	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: Electrical Standards	Section: 26 05 29 Electrical Supports and Seismic Restraints
		Date: 6/15/16
		Author: Office of Facilities
CC: Project Folder		


Date	Description of Change	Pages / Sections Modified	ID
10/14	Revision 3		jc
6/15/16	Updated format, division title, and removed references to other sections.	-	mg144

## A. Summary

This section contains design criteria for supporting devices, including anchors and fasteners for raceways and equipment.

## B. System Design and Performance Requirements

1. When located in the following facilities, design the electrical system components listed in paragraph 2 to withstand the effects of seismic forces. Comply with the requirements of the Connecticut State Building Code.
  - Buildings occupied by University police
  - Power plants
  - Telecommunications equipment centers
  - Buildings containing hazardous materials in excess of exempt amounts allowed by code
  - Health care facilities
  - Assembly occupancies
  - Residential colleges, dormitories, and similar buildings that house students
    - Laboratories and classroom buildings exceeding 50,000 square feet gross area.
  
2. When located in the occupancies listed in paragraph 1, design supports for the following types of equipment to withstand the effects of seismic forces.
  - Conduits supported by individual hangers more than 12 inches in length from the top of the conduit to the bottom of the supporting structure
  - Conduits 2-1/2 inches trade size and larger
  - Transformers
  - Switchgear and switchboards
  - Bus ducts
  - Panelboards

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- Motor control centers
  - Motor controllers
  - Motors
  - Lighting fixtures \* If over 12”, then flexible fitting is required for raceway.
3. Design supports for the following types of equipment, including associated raceways, to withstand the effects of seismic forces in all buildings, regardless of occupancy.
    - All components of systems operating over 600 volts, including manholes and duct banks.
    - Substations.
    - Emergency electrical systems, legally required standby systems, and optional standby systems, including all wiring on line sides of transfer switches.
    - Fire alarm systems.
    - Telecommunications systems from plant to telephone cabinets and backboards.
  4. Design all raceway and equipment supports for easy installation and removal or disassembly with as little damage as possible to the underlying structure. System shall use fastening systems, such as screws, bolts, and beam clamps, unless specific design conditions require alternate supporting methods. Nails, power-driven studs, welds, and similar methods are not acceptable.

**C. Manufacturers**

Any product that meets the materials requirements is acceptable.

**D. Materials**

1. Use galvanized steel, aluminum or malleable iron supports, treated for rust resistance. Any cuts for support shall be treated with a rust inhibitor.
2. Use stainless steel fasteners in damp and wet locations and where they are exposed to view in finished areas.
3. Use expansion shield or expansion bolt anchors in concrete or masonry structures that are rated to support, at a minimum, four times the anticipated load. Anchors

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attached to concrete ceilings must be vibration- and shock-resistant.

4. Use 3/4-inch thick exterior grade plywood backboards, primed and painted prior to mounting.

**E. Installation Guidelines**

1. Use beam clamps when mounting to structural steel construction. Do not drill structural steel.
2. For surface-mounted panelboards and equipment cabinets installed against walls, provide support channels to create a minimum one-inch ventilation air space behind the enclosure.

“END OF SECTION”