



Installation Instructions

SJS-FP (Seismic Joint System, For Plaza Decks and Split Slabs)

IMPORTANT!

Do not install this material until all members of your crew have read and understand these instructions.

If any of the crew do not understand any part of these instructions call EMSEAL:
USA & Canada: 1-800-526-8365 or 508-836-0280

This product can only fulfill its design function if it has been correctly selected and correctly installed. This means that joint width (after allowance for concrete shrinkage and post-tensioning shortening where applicable), total joint movement and expected loads must have been considered and accounted for.

These installation instructions are generic and may need adapting to suit specific project requirements and unique conditions. Consult EMSEAL if necessary.

The SJS-FP SYSTEM is a silicone bellows/coverplate system that is adhered to the faces of steel-and-aluminum retainer legs into which are locked side flashing sheets for watertight integration with buried split-slab or plaza-deck waterproofing membranes.

The installation of the SJS-FP occurs over six stages:

STAGE 1: Installation of the FP retainer legs onto the structural slab as well as the installation of the FP flashing sheets.

STAGE 2: Installation of the SJS-FP foam/spline assemblies into the FP retainer legs.

STAGE 3: Sealing and closing of the FP capping system

STAGE 4: Integration of the side sheets into the deck waterproofing membrane system .

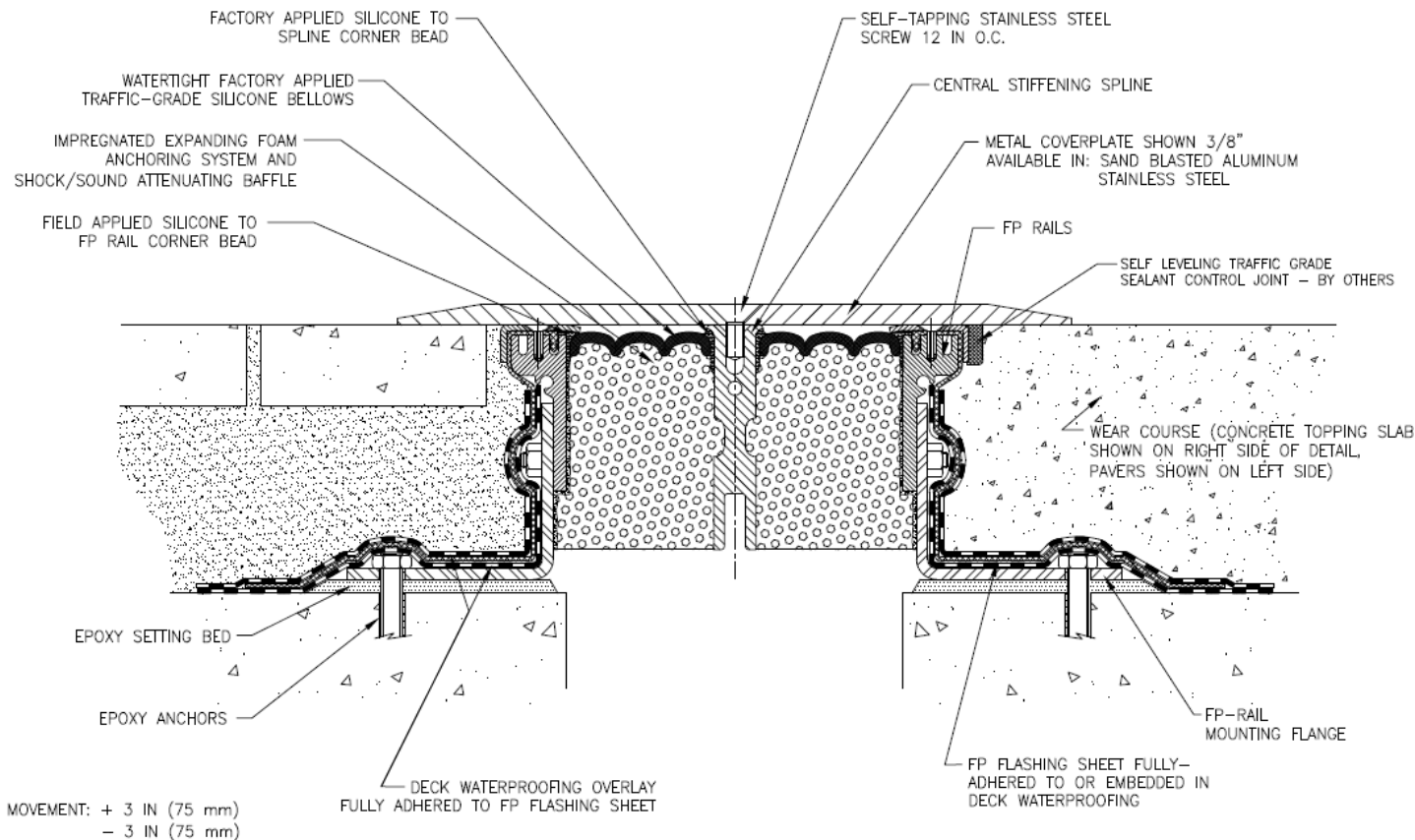
STAGE 5: Installation of the wear course (pavers, topping slab, etc.) and installation of the optional EMBRETE elastomeric nosing material.

STAGE 6: Installation of the SJS coverplates.



Please contact EMSEAL with any job-specific installation questions (1-800-526-8365 or 508-836-0281).

STANDARD SYSTEM COMPONENTS



EQUIPMENT LIST:

In addition to a reliable power source, normal tools of the trade and safety equipment as required by the installing contractor's internal safety program and in compliance with industry standards and local, state and federal safety requirements, the following material and equipment must be on-site before the EMSEAL Technician arrives or before installation can begin:

