



# SUBSTITUTION REQUEST

(After the Bidding/Negotiating Phase)

Project: \_\_\_\_\_ Substitution Request Number: \_\_\_\_\_  
 \_\_\_\_\_  
 From: \_\_\_\_\_  
 To: \_\_\_\_\_ Date: \_\_\_\_\_  
 \_\_\_\_\_  
 A/E Project Number: \_\_\_\_\_  
 Re: \_\_\_\_\_ Contract For: \_\_\_\_\_

Specification Title: \_\_\_\_\_ Description: \_\_\_\_\_  
 Section: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

Proposed Substitution: \_\_\_\_\_  
 Manufacturer: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Trade Name: \_\_\_\_\_ Model No.: \_\_\_\_\_  
 Installer: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Address: \_\_\_\_\_

History:  New product  1-4 years old  5-10 years old  More than 10 years old

Differences between proposed substitution and specified product: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Point-by-point comparative data attached — REQUIRED BY A/E

Reason for not providing specified item: \_\_\_\_\_  
 \_\_\_\_\_

### Similar Installation:

Project: \_\_\_\_\_ Architect: \_\_\_\_\_  
 Address: \_\_\_\_\_ Owner: \_\_\_\_\_  
 \_\_\_\_\_ Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of Work:  No  Yes; explain \_\_\_\_\_

Savings to Owner for accepting substitution: \_\_\_\_\_ (\$ \_\_\_\_\_).

Proposed substitution changes Contract Time:  No  Yes [Add] [Deduct] \_\_\_\_\_ days.

Supporting Data Attached:  Drawings  Product Data  Samples  Tests  Reports  \_\_\_\_\_

# SUBSTITUTION REQUEST

(After the Bidding/Negotiating Phase — Continued)

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The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
  - Same warranty will be furnished for proposed substitution as for specified product.
  - Same maintenance service and source of replacement parts, as applicable, is available.
  - Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
  - Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
  - Proposed substitution does not affect dimensions and functional clearances.
  - Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
  - Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.
- 

Submitted by: \_\_\_\_\_

Signed by: \_\_\_\_\_

Firm: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Telephone: \_\_\_\_\_

Attachments:

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### A/E's REVIEW AND ACTION

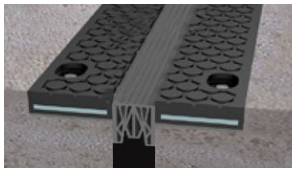
- Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

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Additional Comments:  Contractor  Subcontractor  Supplier  Manufacturer  A/E  
 Other:

# EB-Series



## Description

The EB-Series Elastomeric Block System is specifically designed for parking deck applications.

It features a continuously extruded elastomeric membrane, which is securely sandwiched to the concrete deck with the use of steel reinforced anchor blocks. Once installed, this system provides a watertight seal while moving in response to fluctuations in joint width.

The design of the block incorporates the durability of armored joint systems with the flexibility of an elastomeric compound. The steel reinforced sections are heat and pressure molded into blocks using an ethylene propylene diene monomer (EPDM) elastomeric compound. The EPDM blocks absorb and dissipate the shocks from the impacts of vehicular traffic.

The center portion of the system incorporates a seal made of thermo-rubber Santoprene. The multi-chambered seal incorporates extruded wing flanges that are designed to provide a gasket type seal against the intrusion of water.

## Physical Properties

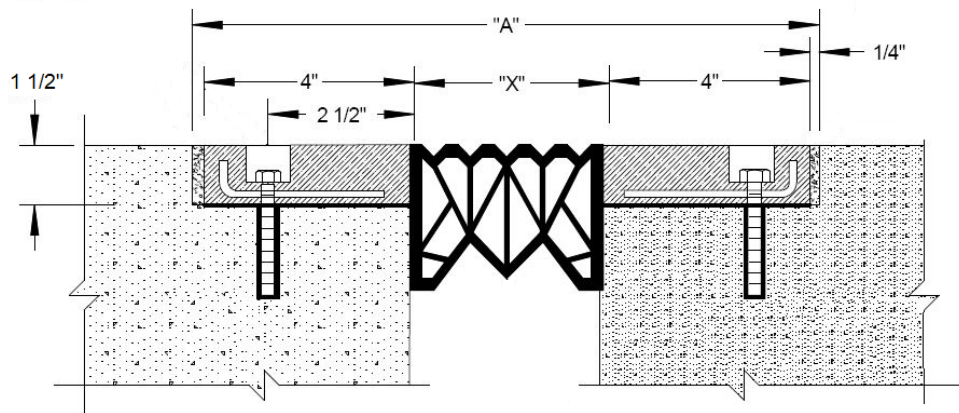
Reference Tables 1 and 2 for values and specific information.

