

SECTION 26 05 48.00 10

SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT
10/07

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 325 (2017) Steel Construction Manual

ASTM INTERNATIONAL (ASTM)

ASTM E580/E580M (2020) Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions

ARCHITECTURAL INSTITUTE OF JAPAN (AIJ)

JASS 6 (2015) Structural Steelwork Specification for Building Construction

JAPANESE STANDARDS ASSOCIATION (JSA)

JIS C 8105-2 Series Luminaires: Particular Requirements for Safety

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-301-01 (2023; with Change 1, 2023) Structural Engineering

UNDERWRITERS LABORATORIES (UL)

UL 1598 (2021; Reprint Jun 2021) Luminaires

1.2 SYSTEM DESCRIPTION

1.2.1 General Requirements

The requirements for seismic protection measures described in this section shall be applied to the electrical equipment and systems listed below. Structural requirements shall be in accordance with Section 13 48 73 SEISMIC CONTROL FOR MECHANICAL EQUIPMENT.

1.2.2 Electrical Equipment

Electrical equipment shall include the following items to the extent required on the drawings or in other sections of these specifications:

| | |
|------------------------------|--------------------|
| Control Panels | Air Handling Units |
| Pumps with Motors | Switchgear |
| Light Fixtures | Unit Substations |
| Motor Control Centers | Transformers |
| Switchboards (Floor Mounted) | Storage Racks |
| Solar Heating Units | [_____] |

1.2.3 Electrical Systems

The following electrical systems shall be installed as required on the drawings and other sections of these specifications and shall be seismically protected in accordance with this specification: [_____]

1.2.4 Contractor Designed Bracing

Submit copies of the Design Calculations with the Drawings. Calculations shall be approved, certified, stamped and signed by a Registered Professional Engineer. Calculations shall verify the capability of structural members to which bracing is attached for carrying the load from the brace. Design the bracing in accordance with UFC 3-301-01 and additional data furnished by the Contracting Officer. Resistance to lateral forces induced by earthquakes shall be accomplished without consideration of friction resulting from gravity loads. UFC 3-301-01 uses parameters for the building, not for the equipment in the building; therefore, corresponding adjustments to the formulas shall be required. Loadings determined using UFC 3-301-01 are based on strength design; therefore, AISC 325 or JASS 6 shall be used for the design. Develop the bracing for the following electrical equipment and systems: [_____].

1.2.5 Conduits Requiring No Special Seismic Restraints

Seismic restraints may be omitted from electrical conduit less than 64 mm trade size and [_____]. All other interior conduit, shall be seismically protected as specified.

1.3 EQUIPMENT REQUIREMENTS

Submit detail drawings along with catalog cuts, templates, and erection and installation details, as appropriate, for the items listed. Submittals shall be complete in detail, indicating thickness, type, grade, class of metal, and dimensions; and shall show construction details, reinforcement, anchorage, and installation with relation to the building construction. Submit copies of the design calculations with the detail drawings. Calculations shall be stamped by a registered engineer and shall verify the capability of structural members to which bracing is attached for carrying the load from the brace.

1.3.1 Rigidly Mounted Equipment

The following specific items of equipment: [_____] to be furnished under this contract shall be constructed and assembled to withstand the seismic

forces specified in UFC 3-301-01. Each item of rigid electrical equipment shall be entirely located and rigidly attached on one side only of a building expansion joint. Piping, electrical conduit, etc., which cross the expansion joint shall be provided with flexible joints that are capable of accommodating displacements equal to the full width of the joint in both orthogonal directions.

Engine-Generators
Substations
Transformers
Switch Boards and Switch Gears
Motor Control Centers
Free Standing Electric Motors
[_____]

1.3.2 Nonrigid or Flexibly-Mounted Equipment

The following specific items of equipment to be furnished: [_____] shall be constructed and assembled to resist a horizontal lateral force of [_____] times the operating weight of the equipment at the vertical center of gravity of the equipment.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Lighting Fixtures in Buildings
Equipment Requirements

SD-03 Product Data

Lighting Fixtures in Buildings; G[, [_____]]
Equipment Requirements; G[, [_____]]
Contractor Designed Bracing; G[, [_____]]

PART 2 PRODUCTS

2.1 LIGHTING FIXTURE SUPPORTS

Lighting fixtures and supports shall conform to UL 1598 or JIS C 8105-2

2.2 SWAY BRACING MATERIALS

Sway bracing materials (e.g. rods, plates, rope, angles, etc.) shall be as specified in Section 13 48 73 SEISMIC CONTROL FOR MECHANICAL EQUIPMENT.

PART 3 EXECUTION

3.1 SWAY BRACES FOR CONDUIT

Conduit shall be braced as for an equivalent weight pipe in accordance with Section 23 05 48.19 [SEISMIC] BRACING FOR HVAC.

3.2 LIGHTING FIXTURES IN BUILDINGS

Lighting fixtures and supports shall conform to the following:

3.2.1 Pendant Fixtures

Pendant fixtures shall conform to the requirements of UFC 3-301-01.

3.2.2 Ceiling Attached Fixtures

3.2.2.1 Recessed Fixtures

Recessed fluorescent individual or continuous-row mounted fixtures shall be supported by a seismic-resistant suspended ceiling support system built in accordance with [ASTM E580/E580M][Section 09 51 00 ACOUSTICAL CEILINGS]. Seismic protection for the fixtures shall conform to the requirements of UFC 3-301-01. Recessed lighting fixtures not over 25 kg in weight may be supported by and attached directly to the ceiling system runners using screws or bolts, number and size as required by the seismic design. Fixture accessories, including louvers, diffusers, and lenses shall have lock or screw attachments.

3.2.2.2 Surface-Mounted Fixtures

Surface-mounted fluorescent individual or continuous-row fixtures shall be attached to a seismic-resistant ceiling support system built in accordance with [ASTM E580/E580M][Section 09 51 00 ACOUSTICAL CEILINGS]. Seismic protection for the fixtures shall conform to the requirements of UFC 3-301-01.

3.2.3 Assembly Mounted on Outlet Box

A supporting assembly, that is intended to be mounted on an outlet box, shall be designed to accommodate mounting features on [100] [75] mm boxes, plaster rings, and fixture studs.

3.2.4 Wall-Mounted Emergency Light Unit

Attachments for wall-mounted emergency light units shall be designed and secured for the worst expected seismic disturbance at the site.

3.2.5 Lateral Force

Structural requirements for light fixture bracing shall be in accordance with Section 13 48 73 SEISMIC CONTROL FOR MECHANICAL EQUIPMENT.

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