SECTION 262413

DISTRIBUTION SWITCHBOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Main switchboard.

B. Distribution switchboard.

1.2 RELATED SECTIONS

A. Division 03 - Cast-in-Place Concrete: Concrete pads.

B. Division 09 - Painting.

C. Section 26 05 46 - Utility Service Entrance: Utility metering equipment.

D. Section 26 05 73 - Overcurrent Protective Device Coordination Study.

E. Section 26 25 00 - Feeder and Plug-In Busway.

F. Section 26 35 53 - Transient Voltage Surge Suppression.

1.3 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

B. ANSI/IEEE C12.1 - Code for Electricity Metering.

C. ANSI C39.1 - Electrical Analog Indicating Instruments.

D. ANSI C57.13 - Instrument Transformers.

E. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.

F. NEMA KS 1 - Enclosed Switches.

G. NEMA PB 2 - Deadfront Distribution Switchboards.

H. NEMA PB 2.1 - Proper Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or Less.

1.4 SUBMITTALS

A. Submit under the provisions of Division 01.

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 and trip ratings, fault current withstand ratings, and time-current curves of all equipment and components.

D. Submit together with Section 26 22 00 - Dry Type Transformers, Section 26 24 13 - Distribution Switchboards, and Section 26 24 16 - Panelboards.

E. Test Reports: Indicate results of factory production tests.

F. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.5 OPERATION AND MAINTENANCE DATA

A. Submit under the provisions of Division 01.

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

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under the provisions of Division 01.

B. Deliver in 48-inch maximum width shipping splits, individually wrapped for protection and mounted on shipping skids.

C. Accept switchboards on site. Inspect for damage.

D. 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.

E. 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.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Conform to NEMA PB 2 service conditions during and after installation of switchboards.

1.8 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings instructed by manufacturer.

1.9 MAINTENANCE MATERIALS

A. Provide maintenance materials under the provisions of Division 01.

B. Provide two of each key.

C. Provide two fuse pullers.

1.10 EXTRA MATERIALS

A. Furnish under the provisions of Division 01.

B. Provide three of each size and type of fuse installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Square D Model Power-Style QED.

B. General Electric Spectra Series - SCP Plus.

C. Siemens Model SB.

D. Eaton Model Pow-R-Line C.

2.2 SWITCHBOARD

A. Description: NEMA PB 2 with electrical ratings and configurations as indicated.

B. Main Section Devices: Group mounted.

C. Distribution Section Devices: Group mounted.

D. Auxiliary Section Devices: Group mounted.

E. Bus Material: Aluminum with tin plating, standard size.

F. Bus Connections: Bolted, accessible from front for maintenance.

G. Fully insulated load side bus bars.

H. Ground Bus: Extend length of switchboard.

I. Molded Case Circuit Breakers: NEMA AB 1, integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

J. Solid-state Molded Case Circuit Breakers: NEMA AB 1, provide electronic sensing, timing, and tripping circuits for adjustable current settings; ground fault trip; instantaneous trip; and adjustable short time trip. Provide stationary mounting. Provide ground fault sensing integral with circuit breaker.

K. Line and Load Terminations: Accessible from the front only of the switchboard, suitable for the conductor materials and sizes indicated.

L. Ground Fault Sensor: Zero sequence type.

M. Ground Fault Relay: Adjustable ground fault sensitivity from 200 to 1200 amperes, time delay adjustable from 0 to 15 seconds. Provide monitor panel with lamp to indicate relay operation, TEST and RESET control switches.

N. Provide metering transformer compartment for Utility Company's use. Provide compartment size, bus spacing and drilling, door, and locking and sealing requirements in accordance with Section 26 05 46.

O. Pull Section: 18-inch width, depth, and height to match switchboard. Arrange as shown on Drawings.

P. Future Provisions: Fully equipped spaces for future devices with bussing and bus connections, suitably insulated and braced for short circuit currents. Provide continuous current rating as indicated.

Q. Enclosure: Type 1 - General Purpose.
   1. Align sections at front and rear.
   2. Switchboard Height: 90 inches excluding floor sills, lifting members and pull boxes.
   3. 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.
   4. Mimic Bus: Show bussing, connections, and devices in single line form on the front panels of the switchboard using black color factory painting.

R. Provide service entrance label.

2.3 ELECTRONIC POWER METER

A. ANSI C12.16 and CSA CAN-C17-M84, multi-function electronic power meter capable of the following measurements to +/- 0.5% accuracy.
   1. Voltage on Phase A, B, C (L-L, L-N).
   2. Amperage on Phase A, B, C, and Neutral.
   3. Frequency.
   4. Power factor (per phase and total).
   5. kW, kVA, and kvar (per phase and total).

B. Meter shall provide CT and VT transformer ratios and shall be programmable to give a "Direct Reading" value.

C. Meter display shall be minimum (6-digit alphanumeric LCD dot matrix type).

2.4 SURGE SUPPRESSION

A. Transient Voltage Suppressors (TVSS) shall be installed within the switchboard(s) by the manufacturer of the switchboard(s). Suppressors shall be listed in accordance with UL 1449. Standard for Safety, Transient Voltage Surge Suppressors.

B. Suppressors shall meet requirements of Section 26 35 53.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surface is suitable for switchboard installation.

3.2 PREPARATION

A. Provide concrete housekeeping pad under the provisions of Division 03.

3.3 INSTALLATION

A. Install switchboard in locations shown on Drawings, in accordance with the manufacturer's written instructions and NEMA PB 2.1.

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

C. Install fuses in each switch.

3.4 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.

D. Physically test key interlock systems to insure proper function.

3.5 ADJUSTING

A. Adjust all operating mechanisms for free mechanical movement.

B. Tighten bolted bus connections in accordance with the manufacturer's instructions.

C. Adjust circuit breaker trip and time delay settings to values indicated or as instructed by the Architect/Engineer.

3.6 CLEANING

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

END OF SECTION