**TABLE 1 – Physical Properties of the EPDM-Based Thermo-Rubber Seal Element**

Property	ASTM Test Method	Requirement
Tensile strength, min.	D412	815 psi
Elongation at break, min.	D412	430%
Hardness (Shore A)	D2240	65+/-5

**TABLE 2 – Physical Properties of the EPDM Elastomeric Anchor Panel**

Property	ASTM Test Method	Requirement
Tensile strength, min.	D412	1500 psi
Elongation at break, min.	D412	350%
Hardness (Shore A)	D2240	60+/-5
Compression Set	395	50% max



PRODUCT	MIN. WIDTH (X) IN (MM)	MID RANGE (X) IN (MM)	MAX. WIDTH (X) IN (MM)	TOTAL MOVEMENT IN (MM)	"NORMAL" WIDTH (A) IN (MM)	BLOCKOUT DEPTH IN (MM)
EB-150	0.84" (21)	1.50" (38)	2.16" (55)	1.31" (33)	10.00" (254)	1.50" (38)
EB-250	1.25" (32)	2.50" (64)	3.75" (95)	2.50" (64)	11.00" (279)	1.50" (38)
EB-375	1.75" (45)	3.75" (95)	5.75" (146)	4.00" (102)	12.25" (311)	1.50" (38)

# EB-Series

## INSTALLATION INSTRUCTIONS

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### Preparatory Work

The expansion joint blockout and stem openings shall be a consistent width and depth along the entire length. They shall be the required widths and depths for the specified system on this project. Refer to the EB-Series drawing for the specific sizing/dimension information.

Edge spalling, sharp projections, and concrete voids shall be repaired prior to proceeding with the joint installation. All concrete repair materials used should have reached full cure conditions as specified by the manufacturer.

The Elastomeric Block joint seal element shall be unrolled and allowed to lie in a relaxed position. Once relaxed, the seal should be cut to length and any splices can be made (see Splicing section).

The vertical and horizontal faces of the expansion joint blockout should be cleaned to remove laitance, loosely bonded material, and any other contaminants that may inhibit bonding of the bedding and edge void sealants to the concrete.

The blockout should be clean and dry for system installation. Tape off the adjoining surfaces in order to maintain a neat appearance.

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### Material Installation

In preparation for installation of the EB-Series expansion joint it is important to understand that there are two liquid accessories used in the process. First of all there is the 910 Tack Coat (2-Part urethane, 1.5 Gal Units). This 910 Tack Coat is used for the bedding of the seal wings as well as for the filling of the bolt holes once the anchors are completely tightened. To ensure proper allocation of the 910 Tack Coat it should be noted that the bedding aspect of the installation assumes that one unit of 910 will handle 15 feet of joint, both sides included. Knowing this, calculate and set aside the proper number of units for the bedding portion of the installation. Then set the remaining units aside for the filling of bolt holes that will occur later in the installation process. The other liquid component is the 825 Sealant. The sealant is provided in 20 oz sausage packs and it is used exclusively for the Edge Void Sealant.

Once you have tools and materials organized at the joint being installed you can install the EB-Series seal into the joint gap. Next open and begin to mix the first unit of 910 Tack Coat. This is done by pouring the two components into a clean and dry pail. Mix with an electric drill motor and mixing paddle. Mix for approximately 2-3 minutes, and until the mix is of a consistent color and texture.

This 910 Tack Coat bedding material goes UNDER the flat wing flange of the EB-Series seal. Next, flip up the wing flange of the seal so the bedding can be gunned out. Using a bulk caulking gun with a tapered tip but to 1/2", run out 3/8" beads of the 910 Tack Coat.

Gun out the material in a zig zag pattern UNDER the wing flange and along the blackout base. Recall that the coverage is 15 ft. of joint, both sides per 1.5 Gallon unit.

Do this on both sides of the joint gap opening.

With the EB-Series seal now in place, start at one end of the joint location and begin to place the 6 ft. anchor panels. Layout of the anchor panels is important for a good installation. Place the panels into the joint, laying them on top of the seal flange. The anchor panels need to be placed so the bolt hole cavities are located away from the joint gap. The panels are properly placed when the anchor hole is 2.5" away from the joint gap edge and the EB-Series seal. Ensure that the tongue end aligns and fit into the opposing groove of each panel. **Be sure the panels are properly placed in the blackout. DO NOT ALLOW ANCHOR PANELS TO CANTILEVER INTO THE JOINT GAP OPENING.** Walk down the panels to assure that the panels and seal wings are pressed firmly into place.

