BASIS OF DESIGN

This section applies to the design and installation of panelboards.

Design Criteria

Building panelboards shall be accessible from the front and shall utilize group-mounted thermal-magnetic molded case circuit breakers. Load centers are not acceptable. Panel shall have a dedicated-access hinged door.

Provide multiple lugs or feed-through type panels when required.

Laboratory panels shall have double lugs.

Provide all 208Y/120V panels with a dedicated, isolated, full-size ground bus to serve future computer equipment, and separate equipment grounding conductor bus. Provide terminals for a minimum of 50 percent of panel circuits on each bus.

Provide isolation panels for Medical Center and other special applications when required.

Provide “service entrance” listed service entrance applications.

Panelboards shall be 100 percent neutral rated, or greater when required.

Panelboards shall be 200 percent neutral rated when serving non-linear type loads.

Locate panels in electrical rooms, electrical closets, or utility hallways on each floor. Special rooms and laboratories with highly concentrated loads should have separate panels. Do not locate panels in janitor closets or toilet room entries. Locate panels near columns, or on permanent corridor walls or other permanent features to prevent future relocations.

Surface-mounted panels are preferred to flush panels. Surface-mount panels in utility spaces. In finished areas provide flush mount with full height access to ceiling for future raceways. Provide a minimum of three ¾-inch spare conduits stubbed into ceiling space.

Panels shall not have subfeed breakers. If multiple panels are supplied from a long feeder, use subfeed lugs or a separate splice box with full-size tap to panel mains.
Design Evaluation

The following information is required to evaluate the design:

• **Schematic Design Phase**
  – Description of overall design concept for power distribution

• **Design Development Phase**
  – Load calculations to determine quantity of panelboards
  – Preliminary one-line and riser diagrams showing quantity and location of panelboards
  – Preliminary plans showing panel locations and compliance to clearance requirements
  – Draft specifications

• **Construction Documents Phase**
  – Final load calculations to determine quantity of panelboards
  – Final one-line and riser diagrams showing quantity and location of panelboards
  – Final plans showing panel locations and compliance with clearance requirements
  – Completed panel schedules showing circuit numbers and load information
  – Final specifications

Submittals

• Shop drawings for review before manufacture
• Panel schedules

Products, Materials, and Equipment

*Accepted Manufacturers*

• Square D
• Cutler Hammer
• General Electric
**Cabinets and Fronts**

- Cabinets and fronts shall be dead-front type.
- Doors shall be tight-closing without play, when latched. Where remote controlled switch or contactor is mounted in panelboard, mount on same frame as panelboard interior with dedicated access hinged door and key lock.
- Provide hinged door-in-door construction with lockable metal latch fasteners on all doors. When more than one fastener is required on a door, provide single operator handle with multi-point fasteners. Locks shall be keyed alike and match the existing standard keying system (Corbin Cabinet Lock TEU-1 or GE – 75). Opening outer door should expose terminals and circuit breakers in a single operation.

**Circuit Breakers and Fused Switches**

- Circuit breakers and fused switches shall have Underwriters Laboratories (UL) interrupting rating labeled.
- Coordinate interrupting ratings with the Protective System Device Studies. Minimum ratings shall be as follows:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Minimum Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>208Y/120V Panelboards</td>
<td>10,000 AIC symmetrical</td>
</tr>
<tr>
<td>480Y/277V Panelboards</td>
<td>14,000 AIC symmetrical</td>
</tr>
<tr>
<td>Fusible Panelboards</td>
<td>100,000 AIC symmetrical</td>
</tr>
</tbody>
</table>

- Circuit breakers shall be “bolt-in” breaker units with common trip on multiple pole breakers.
- Provide minimum of 30 percent spare breakers for lighting panels and 35 percent spare breakers for receptacle and equipment branch panels.
- Spaces shall be provided with busing, device-mounting hardware and steel knockouts in dead front.
- Provide only 42 circuit panels with copper bus rated at 225 amp.

**Installation, Fabrication, and Construction**

Firmly anchor cabinets directly or with concealed bracing to building structure.

Mount 6 feet, 6 inches above finished floor unless otherwise required. When not located directly on the wall, provide support frame of formed steel channel anchored to floor and ceiling structure.
Panelboards rated for 400 and 600 amps shall accept 225-amp frame circuit breakers.

Verify space available with equipment sizes and code required working clearances before submitting shop drawings.

Furnish cabinets prime painted. Do not field paint factory-finished panelboard or equipment covers.

Locate in dedicated spaces. Coordinate project construction so piping, ducts, and so forth are routed around dedicated spaces above and in front of panelboards per code.

Provide nameplates and directories.

END