

**Expansion Joint Guide Specifications**

Specifier Note: The purpose of this guide specification is to assist the specifier in correctly specifying expansion joint products and incorporating quality assurance measures to ensure a successful installation. The specifier needs to edit the guide specifications to fit the needs of specific projects.

Contact an MM Systems Expansion Joint Specialist to assist in appropriate product selections and specification development.

Email Contact: ProductSpecialist@mm-usa.com or Phone: 706-824-7500

MM SYSTEMS

50 MM Way

Pendergrass GA 30567

Attn: National Product Specialist

Throughout the guide specification, there are Specifier notes to assist in editing of the file.



To view non-printing **Editor's Notes** that provide guidance for editing, toggle the “Paragraph” button to open and close.

The specifier needs to select project specific requirement where Brackets [ ]; “AND/OR”; and “OR” have been used to indicate when a selection is required.

SPECIFICATION

**Sections 07 95 13.16**

 **Vertical Seismic Sealing System - VSS Series**

 **(**Water Resistant Vertical Expansion Joint Sealing System)

# PART 1 – GENERAL

* 1. WORK INCLUDED
1. The work shall consist of furnishing and installing vertical expansion joints capable of accommodating thermal and seismic movement in accordance with the details shown on the plans and the requirements of the specifications. The expansion joint assembly must utilize elastoprene rubber seals that snap-lock into aluminum wall frames mounted to the structural vertical joint opening.
2. Related Work
* Section 07 71 29 Roof Expansion Joints
* Section 07 91 00 Preformed Joint Seals
* Section 07 95 13.13 Interior Expansion Joint Cover Assemblies
* Section 07 95 13.16 Exterior Expansion Joint Cover Assemblies
* Section 07 95 13.19 Parking Expansion Joint Cover Assemblies
	1. DEFINITIONS (specifier can add actual joint gap values in A through E below)
1. Nominal Joint Width – the width of the linear opening based on an average mean temperature of 60 degrees Fahrenheit (15 degrees Celsius).
2. Maximum Thermal Joint Width – widest linear structural joint opening expected for normal thermal contraction of the structure.
3. Maximum Seismic Joint Width – widest linear structural joint opening expected during a seismic event.
4. Minimum Thermal Joint Width – narrowest linear opening expected for normal thermal expansion of the structure.
5. Minimum Seismic Joint Width – narrowest linear opening expected during a seismic event without damaging the structure.
6. Total Movement Capability – value obtained from the difference between the widest and narrowest joint opening expressed in inches (or millimeters).
	1. ACTION SUBMITTALS
7. Standard Submittal Package – submit typical expansion joint placement drawing(s) indicating pertinent dimensions, general construction, expansion joint locations, joint opening dimensions, and product information.
8. Sustainable Design Submittals
9. Recycled Content – provide product data for recycled content indicating post-consume and pre-consumer recycled content.
10. Samples – submit 3D virtual samples demonstrating expansion joint movement and its functioning components thereby fostering an eco-friendly alternative that complies with US Green Building Council initiatives.
11. Independent Third-party Analysis – submit independent ASTM-E1399 analysis from a licensed professional engineer in State of [list state] confirming compliance for cyclical movement requirements along with minimum and maximum specified joint movement capability.

## Quality AssurancE

1. Pre-construction Meeting – the General Contractor, Engineer/Architect, Concrete Subcontractor, Manufacturer’s Representative and Certified Contractor, will conduct a pre-construction meeting to discuss joint gap construction, joint gap settings, construction phasing and quality assurance.
2. Joint Opening Adjustment – the General Contractor shall consult with the Project Engineer to adjust the nominal joint opening the day of substrate construction. Provide a temperature adjustment table with expansion joint openings calculated in five (5ºF) degree increments based on a temperature range of [-20ºF to 120ºF / adjust for project] to allow for proper joint sizing.
3. Pre-installation Inspection – the General Contractor, Engineer, Architect, Manufacturer’s Representative and Certified Installer, will conduct a pre-installation project site inspection. The General Contractor shall provide a field report that summarizes the project conditions and any remedial action necessary to correct field conditions (substrate, joint size, non-parallel sidewalls, vertical offsets, etc.) that may affect expansion joint system performance.
4. Mockups – build one mockup for each expansion joint style as specified herein to demonstrate aesthetic standards and to set quality standards for materials and execution. Minimum 10-feet for each. Approval of mockups does not constitute acceptance of deviations. Use step-by-step layering method thereby exposing individual components to establish the quality standard for specific joint type installation. Subject to compliance, approved mockup may become part of completed work. (Mockups should remain in place until the end of the project to allow installers to reference proper concrete preparation, proper joint opening dimensions, and acceptable tolerances)
5. Inspect representative areas of Work and discuss condition of substrate and other preparatory work performed by other trades.
6. Review Contract Document requirements and approved submittals.
7. Review inspection and testing requirements.
8. Evaluate environmental conditions and procedures for managing unfavorable site conditions.
9. Resolve deviations or differences between existing site conditions, Contract Documents, and the Manufacturer's Specifications.
10. General Contractor to document deviations and remediation agreements and then prepare and issue a Quality Assurance Field Report to all parties.
11. Experience – the installer shall provide proof of certification from manufacturer and proof of participation in manufacturer’s continuing education program.