<p>Crew A crew of 4 is typical when installing this system but could vary with the size and complexity of the job.</p> <p>For Welding Rubber: IMPORTANT: <i>If you are planning to, or will need to, field-weld any of the rubber components, be sure to order an on-loan weld-kit from EMSEAL.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> On-loan weld kit from EMSEAL <p>For Cutting, Drilling, Screwing, Fastening:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 4-inch angle grinder(s) <ul style="list-style-type: none"> <input type="checkbox"/> Diamond cup blade(s) for concrete <input type="checkbox"/> thin "cut-off" blade(s) for metal <input type="checkbox"/> "Zek" wheel pads or 20-grit sanding disks (<i>for abrading EMCRETE elastomeric nosing material</i>) <input type="checkbox"/> "Sawz-All" <ul style="list-style-type: none"> <input type="checkbox"/> long and short metal cutting blades for sawz all <input type="checkbox"/> min. 2 ea - Hammer Drills with depth guides <ul style="list-style-type: none"> <input type="checkbox"/> min. 6 ea - Hammer drill bits, 3/8-inch diameter, suitable for masonry/concrete <input type="checkbox"/> compressed air blower with small gauge extension tube (<i>for blowing out anchor holes</i>) <input type="checkbox"/> standard commercial-grade high-speed cordless drills <u>with adjustable torque settings</u> <ul style="list-style-type: none"> <input type="checkbox"/> drill index with sizes 1/32-inch to 1/2-inch minimum <input type="checkbox"/> high-speed, 3/4-inch, metal countersink bits <input type="checkbox"/> 5mm (13/64") and 8mm (5/16") high speed drill bits (<i>for preparing new holes in rails and caps at cuts</i>) <input type="checkbox"/> 6mm taps (<i>for re-tapping the capping-strip screw holes after you cross-thread a few of them</i>) <input type="checkbox"/> min. 6 ea – 7/32-inch hex bit socket drill drivers (3/8-inch drive) <input type="checkbox"/> 3/8-inch socket adapters (for use in drills) <input type="checkbox"/> small hand-held metal (fine-toothed) file (<i>for removing metal burrs after cutting</i>) <input type="checkbox"/> minimum 6 ea - #3 screw-gun bits <input type="checkbox"/> Torque-Wrench--long-handled 3/8-inch socket with adapter to accept #3 screw-gun tip Note: torque wrench must accurately read as low as 60 in-lbs (5.2 ft-lbs; 7 Nm) and as much as 240 in-lbs (20 ft-lbs; 27Nm)--(<i>for final torque setting on capping strip and cover plate screw</i>). <input type="checkbox"/> 1/4" diameter Awl <p>For Cutting Foam:</p> <ul style="list-style-type: none"> <input type="checkbox"/> long-bladed, serrated, chef's knife (or bread knife), or <input type="checkbox"/> hack saw 	<p>For Mixing and Spreading:</p> <ul style="list-style-type: none"> <input type="checkbox"/> heavy duty electric, plug-in, low speed - high torque drill for mixing thick epoxy <ul style="list-style-type: none"> <input type="checkbox"/> min. 2 ea - 3-inch diameter paddle mixers <input type="checkbox"/> min. 2 ea - 1 1/2" diameter "jiffy mixers" <input type="checkbox"/> minimum 6 ea - 2" margin trowels <input type="checkbox"/> Clean or unused, 5-gal or larger, plaster/paint pails to mix epoxy, hold cleaning solvents, etc. <p>For Forming EMCRETE Nosing Material: <i>(if being used in your installation)</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> 2-inch Duct Tape (Total quantity 3-times the joint length) for wrapping the Styrofoam to aide release from nosing material <input type="checkbox"/> Rolls of red construction paper (<i>at least twice as much as joint footage, to mask off deck and to create a masked mixing area</i>) <p>For Gunning and Tooling:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 20-oz sausage caulk guns (<i>for silicone</i>) <ul style="list-style-type: none"> <input type="checkbox"/> Sausage-gun nozzles (cones) <input type="checkbox"/> 10-oz cartridge caulk guns (<i>for anchor epoxy</i>) <input type="checkbox"/> min. 3 ea. - 3/4" caulk knives <input type="checkbox"/> Utility knives <p>Other Miscellaneous Tools and Materials:</p> <ul style="list-style-type: none"> <input type="checkbox"/> heavy hammer (<i>3-pound--to tap end of spline to set spline pins at opposite end of stick</i>) <input type="checkbox"/> 2 - plastic spray bottles, (<i>1 bottle with solvent, and (1 bottle with clean water)</i>) <input type="checkbox"/> Duct tape <input type="checkbox"/> levels, 2-foot, 4-foot and torpedo-level <input type="checkbox"/> 100-foot tape measure <input type="checkbox"/> combination square <input type="checkbox"/> chalk box with chalk <input type="checkbox"/> flat bar and small pry bar <input type="checkbox"/> rubber mallet <input type="checkbox"/> 5-gal pail of (Acetone* or effective alternative solvent) <input type="checkbox"/> box of clean, dry, lint-free, cloth rags <input type="checkbox"/> vise grips (2-pair) <input type="checkbox"/> shop Vac <input type="checkbox"/> extension cords with 4-way box <input type="checkbox"/> 2 - 9/16" open-end wrenches and/or 9/16" deep drive sockets & ratchets <p>*Solvents mentioned or referred to are toxic and flammable. Observe solvent manufacturer's precautions and refer to MSDS, as well as local and federal requirements for handling and use.</p>
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STAGE 1: Installation of FP Retainer Legs (rails) and Flashing Sheets

The principle used in this installation method for setting the height of the FP System is to tap the mounting flanges of the FP rails down into a wet epoxy-mortar setting bed until the top surface of the joint is at the desired elevation relative to the finished wear-course level.

Check that sufficient height between the top of the structural slab (or curb cast onto and pinned into the structural slab) and finished elevation of the topping exists to accommodate the specific FP model being installed. There should be enough room to accommodate the height of the FP System ordered plus at least 1/4 - 3/8-inch (6-9mm) of setting bed.

ALSO, be sure to pay attention to the details as they related to coverplate configuration. Coverplates can be installed on top of the finished wear course, or in concrete topping slabs recessed in blockouts so that the top of the plates are at the same elevation as the rest of the topping slab.

STEP 1: Prepare Deck Surface

Using a grinder or blaster, clean and prepare a 6" wide strip on either side of the joint gap (or if a curb is being cast on which to seat the SJS-FP, similarly prepare the top surface of the curb). The resulting concrete surface must be clean, dry, and free of all dirt and contaminants and must be the correct depth below the finished wear course level.

Thoroughly blow clean the deck surface and at least 5-feet of the adjacent work area along the entire joint length.

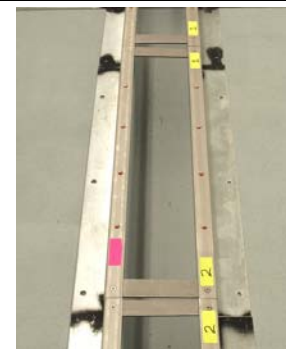
Any significant unevenness in the deck surface or spalling at the joint edge must be repaired with a suitable patching material using proper shelf geometry for spall repair.

STEP 2: Lay Out the Joint

Lay out the FP rails onto the deck and over the joint-gap so you can become acquainted with the system.

IMPORTANT: Factory-Fabricated Transitions

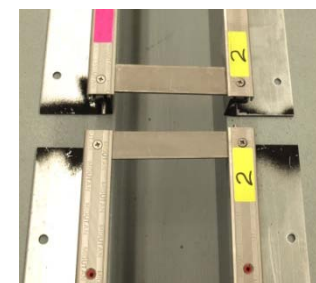
If your job contains factory-fabricated transitions such as tees, flat 90's, upturns or downturns, these are fixed points and must be installed first. Before continuing with these instruction read *"SJS-FP Addendum 1—Installing Transitions in SJS-FP SYSTEM"* beginning on Page 19.



The system is supplied with the rails clamped together by metal spacers at a distance near the midpoint of its movement range. Installation at temperatures other than mean seasonal temperature may necessitate on-site adjustment. Consult EMSEAL or the owner's responsible engineer before proceeding.

DO NOT REMOVE CLAMPING SPACERS BETWEEN RAILS UNTIL TOLD TO DO SO LATER IN THESE INSTRUCTIONS.

