

SECTION 262413 – SWITCHBOARDS

PART 1 - GENERAL

1.1 SCOPE

- A. This section deals with requirements for circuit breaker type switchboards.

PART 2 - PRODUCTS

2.1 SWITCHBOARDS

A. General:

1. Switchboard shall be totally enclosed, self supporting metal structure, contain industrial type main and distribution molded case circuit breakers and other associated equipment as indicated. The switchboard shall be completely front accessible.
2. Each switchboard, as a complete unit, shall be given a single integrated equipment rating by the manufacturer. The integrated equipment short circuit rating shall certify that all equipment is capable of withstanding the stresses of a fault equal to that of the least over current protective device contained therein. Such rating shall be established by the actual tests by the manufacturer on a similar equipment construction as the subject switchboard. This test data shall be available and shall be furnished to the engineer, if requested, with or before the submittal or approved drawing. Entire switchboard assembly, including all bussing, shall have SCCR ratings meeting or exceeding the minimum AIC ratings listed on the plans for the switchboard. When a power distribution system electrical study (including short circuit stud, etc.) is a part of the project, contractor shall further verify that all proposed equipment is properly rated (per the results of the study) prior to submitting shop drawings. All ratings shall be full ratings. Series ratings will not be allowed unless shown otherwise on drawings.
3. Future Provisions: All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices, including all appropriate connectors and mounting hardware.
4. Top/bottom feed arrangement and lug sizes/quantities shall be coordinated by the contractor.

B. Bussing:

1. The switchboard bussing shall be silver plated copper and of sufficient cross-sectional area to continuously conduct rated full load current as shown on plans with a maximum temperature rise of 50 degrees C., above an ambient temperature of 25 degrees C. Switchboard shall have a 25% full length ground bus. Neutral bus shall be full capacity. Connections for all current carrying parts shall be bolted. Aluminum bussing is not acceptable. Tapered bussing is not acceptable.
2. The main horizontal bus shall be located at the back of the switchboard to permit a maximum of available conduit area. The end section shall have bus provisions for future addition. The provisions shall include the bus installed to the extreme side of the switchboard and pre-punched to facilitate future bolted splice plates. The horizontal main bus supports, connections, and joints shall be bolted with grade 5 carriage bolts and Belleville washers. The main horizontal bus shall be same size, continuous through the board.

2.2 CIRCUIT BREAKERS

- A. Where the highest continuous current trip setting for which the actual overcurrent device installed in a circuit breaker is rated (or can be adjusted to is 1200A or higher, breakers shall be

electronic trip and shall be provided with arc energy-reducing maintenance switching (with local status indicator) to reduce arc flash energy per NEC 240.87 requirements.

- B. Circuit breakers shall be quick-break, quick-make thermal-magnetic type for alternating current unless noted otherwise. Breakers shall trip free of the handle and tripping shall be indicated by the handle assuming a position between OFF and ON. Multipole breakers shall be internal common trip with single operating handle; external handle ties are not acceptable.
- C. All breakers shall meet the minimum RMS symmetrical interrupting capacity ratings shown on plans for the associated panel. All interrupting ratings shall be full ratings. Series ratings will not be allowed unless shown otherwise on drawings.
- D. Main circuit breakers, 1000 amps and larger, on 277/480 volt, 3 phase, 4 wire systems shall be electronic trip molded case 80% rated equipped with ground fault sensing and automatic trip unless noted otherwise. The following requirements shall be met:
 - 1. These main breakers shall be equipped with an electric trip device having the following fully-adjustable, time/current response adjustments:
 - a. Long Time Pickup.
 - b. Long Time Delay.
 - c. Short Time Pickup.
 - d. Short Time Delay
 - e. Ground Fault Pickup.
 - f. Ground Fault Delay.
 - g. Instantaneous settings.
- E. All circuit breakers shall be installed so that the center of the grip of the operating handle, when in its highest position, is not more than 6'-7" above the floor or working platform (the height of the concrete housekeeping pad shall be included in the breaker height calculations).
- F. All branch circuit breakers shall be listed to UL489 or shall be specially-tested to be HACR listed.

2.3 SWITCHBOARD FRAMING & CONSTRUCTION

- A. The switchboard shall be fabricated on a die-form steel base assembly consisting of formed steel and commercial channel welded or bolted together to rigidly support the entire shipping unit for moving on rollers and floor mounting. The framework is to be formed code gauge steel, rigidly welded and bolted together to support all cover plates, bussing, and component devices during service and installation. The dimensions shall be shown on plans. These dimensions shall not be exceeded without specific approval.
- B. Each switchboard section shall have one open bottom and individual removable top plate for installation and termination of conduit. Top and bottom conduit area is to be clearly shown and dimensioned on the shop drawings. The wireway front covers are to be hinged to permit access to the branch circuit breaker load side terminals without removing the covers. All front plates used for mounting meters, selector switches or other front mounted devices shall be hinged with all wiring installed and laced with flexibility at the hinged side. All course plates shall be screw removable and small enough for easy handling by one man. The paint finish shall be gray enamel over a rust-inhibiting phosphate primer, ASA #48.

2.4 ACCESSORIES

- A. Each circuit breaker shall have engraved black on white engraved nameplate, providing circuit identification.

- B. Provide power meter (with door-mounted display) to monitor, display and alarm relevant current, voltage, power and energy variables. Shall be Square 'D' #PM850 or equal.

2.5 MANUFACTURER

- A. Switchboard to be manufactured by Square 'D', G.E., Siemens or Cutler Hammer or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Switchboards shall be installed on four inch thick concrete pads unless specifically shown otherwise. Pad shall extend a minimum of 4 inches to all sides of the switchboard and shall have beveled edges.
- B. All switchboard dimensions and clearances shall be carefully checked and coordinated with the proper trades to ensure proper mounting space and support prior to roughing in equipment.
- C. Wiring in panelboard gutters shall be done in a neat and workmanlike manner. Wiring shall be grouped into neat bundles and secured with approved tie wraps.

3.2 SWITCHBOARD IDENTIFICATION

- A. Refer to Specification Section 260553.

END OF SECTION 262413