

SECTION 13 08 00**SEISMIC RESTRAINT FOR NON-STRUCTURAL COMPONENTS****GENERAL****1.01 SECTION INCLUDES**

- A. Provide seismic restraint in accordance with the requirements of this section in order to maintain the integrity of nonstructural components of the building so that they remain safe and functional in case of seismic event.
- B. Definitions: Non-structural building components are components or systems that are not part of the building's structural system whether inside or outside, above or below grade. Non-structural components of buildings include:
 - 1. Architectural Elements: Facades that are not part of the structural system and its shear resistant elements; cornices and other architectural projections and parapets that do not function structurally; glazing; nonbearing partitions; suspended ceilings; stairs isolated from the basic structure; cabinets; bookshelves; medical equipment; elevators; and storage racks.
 - 2. Electrical Elements: Power and lighting systems; substations; switchgear and switchboards; auxiliary engine-generator sets; transfer switches; motor control centers; motor generators; selector and controller panels; fire protection and alarm systems; special life support systems; and telephone and communication systems.
 - 3. Mechanical Elements: Heating, ventilating, and air-conditioning systems; medical gas systems; plumbing systems; sprinkler systems; pneumatic systems; boiler equipment and components.

1.02 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
- C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.
- D. NFPA 13 - Standard for the Installation of Sprinkler Systems; 2016.
- E. OSSC - Oregon Structural Specialty Code; Current Edition.
- F. SMACNA (SRM) - Seismic Restraint Manual Guidelines for Mechanical Systems; Sheet Metal and Air Conditioning Contractors' National Association; 2008.

1.03 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete
- B. Section 04 20 00 - Unit Masonry
- C. Section 05 12 00 - Structural Steel Framing
- D. Section 05 40 00 - Cold-Formed Metal Framing
- E. Section 06 20 00 - Finish Carpentry
- F. Section 06 41 00 - Architectural Wood Casework
- G. Section 08 11 13 - Hollow Metal Doors and Frames
- H. Section 08 80 00 - Glazing
- I. Section 09 51 00 - Acoustical Ceilings
- J. Section 21 13 00 - Fire-Suppression Sprinkler Systems

- K. Section 23 05 48 - Vibration and Seismic Controls for HVAC
- L. Section 23 33 00 - Air Duct Accessories
- M. Section 26 05 19 - Low Voltage Electrical
- N. Section 26 22 10, Tap-out Control Systems.
- O. Section 26 32 14, Gas Engine Generators.
- P. Section 26 43 00 - Surge Protective Devices
- Q. Section 26 51 00 - Interior Lighting
- R. Section 27 15 00, Communications Horizontal Cabling.
- S. Section 28 46 00 - Fire Detection and Alarm

1.04 QUALITY CONTROL

- A. Shop-Drawing Preparation:
 - 1. Submit seismic-force-restraint shop drawings to the Structural Engineer of Record.
- B. Coordination:
 - 1. Do not install seismic restraints until seismic restraint submittals are approved by the Structural Engineer of Record.
 - 2. Coordinate and install trapezes or other multi-pipe hanger systems prior to pipe installation.

1.05 SUBMITTALS

- A. Submit a coordinated set of architectural components, mechanical and electrical equipment anchorage drawings prior to installation including:
 - 1. Description, layout, and location of items to be anchored or braced with anchorage or brace points noted and dimensioned.
 - 2. Details of anchorage or bracing at large scale with all members, parts brackets shown, together with all connections, bolts, welds etc., clearly identified and specified.
- B. Submit the appropriate ICC-ES evaluation reports for concrete anchors.
- C. Submit the appropriate seismic certification(s) in accordance with ASCE 7 Section 13.2.2.

PRODUCTS

EXECUTION

3.01 CONSTRUCTION, GENERAL

- A. The design of all components as listed following this section are to meet non-structural design criteria of the governing building code and performance objective as listed on the Structural Drawings.
- B. Provide equipment supports and anchoring devices to withstand the seismic design forces, so that when seismic design forces are applied, the equipment cannot displace, overturn, or become inoperable.
- C. Provide anchorages in conformance with recommendations of the equipment manufacturer and as shown on approved shop drawings and Construction Documents.
- D. Provide supports and anchoring so that, upon application of seismic forces, device remains fully connected as operable systems which will not displace sufficiently to damage adjacent or connecting equipment, or building members.

3.02 RESTRAINT AND BRACING FOR MECHANICAL AND ELECTRICAL EQUIPMENT AND ASSOCIATED SYSTEMS

- A. See requirements of Sections 21 00 00 through 28 00 00 for equipment, duct work, conduits, and other miscellaneous mechanical, electrical, or plumbing systems to be restrained or braced.

3.03 PARTITIONS

- A. In buildings with flexible structural frames, anchor partitions to only one structural element, such as a floor slab, and separate such partition by a physical gap from all other structural elements.
- B. Properly anchor masonry walls to the structure for restraint, so as to carry lateral loads imposed due to earthquake along with their own weight and other lateral forces.

3.04 CEILINGS AND LIGHTING FIXTURES

- A. Independently support and laterally brace all lighting fixtures.
- B. Ceilings shall be designed and installed in accordance with ASTM C636/C636M, ASTM E580/E580M, and ASCE 7 Section 13.5.6.

3.05 FACADES AND GLAZING

- A. Do not install concrete masonry unit filler walls in a manner that can restrain the lateral deflection of the building frame. Provide a gap with adequately sized resilient filler to separate the structural frame from the non-structural filler wall.
- B. Install attachments to structure for all façade materials as shown on construction drawings to ensure strength against applicable seismic forces at the project location.

3.06 STORAGE RACKS, CABINETS, AND BOOKCASES

- A. Install storage racks to withstand earthquake forces and anchored to the floor or laterally braced from the top to the structural elements.
- B. Anchor medical supply cabinets to the floor or walls and equip them with properly engaged, lockable latches.
- C. Anchor filing cabinets that are more than 2 drawers high to the floor or walls, and equip all drawers with properly engaged, lockable latches.
- D. Anchor bookcases that are more than 30 inches high to the floor or walls, and equip any doors with properly engaged, lockable latches.

3.07 DOORS REQUIRED FOR EMERGENCY SERVICES EGRESS

- A. Apparatus bay doors and components to be designed and connected to structure to accommodate the drift limits associated with the appropriate nonstructural performance level.

END OF SECTION 13 08 00