With the panels loose laid in the blackout it is important to wedge the panels away from the concrete blackout edge in order to form the 1/4" gap for the edge void sealant. As the anchor panels are wedged over into position it is important to compress the top portion of the EB-Series seal to a point that is equivalent to the lower portion that is compressed into the joint gap opening.

Beginning at one end of the joint length, begin to drill the anchor holes in the first set of opposing anchor panels.

This joint system utilizes wedge bolt anchors. This is a 5/8" hex head bolt with a 4" thread length. The anchors require that the pilot hole be drilled with a 5/8" diameter drill bit. Utilizing a 5/8" concrete drill bit, drill the anchor holes into the concrete deck (through the rubber flange) to a depth of 4". Vacuum out the loose concrete dust.

With all the anchor holes properly located in the first opposing set of anchor panels, begin to install anchors. When using electric or pneumatic impact wrenches be sure to feather the trigger in order to avoid over tightening or stripping of the anchor. Utilize a hand torque wrench for final tightening.

Repeat this process down the length of the joint by drilling and anchoring each succeeding set of anchor panels. Force each ensuing panel firmly against the already installed panel so that the tongue and groove sections are tight. Having done so, tighten down the hardware on this panel. This process is to be repeated correspondingly for both sides of the joint gap working down the full length of the joint.

The wedge bolt anchors should be torqued to 60 ft-lbs Max.

Anchor panels should be laid out in such a way to ensure that the final piece is a minimum of two feet in length so that it has at least two anchor locations holding it in place. Anchor panels can be field cut using a cutoff saw.

Once all of the panels are in place re-torque each bolt to ensure a snug fit.

With the system now in place, mix and install 910 Tack Coat sealant and fill the bolt hole cavities. For the edge void areas utilize the 825 sealant material provided in 20 oz sausages. Edge voids are assumed to be 1/4" in width.

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## Clean Up

Remove any tape and/or protective paper from the concrete and dispose of properly. Wipe the system with an organic solvent to remove any dirt or deposited sealant materials.

## Splicing

Butt splices of the EB-Series seal can be easily completed in the field by using a heat fusing process. The anchor panels are simply cut in the field and butted together. A cutoff saw is best for this as the anchor panel has a heavy steel reinforcement.

There is no means of fusing the anchor blocks together as they are an EPDM rubber material.

For the seal element, the first step is to make sure that the ends of the seal to be spliced have fresh, straight cuts. Utilizing a Splicing Iron that is preheated to 400° F - 425° F, hold it between each end of the prepared EB-Series seal. When each surface shows about a 1/8" bead of melted material (approx. 3-4 minutes) quickly remove the splicing iron, aligning the joint ends and forcing together until they bond (about 3-5 minutes). Allow the splice to cool for 15 minutes before proceeding. Do not move, bend, stretch or stress the splice for 2 hours.

Directional changes of the seal element can be pre-manufactured by EMS. This then leaves only simple butt splicing for completion in the field.

# SPECIFICATION Division 07900

## EB-Series System [Elastomeric Block]

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### **PART 1 GENERAL**

#### **1.01 Summary**

- A. Provide all labor, materials, equipment, and services; perform all operations required for complete installation of expansion control system and related work as indicated on the drawings and specified herein.
- B. Work Included: The work shall consist of furnishing and installing expansion joints in accordance with the details shown on the plans and the requirements of the specifications. The joints utilize extruded elastomeric seals, molded, steel reinforced pads, urethane sealants, and bedding.

#### **1.02 Quality Assurance**

- A. Materials and work will conform to the latest edition of reference specifications specified herein and to all applicable codes and requirements of local authorities having jurisdiction.
- B. The manufacturer will have documented experience in expansion joint control covers and systems for parking structures.
- C. The manufacturer will provide the owner/operator, through the architect/engineer, with a preventative maintenance guideline for parking structure expansion joint control systems, as related to the National Parking Association publication "Parking Garage Maintenance Manual".
- D. Fire Barrier - Where indicated, provide expansion joint cover assemblies whose fire resistance and cycling capability has been determined per UL 2079 by Underwriter Laboratories, Inc. Fire rating not less than the rating of adjacent construction.

