



# 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

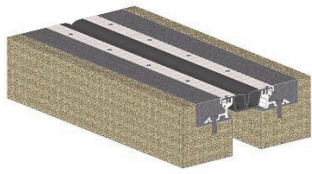
- Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Substitution rejected - Use specified materials.
- Substitution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

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

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

# DD-Series



## Description

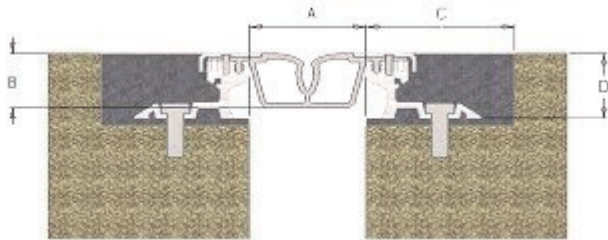
The DD-Series Strip Seal System is designed for use as a “stand alone” an expansion joint system or in conjunction with

membrane waterproofing in the sealing of expansion joints in building complexes. It features a preformed sealing element affixed to aluminum rails and clamped tightly by formed plates. The system can be used with a Polycrete elastomeric concrete header material, or separate preformed sheeting can be added to be used with the membrane material. Once installed, this system provides a watertight seal, while flexing in response to changes in joint width.

The formed top plate clamps the flaps of the sealing element permanently in place on top of the aluminum rails. The flaps of the seal are continuous so that discontinuities between metal parts are kept watertight.

The sealing element is extruded from a thermo-rubber material, which can be heat-fused to seal directional changes. This is particularly important where the system is used in below-grade applications, where it would prove particularly expensive to excavate in order to check and/or fix leaking conditions.

**LEED Credits** - Up to two (2) LEED credits depending on the location of the project.



## Physical Properties

The system consists of four items: an elastomeric sealing element, a formed top plate, an aluminum rail, and drill-in anchors spaced at 12” o/c.

The seal is an extruded shape made from an EPDM-based, thermo-rubber material (Santoprene®). This material has properties as shown in Table 1. The preformed sheet attachment if required, is also extruded from thermo-rubber.

The formed top plate is fabricated from stainless steel meeting ASTM A167 Type 304. The edge rails are extruded from aluminum with properties meeting ASTM B221 alloy 6063-T5. The drill-in anchors and screws are selected and supplied to meet the specific application.

The Polycrete consists of a combination of a resin mixture and a gradation of sands and aggregate sizes (see the Polycrete data sheet for further information and technical properties.)

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

Property	ASTM Test Method	Requirement
Tensile strength, min.	D412	1000 psi
Elongation at break, min.	D412	410%
Hardness, Type A durometer	D2240 (modified)	67
Compression set	D395 (Method B)	
168h @ 77°F		24%
168h @ 212°F		36%
Tear strength	D624	140 lb/in
Tension set	D412	10%
100% modulus	D412	420 psi
Specific gravity	D792	0.97
Brittle point	D746	< -81°F

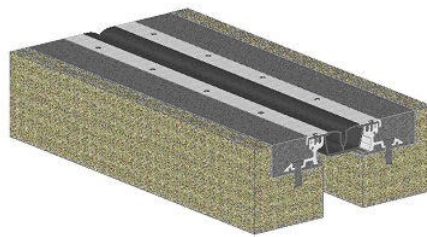
PRODUCT	MIN. WIDTH IN (MM)	MID-RANGE IN (MM)	MAX. WIDTH IN (MM)	TOTAL MOVEMENT IN (MM)	DIM. A: IN (MM)	DIM. B: IN (MM)	DIM. C: IN (MM)	DIM. D: IN (MM)
<b>DD-400</b>	1.25" (31.7)	2.75" (69.9)	4.25" (107.9)	3.00" (76.2)	2.50" (63.5)	1.75" (44.4)	3.50" (88.9)	1.75" (44.4)

# DD-Series

## INSTALLATION INSTRUCTIONS

### Materials & Pre-Installation Procedure

1. Aluminum edge rails are to be match drilled in the field to assure a tight and accurate fit with the seal wing and pre-drilled S.S. covers. The “snap-in seal wings” align the seal for the ease of installation.
2. The seal is made of an extruded thermoplastic material. The gland may be cut in the field and heat-welded to match directional changes such as curbs, stairs, columns and dogleg conditions.
3. Pre-drilled and countersunk stainless steel covers are fastened into the heavy-duty aluminum edge rails with stainless steel machine screws.
4. The setting bed must be level prior to the installation of the edge rails. It is of vital importance that the edge rails be set flat and level to the deck surface elevation.
5. Either epoxy-set anchorage or drilled in anchors pre-secure the edge rails onto sound concrete. This is imperative for a successful installation. Polycrystalline bedding and elastomeric concrete header materials are also recognized methods of fastening the system to the concrete substrate.