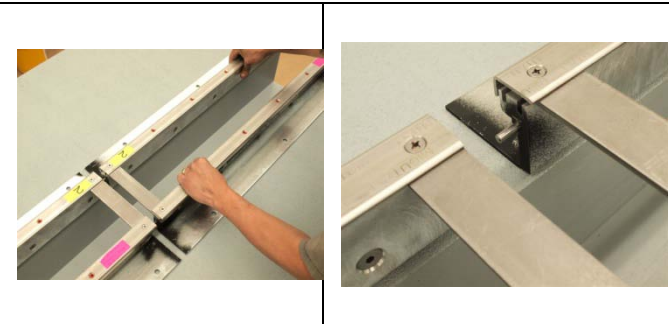
Each length is 4 meters or 13.12 ft (approximately 13'-1 7/16") long. IF ends are marked with a number that is in sequence with the number of the preceding length. Lay the lengths down, end to end, matching-number to matching-number.



Positive alignment between lengths is made by mating the factory-installed stainless steel joining pins between each length.

Push sections with matching numbers together ensuring that the stainless-steel pins are properly seated.

TIP: Sometimes the metal pins will not align easily. To fix this loosen the screws in the capping strips that hold the clamping spacers. This will give you some 'play' to help with pin alignment. Once aligned, retighten the screws.



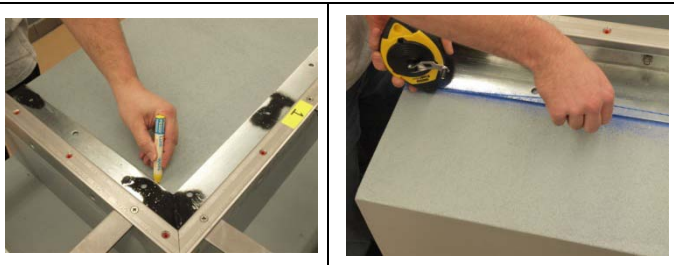
Continue the above process along the entire length of the expansion joint system.

Check length of final piece(s) and mark for cutting.

NOTE: Where rails are cut leaving more than 3-inches (75mm) of undrilled mounting flange and stainless steel cap it will be necessary to drill and tap new holes to accommodate hardware.

STEP 3: Mark Setting Bed Location

Mark the edge of the mounting flanges with a lumber crayon or chalk line (*this is the line to which you will install the setting-bed epoxy*).



STEP 4: Mark Irregularities in the Decks










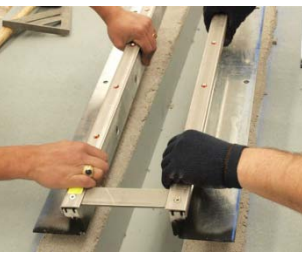

Inspect the area under the joint looking for dips, bumps and other irregularities in the deck surface. In these locations you will need more or less epoxy setting bed. Mark these locations with a lumber crayon so you can apply the epoxy mortar as needed to achieve the desired finished system height and so the rails are fully supported everywhere.

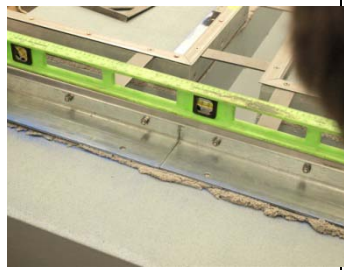
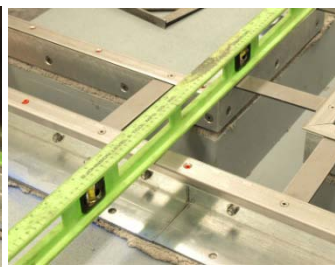

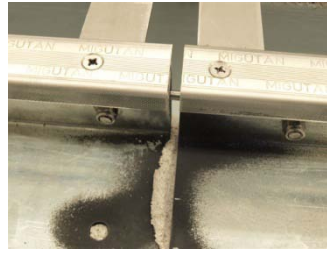


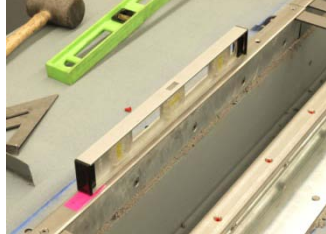
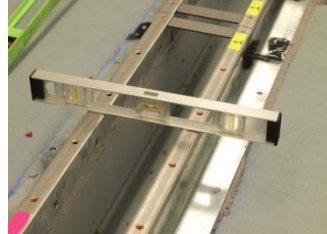


STEP 5: Mix Setting Bed Epoxy Mortar

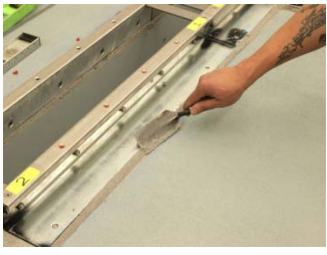

Use the SIKADUR 31 Hi-Mod Gel mixed with sand supplied by EMSEAL to make an epoxy-mortar:

Lift lid-tabs, remove lids, and transfer contents of Part-A and Part-B to a clean, empty 5-gallon mixing pail.






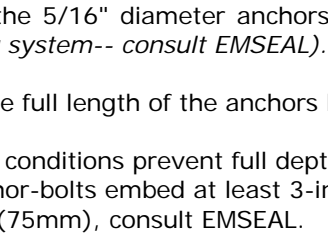
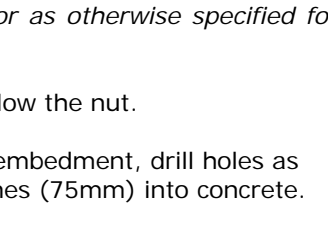

<p>Using heavy-duty mixing drill and 3-inch diameter mixing paddle, blend the epoxy and sand to a uniform gray color.</p> <p>Be sure to scrape up and down against the sides of the pail to incorporate all of the material.</p>			
<p>Open 3-bags of sand add them gradually to the mix, blending each fully into the epoxy.</p> <p>Transfer mixed epoxy to smaller pails to slow down cure time and to make more manageable working pails.</p>			
<p>STEP 6: Lay Setting Bed</p> <p>Lay epoxy-mortar setting bed approximately <u>3/8-inch (9mm) thick*</u> and about 1/2" (12mm) wider than your chalk line on both sides of joint gap.</p> <p><i>*except as needed to address irregularities in the deck or to achieve desired finished height.</i></p>			
<p>The setting bed must be of consistent thickness across and lengthwise. Ensure that there are no voids that would leave the rails unsupported at any point.</p> <p>TIP: mark a screwdriver or stick with duct-tape, 3/8-inch (6mm) from the tip to use as a depth gauge</p>			
<p>STEP 7: Solvent Wipe Bottom of Mounting Flanges</p> <p>Turn the rails over and solvent wipe the mounting flanges to remove all contaminants.</p> <p>Set rails aside being careful not to re-contaminate them.</p>			
<p>STEP 8: Lower Rails into Wet Setting Bed</p> <p>Place the first length of FP rails into the wet, epoxy-mortar setting bed.</p> <p>Tap the system down into the setting bed until the upper surface is at the required elevation and the rails are level.</p> <p>Ensure that the flanges are fully embedded in the wet epoxy and that no hollow areas exist beneath the flanges.</p>			