#### **1.03 Submittals**

- A. Product Data - Submit copies of manufacturer's latest published literature for materials specified herein for approval. Data to clearly indicate movement capability of cover assemblies and suitability of material.
- B. Certificates - Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of fire-rated expansion joint assemblies with requirements indicated.
- C. Shop Drawings - Submit shop drawings for work specified herein for approval. Shop drawings showing full extent of expansion joint cover assemblies. Include large-scale details indicating profiles of each type of expansion joint cover assembly, splice joints between sections, joinery with other types, special end conditions, anchorages, fasteners, and relationship to adjoining work and finishes.

- D. Samples will include the following - Samples of each type of system to be used in work with color samples.

#### **1.04 Delivery, Storage**

- A. Deliver products in manufacturers original, intact, labeled containers, pallets, and/or bundles and store in a dry environment with ambient temperatures above 40°F. Protect materials from general construction site activities.

### **PART 2 PRODUCTS**

#### **2.01 General**

- A. Provide an expansion joint sealing system that is capable of withstanding HS-20 loading requirements while accommodating multi-directional movement. The system shall be composed of heavy-duty steel reinforced EPDM anchor panels with integral bolt cavities for the manufacturer's recommended anchorage system. Anchor panels shall be comprised of EPDM rubber meeting the properties as outlined below. Panels shall have molded anchorage slots located at 12" O.C. utilizing 5/8" diameter anchor bolts. Panels shall have integrally molded 1/4" A36 carbon steel reinforcement angle profiles to provide a durable, rigid system. Panels shall have a minimum thickness of 1.375" and a width of 4" in size. The EPDM panels shall have tongue and groove ends and shall be designed to accept and interlock with the manufacturer's preformed elastomeric seal. Provide thermo-rubber seal profiles that satisfy project requirements including movement and pertinent ADA legislation.

Furnish the EB-Series Elastomeric Block Expansion Joint System as manufactured by Erie Metal Specialties, Inc. and as indicated on the drawings. Alternate product will be considered if submitted at least 15 days prior to bid.

#### **2.02 Manufacturers**

- A. Expansion joint cover assemblies specified herein and indicated on the drawings shall be manufactured by EMS, Inc. 13311 Main Road, Akron, NY 14001.

#### **2.03 Materials**

- A. Urethane Bedding Sealant

Provide manufacturer supplied bedding material to the bottom of the blockout prior to placement of the extruded seal. The bedding material is a single component mastic sealant packaged in 20 oz. foil sausage packs. The material shall meet the following physical properties indicated below:



### PHYSICAL PROPERTIES – Bedding Sealant

<u>Property</u>	<u>Results</u>
Solids	100%
Tensile Strength	312 psi
Elongation	625%
Viscosity	Paste
Flash Point	266°F
Cure Time	10 hours

#### B. Extruded Elastomeric Seal

Provide seal as specified and indicated on the contract drawings. Seal design shall incorporate integral “flanges” on each side, which are locked to the substrate by the molded EPDM anchor panels. Seal material shall meet the following physical properties indicated below:

### PHYSICAL PROPERTIES – Elastomeric Seal

<u>Property</u>	<u>ASTM Test Method</u>	<u>Results</u>
Shore A Hardness	D-2240	65 +/-5
Tensile Strength	D-412	815 psi
Ultimate Elongation	D-412	400%
100% Modulus	D-412	377 PSI
Tear Strength	D-642	160 lb/in
Compression Set	D-395	23% @ 77°F
168 hours		36% @ 212°F
Brittle Point	D-746	-76°F

#### C. Molded Elastomeric Panel

Molded panel shall be made of steel reinforced EPDM meeting ASTM D-2000. It will be heavy duty, capable of withstanding HS-20 loading, with a non-skid surface, having integrated bolt hole cavities and meeting the following physical requirements:

### PHYSICAL PROPERTIES – Molded Elastomeric Panel

<u>Property</u>	<u>ASTM Test Method</u>	<u>Results</u>
Shore A Hardness	D-2240	60 +/-5
Tensile Strength	D-412	1500 psi
Elongation Break	D-412	350% min
Compression Set	D-395	50% max
Heat Resistance (70 hrs @ 212°F)		
Tensile Strength, max	D-573	25%
Elongation, max	D-573	25%
Hardness, max	D-573	10 pts
Total Weight, 6 ft. Molded Panel		32 lbs, min
Oil Resistance (70 hrs @ 212°F)		
Volume, max	D-471	120%
Ozone Resistance (50pphm for 72 hrs @ 104°F)	No Cracks	Pass

- D. Steel Inserts – Panels shall be molded with 1/4" thick A36 carbon steel reinforcement angles. The steel insert shall have a vertical leg length of 1" and a horizontal leg length of 3.5". Slotted holes for anchor bolts will be provided at 12" O.C.
- E. Sealants – Bolt hole cavity and edge void sealants shall be provided by manufacturer.
- F. Anchorage – provide 5/8" dia hex wedge anchor x 4" @ 12" O.C. Install anchors in strict accordance with manufacturer's recommendations into sound concrete.