### Aluminum Edge Rails

1. The aluminum edge rails are made to meet ASTM B 221, 6063-T5 alloy. The top of the vertical leg of the extrusion has two channels into which temporary alignment pins are inserted to positively align consecutive lengths. After rails are secured to the deck recess, the pins should be removed to allow the seal lugs to be installed.
2. The edge rails are extruded to assure uniformity of the edge of the flange, which is to be fully supported on the deck substrate. The deck waterproofing should be laid so as to eliminate any abrupt angles. The deck-mounted flanges of the edge rails contain a recessed channel to receive the anchors and/or nuts, which will be subsequently filled and will serve to hold the nuts below the plane of the waterproofing materials above.
3. The top surface of each edge rail incorporates two locations for fastening of the waterproof membrane (if required). One location is the side reglet, which acts as a receiver for a sealing insert and side flashing sheets if required. The other location is the second channel extruded into the rails, which will accept the insertion of a sheet of PVC or other water-shedding material. After the seal is snapped into place, the S.S. cover angles and S.S. screws securely hold the sheeting in place.



## DD-Series Sealing Element

1. The heart of the system is the DD-series seal. The seal is made from thermo-plastic material (trade name Santoprene), which enables the heat welding of various configurations at directional changes and transitions as mentioned above. These changes in plane or irregularities around columns, wall to floor, or up-and-over conditions such as stairs or curbs are a common occurrence. Thermo-plastic material lends itself very well to solving these difficult-to-seal conditions.
2. Factory-made directional changes and transitions may be made at EMS's fabrication plant, to drawings and dimensions provided by the field contractor. However, with minimal training, field crewmen will adapt quickly to create successful splices

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## Side Flashing Sheet

1. The side flashing sheets are optional. If required, the sheets are provided in rolls of 12" wide, 1/8" thick thermal-rubber sheeting. This material will allow heat-welding at all joints for continuous waterproofing at all transitions, corners, upturns, etc. The flashing sheet may be inserted into the top channel or into the side extruded reglet located on the vertical leg of the aluminum edge rail.
2. If required, flashing sheets should be "sandwiched" between two layers of the deck waterproofing system. The flashing materials must be made of similar material to ensure adhesion with deck waterproofing materials. Flashing sheets should have a short-term temperature resistance (350°F - 400°F) suitable for integration with the hot applied deck waterproofing membrane systems.

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## Stainless Steel Cover Angles

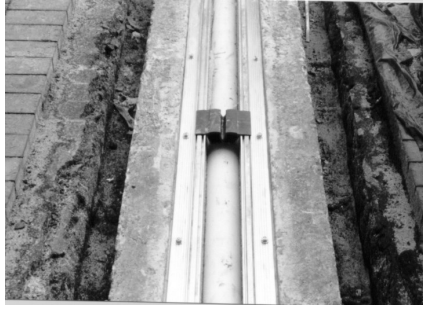
1. The formed Stainless steel cover angles comply with ASTM A167, Type 304 with mill finish. They are secured to the extrusion with stainless steel machine screws, 6" on center, which are seated into the countersunk seats in the stainless steel angles. These formed angle covers are removable to allow for expansion joint gland replacement. At locations where cover plates are required over top of the DD-series gland, a specially fabricated stainless steel cover plate can be made to extend across the sealing gland and rest on the top of the opposite side cover angle. Sizing of the plate is dependent on loading and width of the joint opening. The cover plate will be made from stainless steel plating.

