SECTION 22 05 48

VIBRATION CONTROLS

FOR PLUMBING PIPING AND EQUIPMENT

**PART 1 GENERAL**

1. **REFER TO SECTION 23 0548.**
2. Any additional verifications sound and noise improvement based on final site majors shall be taken into consideration as part of contractor scope of work

**PART 2 PRODUCTS**

1. **REFER TO SECTION 23 0548.**
2. **PERFORMANCE REQUIREMENTS**
3. General:
4. All vibration isolators, base frames and inertia bases to conform to all uniform deflection and stability requirements under all operating loads.
5. Steel springs to function without undue stress or overloading.
6. Steel springs to operate in the linear portion of the load versus deflection curve over deflection range of not less than 50 percent above specified deflection.
7. Lateral to vertical stiffness ratio to not exceed 0.08 with spring deflection at minimum 75 percent of specified deflection.
8. All equipment mounted on vibration isolated bases to have minimum operating clearance of 50 mm (2 inches) between the base and floor or support beneath unless noted otherwise.
9. **EQUIPMENT SUPPORT BASES**

A. Structural Bases:

1. Construction: Engineered, structural steel frames with welded brackets for side mounting of the isolators.
2. Frames: Square, rectangular or T-shaped.
3. Design: Sufficiently rigid to prevent misalignment or undue stress on machine, and to transmit design loads to isolators and snobbier.

B. Concrete Inertia Bases:

1. Construction: Engineered, steel forms, with integrated isolator brackets and anchor bolts, welded or tied reinforcing bars running both ways in a single layer.
2. Size: 152 mm (6 inches) minimum depth and sized to accommodate elbow supports.
3. Mass: Minimum of 1.5 times weight of isolated equipment.
4. Connecting Point: Reinforced to connect isolators and snobbier to base including template and fastening devices for equipment.
5. Concrete: Filled on site with minimum 20 ml. Pa (3000 psi) concrete. See Section 03 3000 for additional requirements.
6. **VIBRATION ISOLATORS**

A. Non-Seismic Type:

1. All Elastomeric-Fiber Glass Pads:
2. Configuration: Flat or molded.
3. Thickness: 6 mm (0.25 inch) minimum.
4. Assembly: Single or multiple layers using bonded, galvanized sheet metal separation plate between each layer with load plate providing evenly distributed load over pad surface.
5. Elastomeric Mounts:
6. Material: Oil, ozone, and oxidant resistant compounds.
7. Assembly: Encapsulated load transfer plate bolted to equipment and base plate with anchor hole bolted to supporting structure.
8. Steel Springs:
9. Assembly: Freestanding, laterally stable without housing.
10. Leveling Device: Rigidly connected to equipment or frame.
11. Restrained Steel Springs:
12. Housing: Rigid blocking during rigging prevents equipment installed and operating height from changing during temporary weight reduction.
13. Equipment Wind Loading: Adequate means for fastening isolator top to equipment and isolator base plate to supporting structure.
14. Elastomeric Hangers:
15. Housing: Steel construction containing elastomeric isolation element to prevent rod contact with housing and short-circuiting of isolating function.
16. Incorporate steel load distribution plate sandwiching elastomeric element to housing.
17. Spring Hanger:
18. Housing: Steel construction containing stable steel spring and integral elastomeric element preventing metal to metal contact.
19. Bottom Opening: Sized to allow plus/minus 15 degrees rod misalignment.
20. Combination Elastomeric-Spring Hanger:
21. Housing: Steel construction containing stable steel spring with elastomeric element in series isolating upper connection of hanger box to building structure.
22. Bottom Opening: Sized to allow plus/minus 15 degrees rod misalignment.
23. Thrust Restraints:
24. Housing: Steel construction containing stable steel spring and integral elastomeric element installed in pairs to resist air pressure thrusts.
25. Bottom Openings: Sized to allow plus/minus 15 degrees rod misalignment.
26. **ROOF CURBS**
27. Vibration Isolation Curbs:
28. Non-Seismic Curb Rail:
29. Location: Between existing roof curb and rooftop equipment.
30. Construction: Aluminum.
31. Integral vibration isolation to conform to requirements of this section.
32. Weather exposed components consist of corrosion resistant materials.
33. Non-Seismic Curb:
34. Location: Between structure and rooftop equipment.
35. Construction: Aluminum.
36. Integral vibration isolation to conform to requirements of this section.
37. Weather exposed components consist of corrosion resistant materials.
38. **PIPE RISERS**
39. PIPE ANCHORS
40. All-directional acoustical pipe anchor, consisting of two sizes of steel tubing separated by a minimum 1/2" (12mm) thick 60 diameter neoprene. Vertical restraint shall be provided by similar material arranged to prevent vertical travel in either direction. Allowable loads on the isolation material should not exceed 500 psi (.35 kg/mm2) and the design shall be balanced for equal resistance in any direction.
41. PIPE GUIDES

1. Pipe guides shall consist of a telescopic arrangement of two sizes of steel tubing

separated by a minimum 1/2" (12mm) thickness of 60 diameter neoprene. The height of the guides shall be preset with a shear pin to allow vertical motion due to pipe expansion or contraction. Shear pin shall be removable and raiser table to allow for selection of pipe movement. Guides shall be capable of "1 5/8" (41mm) motion, or to meet location requirements.

**PART 3 EXECUTION**

1. **REFER TO SECTION 23 0548.**

**END OF SECTION**