## **2.04 Fabrication**

- A. Molded panels shall be shipped in manufacturer's standard 6 ft lengths and shall be cut to length in the field. As well, directional changes shall be miter cut in the field.
- B. Elastomeric seals shall be shipped in the longest practical lengths in manufacturer's standard shipping carton.

## **2.05 Finishes**

- A. Finishes – Molded panels and elastomeric seals shall be supplied in standard color: black.

## **PART 3 - EXECUTION**

### **3.01 Installation**

- A. Protect all expansion joint components from damage during the placement of concrete or elastomeric concrete; work in adjacent areas and construction traffic until completion of structure.
- B. Expansion joint systems shall be set to the proper width for the ambient temperature at time of installation. Properly align all molded shapes prior to anchoring operations to ensure proper joint performance.
- C. Expansion joint systems shall be installed in strict accordance with the manufacturer's typical details and instructions along with the advice of their qualified representative. Contact manufacturer to discuss field splicing of all components prior to their installation to verify correct and proper procedures.

### **3.02 Clean and Protect**

- A. Protect system and its components during construction. After work is complete in adjacent areas, clean excess adhesive from elastomeric seal with a suitable cleaner that will not harm or attack material.

END OF SECTION

# EB-Series

## PHYSICAL PROPERTIES

**Table 1 – Physical Properties of the EPDM-Based Thermo-Rubber Seal Element**

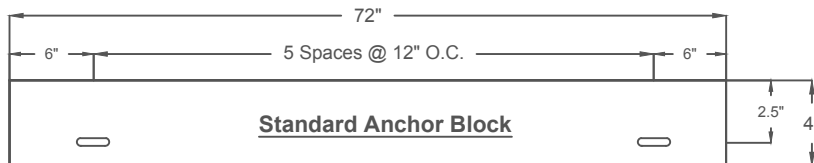
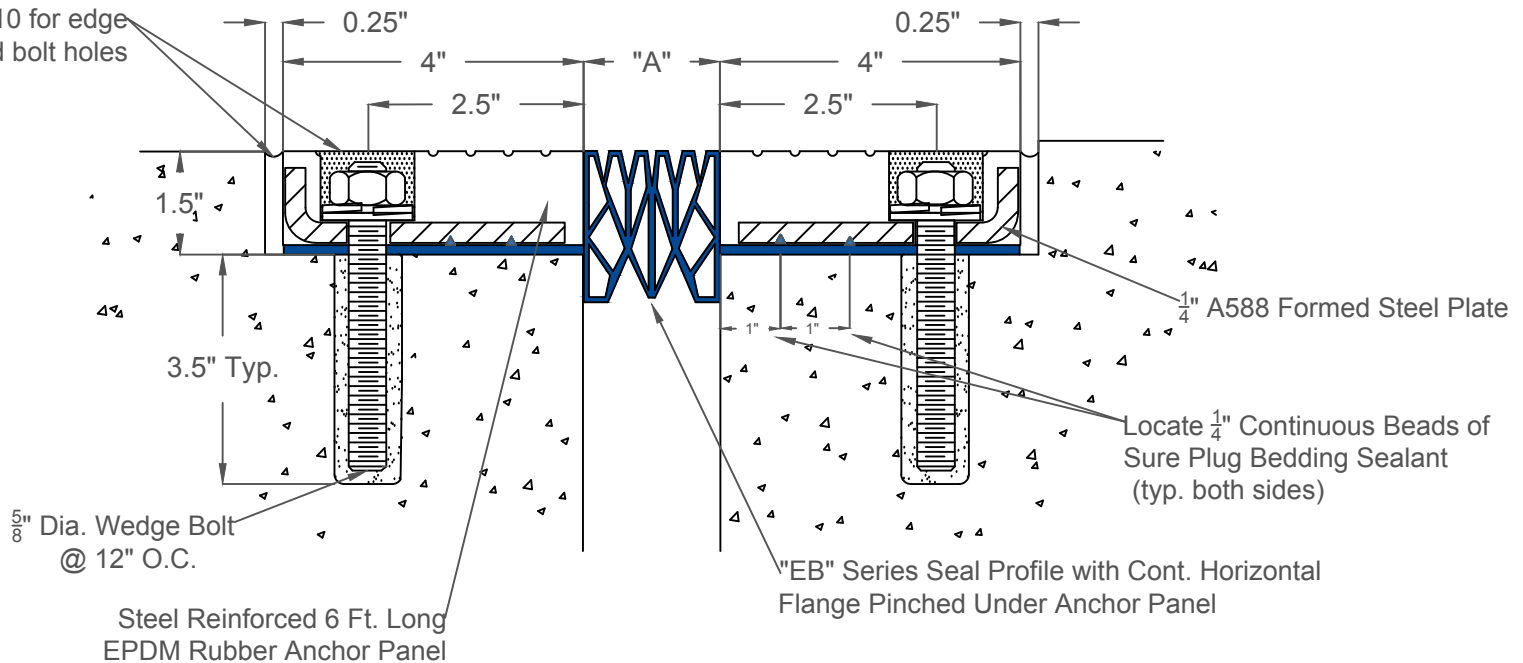
<i>Properties</i>	<i>Result</i>
Tensile strength, min.	ASTM D412, 815 psi
Ultimate Elongation	ASTM D412, 430%
Hardness (Shore A)	ASTM D2240, 65 +/- 5