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## Factory Fabrication of Transitions And Temperature Adjustments

1. In addition to factory-heat welded splices, EMS's fabrication plant will also fabricate the aluminum edge rails to match the field conditions.
2. At the time of installation, the engineer of record should be consulted for the temperature adjustment table. This will determine the joint opening "setting" at that given deck temperature. Preset the distance between the aluminum rail extrusions prior to anchoring the rails into place with the use of spacers. Keep in mind that the opening may be wider or narrower the next day. Adjustments must be made to remain in sync with the deck temperature.





## Surface Conditions

1. Joint surfaces to receive system should be sound, smooth, straight, parallel and level from side to side.

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## Installation

1. Inspection: The manufacturer's technician should be on site at commencement of installation for inspection of substrate preparation and demonstration of installation procedures. Bids must include a specific line item for manufacturer's technical service and will be considered incomplete and subject to disqualification if excluded. Technical service is defined as the paid, contracted service of a manufacturer's representative or factory technician.
2. The following is a general summary of installation requirements. In all cases, the manufacturer's standard written instructions of the manufacturer's technician are to be followed.

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## Anchorage

1. Use epoxy anchoring devices and fasteners for securing expansion joint cover assemblies or concrete expansion anchors (it is the contractor's option to purchase from manufacturer). Fasteners should be 3/8" diameter x 4" long anchor, carbon-steel grade II, zinc-chromate yellow finish, UNC 16, threaded end-to-end, with nut of same material.
2. Use a suitable epoxy sand mix to level the base of the expansion joint recess. Use a 100% solids epoxy.

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## Size Up

1. Perform all cutting and fitting required for installation of expansion joint covers. Install joint cover assemblies in true alignment and proper relationship to expansion joints and adjoining finished surfaces measured from established lines and levels. Take into consideration movement table from engineer.
2. Allow adequate free movement for thermal expansion and contraction of metal to avoid buckling. Securely attach in place with all required accessories. Locate anchors at recommended intervals, not less than three inches from each end.
3. Maintain continuity of expansion joint cover assemblies with end joints held to a minimum and metal members aligned with metal guide pins.

## Seal Placement

1. Integrate flashing sheets with deck waterproofing system materials according to waterproofing manufacturer's instructions. Install seals in continuous lengths to comply to eliminate leakage opportunities. All transitions and terminations should be factory-welded wherever possible, according to field-measurements and drawings on centerline provided by the contractor. Site welding, when needed, should be carried out after suitable instruction by the expansion joint manufacturer and/or their representative.
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## Site Cleanup

1. Dispose of all waste materials from the site. Seal should be cleaned of all foreign matter, as recommended by the seal manufacturer.



# SPECIFICATION

Division 07900  
DD-Series Plaza Deck Joint System

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## **PART 1 - GENERAL**

### **1.01 Summary**

- A. Section Includes: Furnishing of all materials, labor, and equipment necessary to the surface preparation and the installation of the sealed expansion joints in accordance with the details shown on the plans and these specifications. This design is for parking deck and interior joint applications. Aluminum strip seal extrusions are used with stainless steel cover plates on each top edge of the rails. An optional oversized wing can be fitted into additional retainer receiver locations under the stainless steel metal covers on each side. The design is arranged to flex in response to thermal joint movement and to seal against the intrusion of moisture.
- B. Related Sections:
  - 1. Section 03300 - Cast-in-place concrete
  - 2. Section 05800 - Joint Sealant

### **1.02 References**

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM D2240
  - 2. ASTM D412
  - 3. ASTM D624
  - 4. ASTM D395
  - 5. ASTM D792
  - 6. ASTM D746

### **1.03 Quality Assurance**

- A. Application Qualifications: The manufacturer of the expansion joint will provide a technically qualified representative who will train the installer on the proper techniques for installing the expansion joint. Each installation will be registered and approved by the manufacturer.
- B. For the purpose of designating type and quality for work of this section, drawings and specifications are based on products manufactured or furnished by the manufacturer listed in Part 2 of this section. No other products will be considered for use.
- C. Execute work of this section by skilled, trained applicators conforming to installation methods and procedures in accordance with the manufacturer's printed instructions. The applicator must be licensed or approved by the manufacturer. In the latter case, the manufacturer's technical representative must be present for the installation of three (3) joint lengths - equaling no less than 100 LF of joint.



