SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.01 REFERENCE

A. Refer to Section 26 00 00 for additional requirements of this section.
B. Refer to requirements of the National Electrical Code, UL, and the NFPA.

1.02 WORK INCLUDED

A. Provide all labor, material, equipment and supervision necessary to furnish and install panelboards as specified.

1.03 SUBMITTALS

A. Submit manufacturers shop drawings of all equipment specified in this section.

1.04 QUALITY ASSURANCE

A. Verify that all equipment is installed in accordance with the manufacturers' warranty requirements.

PART 2 - PRODUCTS

2.01 DISTRIBUTION PANELBOARDS (MDP or PP)

A. GENERAL - Furnish and install distribution and power panelboards as indicated in the panelboard schedule and where shown on the plans. Panelboards shall be equipped with thermal-magnetic, molded case circuit breakers of frame and trip ratings as shown on the schedule.
B. BUSSING ASSEMBLY AND TEMPERATURE RISE - Panelboard bus structure and main lugs or main breaker shall have current ratings as shown on the panelboard schedule. Bus shall be plated copper.
C. CIRCUIT BREAKERS - Circuit breakers shall be equipped with individually insulated, braced and protected connectors. Circuit breakers shall be flush with each other. Tripped indication shall be clearly shown. Provisions for additional breakers shall be such that no additional connectors will be required to add breakers. Mechanical lugs are to be copper. For 480 V applications over 1000 Amp, the main breaker is to include electronic trip with LSIG characteristics.
D. EQUIPMENT SHORT CIRCUIT RATING (FULLY RATED) - Each panelboard shall have a short circuit current rating equal to or greater than the integrated equipment rating shown on the panelboard schedule or on the plans. Panelboards shall be marked with their maximum short circuit current rating at the supply voltage and shall be UL listed.
E. ARC ENERGY REDUCTION – Where circuit breakers rated 1200A or higher are installed, provide arch flash mitigation documentation to those authorized to design, install, operated, or inspect the installation. Provide energy-reducing maintenance switching with local status indicator as means to reduce clearing time of the fuses or the breakers.
F. CABINET - Panelboard assembly shall be enclosed in a steel cabinet. The rigidity and gauge of

steel to be as specified in UL Standard 50 for cabinets. The size of wiring gutters shall be in accordance with UL Standard 67. Cabinets to be equipped with latch and tumbler-type lock on door of trim. Doors over 48" long shall be equipped with three-point latch and vault lock. All locks shall be keyed alike. End walls shall be removable. Fronts shall be of code gauge steel. Baked enamel finish electro-deposited over cleaned phosphatized steel.

G. SAFETY BARRIERS - The panelboard interior assembly shall be dead front with panelboard front removed. Main lugs or main breakers shall have barriers on five sides. The barrier in front of the main lugs shall be hinged to a fixed part of the interior. The end of the bus structure opposite the mains shall have barriers.

H. UL LISTING - Panelboards shall be listed by Underwriters Laboratories and shall bear the UL label. When required, panelboards shall be suitable for use as service equipment.

I. NAMEPLATES - Provide laminated black phenolic resin with white core with 3/16 inch high engraved lettered nameplates for each circuit breaker to indicate the feeder, panelboard and equipment served. Mounted, with plated screws, adjacent to or on front of the breaker.

J. Panelboards shall be by Square D, Siemens, Cutler Hammer or ABB Group.

2.02 LIGHTING & RECEPTACLE PANELS (LP or RP)

A. GENERAL - Furnish and install circuit breaker lighting panelboards as indicated in the panelboard schedule and where shown on the plans. Panelboards shall be equipped with thermal-magnetic molded case circuit breakers with frame and trip ratings as shown on the schedule.

