



Division 230548

Vibration and Seismic Controls

DESIGN GUIDE

1 General

1.1 Acoustician

- A. When project has an acoustician, the Acoustician shall develop space vibration and sound criteria. In this circumstance, the required vibration and sound controls will be developed by the project acoustician and this section shall conform to the Acoustician's requirements.

1.2 Submittals-Seismic

- A. Provide submittal drawings for all seismic controls. Submittals shall include device dimensions, placement, attachment and anchorage requirements.
- B. Provide calculations for selection of seismic/wind restraints and their positive attachments, certified by a qualified professional engineer, licensed in the state/province of the project. Include seismic force loads.
- C. Stamped submittal package shall be project and product specific. Generic stamped calculations are not acceptable.
- D. Seismic force loads at attachments to the structure shall be approved by the project structural engineer.



2 Materials

2.1 Vibration Controls

- A. Section includes:
 - 1. Spring isolators
 - 2. Neoprene isolators
 - 3. Structural steel bases
 - 4. Inertia bases
 - 5. Flexible duct connectors
 - 6. Flexible pipe connectors
- B. Identify materials and types specific to the equipment and systems provided in the project and the project sound criteria.

2.2 Seismic Controls

- A. Central Washington has a relatively high Seismic Design Category requiring Seismic Controls on most projects. For example:
 - 1. Health Education (Permit 2021): SDC-D
 - 2. Health Sciences (Permit 2019): SDC-D
 - 3. Dugmore Hall (Permit 2018): SCD-D
 - 4. Discovery Hall (Permit 2014): SCD-D
- B. The engineer shall determine the project Seismic Design Category and equipment importance factor.
- C. The Division 22 and 23 project documents shall indicate the SDC and seismic criteria. Installation shall conform to the SDC category and the equipment important factor.



3 Execution

3.1 Installation-Vibration Controls

- A. These are basic requirements. If the project acoustician has more restrictive requirements, their requirements shall supersede these requirements.
- B. Installation
 - 1. Provide in accordance with manufacturer's instructions.
 - 2. Provide isolation for all motor driven equipment furnished in this project:
 - a. Exceptions:
 - 1) In-line circulating pumps
 - 2) Ceiling mounted exhaust fans
 - 3) Curb mounted roof exhausters
- C. Install spring hangers without binding.
- D. Connect wiring to isolated equipment with flexible hanging loop.
- E. Vibration Isolation Schedules:
 - 1. Flexible duct connectors:
 - a. Provide at connections to all air moving equipment unless noted otherwise on the drawings.
 - b. Ensure metal bands at connectors are parallel with minimum 1" flex between ductwork and the fan while running.
 - 2. Neoprene pad:
 - a. Provide continuous pad between each base mounted rail base and the floor/slab or housekeeping pad for base mounted equipment that is not mounted with external spring isolators.
 - 1) Equipment



- a) Air Handling Unit
 - b) Chillers
 - c) Condensing Unit
3. Hanging isolators:
- a. Provide at all connections to suspended fan coil units.
4. Base mounted isolators
- a. Provide for condensing units
 - b. Base mounted air moving equipment
 - 1) Exceptions:
 - a) Direct Drive fans situated in a fan array
 - b) Fans that are internally isolated.
 - c) Some direct drive Fan Wall construction that has very low vibration.
5. Flexible piping connections:
- a. Provide neoprene connectors at all base mounted pumps.
 - b. Provide braided hose connectors at all connections to isolated air moving equipment. Piping connectors made with hose connection kits in Section 232116 is exempt from this requirement.
 - c. Provide braided hose connectors at all pipe connections to chillers
 - d. Provide braided hose connectors at all pipe connections to condensing units
 - e. Provide braided hose connectors to all cooling towers.
 - f. Drain piping is excluded from the above requirements.
6. Inertia Base:



- a. Provide at all base mounted pumps on elevated slabs (not required for pumps located on slab on grade) (not required in central plants that do not have regular occupancy).

3.2 Installation-Seismic Controls

- A. Seismic controls shall not interfere with the performance of the vibration controls.

3.3 Seismic Inspection and Certification

- A. Provide for field inspections of seismic controls from agency independent from the contractor.
- B. After installation, the independent agency shall submit a certificate stating that systems are properly installed.

4 Appendix

4.1 Reserved for future.

