

Vibration Isolation and Seismic Control Manufacturer's Assn.
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SEISMIC RESTRAINT SPECIFICATION GUIDELINES FOR MECHANICAL, ELECTRICAL AND PLUMBING SYSTEMS

1.0 General

1.01 Related Work Specified Elsewhere

- 1) VISCMA 103-2007: Vibration Isolation Specification Guidelines for Mechanical, Electrical and Plumbing Systems
- 2) ***(Applicable Vibration Isolation portion of specs - fill in as required)***

1.02 Definitions and Referenced Standards

- 1) Building Codes: IBC-200x, ASCE7-xx, NBC-Canada, NFPA 5000, UBC, TI-809-04, Applicable State and Local Codes
- 2) NFPA-13: Installation of Fire Sprinkler Systems
- 3) FEMA: Federal Emergency Management Agency
- 4) FEMA Seismic Restraint Installation Manuals 412, 413 & 414
 - a) FEMA 412: Installing Seismic Restraints for Mechanical Equipment
 - b) FEMA 413: Installing Seismic Restraints for Electrical Equipment
 - c) FEMA 414: Installing Seismic Restraints for Duct and Pipe
- 5) A_v : Effective peak velocity related acceleration coefficient BOCA, SBC Code.
- 6) S_1 : Mapped Long Period Seismic Acceleration Coefficient IBC, TI-809-04, ASCE7.
- 7) S_s : Mapped Short Period Seismic Acceleration Coefficient IBC, TI-809-04, ASCE7.
- 8) v : Zonal Velocity Coefficient NBC-Canada
- 9) VISCMA: The Vibration Isolation and Seismic Control Manufacturers Association has developed Testing and Rating Standards for Seismic Restraint Components that comply with Code and ASHRAE based requirements.
- 10) VISCMA 102-2007: Static Qualification Standards for Obtaining a VISCMA Compliant Seismic Component Rating

- 11) ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.)
- 12) ASHRAE Applications Handbook; Seismic and Wind Restraint Design Chapter
- 13) ASHRAE Standard 171-2008: Method of Test for Seismic Restraints
- 14) Z: Seismic Zone defines Seismic Coefficient C_a used by UBC Code.

1.03 Performance Requirements

- 1) Mapped Ground Acceleration Coefficient (A_v , S_s , v or Z depending on Code = **X.XX**)
- 2) (If IBC or TI-809-04) Mapped Long Period Ground Acceleration Coefficient $S_1 = \mathbf{X.XX}$
- 3) Soil Type = S_a , S_b , S_c , S_d , S_e , S_f as appropriate. (If NBC Canada, the Foundation Factor)
- 4) Importance or Performance Factor appropriate to structure (UBC only)
 $I = \mathbf{X.XX}$
- 5) If UBC (Zone 4), Proximity to Fault (Near source factor, N_a) = \mathbf{X} km and, if less than 10km, Fault (Source) Type (A, B, C)
- 6) Equipment Schedule (IBC, TI-809-04, 97UBC) The Mechanical Engineer of record will provide a comprehensive Equipment Schedule indicating individual Equipment Importance factors, I_p (Including Equipment whose Importance factors, may be increased by proximity to critical components), Equipment Elevation both in the structure and (if floor mounted, relative to the floor), Roof Elevation and Structural Interface material (i.e.: anchored to concrete).
- 7) Schedule or Drawings indicating essential, life-safety or hazardous ($I_p=1.5$) Duct/Piping systems (Including systems whose Importance factor may be increased by proximity to essential, life-safety or hazardous components).

1.04 Submittals

- 1) Product Data: Include VISCMA Seismic Rating documentation for each seismically rated isolator or restraint component. Include ratings for horizontal, vertical and combined loads.
- 2) Shop Drawings shall include the following:
 - A) Design Calculations: Calculate requirements for selecting seismically-rated vibration isolators and seismic restraints. Certification documents to be signed and sealed by a qualified

Professional Engineer with at least 5 years experience in the design of seismic restraints.