<p>STEP 9: Level Rails</p> <p>Using a level, make sure the joint is level side to side and lengthwise*.</p> <p>Use a rubber mallet to drive the rails into the wet epoxy mortar to achieve the desired elevation and to level the rails.</p> <p><i>*or to match slope in deck for drainage as designed</i></p>		
<p>STEP 10: Install Next Rail Length</p> <p>Position the next length of FP rail making sure it is interlocked with the previous section.</p> <p>Alignment between lengths is made with stainless steel pins set into one end of the rails. Insert the pins into the holes of the adjoining piece. TIP: Sometimes the metal pins will not align easily. To fix this loosen the screws in the capping strips that hold the clamping spacers. This will give you some 'play' to help with pin alignment. Once aligned, retighten the screws.</p>		
<p>Ensure that joints are properly executed to achieve proper appearance and performance. There should be no gaps between adjoining capping strips.</p> <p>Tap the ends of the rails to achieve proper alignment and remove any epoxy that prevents the legs from coming together.</p>		
<p>Repeat procedure until final section is reached.</p> <p>Install final section by lifting previous section slightly until the sections can be interlocked.</p>		
<p>Ensure that all sections are level from side to side and along and the joint*.</p> <p><i>*or to match slope in deck for drainage as designed</i></p>		
<p>Using a margin trowel remove epoxy that squeezed out from under the mounting flanges into the joint.</p> <p>Use the extra material to pack and fill in voids under the mounting flanges</p>		

<p>Tool epoxy along the outer edges of the mounting flanges into a cant-strip to make a ramp for the deck waterproofing material.</p> <p>Allow epoxy-mortar setting bed to cure in accordance with the epoxy manufacturer's recommended curing times shown on the pails.</p>	
<p>Clean your epoxy trowels, mixers, etc. in buckets using solvent and a wire brush.</p> <p>TIP: Cleaning tools while the epoxy is still wet will save a lot of time.</p>	

STEP 11: Drill Anchor Holes

IMPORTANT: DO NOT drill anchor holes until the setting bed epoxy has hardened sufficiently to be drillable.






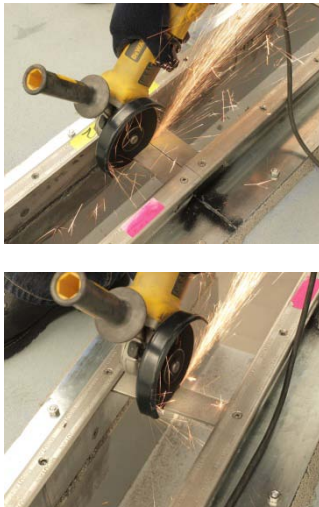


<p>Using one of the threaded-rod anchors with a nut screwed flush to the top as a guide; mark the shank of the drill-bit for the correct anchor-hole depth.</p>				
<p>Drill 3/8" diameter holes for the 5/16" diameter anchors (or as otherwise specified for the particular job or anchoring system-- consult EMSEAL).</p> <p>Drill holes to a depth to suit the full length of the anchors below the nut.</p> <p>NOTE: If obstructions or other conditions prevent full depth embedment, drill holes as appropriate ensuring that anchor-bolts embed at least 3-inches (75mm) into concrete. For depths less than 3-inches (75mm), consult EMSEAL.</p>				

<p>Vacuum dust piles from around holes. Blow dust from inside the holes using a forced-air blast and then vacuum again.</p> <p>TIP: a shop-vac on "blow" will work for this.</p>			
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STEP 12: Install Epoxy Anchors

Prepare all the threaded-rod anchors by screwing nuts onto one end.

<p>The two-component anchor epoxy is supplied in 10-oz caulk tubes with static mixing nozzles. Install the cartridge into a cartridge caulk gun, remove the cap and cut off the wire-tie-off. Screw a static mixing nozzle onto the cartridge</p>			
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<p>Gun epoxy through the static mixing nozzle into a pail or garbage can until a uniform light-gray color is achieved</p> <p>Inject anchor epoxy into holes</p> <p>CAUTION: pay attention to the cure times chart on the anchor-epoxy cartridge and the temperature at time of installation. Anchors MUST be placed into wet epoxy. Don't get too far ahead.</p>		
<p>Install anchors into wet epoxy</p> <p>Spin anchor once 360° to ensure epoxy completely surrounds and coats the anchor.</p>		
<p>Remove excess epoxy from around the nut that might obstruct tightening later.</p> <p>Allow epoxy to cure according to chart(s) on epoxy cartridge.</p>		
<p>STEP 13: <u>After Setting-Bed Epoxy is CURED, Cut Through Clamping Spacers to allow free movement</u></p> <p>IMPORTANT! If at the end of the day you have installed the rails into setting bed and/or anchored the rails using the threaded rod anchors, you must cut through the clamping spacers between the two sides of each rail using a grinder with metal cutting "cut-off" blade.</p> <p>THIS IS IMPORTANT BECAUSE AS THE TEMPERATURE DROPS OVERNIGHT, THE JOINT WILL OPEN AND WILL SERIOUSLY DAMAGE THE METAL COMPONENTS IF THEY REMAIN RIGIDLY CONNECTED TOGETHER.</p>		
<p>STEP 14: Tighten Nuts</p> <p>With anchors secured in cured epoxy, tighten the nuts onto the mounting flanges.</p> <p>IMPORTANT: In cases where anchors protrude above the nut, cut off excess anchor height and grind to remove any sharp edges that might damage waterproofing membrane. DO NOT cut holes in flashing sheets to go over protruding anchors.</p>		
<p>STEP 15: Remove Stainless Steel Capping Strips and Spacers</p> <p>Before you can install the SJS-FP foam and spline assembly, you must remove the stainless steel capping strips and the clamping spacers.</p> <p>IMPORTANT: Label the locations of the capping strips so that they can be reinstalled in the same locations. Do not mix them up, as the pre-drilled holes in the retainer caps may not line up with the holes in the rails.</p>		

STEP 16: Remove Shipping Gaskets and Plugs

Remove rubber filler strips from “reglets” in top of rails and remove plastic plugs from the capping strip holes in the top of the rails.



STEP 17: Install Rubber Flashing Sheets

Roll out flashing sheets along the edges of the joint.

Press locking rib into inner groove (closest to the joint-gap) on rail.

(NOTE: the outer groove is not used with SJS Systems and will be overlapped by the side flashing sheet).

Tap the sheet with a rubber mallet to ensure the locking rib is securely seated



STAGE 2: INSTALLING THE FOAM/SPLINE ASSEMBLY INTO THE FP RETAINER LEGS

Start at one end being sure to make the termination point watertight using a factory-fabricated termination, or field-executed transition to one of EMSEAL's vertical-plane products. In cases where the joint ends at the end of the slab such that water drains off the joint, be sure to coat the exposed foam end with silicone—CONSULT EMSEAL.

STORAGE and HANDLING:

The SJS-FP Foam/Spline assembly comes pre-assembled, pre-compressed to less than the joint size, and with “hanger-bars” pre-attached.

NOTE: The precompressed foam in the SJS-FP system will expand faster when hot and slower when cold.

On hot days Above 80°F (26°C):

Keep the material in its cardboard shipping cartons, out of direct sunlight (preferably on an intermediate, shaded deck. If no shade is available on a really hot day, keep the material inside an air-conditioned job van, or open the lids of the shipping cartons and lay bags of ice over the material. This will give you more working time.

On cold days Below 41°F (5°C):

If it is sunny out, open the cartons and set the material in the sun. Or, keep the material in a heated job-van or tent until immediately prior to use.



