SECTION 23 05 48
VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

THE CONTRACTOR IS REFERRED TO THE "SPECIAL NOTICE TO CONTRACTORS SUMMARY FORM "THE "FORM OF PROPOSAL"; THE "FORM OF BID BOND"; "DIVISION 01 – GENERAL REQUIREMENTS" OF THE "CONTRACT SPECIFICATIONS"; THE "CONTRACT DRAWINGS" AND ALL AMENDMENTS AND ADDENDA THERETO; ALL OF WHICH GOVERN THE WORK OF THIS SECTION.

1.01 SECTION INCLUDES

A. Equipment support bases.

B. Vibration isolators.

C. Seismic restraints for suspended components and equipment.

D. Roof curbs.

1.02 RELATED REQUIREMENTS

A. Code-Required Special Inspections.

1.03 REFERENCE STANDARDS

A. ASHRAE (HVACA)- ASHRAE Handbook - HVAC Applications; 2015.

B. SMACNA (SRM)- Seismic Restraint Manual Guidelines for Mechanical Systems; Sheet Metal and Air Conditioning Contractors' National Association; 2008.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data:
   1. Provide manufacturer's product literature documenting compliance with PART 2 PRODUCTS.
   2. Include seismic rating documentation for each isolator and restraint component accounting for horizontal, vertical, and combined loads.

C. Shop Drawings:
   1. Provide schedule of vibration isolator type with location and load on each.
   2. Fully dimensioned fabrication drawings and installation details for vibration isolation bases, member sizes, attachments to isolators, and supported equipment.
   3. Include auxiliary motor slide bases and rails, base weights, inertia bases, concrete weights, equipment static loads, support points, vibration isolators, and detailed layout of isolator location and orientation with static and dynamic load on each isolator.
   4. Include selections from prescriptive design tables that indicate compliance with the applicable building code and the vibration isolator manufacturer's requirements.
   5. Clearly indicate the load and capacity assumptions selected. Include copies of any calculations.
   6. Include the calculations that indicate compliance with the applicable building code for seismic controls and the vibration isolator manufacturer's requirements.

D. Manufacturer's Instructions: Indicate installation instructions with special procedures and setting dimensions.

1.05 QUALITY ASSURANCE

A. Perform design and installation in accordance with applicable codes.

PART 2 PRODUCTS

2.01 2.01 MANUFACTURERS

A. Kinetics Noise Control, In: www.kineticsnoise.com.

B. Mason Industries: www.mason-ind.com.

C. Vibration Eliminator Company, Inc: www.veco-nyc.com.

D. Approved Equal.

2.02 PERFORMANCE REQUIREMENTS

A. General:
   1. All vibration isolators and base frames to conform to all uniform deflection and stability requirements under all operating loads.
   2. Steel springs to function without undue stress or overloading.
   3. All equipment mounted on vibration isolated bases to have minimum operating clearance of 2 inches between the base and floor or support beneath unless noted otherwise.

2.03 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 snubbers.
   4. Applications: Adjustable motor slide rails for centrifugal fans.

2.04 VIBRATION ISOLATORS

A. Seismic Type:
   1. Coil Springs Consisting of Single Elements:
      a. Housing: Manufactured from cast iron material.
      b. Ductile Material: Designed and rated for seismic applications.
      c. Spring: Restrained by housing without significant degradation of vibration isolation capabilities during normal equipment operating conditions.
      d. Resilient Snubbing Grommet System: Incorporated and designed with clearances of no more than 0.25 inch in any direction preventing direct metal-to-metal contact between supported member and fixed restraint housing.
      e. Resilient Pad: Located in series with spring.
      f. Coil Springs: Color coded elements to have a lateral stiffness greater than 0.8 times the rated vertical stiffness with 50 percent overload capacity.
      g. Finish: Suitable for the application.

2.05 SEISMIC RESTRAINTS FOR SUSPENDED COMPONENTS AND EQUIPMENT

A. Comply with:
   1. ASHRAE (HVACA) Handbook - HVAC Applications.
   2. SMACNA (SRM).

2.06 ROOF CURBS

A. Vibration Isolation Curbs:
   1. Seismic Curb:
      a. Location: Between structure and rooftop equipment.
      b. Construction: Steel.
      c. Integral vibration isolation to conform to requirements of this section.
      d. Snubbers consist of minimum 0.25 inch thick resilient pads to avoid metal-to-metal contact without compromising vibration isolating capabilities.
      e. Weather exposed components consist of corrosion resistant materials.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Install in accordance with manufacturer's instructions.

3.02 INSTALLATION - SEISMIC

A. Comply with:
   1. ASHRAE (HVACA) Handbook - HVAC Applications.
   2. SMACNA (SRM).

B. Floor and Base-Mounted Equipment, Vibration Isolated Equipment and associated Vibration and Seismic Controls for Connections:

C. Suspended Mechanical Equipment:

D. Ductwork:
   1. Provide seismic bracing for ducts with cross sectional area greater than 6 sq ft (independent of duct contents).

3.03 SCHEDULE

A. Equipment Isolation Schedule.
   1. Packaged Roof Top Make-Up Units.
      a. Base: Structural steel base.
      b. Isolator Type: Open Spring Isolators

END OF SECTION 23 05 48 23 05 48