



# Division 262413

# Distribution Switchboards

## DESIGN GUIDE

## 1 General

### 1.1 Introduction

- A. This section applies to the following:
  - 1. Main service switchboards
  - 2. Secondary distribution switchboards
- B. Main service switchboards shall be located indoors within a ground floor main electrical room. Avoid locating switchboards over structural footings and foundations. Basement main electrical rooms require approval of the ELSM and should be avoided due to the presence of ground water on the campus.
- C. Sub distribution switchboards shall be located indoors within the ground floor main electrical room or sub electrical rooms. Avoid locating switchboards over structural footings and foundations.
- D. Main electrical rooms should be located in close proximity to the outdoor service transformers to limit the distance of the incoming service conductors.

## 2 Materials

### 2.1 General

- A. Manufacturers: Eaton Electrical, General Electric, Square D or approved equal.



- B. Switchboard enclosures shall be NEMA Type 1 general purpose enclosures, unless specifically noted otherwise. Enclosures shall be made from heavy gauge galvanized steel.
- C. Switchboard buses shall be solid and full-capacity rated
- D. Bus bars shall be copper, no exceptions.
- E. Provide a full-capacity neutral bus for each switchboard indicated with neutral.
- F. A copper ground bus shall be provided in each switchboard.
- G. Seismic Construction: The equipment shall be constructed to meet the project seismic requirements.

## 2.2 Main Service Switchboard

- A. Metering: Switchboard shall include metering and switchboard instrumentation as indicated on the drawings. Metering shall be Square PM8000 series meter with Display, fiber patch panel and fiber connection. Verify complete model number and fiber connection type with the ELSM prior to ordering. Install meter in separate section of the switchboard with hinged cover. Main meters shall report to the campus ION system via a fiber network connection.
- B. Main and Tie Devices: Each device shall be electronic trip, molded-case, service-rated circuit breaker, with LSI. Devices shall be individually mounted and compartmented.
- C. Distribution Devices: Each device shall be a quick-make, quick-break molded-case thermal magnetic circuit breakers. Devices shall be group mounted.
- D. Ground Fault Protection: Provide ground fault protection where required by code.

## 2.3 Secondary Distribution Switchboards

- A. Energy Metering: Where required by the energy code, distribution switchboards shall include energy metering mounted in a separate section of the switchboard with hinged cover. Metering shall be compatible with the Building Management System (BMS). Energy meters shall be networked to the BMS for data reporting.



- B. Main Lugs: Suitable lugs shall be provided for connection of the incoming feeder.
- C. Main Devices: Molded case circuit breaker sized as indicated on the drawings. Devices shall be individually mounted and compartmented.
- D. Distribution Section Devices: Each device shall be a quick-make, quick-break molded-case circuit breaker. Devices over 200 amperes shall be individually mounted; devices 200 amperes and under shall be twin mounted.
- E. Ground Fault Protection: Provide ground fault protection where required by code.

## 2.4 Short Circuit Ratings

- A. Each switchboard shall be labeled with a UL integrated equipment short circuit rating. All overcurrent protective devices shall have the interrupting capacity rating as indicated without relying upon series-connected ratings.
- B. Switchboards shall have short circuit ratings as shown on the drawings, but not less than 50,000 amperes RMS symmetrical at rated voltage.

# 3 Execution

## 3.1 Preparation

- A. Provide a 4-inch high concrete housekeeping pad for each switchboard, extending approximately 1 inch beyond the equipment enclosure on both sides and in front.

## 3.2 Electrical Meter Installation

- A. The installing division 26 electrical contractor shall verify current transducers are the correct rating and verify arrows point to the load on all phases as applicable.



- B. The installing division 26 contactor shall verify meter readings with an external handheld meter  $\pm 5\%$  prior to demonstration to the commissioning agent.
- C. Calibration will be verified in the CX process-even for factory calibrated meters.

### **3.3 Adjustment and Testing**

- A. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Check tightness of bolted connections and circuit breaker connections using calibrated torque wrench per manufacturer's instructions. Record date and torque value and include in O&M manuals.

## **4 Appendix**

### **4.1 Reserved for future.**