STEP 18: Mix Epoxy Adhesive

EMSEAL 820 epoxy adhesive may be used in the 41°F (5°C) to 95°F (35°C) temperature range.


Using a trowel, transfer the entire contents of Part B (hardener) into the contents of Part A (base).

Mix the material thoroughly with a drill and mixing paddle. Scrape the walls and bottom of the container to ensure uniform and complete mixing.

Mix to a uniform gray color with no black or white streaks.


Ensure that the mixed epoxy adhesive is applied to the substrate before the pot life has expired (10 - 30 minutes depending on the ambient temperature).





<p>STEP 19: Apply Epoxy Adhesive to Faces of FP Legs and Concrete</p> <p>Apply a thin coat (no more than 1/16" thick) to both joint faces to a depth of 6-inches (150mm)—be sure to extend epoxy between parapet or split column faces of transitions to upturns.</p> <p>WARNING: Epoxy will harden more quickly when left in the pot--get it onto the joint face as soon as possible.</p> <p>The epoxy must still be wet when installing the SJS-FP foam and spline assembly into the joint-opening.</p> <p>If the epoxy cures before installing the SJS-FP then reapply new epoxy. If work is interrupted for more than 2 hours after initial cure then grind the old epoxy and apply new wet epoxy.</p> <p>IMPORTANT: While one or more workers are applying epoxy to the joint faces, others must prepare the SJS-FP foam/spline assemblies.</p>	
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STEP 20: INSTALL a "Starter Piece" of SJS-FP Foam/Spline Assembly

Starter pieces are custom configured and have a "soft end" where the center spline stops short and the last six to eight inches is foam only.

<p>STEP 21: Cut the Shrink Wrap Packaging</p> <p>Cut shrink-wrap by running a utility knife along the hardboard sides. (DO NOT cut along silicone bellows surfaces).</p> <p>IMPORTANT: Work quickly and deliberately after cutting the shrink-wrap to avoid material expanding beyond a usable size.</p>	
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<p>STEP 22: Remove Shrink-Wrap and Hardboard Packaging</p> <p>Working around the hanger-bars, remove and discard shrink-wrap and hardboard.</p>		
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<p>Wipe Release Agent Off Silicone Face, Top and Sides</p> <p>For packaging and production reasons, the silicone facing is coated in the factory with a release agent.</p> <p>Prior to installation, this release agent must be wiped off all surfaces that will later make contact with liquid-applied silicone. This includes the face, tops and grooves of the bellows next to the face, and along the sides.</p>		
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<p>Lightly, quickly and thoroughly wipe the cured silicone facing with a lint-free rag made damp with water to remove the release agent.</p> <p><i>CAUTION: if the material is expanding rapidly then skip this step and do it later before joins are made and before the sealant bands are injected.</i></p>	
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STEP 23: Rotate Hanger Bars

Rotate the hanger bars and holding the material by the hanger-bars position it over the joint opening.



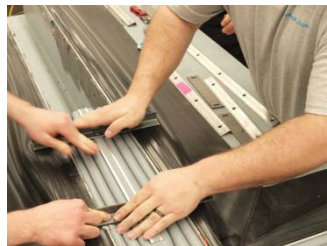
STEP 24: Allow Foam to Expand to Suit Joint-Gap Size

If the foam is expanding slowly, allow the foam to expand to the width of the joint then lower the foam/spline assembly into the wet epoxy on the joint faces.

Press the material down firmly until the hanger bars are touching the tops of the side sheets in the rails. The hanger bars will support the system while the epoxy cures and will set the foam/spline assembly at the proper height.

STEP 25: Insert Material into Wet Epoxy

Lower the piece into the wet epoxy on the joint faces.



STEP 26: INSTALL Next Lengths

(Note: standard lengths of SJS-FP have a pin in one end of the spline, and a hole in the other. Make sure you are aligned properly to join to the already installed length).

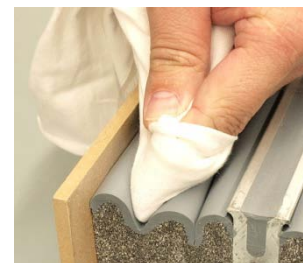
STEP 27: Prepare Faces to Be Joined

TIP: On hot days, the silicone liquid sealant used as a joining material can be applied to the ends of each stick prior to unpacking them. To do this, carefully cut and peel the plastic shrink wrap away from around the end of the stick.

CAUTION: DO NOT cut on the silicone bellows!

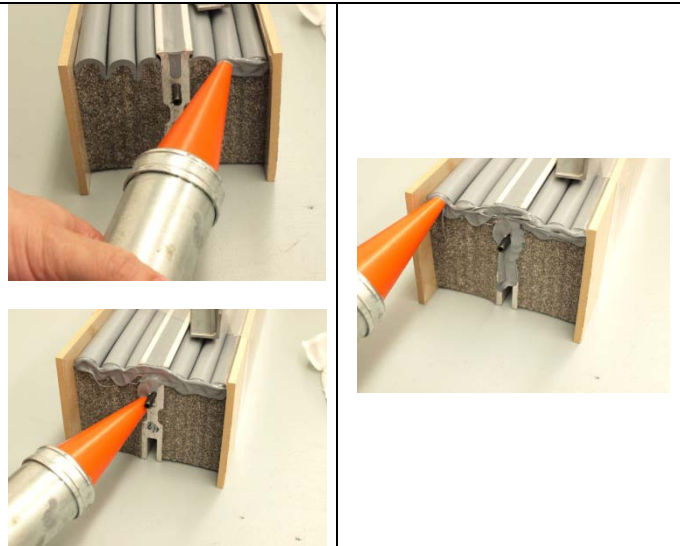


To remove the factory-applied release agent, thoroughly wipe the cured silicone face, tops and grooves of the bellows next to the face, and along the sides with a lint-free rag made damp with water.



STEP 28: Apply Silicone To End Of Bellows and Spline

Using a 20-oz sausage gun and the sausages of silicone provided, gun a bead of silicone along the face of the edge of the factory-cured silicone bellows and across and down the spline of the SJS-FP face.



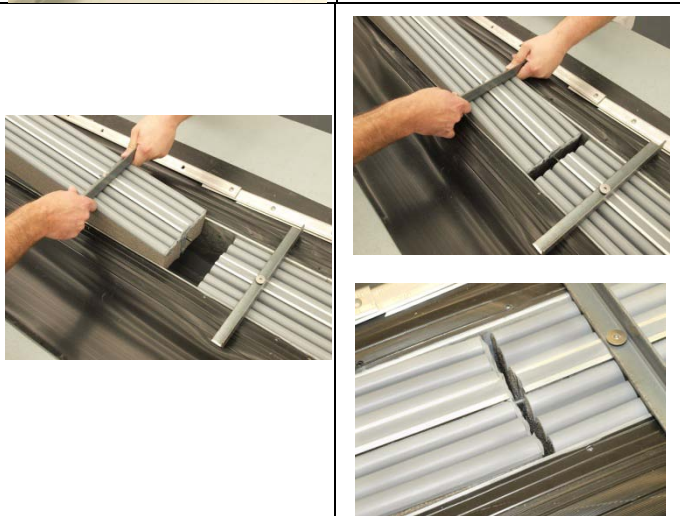
STEP 29: Install and Join To Previous Length

Unpack next foam/spline assembly and lower it into the joint sliding it up to align with the already installed piece.

