

## 1. **General Information**

### 1.1 **Summary**

#### .1 Section Contents

- .1 Anti-vibration and earthquake-proof systems and devices and related installation methods.

### 1.2 **References**

- .1 Unless otherwise indicated, complete all work in accordance with the current edition of the "*Code de Construction du Québec*"
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Data Sheets (DS).
- .3 National Fire Protection Association (NFPA)
  - .1 NFPA 13 in effect, Standard for the Installation of Sprinkler Systems.

## 2. **Products**

### 2.1 **General information**

- .1 The dimensions and shape of the bases, in addition to the performance characteristics of the anti-vibration devices must be in accordance with the indications.

### 2.2 **Earthquake-proof systems and devices**

#### .1 General information

- .1 The equipment and / or systems as recommended by the seismic engineer must remain operational during earthquakes and after such phenomena:
- .2 The earthquake-proof systems and devices must be operational in all directions.
- .3 The attachments and bonding points must be able to withstand the same maximum loads as the earthquake-proof systems and devices.
- .4 The use of anchors and fasteners installed with a nail gun or in holes drilled for this purpose is prohibited.
- .5 No device, related support or bonding pad must yield before the frame yields.

- .6 The use of cast iron supports or threaded pipes is prohibited.
- .7 Earthquake-proof systems and devices must not interfere with the operation of the fire protection devices or compromise their integrity.
- .2 Static support material
  - .1 The equipment must be subject to supports / suspensions, which must be bonded to the building frame.
  - .2 Suspended equipment and devices
    - .1 One or more of the methods listed below may be used.
      - .1 Bonding in support on the frame.
      - .2 Bracing for all planes.
      - .3 Bracing for the frame.
      - .4 Protection provided by means of retaining cables.
    - .3 Earthquake-proof systems and devices
      - .1 The earthquake-proof systems and devices must be operational in flexibility and continuity.
      - .2 They should never be compressed to the point of losing their effectiveness.
  - .3 Material with elastic support (isolated against vibrations)
    - .1 Earthquake-proof systems and devices must not interfere with the action of acoustic and anti-vibration systems. During normal operation, the clearance between the equipment and the earthquake-proof devices must be 6 to 9 mm.
    - .2 Earthquake-proof devices must be incorporated in the anti-vibration systems with the aim of preventing any complete unloading of the latter.
    - .3 According to the indications.
  - .4 Piping networks
    - .1 Fire protection systems: In accordance with the NFPA 13 standard.
    - .2 All other piping networks: Suspensions longer than 300 mm must be braced.
    - .3 Earthquake-proof devices and systems must meet the requirements for pipe

anchoring and guidance.

.5 Bracing methods and devices

.1 Methods approved by the seismic engineer.

.2 Angles or bends made of structural steel.

.3 Cable restraint systems consisting of grommets, terminal lugs and other hardware for the alignment of seismic devices and preventing the bending of cables at the attachment points; with neoprene elements incorporated in the connections to reduce shock overloads.

**3. Execution**

**3.1 Manufacturer's instructions**

.1 Compliance: Comply with manufacturer's written requirements, recommendations, and specifications, including any available technical bulletins, instructions for handling, storing, and installing products, and data sheet instructions.

**3.2 Installation**

.1 Seismic protection measures must comply with the requirements of the NBC.

.2 Install the anti-vibration devices according to the manufacturer's instructions and adjust the pads so that the devices are level.

.3 Ensure that the connection of the piping, air ducts and wiring system to insulated units does not diminish the flexibility of the anti-vibration isolation system and that the piping or air ducts that pass through walls or floors do not transmit vibrations.

.4 Unless otherwise specified, support the piping connected to insulated units with pads or spring suspension(s) with static deformation of at least 25 mm. Comply with the following rules:

.1 Piping of nominal diameter up to and including DN 4: First 3 anchor points; DN 5 to DN 8: First 4 anchor points; DN 10 and over: First 6 anchor points.

.2 The first anchor point should have a static slump equal to twice the slump of the insulated appliance, but must not exceed 50 mm.

.5 When anti-vibration devices are bolted to the ground, use anti-vibration rubber washers.

.6 Level the bases with leveling pads and blocks so that the piping and air ducts can be connected to a device already at operating level before adjusting the anti-

vibration devices. Ensure that there is no contact between the insulated material and the building frame.

### **3.3 On-site quality control**

- .1 Controls performed on-site by the manufacturer
  - .1 Make the necessary arrangements with the manufacturer's representative to inspect the work referred to in this section and submit the written reports that confirm that they are in accordance with the requirements of the contract documents.
  - .2 Controls performed by the manufacturer on-site: The manufacturer must make recommendations as to the use of the products and visit periodically to verify the quality of the implementation with the following steps:
    - .1 Once the products are delivered and stored on-site;
    - .2 Once the preparatory work and other preliminary works have been completed, but before the installation work begins;
    - .3 Two (2) times during the progress of the works, which is to say once they have been completed at 25% and then at 60%;
    - .4 Once the work is complete.
  - .3 Submit the manufacturer's reports to the ministerial Representative and Engineer three (3) days after the site visit by the manufacturer's representative.
  - .4 If necessary, make corrections and adjustments required based on the written report submitted by the manufacturer.
- .2 Inspection and certification of earthquake-proof systems and devices
  - .1 A competent and experienced acoustic and vibration isolation engineer will measure HVAC equipment anti-vibration rate after commissioning and after completion of TAB operations, which will have been completed pursuant to Section 23 05 93 - HVAC network testing, adjustment and balancing.
  - .2 Notify the ministerial Representative and Engineer 24 hours before starting the tests.
  - .3 Evaluate the performance of the anti-vibration isolation equipment and systems used, the acceptability of noise levels in the occupied areas and, if necessary, recommend corrective actions (including establishing sound level curves).
  - .4 Submit the full test results report, including sound level curves.

### **3.4 Cleaning**

- .1 Once the installation and performance monitoring work is complete, remove excess materials, waste, tools and equipment from the construction site.

**END OF SECTION**