- B) Vibration Isolation Bases: Dimensional drawings, including anchorage and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, base weights, equipment static loads.
- C) Seismic-Restraint Details: Detailed submittal drawings of seismic restraints and snubbers. Show anchorage details and indicate quantity, diameter, and depth of penetration, edge distance and spacing of anchors.
- D) Equipment Seismic Qualification Certification: The Equipment Manufacturer or other parties accepting responsibility for the seismic qualification of the equipment must submit certification that each piece of provided equipment will withstand the seismic force levels identified in "Performance Requirements" above. Include the following:
 - (1) Basis for Certification: Indicate whether the "withstand" certification is based on actual test of assembled components, on calculations or on historic data.
 - (2) Indicate the equipment is certified to be durable enough to:
 - a) structurally resist the design forces and/or;
 - b) remain functional after the seismic event.

(Note: The IBC and TI-809-04 Codes require critical equipment [That with $I_p = 1.5$] to remain functional after the design seismic event.)
- E) Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
- F) Detailed description of the specified equipment anchorage devices on which the certification is based.

1.05 Coordination

- 1) Coordinate size, shape, reinforcement and attachment of all housekeeping pads supporting seismically restrained equipment. Concrete shall have a minimum compressive strength of 3000 psi or as specified.
- 2) Coordinate with seismic restraint manufacturer to locate and size structural supports underneath seismically restrained equipment (e.g. roof curbs, cooling towers and other similar equipment).

1.06 Description of System

- 1) It shall be understood that the requirements of this seismic restraint section are in addition to other requirements as specified elsewhere for the support and attachment of equipment and mechanical services, and for the vibration isolation of same equipment. Nothing on the project drawings or specifications shall be interpreted as justification to waive the requirements of this seismic restraint section.
- 2) The work under this section shall include furnishing all labor and materials, and performing all operations necessary for the complete execution of the installation of seismic restraint assemblies specified in this section.
- 3) All seismic restraint assemblies shall meet the following minimum requirements:
 - A) The snubber/restrained isolator for isolated equipment shall include a resilient element that will ensure that no un-cushioned shock can occur (excluding cable restraints).
 - B) It shall be possible to visually inspect the resilient snubbing material for damage and allow for replacement, if necessary.
 - C) All snubbers to include a maximum air gap of 0.25" (6mm).
 - D) Seismic restraint system shall be designed to offer seismic restraint in all directions.
 - E) Seismic restraint capacities to be verified by one of the following methods:
 - 1) An NRTL (Nationally Recognized Testing Laboratory), or laboratory recommended by VISCMA.
 - 2) Certified by a registered Professional Engineer with at least five years of experience, using industry standard methods of analysis, which employ common engineering practices. Adherence to the ratings standard within VISCMA 102-2007 is required.
 - 3) Certified by a qualified registered Professional Engineer with at least five years of experience, using ASHRAE Standard 171-2008 and VISCMA 102-2007.
 - 4) By a nationally recognized agency, such as VISCMA, that has reviewed and approved the restraint.

1.07 System Design

- 1) Seismic restraint manufacturer shall be responsible for the structural design of attachment hardware as required to attach snubbers/restraints to both the equipment and supporting structure on vibration isolated

equipment, or to directly attach equipment to the building structure for non-isolated equipment.

- 2) The contractor shall furnish to the seismic restraint manufacturer, a complete set of approved shop drawings of all equipment which is to be restrained, from which the selection and design of seismic restraint devices and/or attachment hardware will be completed. The shop drawings furnished shall include, at a minimum, basic equipment layout, length and width dimensions, and installed operating weights of the equipment to be restrained.
- 3) All piping and ductwork is to be restrained to meet code requirements. At a minimum, the seismic restraint manufacturer shall provide documentation on maximum restraint spacing for various restraint sizes and anchors, as well as 'worst case' reaction loads for each restraint and/or anchor size.
- 4) The contractor shall ensure that all housekeeping pads used are adequately reinforced and are properly dowelled to the building structure, so as to withstand calculated seismic forces. In addition, the size of the housekeeping pad is to be coordinated with the seismic restraint manufacturer to ensure that adequate edge distances exist in order to obtain desired equipment anchor capacities.