Make sure the joining pin aligns with and is inserted into the hole in the previously installed spline.

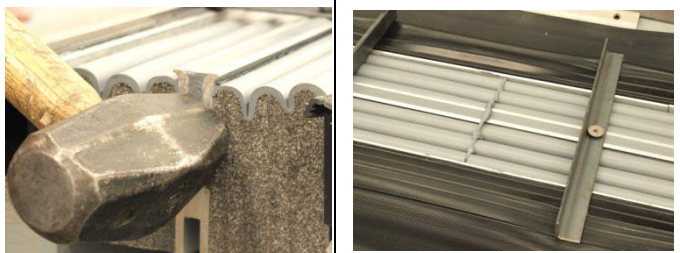
Ensure the splines of each length are pushed-up against each other.

(NOTE: Some of the silicone tooled to the face should squeeze out between the bellows faces).



STEP 30: Drive Spline Join Together

If the joining spline pin did not seat all the way just by pushing, using a 3-pound hammer, tap the metal end of the spline away from the joint to ensure that the spline pin is driven all the way into the previously installed length. (Note: liquid silicone should squeeze up out of the join).



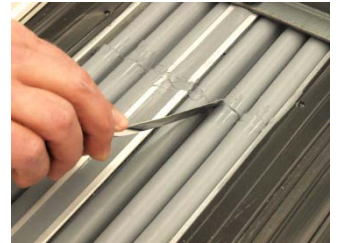
STEP 31: Tool the Joining Silicone into and Across the Bellows

Use a caulk knife to tool the squeezed-out silicone from the grooves of the bellows and blend the join between the two sticks.

If necessary, use the caulk gun to apply additional silicone to the join between the two lengths and tool excess from surface and between wrinkles of the bellows.

STEP 32: Repeat Process

Repeat until all of the joint assemblies have been completely installed.

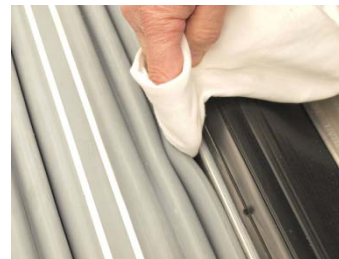
**STAGE 3: Sealing and Closing the FP Capping System****STEP 33: Remove Hanger Bars**

Starting at one end of the joint, remove the first one or two hangers to make room to reinstall the first capping strips.

**STEP 34: Clean Bellows**

Using lint-free cotton rags and solvent clean the silicone bellows next to the joint faces to receive the silicone sealant bands and corner beads.

Note: if you did not clean off the factory release agent in STEP 28, do it now.




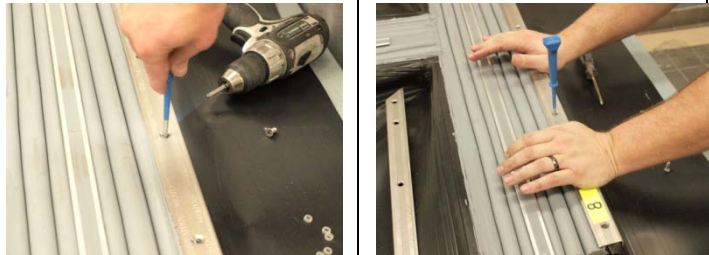

**STEP 35: Inject Silicone Sealant Bands**

Using the silicone sausages provided and a sausage gun and cones, inject sealant bands between the foam, silicone bellows, and rail faces. Inject a deep, minimum $\frac{3}{4}$ " (20mm), band of liquid silicone.


TIP: use the tip of a caulk knife twisted between the rail and the silicone bellows to make an opening into which to push the cone tip.

IMPORTANT: On installations of long runs of material, have one worker drop back after the installation of the first several lengths to install the silicone sealant bands before the epoxy cures.



<p>STEP 36: Install Silicone Lap Sealant to Top of Rails and Onto Flashing Sheet Edge</p> <p>Gun a band of silicone to cover the visible top of the aluminum rails and that bridges onto the edge of the side flashing sheets.</p>	
<p>STEP 37: Tool Silicone Sealant Bands and Lap Sealant</p> <p>Using a caulk knife, tool the silicone lap sealant and the silicone that squeezed out after injecting the sealant bands. Tool this silicone to form a band of sealant from the top of the FP flashing sheet to the top of the silicone bellows on the foam/spline assembly</p>	
<p>STEP 38: Install Capping Strips</p> <p>Install stainless steel capping strips, aligning strips at screw holes.</p>	
<p>Locate the hole for the stainless steel screw at the beginning of the first section of the rail and make a hole in the rubber of the flashing sheet using a 1/4" awl.</p>	
<p>STEP 39: Place Nylon Washers</p> <p>IMPORTANT: Each capping strip screw is installed through a nylon washer. Place the washers in the holes and insert screws through them.</p>	

<p>STEP 40: Install Capping Strip Screws</p> <p>Using the stainless steel screws and nylon seating washers supplied anchor the first section of the stainless steel retainer cap.</p> <p>Continue to install all screws using a drill driver. Be sure not to over tighten.</p>		
<p>IMPORTANT: Use a torque wrench to do the final tightening of the capping strip screws to 60 in-lbs (5.2 ft-lbs; 7 Nm).</p> <p>Keep the screw bit fully and firmly inserted into the screw. If you don't you will strip the screw head.</p>		
<p>IMPORTANT: If you strip or cross-thread a screw while installing it, remove the screw and use a 6mm tap and to manually re-thread the hole. Reinstall the nylon washer and screw.</p>		
<p>STAGE 4: INTEGRATE FLASHING SHEETS INTO WATERPROOFING MEMBRANE</p> <p>Principle: The FP flashing sheets are installed into a sandwich with layers of the buried deck waterproofing system. Each layer is fully adhered to the next. Usually this is done using hot-rubberized asphalt membranes. (NOTE: If using other systems be sure to adhere each layer to the bottom and top surfaces of the FP flashing sheets using mastics or splicing methods designed for use with the membrane being used).</p> <p>Pull the side sheets up over the FP assembly and hold them there with weights.</p> <p>Apply the first layer of waterproofing material across the mounting flanges and all the way up the FP legs to just under the pulled-back FP flashing sheet. Release the FP flashing sheet and press it into the membrane—BE SURE to press the flashing sheet firmly into the corner between the leg and the mounting flange. Eliminate all bubbles and puckers.</p> <p>Apply another layer of the waterproofing material over the top and up the face of the FP flashing sheet. Embed and adhere the protection course over and up the flashing sheet sandwich.</p> <p>NOTE: At this point water testing, if required, would occur.</p>		

<p>STAGE 5: INSTALLING WEAR COURSE--PAVERS, or TOPPING SLAB with or without ECRETE NOSING MATERIAL</p> <p>INSTALL WEAR COURSE: The wear course may commonly consist of</p>	
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pavers, concrete, or concrete with EMCRETE header.

CONCRETE TOPPING SLAB: Form a control joint between the back edge of the stainless steel capping strips and the concrete. Once the slab has cured, strip the form and seal this joint with a self-leveling liquid sealant (by others).

PAVERS: No control joint required.

