

**SAM HOUSTON STATE UNIVERSITY  
DESIGN AND CONSTRUCTION STANDARDS**

**DIVISION 26 00 00  
ELECTRICAL**

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5. Provide housekeeping pads for all floor/ground mounted equipment. Minimum 3 ½” in height, extending at least 4” beyond supported equipment

### **26 05 33 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**

#### **A. Products**

1. Rigid Metal Conduit (RMC)
  - a. Use RMC in all locations where conduit is run exposed and is subject to physical damage.
  - b. Use PVC coated RMC in all locations where conduit is exposed to corrosive chemicals, such as near cooling towers.
  - c. All underground 90 degree fittings shall be PVC coated long-sweep 90 degree elbows.
  - d. Use PVC coated long-sweep 90 degree elbows and transition to taped RMC where transitioning up to grade/into building
  - e. Use tapped RMC where passing through foundation walls/slabs.
2. Intermediate Metal Conduit (IMC)
  - a. Use IMC for all locations where conduit is run exposed outdoors where not subject to physical damage.
3. Electrical Metallic Tubing (EMT)
  - a. Use EMT for conduit run concealed, and where run exposed indoors and not subject to physical damage.
4. Flexible Metal Conduit (FMC)/Liquid-ti

- l. All medium voltage ductbanks shall be colored red.
7. Electrical Manholes
  - a. Precast concrete electrical manholes 8' x 10' x 8' including thin-wall knockout, pull irons, sump box with grate, ground rod sleeve, fiberglass ladder, ladder up. 1 neck extension and a ring and a ductile iron cover marked "ELECTRIC" cast bin to a 42" diameter precast concrete neck extension X21" high.
  - b. Manholes shall have a minimum of a 42" hole opening.
  - c. Ladder ups will be mounted in the center of every ladder.
  - d. All 600 amp T-bodies and 200 amp elbows will have test points.
  - e. All manholes will be clean at the completion of the project.
  - f. Stabilizing sand shall be used for installation of all manholes.
  - g. A minimum of 10' of rigid conduit with galvanized bell ends shall be required on each duct bank coming in and going out of the manhole.
  - h. All conduits shall be cut off flush with the wall in the manholes.
  - i. All electrical manhole covers shall be labeled with "ELECTRIC" on the lid with the Manhole Number "MH-XX" Refer to the drawings for the manhole number.
  - j. All cables shall be labeled with feeder number and bldg. numbers, cables should be marked with colored tape to identify the phasing.
  - k. All empty ducts coming into manholes shall be provided with pull rope and sealed off.
  - l. All fire taping shall be wrapped with cloth taping (3M 77 cloth tape) and be used from duct to termination.
  - m. All ducts shall be swabbed before sealing or pulling cable.
  - n. All racks shall be as high as possible in manhole.
  - o. All racks and arms shall be fiberglass.
  - p. Every wall shall have two support racks mounted in order to support cable.
  - q. Tie wraps shall be 3' in length and ½" in width.
  - r. Manhole lids shall be flush with the paved surface or 4" above final grade if in a non-paved area.
  - s. Iron casting for manhole rings and covers shall conform to ASRM A48, Class 30, and be traffic rated.
  - t. All manholes shall have a minimum of two 5/8" x 10' grounding rods.
  - u. All medium voltage cables in manholes must have a full loop in the manhole whether terminating or passing through.
  - v. Where possible and not cost prohibitive, provide 120V power to manhole for maintenance purposes. Coordinate with SHSU facilities during design.
- B. Installation Requirements
  1. Minimum Conduit size shall be ¾".
  2. All fittings for metallic conduit shall be threaded steel or compression type; set-screw and diecast fittings are **NOT** acceptable.
  3. FMC light fixture whips shall be limited to 6'. MC cable may be used for fixture whips above accessible ceiling.
  4. All junction boxes shall be accessible. Provide access panels as required.
  5. Conduits routed in slabs shall be limited to branch circuiting feeding cast-in-place floor boxes only. RMC conduit shall be used where turning up into wall. In slab conduits shall not cross expansion joints or penetrate foundation walls.
  6. Conduit **shall not** be run in slabs in parking garages.

7. All underground 13,200V circuits shall be run in concrete encased duct banks. Concrete shall be red.
8. All conduits going between conditioned and non-conditioned space shall be provided with a

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- a. All receptacles shall be Tamper Resistant Type per NEC requirements.
  - b. 15A devices are allowable within dwelling units on multi-outlet branch circuits. All receptacles in common areas shall be 20A rated minimum.
2. Light Switches
    - a. 15A devices are allowable within dwelling units.
  3. Wallbox Dimmers
    - a. 15A devices are allowable within dwelling units.