1.08 Installation

Installation of all seismic restraint materials specified herein shall be accomplished following the manufacturer's written instructions. Installation instructions shall be submitted to the engineer of record for approval prior to the beginning of the work.

2.0 Materials

2.01 Source of Materials

- 1) The materials and systems specified in this section may be purchased from a VISCMA member.
- 2) Anchor types and sizes are to be per the design data as provided by the seismic restraint manufacturer.
- 3) Materials and systems specified herein and detailed or scheduled on the drawings are not specific to any one VISCMA member. Materials and systems provided must meet all requirements as listed in this specification.

2.02 Factory Finishes

All products shall be provided with a finish suitable for the application.

2.03 Seismic Restraint Types

Vibration Isolator / Snubber Types contained herein are per ASHRAE Applications Handbook, "Seismic and Wind Restraint Design" Latest Edition, where applicable. All restraining systems and devices shall be designed to meet the performance requirements of Section 1.03 without failure. Friction resulting from gravity shall not be included as a basis of design. See Appendix A for manufacturers' model designations.

1) Type A: Coil Spring Isolator Incorporated Within a Cast Iron or Cast Aluminum Housing

Cast iron or aluminum housings have the potential to be brittle when subjected to seismic loading. If used, these shall be of ductile materials designed for and rated in seismic restraint applications.

2) Type B/C/D: Coil Spring Isolator Incorporated Within a Steel Housing

- A) Spring isolators shall be seismically restrained, incorporating single or multiple coil spring elements, having all of the characteristics of free standing coil spring isolators as specified in the vibration isolation portion of this specification. Springs shall be restrained using a housing, without significantly degrading the vibration isolation capabilities of the spring during normal equipment operating conditions.
- B) Vibration isolators shall incorporate a steel housing and resilient snubbing grommet system designed with clearances of no more than 0.25" (6 mm) in any direction and to prevent any direct metal-to-metal contact between the supported member and the fixed restraint housing. In addition to the primary isolation coil spring, the isolator will include a resilient pad in series with the spring(s).
- C) Spring elements shall be color coded or otherwise easily identified. Springs shall have a lateral stiffness greater than 0.8 times the rated vertical stiffness and shall be selected to provide a 50% overload capacity. All springs shall be provided with a finish suitable for the application.

3) Type E: All-Directional Elastomeric Isolator

- A) Vibration Isolators shall be elastomeric, molded from oil, ozone and oxidant resistant compounds, designed to operate within the strain limits of the isolator to provide the maximum isolation and longest life expectancy possible. Isolators shall include an encapsulated load transfer plate for bolting to equipment and a base plate with anchor holes for bolting to

the supporting structure. Cast iron or aluminum housings have the potential to be brittle when subjected to seismic loading. If used, these shall be of ductile materials being designed for and rated in seismic restraint applications.

- B) Isolator shall have minimum operating static deflections as shown on the project Vibration Isolation Schedule or as otherwise indicated in the project documents and shall not exceed published load capacities.

4) Type F: All-Directional External Seismic Snubber Assembly

- A) Equipment shall be restrained against excessive movement during a seismic event by the use of all-directional resilient snubbers, designed to withstand the project-required seismic forces. A minimum of three (3) snubbers are to be used for each equipment installation, oriented to properly restrain the isolated equipment in all directions.
- B) Snubbers shall be of interlocking steel construction and shall be attached to the building structure and equipment in a manner consistent with anticipated design loads. Snubbers shall limit equipment movement at each snubber location to a maximum of 0.25" (6 mm) in any direction.
- C) Snubbers shall include a minimum 0.25" (6 mm) thick resilient pad to cushion any impact and to avoid any potential for metal-to-metal contact. Snubber shall be installed without significantly degrading the vibration isolation capabilities of the isolator during normal equipment operating conditions.