(proper training is the key to the process of understanding minimum substrate standards for a proper expansion joint installation)

## COORDINATION

##  (Expansion joints are typically one of the last purchases on a construction project. However, proper joint opening construction is one of the first quality control items on a project. By selecting the expansion joint manufacturer at the beginning of the project the necessary quality assurance measures can be implemented in a timely manner.)

1. General Contractor shall award expansion joint contract prior to substrate construction to allow quality control coordination as described in section 1.04.
2. Schedule for work in this section shall be planned to allow sufficient time for submittals to be approved and timely production and delivery by manufacturer.
3. General Contractor to coordinate installation of products and systems with interfacing and adjoining construction to provide a suitable and quality installation.
4. Installation Contractor working with the General Contractor shall ensure project wind load requirements are communicated to the expansion joint manufacturer prior to production.

## PRODUCT Delivery, Storage, and Handling

* 1. Deliver products to site in manufacturer’s original, unopened, labeled containers and store under cover in a dry location until installed.
	2. Inspect materials upon arrival. Notify manufacturer within two business days of any damage caused during delivery and handling.
	3. Store components in original containers off the ground in a clean and dry location. Ensure temperature or moisture sensitive components are stored in a tempered location.
	4. General Contractor to provide protective covering on all installed finished surfaces. Protection is required to guard against damage during construction.

## WARRANTY

1. The Manufacturer and Certified Installer jointly warrant to the Owner that the expansion joint system shall be free from manufacturing, material, and installation defects for a period of one (1) year from the date of installation, based on specified movements and design conditions and when installed in accordance with manufacturer’s guidelines and recommendations. The General Contractor assumes responsibility for deficiencies due to concrete and substrate defects.

## PART 2 – PRODUCT

* 1. MANUFACTURER
1. Furnish and install expansion joints as noted in specifications and as indicated on drawings as manufactured by MM Systems, 50 MM Way, Pendergrass, GA, 30567 Phone 800.241.3460 / www.designassist@mm.systems / Web www.mm.systems
2. Basis of Design (Product Standard) – Contract Documents are based on project specific designs by MM Systems as specified to establish a standard of quality. Other manufacturers offering products having equivalent characteristics may be considered for future projects.
3. Single Source Limitations – obtain all expansion joints from single manufacturer.

(Single source responsibility provides essential coordination of loading, waterproofing and life safety fireproofing requirements)

* 1. GENERAL
1. Furnish basis of design VSS Series - Vertical Seismic Sealing System as manufactured by MM Systems.
2. Provide water resistant vertical seismic expansion joint sealing system that meets the necessary thermal movement requirements and can accommodate seismic movement.
3. System shall consist of a continuous elastoprene primary rubber visual seal and a secondary moisture barrier that snap locks into aluminum mounting frames. Seismic applications with joint widths 7-inch and wider shall utilize a pantograph-centering control device. The rubber seal must include steel reinforced splice connections.

(Seismic pantograph control devices are utilized on sizes 7-inches and larger to ensure the expansion joint opens equidistantly throughout the movement cycle and are spaced a maximum of 24 inches apart)

1. Select the system size at each joint location based on the movement and design requirements that meet the project specification or as defined by the structural engineer of record.
2. The Certified Installer must provide written confirmation, utilizing manufacturer’s product data ensuring the model and size selected will comply with and accommodate expansion, contraction, displacement, and lateral shear throughout the full movement cycle.

(Historically, 80% of joint sizing problems are a result of the lack of coordination during the initial construction of the structural joint opening. The ideal time to measure the joint opening is at the coldest temperature when the joint is at its widest point. Confirming the as-built dimensions will allow for proper sizing of the expansion joint assembly.)

* 1. Components and Materials

(Elastoprene is a theromplastic rubber with specailly formulated additives providing enhanced elasticity and UV resistance)

1. Visual ELASTOPRENE Rubber Seal – material shall be a flexible, extruded thermoplastic elastoprene rubber compound exhibiting the physical properties listed in the table below. The seal design shall have locking lugs that snap into aluminum mounting frames.