- D. Do not proceed with the work until surfaces to receive the expansion joints have been inspected by the engineer and approved by the manufacturer. Correct any deficiencies in the surfaces to receive the expansion joints, as recommended by the manufacturer and engineer.
- E. Do not proceed with the work when temperatures are below 40°F, expected to fall below 40°F or above 90°F, unless approved in writing by the manufacturer.
- F. Manufacturer will have a minimum of five (5) years - experience specializing with type of joint system.

#### **1.04 Submittals**

- A. Submit in accordance with Section this Specification, unless otherwise indicated.
- B. Product Data: Manufacturer's specifications and technical data including the following:
  - 1. Manufacturer's installation instructions, specially written for this project
  - 2. Certified test reports indicating compliance with performance requirements specified herein
- C. Shop Drawings: Indicate dimensioning, membrane size, model number, general construction, specific modifications, component connections, anchorage methods, and installation procedures, plus the following specific requirements:
  - 1. Temperature/Adjustment Table, indicating joint width at various temperatures
  - 2. Dimensions based on anticipated movement for the joint location, as supplied by the engineer
- D. Quality Control Submittals:
  - 1. Statement of Qualifications
  - 2. Design Data
  - 3. Test Reports
  - 4. Manufacturer's Field Reports
- E. Contract Close-out Submittals: In accordance with this Specification, submit:
  - 1. Operating and Maintenance Manuals
  - 2. Special Warranties

#### **1.05 Delivery, Storage, and Handling**

- A. Packing and Shipping: Deliver products in original, unopened packaging with labels and seals unbroken.
- B. Storage and Protection: Store materials in accordance with manufacturer's recommendations in area protected from weather, moisture, open flame, and sparks. Adhesive must be stored at temperatures between 40° F and 90° F.

#### **1.06 Warranty**

- A. Warranty will state that the material and installation of the joint system complies with requirements of the contract documents and the manufacturer’s printed instructions for installing the expansion joints.
- B. Warranty will state the responsibility of the installer/manufacturer to stand behind the installed system for the warranty period indicated and for the conditions listed below:
  - 1. Leakage of the parking deck system, including points in transition
  - 2. Abrasion and wear of the materials resulting from normal traffic loading
  - 3. Cracking of the elastomeric concrete material , if used and de-bonding between it and the concrete

**PART 2 - PRODUCTS**

**2.01 Manufacturers**

- A. The Aluminum Strip Seal type membrane shape will be the following:
  - 1. DD-Series profile as supplied by EMS, Inc., 13311 Main Road, Akron, NY 14001  
Phone: (716) 542-3991 Fax: (716) 542-3996

**2.02 Components and Materials**

- A. Moisture Barrier: The extruded configuration will be vinyl material meeting the specifications prescribed in the manufacturer’s product data sheet and ASTM D2000. The material meets the following physical requirements:

<b>TABLE 1 – Physical Properties of the EPDM-Based Thermo-Rubber Seal Element</b>		
<b>Property Requirement</b>	<b>ASTM Test Method</b>	
Tensile strength, min. psi	D412	1000
Elongation at break, min.	D412	410%
Hardness, Type A durometer	D2240 (modified)	67
Compression set	D395 (Method B)	
168h @ 77°F		24%
168h @ 212°F		36%
Tear strength	D624	140 lb/in
Tension set	D412	10%
100% modulus	D412	420 psi
Specific gravity	D792	0.97
Brittle point	D746	< -81°F

**PART 3 - EXECUTION**

**3.01 Inspection**

- A. Prior to installation of the expansion joint profile, the installer will visit the site and notify the proper authority in writing of any conditions (done under other sections) that might be detrimental to the installation or performance of the expansion joint. Coordinate the installation with related work.

**3.02 Preparation of Surfaces of Block Out Recess in Deck**

- A. Construct the block-out recess and joint opening to the dimensions shown in the manufacturer's literature. The width of the joint opening should comply with the dimension shown in the temperature/adjustment table on the contract plans. The anticipated movement should be within the movement limits of the seal size selected for use.

