# SECTION 16440 - PANELBOARDS

## PART 1 - GENERAL

### 1.01 SUMMARY

A. Section includes the following:
   1. Service entrance panelboards.
   2. Power distribution panelboards.
   3. Lighting panelboards.

### 1.02 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 01300, Shop Drawings covering the items included under this Section. Shop Drawing submittals shall include:
   1. Manufacturer's product data on panelboards and enclosures.

### 1.03 QUALITY ASSURANCE

A. Codes and Standards:
   1. UL Compliance: Comply with applicable requirements of UL 67, "Electric Panelboards," and UL's 50, 869, 486A, 486B, and 1053 pertaining to panelboards, accessories, and enclosures. Provide panelboard units which are UL listed and labeled.
   2. NEMA Compliance: Comply with NEMA Standards Pub/No. 250, "Enclosures for Electrical Equipment (1,000 Volts Maximum)," Pub/No. PB 1, "Panelboards," and Pub/No. PB 1.1, "Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less."
   3. Federal Specification Compliance: Comply with FS W-P-115, "Power Distribution Panel," pertaining to panelboards and accessories.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

A. Subject to compliance with specified requirements, manufacturers offering products which may be incorporated in Work include:
   1. Allen Bradley.
   2. Square D Company
   3. General Electric Company.
   4. Siemens, Inc.

### 2.02 PANELBOARDS

A. Except as otherwise indicated, provide panelboards, enclosures, and ancillary components, of types, sizes, and ratings indicated, which comply with manufacturer's standard materials; with design and construction in accordance with published product information. Equip with proper number of unit panelboard devices as required for complete installation. Where types, sizes, or ratings are not

indicated, comply with NEC, UL, and established industry standards for those applications indicated.

B. Service Entrance Panelboards: Provide factory assembled, dead-front safety constructed service entrance circuit breaker type panelboards in sizes and ratings indicated. Equip with panelboard unit devices, of types, ratings, and characteristics indicated. Construct with rectangular-shaped bus bars of ampacity indicated, which are securely mounted and braced for 10,000 rms symmetrical amperes fault current, and with solderless lugs bolted to main bus bars suitable for service with system voltage and phase indicated. Provide branch circuits with molded-case type single pole circuit breakers with toggle handles that indicate when tripped. Select enclosures which are fabricated by same manufacturer as panelboards and which mate and match properly with panelboards. Provide panelboards with UL markings which indicate "suitable for use as service entrance equipment."

C. Power Distribution Panelboards: Provide dead-front safety type power distribution panelboards as indicated, with panelboard switching and protective devices in quantities, ratings, and types shown; with anti-turn solderless pressure type main lug connectors approved for use with copper conductors. Select unit with feeders connecting at top of panel. Equip with tin-plated aluminum, or silver- or tin-plated copper bus bars braced for 50,000 rms symmetrical amperes fault current, and with full-sized neutral bus; provide suitable lugs on neutral bus for outgoing feeders requiring neutral connections. Provide as indicated molded-case bolt-on main and branch circuit breakers for each circuit with toggle handles that indicate when tripped. Where multiple pole breakers are indicated, provide with common trip so overload on one pole will trip all poles simultaneously. Provide panelboards with bare uninsulated grounding bars suitable for bolting to enclosures. Select enclosures fabricated by same manufacturer as panelboards, which mate and match properly with panelboards.

D. Lighting Panelboards: Provide dead-front safety type lighting and appliance panelboards as indicated, with switching and protective devices in quantities, ratings, and types shown; with anti-turn solderless pressure type lug connectors approved for use with copper conductors. Construct unit for connecting feeders at top of panel; equip with copper bus bars, full-sized neutral bar with bolt-in type heavy-duty, quick-make quick-break, single pole circuit breakers, and toggle handles that indicate when tripped. Provide suitable lugs on neutral bus for each outgoing feeder required and provide bare uninsulated grounding bars suitable for bolting to enclosures. Select enclosures fabricated by same manufacturer as panelboards, which mate and match properly with panelboards. Panelboards and circuit breakers shall be braced for 10,000 rms symmetrical amperes fault current unless otherwise indicated.

E. Panelboard Enclosures: Provide galvanized sheet steel or enameled steel cabinet type enclosures (indoor only), in sizes and NEMA types as indicated, code gauge, minimum 16-gauge thickness. Provide stainless steel cabinet type enclosures (outdoor or hazardous/corrosive), in sizes and NEMA types as indicated, code gauge, minimum 16-gauge thickness. Construct with multiple knockouts and wiring gutters. Provide fronts with adjustable trim clamps and doors with flush locks and keys, all panelboard enclosures keyed alike, with concealed piano door hinges and door swings as indicated. Equip with interior circuit directory frame and card with clear plastic covering. Provide baked gray enamel finish over a rust-inhibitor coating. Design enclosures for recessed or surface mounting as indicated. Provide enclosures which are fabricated by same manufacturer as panelboards, which mate and match properly with panelboards to be enclosed.

F. Molded-Case Circuit Breakers: Provide factory assembled, molded-case circuit breakers of frame sizes, characteristics, and ratings, including rms symmetrical interrupting ratings indicated. Select

breakers with permanent thermal and instantaneous magnetic trip, and with fault-current limiting protection, ampere ratings as indicated. Construct with overcenter, trip-free, toggle type operating mechanisms with quick-make quick-break action and positive handle trip indication. Construct breakers for mounting and operating in any physical position and operating in an ambient temperature of 40 degrees C. Provide breakers with mechanical screw type removable connector lugs, AL/CU rated.

G. Ground Fault Protected Breakers: Provide UL Class A protected GFI breakers with 6 mA for personnel protection, and for general-purpose receptacles. For breakers dedicated to equipment (sump pumps, heat trace, etc.), provide breaker with 30 mA equipment protection.

H. Accessories: Provide panelboard accessories and devices including, but not necessarily limited to, ground-fault protection units or circuit breaker locking hardware as indicated.

I. Transient Voltage Surge Suppressors: Provide a TVSS unit for each panelboard provided. The suppressor unit shall include replaceable sacrificial components. The unit shall have a programmable display which includes fault counts and alarm relay output contacts. The unit shall include an Ethernet communications port for interface to Owners equipment.

J. Spares: In each panelboard provide single pole, 20A spare circuit breakers to fill in panel unless otherwise indicated.

## PART 3 - EXECUTION

### 3.01 INSTALLATION OF PANELBOARDS

A. Type out panelboard's circuit directory card upon completion of installation Work.

END OF SECTION