5) Type G: Lateral External Seismic Snubber Assembly

- A) Stable equipment (where uplift forces are zero or are addressed by other restraints) may be restrained against excessive lateral movement during a seismic event by the use of lateral resilient snubbers, designed to withstand the project-required seismic forces. A minimum of three (3) snubbers are to be used at each equipment installation, oriented to effectively restrain the isolated equipment in all lateral directions.
- B) Snubbers shall be of steel construction and shall be attached to the building structure and equipment in a manner consistent with anticipated design loads. Snubbers shall limit equipment movement at each snubber location to a maximum of 0.25" (6 mm) in any direction.
- C) Snubbers shall include a minimum 0.25" (6 mm) thick resilient pad to cushion any impact and to avoid any potential for metal-to-metal contact. Snubber shall be installed without significantly degrading the vibration isolation capabilities of the isolator during normal equipment operating conditions.

6) Type H: Omni-Directional External Seismic Snubber Assembly

- A) Equipment may be restrained by the use of omni-directional resilient snubbers, designed to withstand the project-required seismic forces. A minimum of four (4) snubbers are to be used at each equipment installation, oriented to effectively restrain the isolated equipment in all lateral directions.
- B) Snubbers shall be of steel construction and shall be attached to the building structure and equipment in a manner consistent with anticipated design loads. Snubber clearances shall be limited to a maximum of 0.25" (6 mm) in any direction.
- C) Snubbers shall include resilient pads with a minimum thickness of 0.25" (6 mm) to cushion any impact and to avoid any potential for metal-to-metal contact. Snubber shall be installed without significantly degrading the vibration isolation capabilities of the isolator during normal equipment operating conditions.

7) Type I: Horizontal Single-Axis External Seismic Snubber Assembly

- A) Stable equipment (where uplift forces are zero or are addressed by other restraints) may be restrained against excessive lateral movement during a seismic event by the use of horizontal single-axis resilient snubbers, designed to withstand the project required seismic forces. A minimum of four (4) snubbers are to be used at each equipment installation, oriented to effectively restrain the isolated equipment in all lateral directions.
- B) Snubbers shall be of steel construction and shall be attached to the building structure and equipment in a manner consistent with anticipated design loads. Snubber clearances shall be limited to a maximum of 0.25" (6 mm) in any direction.
- C) Snubbers shall include resilient pads with a minimum thickness of 0.25" (6 mm) to cushion any impact and to avoid any potential for metal-to-metal contact. Snubber shall be installed without significantly degrading the vibration isolation capabilities of the isolator during normal equipment operating conditions.

8) Type J: Cable Restraints for Suspended Components and Systems

- A) Seismic wire rope cable restraints shall consist of steel wire strand cables, sized to resist project seismic loads to restrain suspended components and systems in all lateral directions.
- B) Protective thimbles should be used to eliminate potential for dynamic cable wear and strand breakage, if required.

- C) Restraint system shall be sized to the capacity of the cable or to the capacity of the anchorage, whichever is less. Anchor load is to be calculated taking into account the geometry of the bracket.
- D) Seismic wire rope connections shall be made using overlapping wire rope “U” clips, cable clamping bolts, swaged sleeves or seismically rated tool-less wedge insert lock connectors.
- E) Vertical suspension rods shall be braced as required to avoid potential for buckling due to vertical compression forces. Braces shall be selected to be of sufficient strength to prevent support rod buckling. Brace shall be attached to the vertical suspension rod by a series of attachment clips.
- F) Where clevis hanger brackets are used for seismic restraint attachment, the cross bolt shall be fitted with internal bracing to prevent deformation of the clevis hanger.

9) Type K: Rigid Restraints for Suspended Components and Systems

- A) Rigid restraints shall consist of structural elements, sized to resist project seismic loads to restrain suspended components and systems in all lateral directions.
- B) Structural element shall be capable of carrying both compressive and tensile loading.
- C) Restraint system shall be sized to the capacity of the cable, or to the capacity of the anchorage, whichever is less. Anchor load is to be calculated taking into account the geometry of the bracket.
- D) Anchorage of static support system shall be capable of carrying the additional tension loads generated by the compression of the rigid brace. This is the vertical component of the compressive force in the brace. This load is additive to any static load requirements on the system.
- E) Vertical suspension rods shall be braced as required to avoid potential for buckling due to vertical compression forces. Braces shall be selected to be of sufficient strength to prevent support rod buckling. Brace shall be attached to the vertical suspension rod by a series of attachment clips.
- F) Where clevis hanger brackets are used for seismic restraint attachment, the cross bolt shall be fitted with internal bracing to prevent deformation of the clevis hanger.