EMCRETE: No capping-strip control joint required.

NOTE: If you are using the optional EMCRETE elastomeric nosing installed into a blockout (recess) on each side of the slab for plate leveling and sound absorption, please refer to EMCRETE INSTALLATION INSTRUCTIONS for mixing handling and pouring.

NOTE: For method use in leveling SJS plates on EMCRETE, see SJS Installation Instructions.



STAGE 6: INSTALLING COVERPLATES

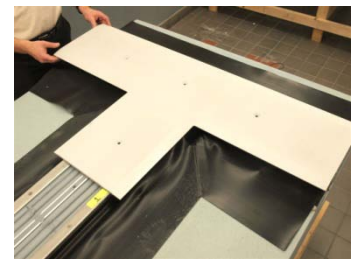
IMPORTANT: Allow for Longitudinal Expansion of Plates: the metal coverplates will lengthen with rises in temperature. If both ends of any joint run have curbs, parapets, walls or other obstacles against which the plates could bind, gaps at the beginning and end of each joint run must be left to accommodate plate expansion. This should have been worked out with EMSEAL at order-time based on information about the job provided by the contractor. Any questions, consult EMSEAL.

CAUTION: Driving the cover plate screws requires a lot of torque. Be sure have a firm grip on a supporting handle on the drill driver. Be sure to brace the drill as needed to prevent it from spinning and causing injury.

STEP 41: Align First Coverplate

Place the first section of coverplate over the joint assembly and line up the screw holes in the plates over the channel in the spline.

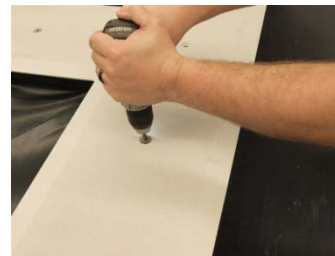
NOTE: The screws are self-tapped into the spline anywhere along the spline. You do not have to align the plate holes with the holes where the hanger-bars were attached.



STEP 42: Screw In Coverplate

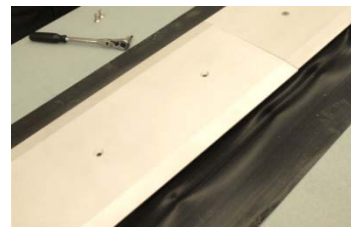
Using a drill-driver and 7/32" hex bit socket, drive the coverplate screws into the spline channel until tight.

IMPORTANT: Fully insert the hex driver into the screw. If you don't you will strip the screw head.



STEP 43: Continue Installing Coverplates

Continue to install coverplate sections until installation is complete with the installation of the final finishing cover plate.

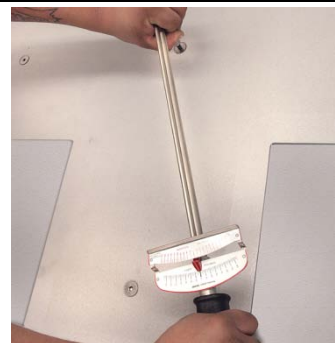


STEP 44: Manually Tighten Coverplate Screws to Final Torque

It is critical that the top of the spline be pulled up tight to the underside of the coverplates.

To achieve this, you must use a torque wrench and tighten each screw to 240 in-lbs (20 ft-lbs; 27Nm).

IMPORTANT: Fully and firmly insert the hex driver into the screw. If you don't you will strip the screw head.



SJS-FP Addendum 1: Installing Transitions in SJS-FP SYSTEM

IMPORTANT!

This is an addendum to "Installation Instructions: SJS-FP (Seismic Joint System, For Plaza Decks and Split Slabs, Fire Rated). Do not install this material until all members of your crew have read and understand both sets of instructions. If any of the crew do not understand any part of these instructions call EMSEAL: USA & Canada: 1-800-526-8365 or 508-836-0280

INSTALLING TRANSITIONS AND TERMINATIONS

Where expansion joints begin, end and run adjacent to, over, under, or around obstructions such as walls, columns, curbs, sidewalks, planters etc., are typically where leaks persist even after straight runs of joints have been properly sealed. Options exist to properly seal these areas.

Transitions and Terminations in Metal Parts:

It is usual for the contractor to order factory-fabricated transitions and terminations, as welded assemblies. The components that make up any factory-fabricated item are welded together in the configuration represented by contractor-supplied drawings and dimensions.

Transitions and Terminations in the Side Flashing Sheets:

NOTE: It is critical to achieving watertightness that wherever a transition or termination exists, the side flashing sheets be properly welded to follow all contours at the condition so that they may be properly integrated with the deck waterproofing materials.

It is possible following proper training from an EMSEAL field technician for the contractor to fabricate transitions and terminations in the heat-weldable side flashing sheets in the field. However, it is more efficient and usual to order transitions and terminations in the side flashing sheets as factory-fabricated, welded items along with the corresponding welded metal parts. The components that make up any factory-fabricated item would be welded together in the configuration represented by contractor-supplied drawings and dimensions. NOTE: It is difficult to accurately represent all substrate contours that the side flashing sheets will come in contact with. For this reason factory-welded side sheets cannot be guaranteed to fit and may require field modification by the contractor.

Transitions and Terminations in SJS-FP Foam/Spline Assembly:

Most transitions and terminations in the foam-and-spline assembly are planned for in consultation with EMSEAL at time of ordering. Some transitions (like curb transitions and treads and risers for example) are factory-fabricated by EMSEAL to the contractors' field measurements. Other transitions and terminations are field-assembled using custom components ordered as agreed. For most flat changes in direction in the horizontal plane, EMSEAL supplies the SJS-FP SYSTEM assembly configured for field joining at the change in direction. In addition connection of the transition pieces is executed at butt joints to straight lengths using methods represented in principle in these instructions and/or as trained by an EMSEAL field technician.

Welded End-Dam Terminations at Vertical-Plane Terminations:

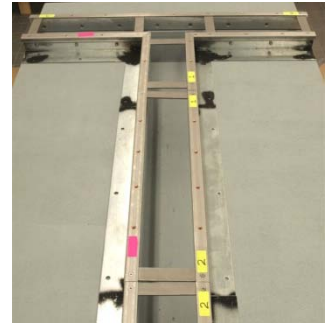
Welded end-dam terminations in flashing sheets at end of joint runs are required wherever the joint ends against a perimeter pour, curb, column or anywhere the deck waterproofing terminates on a vertical surface. An end-dam consists of a folded and welded "boot" in the FP flashing sheet that is embedded and covered in waterproofing membrane materials and is mechanically fixed to the vertical substrate with a termination bar and sealant. The wear-course or topping slab is poured up to and over this termination point and the control joint formed by the pour is sealed with a liquid sealant by others. Welded end-dam terminations can be provided factory made by EMSEAL to field measurements or can be field executed. Instruction for proper field welding is available from the on-site EMSEAL technician. Contact EMSEAL to coordinate instruction.

IMPORTANT: Always Start Installation at Factory-Fabricated Transitions

If your job contains factory-fabricated transitions such as tees, flat 90's, upturns or downturns, these are fixed points and must be installed first.

