



SECTION 02585 ELECTRIC MANHOLES AND HANDHOLES

PART 1 GENERAL

1.1 SECTION INCLUDES

All material, equipment, fabrication, and installation as required for the following:

1. Precast Concrete Electric Manholes (CONTRACTOR Furnished)
2. Precast Manhole Components and Accessories (CONTRACTOR Furnished)
3. Electric Handholes (OWNER Furnished)
4. Manhole Castings/Frames & Covers (OWNER Furnished)
5. Sump Hole Castings/Frames & Covers (CONTRACTOR Furnished)

1.2 RELATED SECTIONS

- A. All sitework sections as applicable
- B. Underground Duct Bank, Section 02580
- C. Concrete For Utility Lines, Section 03303
- D. General Information (Electrical), Section 16050
- E. Electrical Distribution Underground, Section 16375

1.3 SUBMITTALS

- A. Manufacturer's Catalog Data: Provide catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to verify compliance with the Product requirements for underground conduit and accessories as listed herein. Specifically provide information on manhole accessories, attachments, racks, inserts, etc.
- B. Shop Drawings: Submit certified Shop Drawings for **each type of manhole** from the manhole manufacturer. The Shop Drawings shall include all equivalent details and information for comparison to applicable KUB Standard Drawings for manholes as well as any deviations, modifications, or proposed changes to the Standard Drawings, however minor. Drawings shall detail salient manhole accessories and appurtenances such as inserts, pulling irons, hangers, cable racks, sump holes, etc. CONTRACTOR shall submit five copies of such Shop Drawings to OWNER for approval.



PART 2 PRODUCTS

2.1 STANDARD PRODUCT REQUIREMENTS

- A. All precast concrete manhole sections shall be manufactured in a plant especially designed for that purpose. All units shall conform to the specific design characteristics as shown on the applicable KUB Drawings, and all manufacturing work shall be done under strict plant controlled supervision.
- B. Live load design shall be for H-20 and/or H-20-S16 per AASHTO Standard Specifications for Highway Bridges, as amended. Design wheel load shall be 16 kips. The live load shall be that loading which produces the maximum shears and bending moments in the structure.
- C. Precast concrete manholes shall have the required strength as established by ASTM C 478.
- D. Precast concrete manholes shall be constructed with 4500-PSI concrete.

2.2 PRECAST ELECTRIC MANHOLES

- A. Precast electric manholes shall be manufactured by a KUB approved manufacturer with specific modifications as detailed by applicable KUB Standard Drawing and the Project Drawings. Substitute products will be considered if submitted by CONTRACTOR in accordance with Section 01600. **Substitute products must be approved prior to bid opening.**
- B. Precast electric manholes shall be equipped with pull irons, inserts, hangers, anchor bolts, etc., as shown on the Drawings.

2.3 HANDHOLES

Handholes if required will be furnished by the OWNER in accordance with Section 01600.

2.4 ACCESSORIES

- A. Pulling irons: Provide pulling irons as installed by the precast manhole manufacturer and shall be equal to PI-1 (HYTREL™) by Pennsylvania Insert Corporation. Pulling irons shall be specifically located in the manhole at locations identified in the Project Drawings and details.
- B. Standard Manhole Castings/Frames and Covers: Furnished by OWNER. **Manholes at switchgear locations shall have frames cast into top precast section of manhole.**



- C. Precast Concrete Riser Rings (Donuts): Precast concrete riser rings shall be furnished by CONTRACTOR and manufactured by the precast manhole manufacturer at the strengths and loadings equivalent to those specified for the precast manhole.
- D. Sump Hole Frame and Cover: Metal grille-type frame and cover shall be furnished by CONTRACTOR as provided by the manhole manufacturer.
- E. Duct Terminators: Manhole manufacturer shall precast into each manhole duct terminators, as detailed on the applicable KUB Standard Drawings and Project Drawings, consisting of ABS plastic equal to Formex or Bowco brands.
- F. Unistrut Channel: CONTRACTOR shall provide and install unistrut channel around interior perimeter walls of manhole to support cable. Unistrut channel shall be 1-5/8" square with 9/16 diameter holes 1-7/8" on center equal to Unistrut #P1000-HS, American Electric #A-1200-P, B-Line #B-22-1 7/8H, or Kin Line #4112-PO. **OWNER shall provide insulated cable clamps for attaching cable to the unistrut.**

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS: Equipment, materials, and devices shall be installed in accordance with the manufacturer's published instruction and the requirements of the Contract Documents. Except as covered herein excavation, trenching, and backfilling shall conform to the requirements of Section 02321.

