

330513S01 - MANHOLES AND STRUCTURES – Electrical Manholes and Covers

1. GENERAL

This specification is for the Electrical Manholes and Covers only. Specifications for Communication Manholes and Covers are covered in the Communications and Network Systems Telecommunication Standards. Contact UK Communications and Network Systems for a copy of their standard.

2. MATERIAL

1. Electrical Manhole Structure

1. New manholes shall be steel reinforced poured-in-place concrete type and the MINIMUM dimensions shall be 8' wide by 12' deep by 7' high. Pre-cast manholes are not allowed except for special conditions with a written statement granting permission to use a pre-cast manhole from University of Kentucky Manager of Utilities.

The manholes shall meet or exceed the following design criteria:

Earth Load	2 Ft. fill at 130 lb/c.ft.
Surcharge	2 Ft. at 130 lb/c.ft.
Live Load	AASHO H 20 truck load with 20% impact.
fc	4,500 psi
fy	60,000 psi

2. The manhole shall utilize Grade 60 reinforcing rebar tied together to provide a fully continuous cage.
3. All concrete shall meet or exceed 4,500 psi compressive strength.
4. Waterproof exterior surfaces below grade portion of sides and tops of manholes.
5. Waterproof sealant shall be provided between manhole sections, between manhole and entrance riser castings, and between riser casting and manhole cover frame.
6. The manhole shall be provided with a manufacturers warranty against leaks in the manhole resulting from cracks in the manhole structure. The length of this warranty shall be for five years from date of installation.
7. Manhole shall have a sump with a diameter of 18" and a depth of 18" to house the sump pump.
8. The manhole shall have two (2) vents, one high and one low, to provide for natural draft and forced air venting. Refer to Specification drawing 16110D11 for details.

2. Hardware

1. Manhole Frames and Covers

All manhole frames and covers shall be rated at H-20 truck load.

All manhole covers shall be provided with 2 inch lettering "ELECTRIC" and with the manhole number, assigned by University of Kentucky PPD Manager of Electrical Services, welded onto the cover if not provided by the manufacturer.

All manhole covers shall be provided with stainless steel drop handles.

1. High Traffic Areas

Manhole frames and covers in high traffic areas shall be equal to Neenah Series R-1640 and shall provide a cover diameter of 32 inches.

2. Non-Traffic Areas

Flush mounted fabricated aluminum covers rated at H-20 loading shall be allowed in non-traffic areas and shall maintain a 32" diameter clear opening.

2. An enclosed circuit breaker, for power needed inside the manhole, shall be a 125 amp, 120/240 volt AC in a Thermoplastic outdoor enclosure and shall be equal to a GE TPL412RT.
3. The light switch and fan switch shall be 20 amp, 120 volt devices with Crouse Hinds DS185 covers, or equal, in a rain tight device box mounted near the manhole opening for easy access from outside the manhole.

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4. The light fixture shall be a ceiling mounted vapor tight fluorescent unit equal to Lithonia DM 2 32 MVOLT GEB10IS.
5. The exhaust fan shall meet OSHA requirements.
6. A 20 amp, 120 volt GFCI duplex receptacle and a single twist lock L5-20R 20 amp 120 volt receptacle, NOT GFCI protected, for the manhole sump pump shall be mounted in a weatherproof box with an in-use covers near the top of the manhole.
7. The pump shall be equal to or better than a Zoeller Model 98 cast iron series. Pump shall include the following features:
 1. 120 volt motor with a twist lock L5-20R plug.
 2. Non clogging vortex impeller design.
 3. Cast switch case, motor and pump housing, base and impeller. (No sheet metal parts will be acceptable)
 4. Stainless steel screws, float rod, guard, handle and arm and seal assembly
 5. Float operated submersible (NEMA 6) two pole mechanical switch.
 6. Oil filled motor hermetically sealed.
 7. Automatic reset thermal overload protection.
 8. Watertight neoprene ring between motor and pump housing.
 9. Capable of passing 1/2" solids.
 10. 1 1/2 inch NPT discharge.
8. A minimum of one wire pulling eye per short wall and two wire pulling eyes per long wall opposite each duct entry.
9. The 15 KV medium voltage cable shall be supported by thermoplastic elastomer cable clamps. The supports shall be Cooper B-Line Insulclamp® Cable Clamps, or an approved equal, appropriately sized for the cables.
10. All hardware shall be galvanized or stainless.
11. Provide a minimum of 2 grounding electrodes in each manhole. Size in accordance with NEC but minimum size shall be 5/8" by 8' copper clad ground rod.
12. Provide Bell Ends on conduit.
13. Manhole ladder and ladder extensions shall be Halliday Products LD1 and LE1, respectively, or equal.

3. INSTALLATION

1. All low voltage wiring in manholes shall be in Schedule 40 PVC conduit.
2. Junction boxes shall be rigid nonmetallic PVC with gasket.
3. All non current carrying metal parts of the manhole shall be grounded.