

SECTION 16426 – MAIN SERVICE/DISTRIBUTION SWITCHBOARD

GENERAL

1.1 SECTION INCLUDES

- A. Main switchboards.

1.2 RELATED SECTIONS

- A. Section 16421 - Utility Service Entrance

1.3 REFERENCES

- A. ANSI/NFPA 70- National Electrical Code.
- B. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
- C. NEMA PB 2 - Deadfront Distribution Switchboards.
- D. NEMA PB 2.1 - Proper Handling, Installation, Operation, and Maintenance of Deadfront Switchboards Rated 600 Volts or less.

1.4 SUBMITTALS

- A. Submit under provisions of Section 16010.
- B. 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 per phase, neutral, and ground; and switchboard instrument details.
- C. Product Data: Provide electrical characteristics including voltage, frame size, trip ratings and fault current withstand ratings.

1.5 OPERATION AND MAINTENANCE DATA

- A. Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies and recommended maintenance procedures and intervals.

1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in 48-inch maximum width shipping splits, individually wrapped for protection and mounted on shipping skids.
- B. Accept switchboards on site. Inspect for damage.
- C. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- D. Handle in accordance with NEMA PB 2.1 and manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to switchboard internal components, enclosure and finish.

1.8 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

PRODUCTS

2.1 SWITCHBOARD

- A. Acceptable Manufacturers
 - 1. Cutler-Hammer.
 - 2. Square D.
 - 3. General Electric.
 - 4. Siemens.
 - 5. Substitutions: None Permitted.
- B. Description: NEMA PB 2 with electrical ratings and configurations as indicated.
- C. Bus Material: Aluminum with tin plating. Standard size.
- D. Bus Connections: Bolted, accessible from front for maintenance.
- E. Ground Bus: Extend length of switchboard.
- F. Minimum Integrated Short Circuit Rating: 65,000 amperes RMS at 480.
- G. Enclosure: Type 1 - General Purpose.
 - 1. Align sections at rear.
 - 2. Maximum Switchboard Height: 91.5 inches excluding floor sills, lifting members and pull boxes.
 - 3. Finish: Manufacturer's standard light gray enamel over external surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.
- H. Incoming Service/Meter Section

1. Service Entrance: Bolted lug facilities for connection of the incoming service lateral conductors.
2. Service Customer Metering/Protective Relaying
 - a. Manufacturer: *Cutler-Hammer/Eaton* FP-5000, or approved equal.
 - b. Description: Microprocessor-based relay protective device with electrical monitoring capabilities.
 - c. Relay Protection Functions:
 - (1) Phase Inst. OC
 - (2) Phase TOC
 - (3) Residual Ground IOC (calculated)
 - (4) Residual Ground TOC (calculated)
 - (5) Ground Inst. OC (measured)
 - (6) Ground Inst. TOC (measured)
 - (7) TOC Time Reset
 - (8) Negative Sequence OC (unbalance)
 - (9) Negative Sequence Voltage
 - (10) Over Voltage
 - (11) Under Voltage
 - (12) Under Frequency
 - (13) Over Frequency
 - (14) Breaker Failure
 - (15) Power Failure
 - d. Monitoring Functions:
 - (1) Amperes
 - (2) Ampere Demand
 - (3) Volts
 - (4) Watts
 - (5) Watt-Hours
 - (6) Vars
 - (7) Var-Hours
 - (8) Frequency
 - (9) Trending (load profile)
 - (10) Minimum/Maximum recording
 - e. Communication Means: RS-232
 - f. Construction:
 - (1) Mount: Panel-mount within switchgear (draw-out)
 - (2) Input Power: 120 VAC
- I. Main Section:
 1. Devices: Individually mounted.
 2. Main Circuit Breaker: Solid-state Molded case Circuit Breakers; NEMA AB1, provide with electronic sensing, timing and tripping circuits for adjustable current settings, instantaneous trip, adjustable short time trip, adjustable long time trip, ground-fault, and adjustable ground fault trip. Provide stationary mounting.

- J. Distribution Section:
 - 1. Devices: Group mounted.
 - 2. Molded Case Circuit Breakers: NEMA AB 1, integral thermal and instantaneous magnetic trip in each pole.

EXECUTION

3.1 EXAMINATION

- A. Verify that surface is suitable for switchboard installation.

3.2 INSTALLATION

- A. Install switchboard in locations shown on Drawings, in accordance with manufacturer's written instructions and NEMA PB 2.1.
- B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.

3.3 FIELD QUALITY CONTROL

- A. Inspect completed installation for physical damage, proper alignment, anchorage, and grounding.
- B. Measure insulation resistance of each bus section phase to phase and phase to ground for one minute each, at test voltage of 1000 volts; minimum acceptable value for insulation resistance is 2 megohms.
- C. Check tightness of accessible bolted bus joints using calibrated torque wrench.

3.4 ADJUSTING

- A. Tighten bolted bus connections in accordance with manufacturer's instructions.
- B. Adjust circuit breaker trip and time delay settings to values as instructed by the Resident.

3.5 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION