

## SECTION 26 10 00 - ELECTRICAL SYSTEMS - GENERAL

## 1.1 ELECTRICAL – GENERAL

- A. All electrical work shall be in accordance with the current editions of NEC, UL, NEMA, and all other state, and local codes and ordinances.
- B. Electrical Rooms:
1. Shall contain no non-electrical piping.
  2. Shall have a minimum clear height of 12' - 0".
  3. Shall have egress and equipment access openings large enough to accommodate equipment service or replacement.
- C. All electrical conduits shall be a minimum of 3/4" on new installations. Existing relocation of conduit may be 1/2" if original installation is 1/2".

Metal-clad cable, Type MC is not approved for use in Laboratories.

MC Cable is allowable with written approval from the Owner for the following:

- Horizontal branch circuits from device outlet to device outlet on the same wall, but not around wall corners. Exception: Device outlet in exterior wall with windows (wall-to-wall) may be fed by horizontal MC cable runs.
- Interior use only Final connection to Recessed and semi-recessed lighting fixtures

- D. All IT/AV and communication conduits shall designed and installed in accordance with Division 27 section for Technology.
- E. All security systems conduits shall be a minimum of 1" unless specifically noted otherwise in Security Sections.
- F. All devices shall be 20 amps fully rated and shall be specification grade with plastic device cover plates.
- G. All exit lights shall be LED diffuse face type. Use battery mounted inside fixture housing only where required.
- H. All conduit runs from floor to 8' A.F.F. in garages, warehouses and mechanical rooms shall be rigid galvanized steel. It may be EMT elsewhere. Riser penetrations shall have a 4" high curbing.
- I. All branch circuit panels shall be bolt-on circuit breaker type, appropriate for fault currents. New panels shall have minimum of 20% spare capacity.
- J. All fuses 600 AMP and lower shall be Class RK 1, low peak time delay. 601 AMP and larger shall be Class L low peak.
- K. All safety switches shall be heavy duty with provisions for Class RK 1 fuses.

- L. For systems 600 volt and lower, all wire shall be stranded copper, 600 volt, 90 degrees C. THHN or THWN insulation. Minimum wire size shall be No.12 AWG or XLPE.
  - M. For system above 600 volt, all wire shall be copper, at rated voltage or higher, with ground shield and waterproof insulation.
  - N. All transfer switches shall be 3 pole for single-phase systems and 4 pole for three phase systems.
  - O. Designs shall require affixing calculated arc flash protection warning labels in all electrical panels.
  - P. All receptacles on an emergency circuit shall be red in color with red device cover plates.
  - Q. Panel Labeling engraved phenolic plates and shall be as follows:
    - 1. XX-A-BBBC where:
      - a. XX = either RP for 208/120V; LP for 480/277V; or PP for 480V distribution
      - b. A = Floor;
      - c. BBB = Room Number;
      - d. C = Letter sequence. Hallway panels get nearest room number.
    - 2. Example: The 1st 208/120 Panel located on the 3rd Floor at Room 301 shall be labeled as RP-3-301A.
  - R. Wiremold shall be #3000 when applicable. Alternates may be considered as required.
  - S. All recessed lighting shall have at least 6 inch clearance for service and maintenance.
  - T. Power Metering (if applicable) shall be Schneider Electric Power Logic. All new meters/ sub meters are integrated into CWRU Facilities Services, Schneider Electric, Power Monitoring Expert Software.
- 1.2 ACCEPTABLE EQUIPMENT AND DEVICE MANUFACTURERS
- A. Electrical devices:
    - 1. Minimum 20 amps, fully rated.
  - B. Emergency Lighting Units (battery packs):
    - 1. Only use when project has no emergency generator.
    - 2. Battery Packs shall last not less than 90 minutes when in use.
  - C. Exit Lights:
    - 1. Shall be LED only.
    - 2. Shall be red background unless match existing, nearby units
  - D. Panels, Branch Circuits:

1. ABB.
2. Schneider.
3. Eaton Siemens.

E. Panels, Distribution:

1. ABB.
2. Schneider.
3. Eaton Siemens.

F. Lighting Controls:

1. Watt Stopper.

G. Safety Switches:

1. ABB.
2. Schneider.
3. Eaton Siemens.

H. Transfer Switches (All critical service areas shall have bypass capability):

1. Russ Electric.

I. Clock System (Clocks shall be located in all corridors, classrooms, and teaching labs and shall be satellite synchronized):

1. Primex.

### 1.3 ELECTRICAL SERVICE AND DISTRIBUTION

- A. All new switchgear shall utilize Square D Powerlogic Metering and Monitoring Systems, and shall be connected to the existing campus Powerlogic System. All current transformers shall include shorting block installation. New switchgear shall be fitted out completely, blank spaces shall be allowed.
- B. All high voltage service through the metering and primary gear shall be subject to utility (The Medical Center Co.) approval in addition to CWRU's approval.
- C. The installation shall comply with The Medical Center Co. specifications issued in Division 33.

### 1.4 LUMINAIRES AND ACCESSORIES

- A. Architect and/or Lighting Consultant shall conform to either I.E.S., IEEE or to the CWRU Required Design Lighting Levels listed herein. This pertains to maximum, as well as minimum levels. Lighting calculations shall be submitted to CWRU with 90% Design Development review drawings.
- B. Outdoor perimeter and walkway lighting source shall be LED.

- C. New construction installations utilize **LED** lamps **3500K**.
- D. Motion sensors and/or Emergency Management System for lighting control shall be used in hallways, offices, classrooms and restrooms. Provide a minimum of one night-light in each restroom.
- E. Emergency lighting to be provided in all mechanical rooms.

END OF SECTION