SECTION 26 24 13 - SWITCHBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes main and distribution switchboards according to UL 489 listings. For distribution panels rated 800A and below use panelboard construction.

1.2 SUBMITTALS

A. Shop Drawings: Indicate front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars for each phase, neutral, and ground; and switchboard instrument details.

B. Product Data: Submit electrical characteristics including voltage, frame size and trip ratings, fault current withstand ratings, and time-current curves of equipment and components.

C. Submit shop drawings after Short Circuit and Overcurrent Protective Device Coordination Study is approved. Shop drawings without approved study will be returned and not reviewed.

1.3 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations, configurations, and ratings of switchboards and their components on single line diagrams and plan layouts.

B. Operation and Maintenance Data: Submit spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.4 QUALIFICATIONS

A. The manufacturer of the switchboard assembly shall be the same as the manufacturer of the circuit breakers installed within the assembly.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle in accordance with NEMA PB 2.1. Lift only with lugs provided. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

PART 2 –– PRODUCTS

2.1 DISTRIBUTION SWITCHBOARDS

A. Manufacturers:

1. **Cutler-Hammer.**
2. **GE Electrical.**
3. **Square D.**

B. Product Description: NEMA PB 2, enclosed switchboard.

C. Minimum Short Circuit Rating: 65,000 symmetrical amperes rms, fully rated, or higher to exceed 130 percent of the available fault current as indicated on the Short Circuit Study.

D. Device Mounting:

1. Main Section: Panel mounted, solid-state, molded case circuit breakers.
2. Distribution Section: Panel mounted, molded case circuit breakers.

E. Bus:

1. Material: Copper with silver or tin plating standard size.
2. Connections: Bolted, accessible from front for maintenance.
3. Provide bus extensions on ends for future sections.

F. Ground Bus: Extend length of switchboard.

G. Line and Load Terminations: Accessible from front only of switchboard, suitable for conductor materials.

H. Future Provisions: Fully equip spaces for future devices with bussing and bus connections, insulated and braced for short circuit currents. Leave space in design for one spare section to be added. Provide footprint area for future expansion.

I. Switchboard Height: 90 inches, excluding floor sills, lifting members and pull boxes.

J. Finish: Manufacturer's standard light gray enamel over external surfaces. Coat internal surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.

2.2 MOLDED CASE CIRCUIT BREAKER

A. Molded case circuit breakers are for typical frame sizes ranging from 110A to 2500A.

B. Manufacturers:

1. **Cutler-Hammer.**
2. **General Electric.**

3. **Square D.**

4. **Circuit breakers must match switchboard manufacturer.**

C. Product Description: UL 489, molded-case circuit breaker.

D. Field-Adjustable Trip Circuit Breaker: Circuit breakers with frame sizes 250 amperes and larger have mechanism for adjusting long time and short time continuous current, short time and long time pickup current setting for automatic operation. Provide interchangeable trip unit.

E. Circuit breakers with frame sizes 225 amperes and smaller are thermal-magnetic, non-adjustable type.

F. Solid-State Circuit Breaker: Electronic sensing, timing, and tripping circuits for adjustable current settings; ground fault trip with integral ground fault sensing; instantaneous trip; and adjustable short time trip. Listed for 100 percent continuous duty. Provide for circuit breakers rated 400A and above. Accessories:

1. Shunt Trip Device.
2. Undervoltage Trip Device.
3. Auxiliary Switch.
4. Alarm Switch.
5. Electrical Operator.
6. Handle Lock: Provisions for padlocking.
7. Grounding Lug: In each enclosure.

2.3 INSULATED CASE CIRCUIT BREAKER

A. Insulated case circuit breakers are for typical frame sizes ranging from 800A to 6000A.

B. Manufacturers:

1. Match switchboard manufacturer.
2. Substitutions: Not Permitted.

C. Product Description: UL 489, enclosed, insulated-case circuit breaker

D. Trip Unit: Electronic sensing, timing, and tripping circuits for adjustable current settings; ground fault trip with integral ground fault sensing instantaneous trip; and adjustable short time trip.

E. Accessories (dependent on the design of the system):

1. Shunt Trip Device.
2. Undervoltage Trip Device.
3. Auxiliary Switch.

4. Alarm Switch.
5. Electrical Operator.
6. Handle Lock: Provisions for padlocking.
7. Grounding Lug: In each enclosure.

2.4 POWER METERS

A. Power meters are to meter the main circuit breaker and feeder breakers sized 800A and above. Tenant sub metering may be required

B. Manufacturers:

1. **Eaton.**
2. **Square D.**
3. **General Electric.**
4. Eaton is the basis for design. The existing Bradley West Terminal has an Eaton web-based metering system. All power meters must be compatible with the existing Eaton system. Use of the other manufacturers listed does not relieve the Contractor from providing a system that is equal in every respect to the Eaton system and is compatible in every respect with the Eaton system.
5. Substitutions: Not Permitted.

C. Provide metering in accordance with Section 26 09 13 for every main device and tie device. Tenant submetering may be required.

D. Power Meter:

1. Meter: Eaton IQ-260.
2. Gateway Ethernet Switch: Eaton Power Xpert Gateway, PMX-600E.
3. Eaton Multi-Point Metering Module, PXMP Series
4. Internally wire meters and connect to a network gateway ethernet switch for web-based power metering system. Provide all internal wiring, hardware, power supplies and equipment necessary for metering.
5. Provide network gateway ethernet switch in separate enclosure mounted in electrical room. Provide power supply and all wiring to connect gateway ethernet switch to meters, circuit breakers and to LAN network.

2.5 ACCESSORIES

A. Circuit Breaker Lifting Device: Portable, floor supported, elevating carriage with roller base, for movement of circuit breakers in and out of switchboard structure

B. Concrete Housekeeping Pad: 3,000 psi. Pad to extend 4 inches above finished floor and extend 6 inches beyond equipment in all directions. Provide steel reinforcing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The Contractor shall ensure that the switchboard installation shall provide at a minimum physical floor space for one additional switchgear section at each line-up end. A double ended switchboard will require two section floor spaces, one at each end. The Contractor shall properly mark these spaces for future expansion.

B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.

C. Install engraved nameplates.

D. Ground and bond switchboards.

3.2 ADJUSTING

A. Adjust operating mechanisms for free mechanical movement.

B. Tighten bolted bus connections.

C. Adjust circuit breaker trip and time delay settings to values as indicated on short circuit study. Refer to Overcurrent Protective Device Coordination Study. Provide services of an independent third party to make all adjustments.

D. These above adjustments shall be performed by a third party. These adjustments shall include but are not limited to, the following studies: short circuit study, coordination study and arc flash study.

END OF SECTION 26 24 13