**Table 2 – Physical Properties of the EPDM Elastomeric Anchor Panel**

<i>Properties</i>	<i>Result</i>
Tensile strength, min.	ASTM D412, 1500 psi
Ultimate Elongation	ASTM D412, 350%
Hardness (Shore A)	ASTM D2240, 60 +/- 5
Compression Set	ASTM 395, 50% max



EMS 910 for edge void and bolt holes



PRODUCT	"A" Min. Width IN (MM)	"A" Mid Range IN (MM)	"A" Max. Width IN (MM)	Total Movement IN (MM)
EB-150	0.84" (21.4)	1.50" (38.1)	2.07" (52.5)	1.07" (27.2)
EB-250	1.25" (31.8)	2.50" (63.5)	3.75" (95.2)	2.50" (63.5)
EB-375	1.75" (44.5)	3.75" (95.2)	5.75" (146)	4.00" (101.6)

NO.	Description	Date	By

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13311 Main Road \* Akron \* New York \* 14001  
 Phone: (716) 542-3991 \* Fax: (716) 542-3996 \* E-mail: sales@eriemetal.com

PROJECT: N/A

TITLE: EB-Series Slab-Slab Cond.

Detailed by: BAF	Date: 07/20/16
Checked by: SLP	Date: 07/22/16
Scale: NTS	EMS Job #: N/A
Sheet No.: 1 of 1	Drawing No.: EB-1



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## **EB-SERIES RECOMMENDED MAINTENANCE PROGRAM**

GENERAL - The Elastomeric Block System is designed, with proper application, to provide the owner/operator of the structure with a functional, durable, and watertight product, requiring minimal maintenance, other than periodic cleaning. As part of the owner/operator's comprehensive inspection and maintenance program for the structure, it is recommended that the owner/operator follow the guidelines presented in Sections A & B below for the expansion joints. Such maintenance and inspection will uncover any potential problems before damage to the structure can occur.

### **A. INSPECTION**

1. The elastomeric seal, EPDM panels, and deck concrete adjacent to the expansion joints should be examined on a semi-annual basis. Items to inspect include evidence of moisture leakage, obvious damage, and/or a change in the general appearance or functioning of the system.

### **B. MAINTENANCE**

1. On a semi-annual (Spring-Fall) basis, the joint area should be swept clean to remove debris from the grooves in the top surface of the membrane. Once swept, the area should be washed down with water from a low-pressure hose. Evidence of moisture penetration, through or around the system (if any), can be observed at this time.
2. In regions where snow removal is common/required, it is recommended that the snow (and accompanying debris) be removed and piled away from the expansion joint areas. The snow removal equipment preferred is the brush-type. If blade-type snow removal equipment is used, the equipment MUST have blades with functioning rubber tips. Blades must be angled at 15° or greater in relation to the joint layout.

### **C. DAMAGE REPAIR**

GENERAL - In the event that an inspection does uncover damage to the joint area, the owner/operator must contact either the installer or manufacturer of the materials. Repairs that are undertaken without such notice may serve to void any warranties that have been provided.