## **26 28 16 ENCLOSED SWITCHES & CIRCUIT BREAKERS**

- A. Disconnect Switches.
  1. Heavy duty type fused and non-fused, enclosed switches only.
- B. Enclosed Circuit Breakers.
- C. Enclosure Ratings.
  1. NEMA 1 – indoor, dry locations.
  2. NEMA 3R – outdoor, wet locations.
  3. NEMA 4X – outdoor, wet locations where corrosion resistance is required.
    - a. Cooling tower equipment areas.
    - b. Lab exhaust areas.

(iii)



**D. LED Lighting**

1. General requirements
  - a. 0-10V dimming; dimmable to at least 10%
  - b. 4000K color temp
  - c. 3000K color temp for Res Life living areas
  - d. Minimum 80 CRI
  - e. 5 year minimum warranty
2. Exit Signs
  - a. Fixtures shall be LEC or LED, hard wired, perimeter lit and red on clear background type.
  - b. If a back-up circuit is not available, then exit sign must be a battery back-up type with self-diagnostics that shall perform both 30-day and annual 90-minute tests with LED indication.
3. Campus Standard LED light fixtures
  - a. General requirements
    - (i) 0-10V dimming; dimmable to at least 10%
    - (ii) 4000K color temp
    - (iii) Minimum 80 CRI
    - (iv) 5 year minimum warranty
  - b. 2x4 Lay-in Troffer
    - (i) CREE CR2440L94010V or ZR2440L84010V5UNV (Basis of Design V13(R2H 75.0008 Tw74E -1.2404 T

**G. Installation Requirements**

1. Applications other than standard general purpose lighting require presentation to the University. Use of specialty lamps requires prior University approval. Minimize the number of different lamp types used.
2. Outlet boxes for lighting shall be 4" square or 4" octagon boxes mounted to the structure. These boxes may feed up to 4 light fixtures individually so that each fixture can be taken out of service without affecting the remainder of a circuit. Do not daisy chain light fixtures.
3. Stairwell light fixtures shall be located such that they may be reached safely with no more than an 8- foot ladder.
4. All drivers and other serviceable parts of fixtures mounted in hard-lid ceilings shall be accessible from below. If fixture housing does not allow for easy maintenance access from below, drivers shall be remote mounted at a location where accessible via access panel or accessible ceiling type.

**26 56 00 EXTERIOR LIGHTING**

**A. General Requirements**

1. All luminaires shall be Design Lighting Consortium (DLC) listed, latest edition.
2. Do not use low pressure sodium or standard incandescent lamps.
3. Utilize LED fixtures for all exterior lighting.
4. No custom design lighting fixtures.
5. 4000K color temp
6. Follow fixture types shall not be used without prior owner approval:
  - a. Low voltage fixtures requiring remote power supply
  - b. In-grade lighting
  - c. Stairwell step lights
  - d. Handrail lighting

**B. Required Light levels**

1. Pedestrian walkways and parking lots: 2FC min
2. Other / Not Listed: Per IESNA recommendations

**C. LED Approved Manufacturers EXTERIOR lighting:**

- a. Area and Parking Lot Luminaires: (NO EXCEPTIONS without prior approval)
  - (i) CREE - BETA LED Area Lighting Fixture: LED Area Lighting "The Edge" Type V-short Model #: Beta LED# ARE-EDG-5S-R3-24-E-UL-BZ-350
  - (ii) Spec: LED minimum Type V short 6000k 263ci Lumens, Voltage: 120-270, Wet Location listed, Color: Dark Bronze
  - (iii) Parking Lot Pole:
    - (a) United Lighting Standards 30'
    - (b) Model # SSHP-30-6-7-T2-TMB
    - (c) Specs: 6" Square steel pole, height 30'
      - (i) Provided hinged poles when located on top level of parking garages
- b. Pedestrian Walk, Plaza Light Standard (NO EXCEPTIONS without prior approval)
  - (i) CREE - BETA LED Fixture: The edge Round Luminaire
  - (ii) Model# ARE-EDR-5M-R5-06-E-UL-BZ-350
  - (iii) Spec: LED, minimum 5,250 lumens voltage 120-270, wet listed Color: Dark Bronze.
  - (iv) Walkway Pole:
    - (a) United Lighting Standards 12' Aluminum Pole