10) Type L: Roof Curbs (Non-Isolated)

- A) Curbs or fabricated equipment piers used to attach rooftop equipment to the structure shall be of steel construction and shall be attached to the equipment as specified by the manufacturer.

- B) Contractor is responsible for proper seismic attachment of rooftop curb to building structure.
- C) Contractor is responsible for coordinating the location of adequate structural support for the rooftop curb with the general contractor.
- D) Wind Barriers or other shields fastened to building structure shall be ignored when evaluating the capacity of the curb and attachment system.
- E) Components exposed to the weather shall be galvanized or manufactured out of corrosion resistant materials.

11) Type M: Roof Curbs (Isolated)

- A) Curbs or fabricated equipment piers used to attach rooftop equipment to the structure shall be of steel construction and shall be attached to the equipment as specified by the manufacturer.
- B) Contractor is responsible for proper seismic attachment of rooftop curb to building structure.
- C) Contractor is responsible for coordinating the location of adequate structural support for the rooftop curb with the general contractor.
- D) Wind Barriers or other shields fastened to building structure shall be ignored when evaluating the capacity of the curb and attachment system.
- E) Curbs or piers shall be fitted with snubbers capable of resisting all anticipated design load conditions. Snubber clearances in all planes shall be limited to a maximum of 0.25" (6 mm) in any direction.
- F) Snubbers shall include a minimum 0.25" (6 mm) thick resilient pad to cushion any impact and to avoid any potential for metal-to-metal contact. Snubber shall be installed without significantly degrading the vibration isolation capabilities of the isolator during normal equipment operating conditions.
- G) Components exposed to the weather shall be galvanized or manufactured out of corrosion resistant materials.

3.0 Installation, Execution and Inspection

3.01 Installation

- 1) Installation of all seismic restraint materials specified in this section shall be as per the manufacturer's written instructions.
- 2) Refer to FEMA Manuals 412, 413 and 414 for typical industry standard installation guidelines.

- 3) Upon completion of installation of all seismic restraint materials and before start up of restrained equipment, all debris shall be cleaned from beneath all protected equipment, leaving equipment free to contact snubbers.
- 4) All external utility connections to restrained equipment shall be designed to allow differential seismic motion without damage to the equipment or utility connections.
- 5) Adjust isolators and restraints after piping systems have been filled and equipment is at its operating weight, following manufacturer's written instructions.
- 6) After equipment installation is completed, adjust limit stops following manufacturer's written instructions so they are out of contact during normal operation.
- 7) Adjust snubbers according to manufacturer's written instructions.
- 8) Torque anchor bolts according to anchor manufacturer's written instructions to resist seismic forces.

3.02 Execution

- 1) Attach piping to the trapeze per seismic restraint manufacturer's design. Install cables so they do not bend across sharp edges of adjacent equipment or building structure.
- 2) Install vertical braces to stiffen hanger rods and prevent buckling per seismic restraint manufacturer's design. Clamp vertical brace to hanger rods. Requirements apply equally to hanging equipment. Do not weld vertical braces to rods.
- 3) If mounting hole diameter exceeds bolt diameter by more than 0.125" (3 mm), reduce clearance in hole with epoxy grout, flanged elastomeric bushings or welded washer.
- 4) Housekeeping Pads must be adequately reinforced and adequately sized for proper installation of equipment anchors. Refer to seismic restraint manufacturer's written instructions.

3.03 Inspection

- 1) The contractor shall notify the local representative of the seismic restraint manufacturer prior to installing any seismic restraint devices. The contractor shall seek the representative's guidance in any installation procedures with which the counselor is unfamiliar.
- 2) Upon completion of the installation of all seismic restraint devices herein specified, the local representative of the seismic restraint manufacturer shall, at the contractor's request, inspect the completed system and report in writing any installation errors or other fault in the system which could affect the performance of the system.