B. CIRCUIT BREAKERS - Shall be quick-make, quick-break, thermal-magnetic, trip indicating and have common trip on all multipole breakers. Trip indication shall be clearly shown by the breaker handle taking position between "ON" and "OFF" when the breaker is tripped. Branch circuit breakers feeding convenience outlets shall have sensitive instantaneous trip settings of not more than 10 times the trip rating of the breaker to prevent repeated arcing shorts resulting from frayed appliance cords. Single pole 15 and 20 ampere circuit breakers shall be UL listed as "Switching Breakers" at 120V AC and carry the SWD marking. UL Class A ground fault circuit protection shall be provided on 120V AC branch circuits as specified on the plans or panelboard schedule. This protection shall be an integral part of the branch circuit breaker which also provides overload and short circuit protection for branch circuit wiring. Tripping of a branch circuit breaker containing ground fault circuit interruption shall not disturb the feeder circuit to the panelboard. A single pole circuit breaker with integral ground fault circuit interruption shall require no more panelboard branch circuit space than a conventional circuit breaker. A UL listed combination arc fault circuit interrupter (AFCI) shall be provided for all 120V, 15 or 20 Amp branch circuits as indicated on the plans or panelboard schedule or as required by the National Electrical Code. This protection shall be an integral part of the branch circuit breaker which also provides overload and short circuit protection for the branch circuit wiring. This breaker shall require no more panelboard branch circuit space than a conventional circuit breaker. Connections to the bus shall bolt-on.

C. PANELBOARD BUS ASSEMBLY - Bus bar connections to the branch circuit breakers shall be the "distributed phase" or "phase sequence" type. Single phase, three-wire panelboard bussing shall be such that any two adjacent single pole breakers are connected to opposite polarities in such a manner that two pole breakers can be installed in any location. Three phase, four-wire bussing shall be such that any three adjacent single pole breakers are individually connected to each of the three different phases in such a manner that two or three pole breakers can be installed at any location. All current carrying parts of the bus assemble shall be plated copper. Mains ratings shall be shown in the panelboard schedule or on the plans.

D. WIRING TERMINALS - Terminals for feeder conductors to the panelboard mains and neutral shall be UL listed as suitable for the type of conductor specified. Terminals for branch circuit wiring, both breaker and neutral, shall be UL listed as suitable for the type of conductor specified.

E. CABINETS AND FRONTS - The panelboard bus assemble shall be enclosed in a steel cabinet. The size of the wiring gutters and gauge of steel shall be in accordance with NEMA and UL Standards.

The box shall be fabricated from galvanized steel or equivalent rust resistant steel.

Fronts shall include doors and have flush, cylinder tumbler-type locks with catches and spring-loaded stainless steel door pulls. Doors shall be mounted with completely concealed steel hinges. Fronts shall not be removable with door in the locked position. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door. Fronts shall be of code gauge steel.

**Front panel cover is to be door in door construction with piano hinge.

F. EQUIPMENT SHORT CIRCUIT RATING (FULLY RATED) - Each panelboard shall have a short circuit current rating equal to or greater than the integrated equipment rating shown on the panelboard schedule or on the plans. Panelboards shall be marked with their maximum short circuit current rating at the supply voltage and shall be UL listed.
G. UL LISTING - Panelboards shall be listed by Underwriters Laboratories and bear the UL label. Equal panelboards may be provided by Square D, G.E., Cutler Hammer, or Siemens.
H. ELECTRONIC GRADE - Panels indicated to be electronic grade to have 200% rated neutrals, and an isolated ground bar in addition to the equipment ground bar.

PART 3 - EXECUTION

3.01 PANELS

A. Tops not to exceed 72 inches above floor.
B. Provide labeling and complete directories.
C. Ductwork or piping shall not pass over panels.
D. Space shall be clear 36" in front of panel floor to structural slab or roof above.
E. All conduit entering the panel shall have a screwed hub with an insulated bushing and no sharp
F. edges.
    1. Wires shall be labeled and neatly arranged in the wiring gutters with wires cut to proper lengths and neatly racked.
G. Electronic grade panels shall have feeder neutrals rated at 200% to maintain the UL listing of the panel and be provided with isolated ground conductor back to service entrance or feeder transformer.

3.02 GROUNDING

A. All panels shall be grounded to the building equipment grounding system per NEC 408.40. Ground resistance shall not exceed NEC values.

END OF SECTION