This applies to installing transition pieces in:

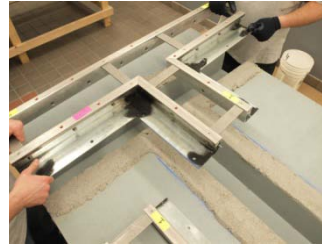
- 1) the FP legs,
- 2) the FP flashing sheets,
- 3) the SJS-FP spline/foam assemblies, and
- 4) the cover plates.

**1) FP RAILS**

Place the factory-fabricated transition in the metal FP rails into the wet, epoxy-mortar setting bed.

Tap the system down into the setting bed until the upper surface is at the required elevation and the rails are level.

Ensure that the flanges are fully embedded in the wet epoxy and that no hollow areas exist beneath the flanges.



Working away from the ends of the transition, connect the straight lengths of rail and install straight lengths.

Position the first straight length of FP rail making sure it is interlocked with the transition.

Alignment and connection between lengths is made with stainless steel pins set into one end of the rails. Insert the pins into the holes of the adjoining piece.

TIP: Sometimes the metal pins will not align easily. To fix this loosen the screws in the capping strips that hold the clamping spacers. This will give you some 'play' to help with pin alignment. Once aligned, retighten the screws.

Install, level, and anchor the rest of the rails in accordance with the standard SJS-FP Installation Instructions starting at **Step 11**.

**2) RUBBER FLASHING SHEETS**

Roll out flashing sheets along the edges of the joint.

Start installation at transitions with factory-made transition pieces. Working away from the fixed transition points, install the flashing sheets in accordance with the standard SJS-FP Installation Instructions starting at **Step 17**.

**3) SJS-FP FOAM/SPLINE ASSEMBLY**

For most flat changes in direction in the horizontal plane, EMSEAL supplies the SJS-FP SYSTEM assembly configured for field joining at the change in direction. In addition connection of the transition pieces is executed at butt joints to straight lengths using methods represented in principle in these instructions and/or as trained by an EMSEAL field technician.

The following describes the installation of a tee starting with the cross piece of the tee. The principle is the same for flat direction changes.

Cut the Shrink Wrap Packaging

Cut shrink-wrap by running a utility knife along the hardboard sides. (DO NOT cut along silicone bellows surfaces).

IMPORTANT: **Work quickly** and deliberately after cutting the shrink-wrap to avoid material expanding beyond a usable size.



Remove Shrink-Wrap and Hardboard Packaging

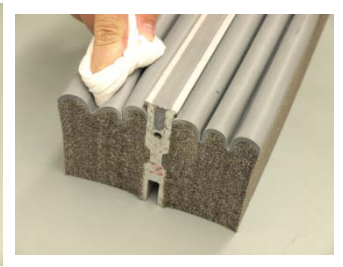
Working around the hanger-bars, remove and discard shrink-wrap and hardboard.



Wipe Release Agent Off Silicone Face, Top and Sides

For packaging and production reasons, the silicone facing is coated in the factory with a release agent.

Prior to installation, this release agent must be wiped off all surfaces that will later make contact with liquid-applied silicone. This includes the face, tops and grooves of the bellows next to the face, and along the sides.



Lightly, quickly and thoroughly wipe the cured silicone facing with a lint-free rag made damp with water to remove the release agent.

CAUTION: if the material is expanding rapidly then skip this step and do it later before joins are made and before the sealant bands are injected.



Rotate Hanger Bars

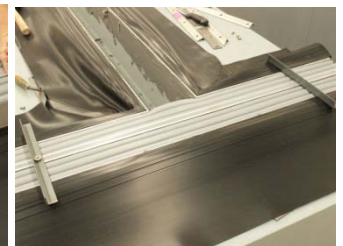
Rotate the hanger bars and holding the material by the hanger-bars position it over the joint opening.



Allow Foam to Expand to Suit Joint-Gap Size

If the foam is expanding slowly, allow the foam to expand to the width of the joint then lower the foam/spline assembly into the wet epoxy on the joint faces.

Press the material down firmly until the hanger bars are touching the tops of the side sheets in the rails. The hanger bars will support the system while the epoxy cures and will set the foam/spline assembly at the proper height.



Install Intersecting Lengths

At tees and flat-90's, intersecting lengths are joined starter pieces that are custom configured that have a "soft end" where the center spline stops short and the last six to eight inches is foam only.

Prepare Faces to Be Joined

TIP: On hot days, the silicone liquid sealant used as a joining material can be applied to the ends of each stick prior to unpacking them. To do this, carefully cut and peel the plastic shrink wrap away from around the end of the stick.

CAUTION: DO NOT cut on the silicone bellows!



To remove the factory-applied release agent, thoroughly wipe the cured silicone face, tops and grooves of the bellows next to the face, and along the sides with a lint-free rag made damp with water.



Apply Silicone Sealant at Bellows Join

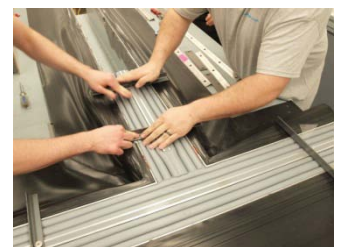
Using a 20-oz sausage caulk gun and the sausages of silicone provided, gun a bead of silicone along the face of the edge of the factory-cured silicone bellows at the top of the SJS-FP foam.



Install Soft-End Into Side of In-Place Length

Lower the joining piece into the wet epoxy on the joint faces and press the joining piece firmly into the side of the previously installed length.

(Notice how the bow in the side of the cross piece is re-compressed by the joining piece—ensuring a compression fit).



Tool and Blend Squeezed-Out Silicone

Tool the silicone that squeezes out at the joint to blend it with the bellows.

(DO NOT allow the silicone to fill the folds of the bellows).



Install Straight-Run Lengths

Having installed the transition pieces, straight lengths can be installed in all directions off the transition in

accordance with the standard SJS-FP Installation Instructions starting at **Step 26**.

4) COVERPLATES

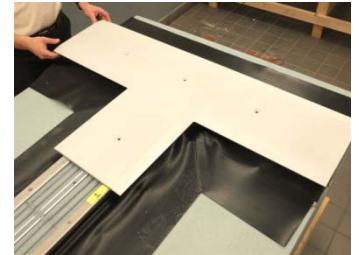
IMPORTANT: Allow for Longitudinal Expansion of Plates: the metal coverplates will lengthen with rises in temperature. A transition marks a fixed point. Other fixed point can be caused by curbs, parapets, walls or other obstacles against which the plates could bind. Gaps at the beginning and/or end of each joint run must be left to accommodate plate expansion. This should have been worked out with EMSEAL at order-time based on information about the job provided by the contractor. Any questions, consult EMSEAL.

Align First Coverplate Over the Transition

As with the other system components, start coverplate installation at transitions first.

Place the first section of coverplate over the joint assembly and line up the screw holes over the channel in the spline.

NOTE: The screws are self-tapped into the spline anywhere along the spline. You do not have to align the plate holes with the holes where the hanger-bars were attached.



Screw In Coverplate

Using a drill-driver and 7/32" hex bit socket, drive the coverplate screws into the spline channel until tight.

Continue to install and tighten coverplate sections in accordance with the standard SJS-FP Installation Instructions starting at **Step 41**.



If any of the crew do not understand any part of these instructions call EMSEAL:
1-800-526-8365 (USA & Canada) or 508-836-0280