- 3) The installing contractor shall submit a report upon request to the building architect and/or engineer, including the manufacturer's representative's final report, indicating that all seismic restraint material has been properly installed, or list steps are to be taken by the contractor to properly complete the seismic restraint work as per the specifications.

4.0 Seismic Restraint for Piping, Ductwork and Conduit

4.01 Piping

- 1) Seismically restrain all piping listed below, using Type J, Cable Restraints or Type K, Rigid Bracing.
 - A) Natural gas piping, medical gas piping, vacuum piping, petroleum based liquid piping, and compressed air piping equal to or greater than 1" (25 mm) inside diameter or if more stringent, in compliance with local code standards.
 - B) Any piping that is deemed critical and must remain functional at the conclusion of a seismic event ($I_P = 1.5$) except as exempted by code requirements. (IBC or TI-809-04)
 - C) Any piping, if it were to fail, would result in damage to a critical piece of equipment or building function ($I_P = 1.5$). (IBC or TI-809-04)
- 2) Brace remainder of piping to code requirements. (IBC or TI-809-04)
- 3) Fire protection, sprinkler piping and related equipment are considered as "Life Safety Equipment" and are to be seismically restrained per guidelines as published by NFPA (National Fire Protection Association), or per IBC requirements; whichever governs.

4.02 Ductwork

- 1) Seismically restrain all ductwork listed below, using Type J, Cable Restraints or Type K, Rigid Bracing.
 - A) All rectangular and oval ducts with cross sectional area equal to or greater than 6 sq. ft. (0.55 sq. meters).
 - B) All round ducts with diameters equal to or greater than 32" (812 mm).
 - C) Any ductwork, which is deemed critical and must remain functional at the conclusion of a seismic event ($I_P = 1.5$) except as exempted by code requirements. (IBC or TI-809-04)
 - D) Any ductwork, which if it were to fail would result in damage to a critical piece of equipment or building function ($I_P = 1.5$). (IBC or TI-809-04)

- 2) Brace remainder of ductwork to code requirements. (IBC or TI-809-04)

4.03 Conduit (Including Cabletrays and Raceways)

Seismically restrain all electrical conduit listed below. Use Type J, Cable Restraints or Type K, Rigid Bracing for all conduit including:

- A) All conduit or busses weighing more than 10# per linear foot.
- B) Any buss duct or conduit 1" in diameter or greater and having an $I_p = 1.5$.
- C) Any conduit or buss duct, which if it were to fail would result in damage to a critical piece of equipment or building function ($I_p = 1.5$). (IBC or TI-809-04)

**Appendix A.
Seismic Snubber Type And Manufacturer**

Seismic Snubber Type	Seismic Product Description	Product Manufacturer	VISCMA Member Model(s)
A	Coil Spring Isolator Incorporated Within A Ductile Iron Or Cast Aluminum Housing	CalDyn/California Dynamics	RJ, TJ
		Kinetics Noise Control	
		M.W. Saussé & Co., Inc.	N/A
		Mason Industries, Inc.	SSLFH
		Thybar Corporation	
		TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	OSTSM
		The VMC Group	AEQM
B	Coil Spring Isolator Incorporated Within a Steel Housing	CalDyn/California Dynamics	JQ, DL
		Kinetics Noise Control	FHS
		M.W. Saussé & Co., Inc.	RMU-EQ
		Mason Industries, Inc.	SLR
		Thybar Corporation	
		TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	KWSR
		The VMC Group	ASCM
C	Coil Spring Isolator Incorporated Within A Steel Housing	CalDyn/California Dynamics	JQ, DL
		Kinetics Noise Control	FLS, FLSS, FTS, FTSS
		M.W. Saussé & Co., Inc.	RMLS-EQ
		Mason Industries, Inc.	SLRS
		Thybar Corporation	
		TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	KWSR
		The VMC Group	CTER, AWRS, AWMR
D	Coil Spring Isolator Incorporated With Integral Seismic Restraint	CalDyn/California Dynamics	JQ, DL
		Kinetics Noise Control	FMS
		M.W. Saussé & Co., Inc.	RMLS-EQ
		Mason Industries, Inc.	SLRS
		Thybar Corporation	
		TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	OSTSM
		The VMC Group	SWSR

