SECTION 16134 – PANELBOARDS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK:

A. Lighting and power panelboards and their installation.

1.2 SUBMITTALS:

A. Provide shop drawings. Include individual diagram of each panelboard showing all specified requirements.

1.3 RELATED SECTIONS:

A. Surge Suppressors……..…Section 16315

PART 2 – PRODUCTS

A. Construct panelboards in accordance with latest NEMA and UL standards.

B. Panelboards to be same manufacturer as other distribution equipment.

C. Panelboard assembly UL labeled, and UL labeled as Service Entrance Equipment where used for that purpose.

D. Panelboards to have integrated equipment fault rating equal to interrupting rating of lowest rated overcurrent device.

E. Panelboards shall be factory assembled.

F. Bussing:

1. 98% conductivity copper, tinplated at joints or equivalent plated 55% conductivity aluminum.

2. Bus assembly designed for a maximum temperature rise of 55 degree C above 40 degree C ambient temperature when carrying rated current.

3. Minimum thickness of bus bars – 3/32”.

4. Bussing braced to withstand a fault current equal to the highest device interrupting capacity in the panel.

5. Neutral bus full size copper or aluminum sized on same basis as phase busses and insulated from the cabinet.

6. Arrange bus bar connections so that adjacent vertical circuit protective devices are consecutively connected to phases A, B and C throughout panel. Provide full capacity ground bus in each panel cabinet, bolted to cabinet.

G. Cable terminations:

1. Include neutral and ground connections as shown.

2. Use 2 bolt tongue or equivalent connection to bus for #1/0 or larger cables.

3. Securely bolt lugs to bus with bolts, nuts and lock washers.

4. Provide double lugs on main bus where shown.

5. Feed-through lugs (one set of lugs on each end of main vertical bus) is not acceptable unless approved by Engineer.

H. Circuit breakers:

1. Molded case, thermal-magnetic, quick-make, quick-break, trip free on faults, thermal-inverse time delay element and magnetic instantaneous trip coil in each ungrounded phase conductor, or approved equivalent solid state trip unit.

2. Engrave breaker ampere rating on handle or trip unit.

3. Furnish multipole breakers with internal common trip.

4. Ground fault breakers class “A” type to trip on fault currents of 4-6 ma.

5. Main circuit breakers UL rated for service entrance use.

6. Switch “SWD” rated where required by NEC.

I. Fusible Switches:

1. UL approved for Service Entrance use.

2. Dual horsepower rated for AC and DC current.

3. Accepts standard One Time, Current Limiting, or Dual Element fuses.

4. Copper Fuse Clips, reinforced for good contact, mounted on insulated base.

5. Interlocked hinged cover. (Interlock defeatable with screwdriver).

6. Padlockable in “on” or “off” position.

7. Quick-make, quick-break mechanism with simultaneous operating poles.

8. Switch contact to be blade type, blow-off butt contacts acceptable only if manufacturer certifies contacts will remain closed under any fault conditions within limits of applied fuse.

J. Surge Protection Device/Transient Voltage Surge Suppression:

1. Panelboard shall be provided by UL 1449 listed and CSA 22.2 certified transient voltage surge suppressor where shown. The panelboard SPD/TVSS shall be tested and suitable for ANSI/IEEE C62.41 Cat. C1 (6kV, 3kA) environments.

2. Suppressor shall be included and mounted within the panelboards by the manufacturer of the equipment. See panelboard schedule for panelboard with TVSS.

3. The panelboard shall be constructed using a direct bus bar connection (no cable connection between bus bar and SPD/TVSS). Panelboards that use a wire connection do not meet the intent of this specification.

4. All monitoring diagnostics features such as indicator lights, trouble alarms and surge counter shall be visible from the front of the panelboard.

K. Panelboards classified by type over-current protection as follows:

1. PQL Plug-in connected, quick-lag circuit breaker distribution, 0-100 ampere branches, with minimum interrupting rating as indicated on the drawings.

2. BQL Bolted quick-lag circuit breaker distribution, 0-100 ampere branches, with minimum interrupting rating as indicated on the drawings.

3. BEF Heavy duty circuit breaker distribution, 0-100 ampere branches with minimum interrupting rating as indicated on the drawings.

4. CCB Heavy duty convertible circuit breaker distribution, 0-800 ampere branches with minimum interrupting rating as indicated on the drawings.

5. FDP Fusible distribution using UL Class fuse with minimum interrupting rating as indicated on the drawings.

L. All spaces in panelboards usable. Panelboard space provided with necessary connections for future installation of overcurrent devices.

M. Identification:

1. Permanently attach nameplates and circuit numbers to panel.

2. Provide typewritten circuit directories describing service of each circuit in Types PQL, BQL and BEF panels.

3. Provide laminated plastic nameplate circuit identification for each circuit in Types CCB and FDP panels.

4. Provide each panelboard with nameplate showing name and voltage.

N. Manufacturers:

1. Panelboards manufactured by Siemens, Square “D”, General Electric or Cutler-Hammer.

2.2 CABINETS: (Same manufacturer as interiors)

A. Code thickness, hot dip galvanized steel or painted with trim and door. Hardware: combination latch and cylinder lock, all keyed the same. Provide celluloid or plastic covered directory card holder on the inside of door. Trim, door and exposed interior shall be finished with factory prime and smooth finish coat. Reinforce cabinets as necessary for service and short circuit rating intended.

B. Flush or surface as indicated of sufficient size to allow minimum 3” gutter space each side of panel and eight inches (8”) at top and bottom, minimum 20” wide. Provide adjustable trim clamp, semi-flush hinges and inside rabbet.

C. Provide panels with door in door trim construction.

PART 3 – EXECUTION

3.1 INSTALLATION:

A. Mount panelboards securely to building structure with 3/8” minimum diameter galvanized bolts and inserts number as required for size of panel, but not less than 4. Mount panelboards with centerline 4’-6” approximately above finished floor. Where panels of different heights are mounted adjacent, install top of panel trim at same height above floor. Close all unused openings.

B. Where two sets of feeder cables are required in panel gutter space, run one set in each side of panel.

END OF SECTION 16134