### 3.03 Installation

#### A. DD-Edge Rails -

1. The edge rails are made from ASTM 6061-T6-aluminum material, which enables the heat welding of various configurations at directional changes and transitions, as mentioned above. These changes in plane, irregularities around columns, wall-to-floor, or up-and-over conditions, such as stairs or curbs are a common occurrence. Thermo-plastic material lends itself very well to solving these difficult to seal conditions. Leave a 1/8" space between the aluminum rail ends to allow for longitudinal expansion.
2. Factory-made directional changes and transitions may be made at EMS's fabrication plant, according to drawings and dimensions provided by the field contractor. However, with minimal training, field crewmen will adapt quickly to successful splices.

#### B. Side Flashing Sheet

1. The side flashing sheets are optional. If required for specific projects the sheets are provided in rolls of 12" wide 1/16" thick PVC sheeting. PVC material will allow heat welding at all joints for continuous waterproofing at all transitions, corners, upturns, etc. The flashing sheet may be inserted into the top channel or into the side extruded reglet located on the vertical leg of the aluminum edge rail.
2. If required, flashing sheets will be "sandwiched" between two layers of the deck waterproofing system. The flashing materials must be PVC-based material to ensure adhesion with deck waterproofing materials. Flashing sheets have a short-term temperature resistance (350°F - 400°F.) suitable for integration with the hot applied, deck waterproofing membrane systems.

#### C. Stainless Steel Cover Angles

1. The formed stainless steel cover angles comply with ASTM A167, Type 304 with mill finish. They are secured to extrusion with stainless steel machine screws, 6" on center, which are seated into the countersunk seats in the stainless steel angles. These formed angle covers are removable to allow for expansion joint gland replacement. At locations where cover plates are required over top of the DD-series gland, a specially fabricated stainless steel cover plate to can be made to extend across the sealing gland and rest on the top of the opposite side cover angle. Sizing of the plate is dependant on loading and width of the joint opening.

#### D. Factory Fabrication Of Transitions and Temperature Adjustment

1. In addition to factory heat welded splices, EMS's fabrication plant we will also fabricate the aluminum edge rails to match the field conditions.
2. At the time of installation, the engineer of record will be consulted for the temperature adjustment table. This will determine the joint opening "setting" at that given deck temperature. Preset the distance between the aluminum rail extrusions prior to anchoring the rails into place with the use of spacers. Keep in mind that the opening may be wider or narrower by the next day. Adjustments must be made to keep in sync with the deck temperature.

#### E. Surface Condition

1. Joint surfaces to receive system will be sound, smooth, straight, parallel, and level from side to side.

#### F. Installation

1. Inspection: Manufacturer's technician will be on site at commencement of installation for inspection of substrate preparation and demonstration of installation procedures. Bids must include a specific line item for manufacturer's technical service and will be considered incomplete and subject to disqualification if excluded. Technical service is defined as the paid, contracted service of a manufacturer's representative or factory technician.
2. The following is a general summary of installation requirements. In all cases the manufacturer's standard written instructions or specific instructions of the manufacturer's technician are to be followed.

#### G. Anchorage

1. Use epoxy anchoring devices and fasteners for securing expansion joint cover assemblies or concrete expansion anchors. It is the contractor's option to purchase fasteners from manufacturer. Fasteners will be 3/8" diameter x 4" long anchor, carbon-steel grade II, zinc-chromate yellow finish, UNC 16, threaded end- to-end, with nuts of the same material.

#### H. Size-up

1. Perform all cutting and fitting required for installation of expansion joint covers. Install joint cover assemblies in true alignment and proper relationship to expansion joints and adjoining finished surfaces measured from established lines and levels. Take into consideration movement table from engineer.
2. Allow adequate free movement for thermal expansion and contraction of metal to avoid buckling. Securely attach in place with all required accessories. Locate anchors at recommended intervals, not less than three inches from each end.
3. Maintain continuity of expansion joint cover assemblies with end joints held to a minimum and metal members aligned with metal guide pins

I. Seal Placement

1. Integrate flashing sheets with deck waterproofing system materials according to waterproofing manufacturer's instructions. Install seals in continuous lengths to eliminate leakage opportunities. All transitions and terminations will be factory-welded wherever possible according to field measurements and drawings on centerline provided by the contractor. Site welding, when needed, will be carried out after suitable instruction by the expansion joint manufacturer and/or their representative.