Seismic Snubber Type	Seismic Product Description	Product Manufacturer	VISCMA Member Model(s)
E	All Direction Elastomeric Isolator	CalDyn/California Dynamics	TYPE JQ-TQN
		Kinetics Noise Control	RQ, KRMS
		M.W. Saussé & Co., Inc.	FUD-EQ, FF-EQ
		Mason Industries, Inc.	RBA, RCA, BRA, BRB, BRC, BRD
		Thybar Corporation	
		TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	368SRS, 368SRD, SM
F	All Direction 3-Axis External Seismic Snubber Assembly	The VMC Group	RSM, MB, SRVD, RDC
		CalDyn/California Dynamics	RL-A, RL-C
		Kinetics Noise Control	HS-5, FMS
		M.W. Saussé & Co., Inc.	SR-3200
		Mason Industries, Inc.	Z-1225
		Thybar Corporation	
		TOLCO	
		Unistrut Corporation	
G	Lateral 2-Axis External Seismic Snubber Assembly	Vibration Eliminator Co., Inc.	ADR
		The VMC Group	ERX, SR
		CalDyn/California Dynamics	RL-A, RL-C
		Kinetics Noise Control	HS-2
		M.W. Saussé & Co., Inc.	SR-3500
		Mason Industries, Inc.	
		Thybar Corporation	
		TOLCO	
H	Omni-Directional 3-Axis External Seismic Snubber Assembly	Unistrut Corporation	
		Vibration Eliminator Co., Inc.	
		The VMC Group	ER
		CalDyn/California Dynamics	RL-A, RL-C
		Kinetics Noise Control	
		M.W. Saussé & Co., Inc.	SR-3200
		Mason Industries, Inc.	Z-1011
		Thybar Corporation	
I	Horizontal 1-Axis External Seismic Snubber Assembly	TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	HCS
		The VMC Group	SR
		CalDyn/California Dynamics	RL-A, RL-C
		Kinetics Noise Control	HS-1
		M.W. Saussé & Co., Inc.	SR-1000
		Mason Industries, Inc.	

Seismic Snubber Type	Seismic Product Description	Product Manufacturer	VISCMA Member Model(s)
J	Cable Restraints For Suspended Components and Systems	CalDyn/California Dynamics	
		Kinetics Noise Control	KSCU
		M.W. Saussé & Co., Inc.	CBK
		Mason Industries, Inc.	SCB
		Thybar Corporation	
		TOLCO	990, 991, 990H, 991H
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	SC
		The VMC Group	SCR, SB, LRC
K	Rigid Restraints For Suspended Components and Systems	CalDyn/California Dynamics	
		Kinetics Noise Control	KSCA
		M.W. Saussé & Co., Inc.	RBK
		Mason Industries, Inc.	SSB
		Thybar Corporation	
		TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	
		The VMC Group	SAB
L	Roof Curbs (Non-Isolated)	CalDyn/California Dynamics	N/A
		Kinetics Noise Control	
		M.W. Saussé & Co., Inc.	SRC
		Mason Industries, Inc.	RRC
		Thybar Corporation	TC-3, TC-5, TC3-MBD
		TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	VERSC, SQRC
		The VMC Group	P6000
M	Roof Curbs (Isolated)	CalDyn/California Dynamics	MW, YW
		Kinetics Noise Control	ESR, KSR, KSCR, KineticsCurb
		M.W. Saussé & Co., Inc.	VIC-EQ, VIC-EQ-SS
		Mason Industries, Inc.	RSC
		Thybar Corporation	Vibro-Curb, Vibro-Mate
		TOLCO	
		Unistrut Corporation	
		Vibration Eliminator Co., Inc.	VERC
		The VMC Group	R6200, R6300, RTIC

**THIS GUIDELINE WAS
DEVELOPED BY THE MEMBERS
OF**



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