 Property Requirement ASTM Method

Tensile Strength 1000 psi (+75/-0) D412

 Ultimate Elongation 445% D412

Hardness, Shore A 65 +/- 3 pts. D2240

Tear Strength 140 pli / 24.5 kN/m @ 23°C D624

 58 pli / 10.2 kN/m @100°C D624

Compression set

168 hrs. 25% @ 23°C D395

 168 hrs. 38% @ 100°C D395

Ozone Resistance No Cracks D1149

UV Resistance Very Good

Brittle Point -76°F(-60°C) D746

1. Secondary Moisture Barrier - elastomeric moisture barrier shall be designed utilizing a serpentine configuration allowing maximum movement and flexibility. Provide side lugs that mechanically lock into the corresponding aluminum frames. Joint widths 7-inch and wider with pantograph centering assemblies shall utilize a Lexsuco Moisture Barrier System.
2. Mounting Frame - snap lock design designed to conform to properties of ASTM B221, alloys 6063-T5, 6005A-T6, 6061-T6.
3. Accessories - provide necessary assembly hardware required for complete installation.
	1. Life Safety – Fire Barrier Systems (as required)
4. Provide PyroFlex Fire Barrier Systems (PF Series), as manufactured by MM Systems. Supply fire-resistive barrier systems that have ratings equal to or greater than the rating of adjacent construction when tested in accordance with ASTM E1966 and ASTM E119. Provide specified (2, 3 or 4 hour) rated fire barrier expansion joint assembly.
5. Designed for specified dynamic structural movement without material degradation or fatigue when tested according to ASTM E 1399. Tested in maximum joint width condition with a simulated field splice.
6. Fire Barrier System shall have been tested to the maximum joint opening as defined by ASTM E1399 which meets or exceeds the maximum joint opening required by the project design requirements.
7. Must be tested and listed by a nationally accredited independent testing laboratory in accordance with UL 2079, or ASTM E1966. Include hose stream test where applicable.
	1. Fabrication
8. Elastoprene Rubber Seal - ship in the longest practical continuous length coiled on manufacturer’s standard reel or in cartons.
9. Secondary Moisture Barrier - ship in the longest practical continuous length on manufacturer’s standard reel or in cartons.
10. Aluminum Mounting Frame - ship in standard 10 ft. lengths and shall be cut to length at jobsite where required. All profiles shall be miter cut in the field to conform to directional changes unless otherwise contracted with expansion joint manufacturer. All anchor holes shall be field drilled in accordance with manufacturer’s drawings. Spacing shall be a maximum of 18” o.c.
11. Pantograph Centering Control Device (where required) - provide factory assembled equidistant centering mechanisms ready for field installation.
12. Fire Barriers (as required) - ship manufacturer’s standard assembly for the required hourly rating with ends prepared for field splicing. Assemblies shall be miter cut in the field to accommodate changes in direction.
	1. Finishes
13. Elastoprene rubber seal shall be supplied in standard colors black, beige, or gray.
14. Contact manufacturer for custom colors or color matching to match the project requirements. (customer color matching is available to meet project specific requirements)
15. Aluminum mounting frames shall be supplied in standard mill finish.

## PART 3 – EXECUTION

* 1. Installation
1. Preparation of the Work Area
2. The contractor shall provide properly formed and sized expansion joint openings constructed to the exact dimensions shown on manufacturer’s standard system drawings or as shown on the contract drawings.
3. The contractor shall insure that the joint opening sidewall interfaces run parallel to each other for the entire length of the joint. Sidewalls should be plumb, and interfaces must be continuously equidistant from each other across the joint width to accommodate the proper installation of the expansion joint sealing system.
4. The contractor shall provide proper and adequate adjacent construction to receive and support the vertical expansion joint system. The supporting framework shall be of proper design to rigidly secure all anchors and hardware to insure proper installation and function of the joint system.
5. Installation of Vertical Expansion Joint System
6. Refer to Manufacturers Installation Guide for step-by-step instructions.
7. Attach aluminum wall frames to substrate using required hardware. Apply silicone or polyurethane sealant (supplied by installer) to seal the back side of the frame to the wall substrate.
8. Uncoil the seal and allow it to relax to relieve any temporary coiling from shipment packaging. The seal shall be cut to the correct length without pulling or exerting excess tension.
9. Field Seal Splices and Mitered Directional Changes – provide steel pin reinforced directional changes for 90° corners, tees, and crosses. Utilize Elastobond Activator and Rubber Splice Adhesive to ensure that all external webs of the seal profile are properly bonded at all splice locations.
10. Apply silicone or polyurethane sealant (supplied by installer) intermittently per the manufacturer’s instructions into the snap-lock cavities.
11. Insert seal into the snap-lock lugs of the aluminum wall frames. Utilize blunt installation tool to properly position the seal.
12. After proper positioning of the seal, clean all excess sealant around the edges and top of the joint.

(contact MM for link to Install Videos and / or for date of the next Contractor Certification College where specifiers and installers are welcome to attend)

* 1. Clean and Protect
1. Protect the system and its components during construction by work from other trades.
2. Where required, install temporary protection over joints.
3. Do not remove protective coverings until finish work in adjacent areas is complete.
4. Prior to project closeout, clean exposed surfaces with a suitable cleaner that will not harm or attack the finish of the concrete or system.

END OF SECTION