- A. Conformance to Codes: The installation shall comply with the requirements of NFPA 70- National Electric Code, ANSI C2, and IEEE Standards, as applicable.
- B. Verification of Dimensions: The CONTRACTOR shall become familiar with the details of the Work, shall verify dimensions in the field, and shall advise the OWNER of any discrepancy before performing the Work. Verify that required excavation has been completed and excavation is clear of obstacles and ready for manhole and/or handhole installation.

3.2 PRECAST ELECTRIC MANHOLES

- A. General Requirements: Manholes shall be located approximately where shown on the Project Drawings. The exact location of each manhole shall be determined after careful consideration has been given to the location of other utilities, existing appurtenances, ground elevations, etc. The location of the manhole shall be approved by the Resident Project Representative before excavation is started. **At no time shall a manhole be installed outside of OWNER acquired easements or road right-of-way.** Manhole entryways and excavations shall be properly roped/taped off and/or barricaded to prevent entry or access by the public.

- B. Specific Requirements: CONTRACTOR shall excavate a hole large enough to accommodate the outside dimensions of the manhole plus a minimum of 12 inches of clearance on every side. Prior to setting manhole, CONTRACTOR shall provide a minimum of six inches of stone bedding as base to receive the manhole. The base material shall be compacted and graded level at the proper elevation to set the manhole in relation to duct bank grade and ground cover requirements. In the case of two-piece manholes, CONTRACTOR shall provide and install sealant between the two pieces. Use flexible Butyl Rubber sealant #SS-S-00210 or other sealant as recommended by the manhole manufacturer. Manholes shall be set in place with the manufacturer's boom equipped truck or with a crane in a manner, which will prevent damage and chipping/cracking of the precast concrete. The top surface of the manhole shall be a minimum of 24 inches below finished grade. The top surface of manholes at switchgear locations shall be 4" above finish grade. Earth cover over the manhole shall not exceed 4 feet of soil. Precast riser rings (donuts) shall be installed to elevate the manhole frame and cover to the required finish grade. The top of the manhole frame and cover shall be approximately ½ inch above the finished grade and in no instance will surface water stand on the manhole cover. Manhole frame shall be set in a suitable bed of mortar. Where duct lines enter manholes, a terminator bank provided by the manhole manufacturer shall be utilized to provide a watertight seal for each conduit. A cast metal grille type frame and cover shall be provided and installed over the sump hole. Backfill manholes in accordance with the requirements of Section 02321. This paragraph does not apply to switch gear pads.
- C. Interior Requirements: Once manholes are set in place they shall be kept free of trash, debris, concrete, soil, etc. CONTRACTOR will be responsible for cleaning out manholes and removing trash, debris, concrete, soil, etc., before beginning cable-pulling operations. CONTRACTOR shall keep manholes pumped free of standing water before, during, and after cable pulling operations until such time as watertight cable splices, joints, or terminations are completed and accepted by OWNER. Cable shall be securely supported from the walls of the manhole by unistrut cable supports as specified herein. Cable supports shall be mounted to the manhole walls at points provided by the manhole manufacturer. 4-point junction racks as specified in Section 16375 shall be installed at points provided by the manhole manufacturer or with anchors recommended by the manhole manufacturer and at locations detailed by the Project Drawings or as otherwise provided by OWNER and/or Resident project representative.

3.3 HANDHOLES AND PULLBOXES

Handholes and/or pullboxes: Handholes and/or pullboxes shall be located approximately as shown on Project Drawings. Handholes and pullboxes will be provided by OWNER and shall be installed in accordance with applicable KUB Standard Drawings and as otherwise detailed on the Project Drawings. Handhole and pullbox tops shall be flush with sidewalks or curbs or placed ½ inch above surrounding finish grades when remote



from curbed roadways or pavements. Each shall have a suitable opening for a ground rod. Conduit, ground rod entrances, and unused openings shall be properly sealed to prevent moisture entrance.

END OF SECTION