

26 24 16 – Panelboards

1. Introduction

- A. Panelboards shall be utilized within electrical distribution system to provide a central location for sub-feed distribution assemblies and branch circuits to originate.

2. References

- A. NFPA 70 National Electrical Code

3. Design Standards

- A. Approved Manufacturers:

- Square D (NF, NQ, or I-line Series)
 - Eaton /Cutler-Hammer (PRL Series)
 - General Electric (Series A or CCB)

- B. Provide full length 75⁰C copper busbars, ratings as required. Tap arrangements shall permit a two or three pole circuit breaker to be installed in any location. Subfeed lug arrangements are not permitted.
- C. Provide full length 75⁰C copper neutral busbar. Lugs shall be provided and sized appropriately for each out-going circuit that requires a neutral connection. Panelboards feeding computer equipment shall be provided with 200% neutral bus and shall have neutral conductors sized appropriately.
- D. Provide copper ground bus. Lugs shall be provided and sized appropriately for each out-going circuit.
- E. Provide a factory installed main circuit breaker in all panelboards. Branch mounted main circuit breakers are not permitted.
- F. All breakers (main and branch) shall be rated 75⁰C. Circuit breakers shall be thermal-magnetic, molded-case bolt-on type with permanent inverse time-current overload and instantaneous magnetic tripping units and suited for the particular load which they serve. (i.e. HACR for heating, air conditioning, and refrigerating equipment, etc.). Thermal elements shall be calibrated for 40⁰C or shall be ambient compensating type and shall be adjustable for breakers greater than 225A. Plug-in assemblies are not permitted.
- G. The use of breakers for switching purposes shall only be utilized with approval from Duke Utility & Engineering Services (DUES).
- H. Shunt trip breakers shall have 120V coils.

- I. Panelboards 1000 amps and greater shall be equipped with digital power meters manufactured and installed by the factory.
 - J. Load centers shall only be utilized with approval from Duke Utility & Engineering services.
 - K. Panels utilized for service entrance shall have appropriate UL labeled as suitable for service entrance. Ground fault protection shall be provided on service entrance breaker.
 - L. Provide 25% spare capacity in each panelboard for both demand and space. Spaces allocated for future use shall be fully bussed and complete with mounting hardware and filler plates.
 - M. Provide door-in-door / hinged trim for all panels.
 - N. Match NEMA rating of panelboard to associated environment.
4. Documentation and Review Requirements
- A. All panelboards, both existing and new, associated with the project shall have a panel schedule. The panel schedule shall include the SE rating, bus rating, voltage rating, main breaker rating, neutral bus rating, AIC rating, panel configuration, total load, demand factor, total demand load, total demand amps. A description of the load shall also be identified. Schedule shall utilize final building room numbers, not architectural drawing room numbers.
 - B. Provide load summary and the NEC required monitoring data for all existing to remain panelboards being utilized within the project.
5. Installation and Performance Requirements
- A. Neatly train and bundle all feeders and branch circuit conductors . Identify branch circuit inside panelboard and at wiring device with self-adhesive wire tag attached to the wire.
 - B. Provide typed panelboard directory. Handwritten directories are not permitted. When circuiting at existing panelboard is changed, a new typed circuit directory shall be provided.
 - C. Provide self-adhesive label that indicates the flash boundary and available incident energy at panelboard. Neatly affix label to exterior portion of panelboard door.
 - D. Perform an infrared camera scan on each panelboard. Open to expose all connections.
 - E. Measure and record steady state load currents at each panelboard feeder. If difference at any panelboard between phases exceeds 10%, rearrange circuits in panelboard to balance phase loads, unless otherwise noted.

- F. Torque all connections to manufacturers recommendations, vacuum, and wipe clean.
- G. Refer to Section 26 08 01 for Electrical Equipment Acceptance Testing.

6. As-Built Requirements

- A. Provide a certified report that identifies the scanning results for all panelboards.
- B. Provide electronic copies of as-built panel schedules
- C. Provide time current curves
- D. Provide settings of all over-current protective devices