope by more than 10 degrees horizontally or vertically shall be accomplished using factory elbows.
  - 3. Raceway shall be installed in accordance with the Manufacturer's requirements and recommendations. The bottom of trench shall be of select backfill or sand.
  - 4. Each of the completed raceways shall be cleaned by drawing through it a standard flexible mandrel one foot long and 1/4-inch smaller than the nominal size of the duct. After passing of the mandrel, a wire brush and swab shall be drawn through.

5. Provide heat shrink tubing around conversion fittings when converting between different raceway materials (i.e.: HDPE to PVC coated RSC).
- B. Sections of pre-fabricated pullboxes shall be assembled with waterproof mastic and shall be set on a 6-inch bed of gravel or as recommended by the manufacturer.
- C. Raceway penetration through walls of structures and pullboxes below grade shall be watertight.
- D. When raceway enters a building, conduit shall transition to rigid steel PVC-coated conduit on stub-up.
- E. Where an underground raceway enters a structure through a concrete wall, provide a **Link-Seal**, or equal sealing device. The sealing device shall be utilized with plastic coated rigid steel conduit. Transition from PVC to plastic coated RSC prior to building entry.

### 3.3 RESTORATION

- A. The CONTRACTOR shall restore all disturbed areas.
- B. Grassed areas shall be backfilled, compacted, and topsoiled and reseeded in accordance with MASS.
- C. Asphalt concrete driveways, bike trails, and roadways and curb and gutter shall be cut and patched to match existing in accordance with MASS, including backfill and compaction to 95 percent density. Reference the conduit trench detail shown on the drawings, with a depth of 24 inches.

**END OF SECTION 26 05 43**