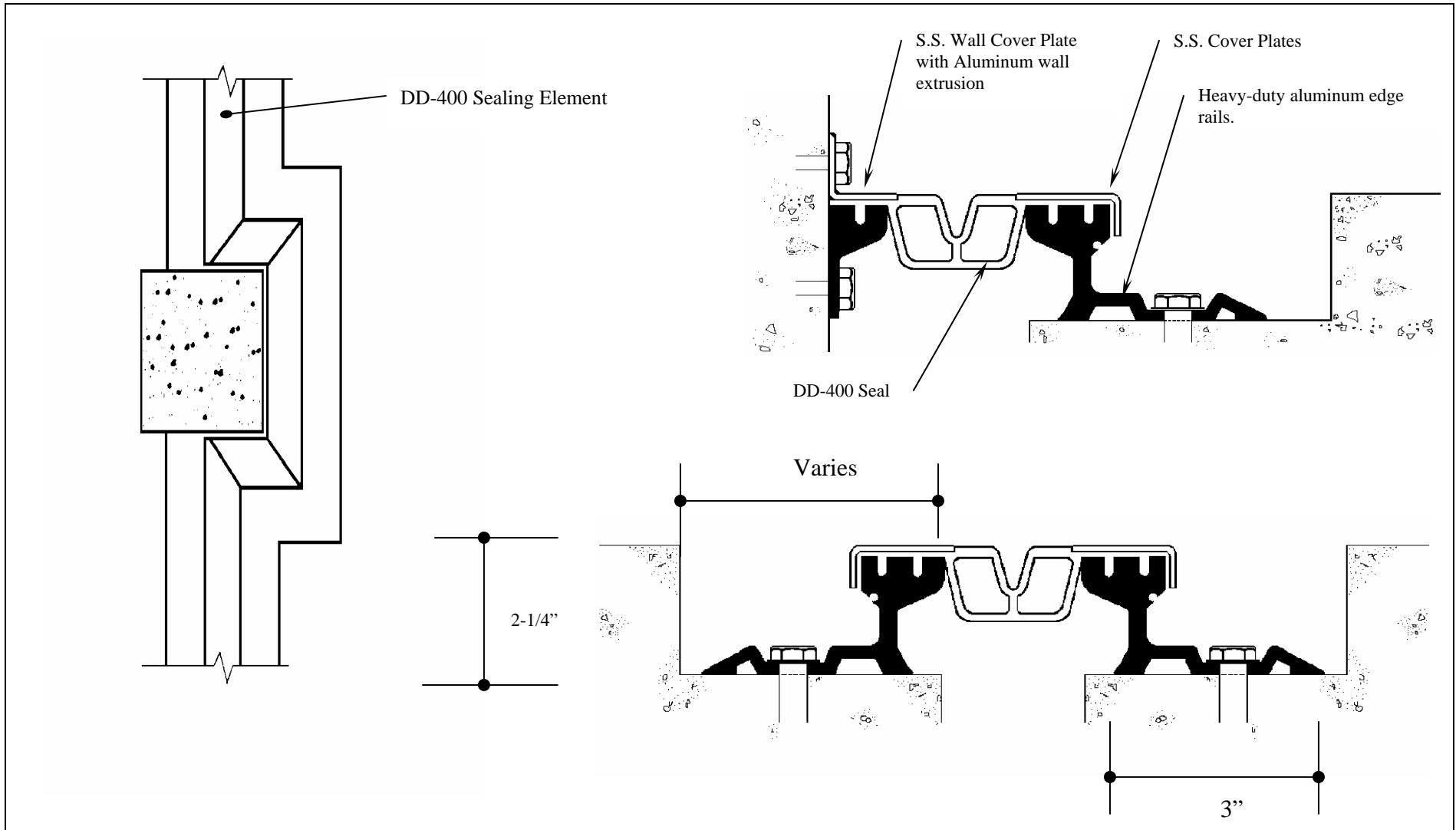
J. Site Cleanup

1. Dispose of all waste materials from the site. Seal will be cleaned of all foreign matter as recommended by the seal manufacturer

**3.05 Field Quality Control**

- A. Work that does not conform to the specified requirements will be corrected and/or replaced as directed by the manufacturer and engineer.
- B. Manufacturer/installer will supply guaranty/warranty to the owner authority, as required.

**END OF SECTION**



NO.	Description	Date	By
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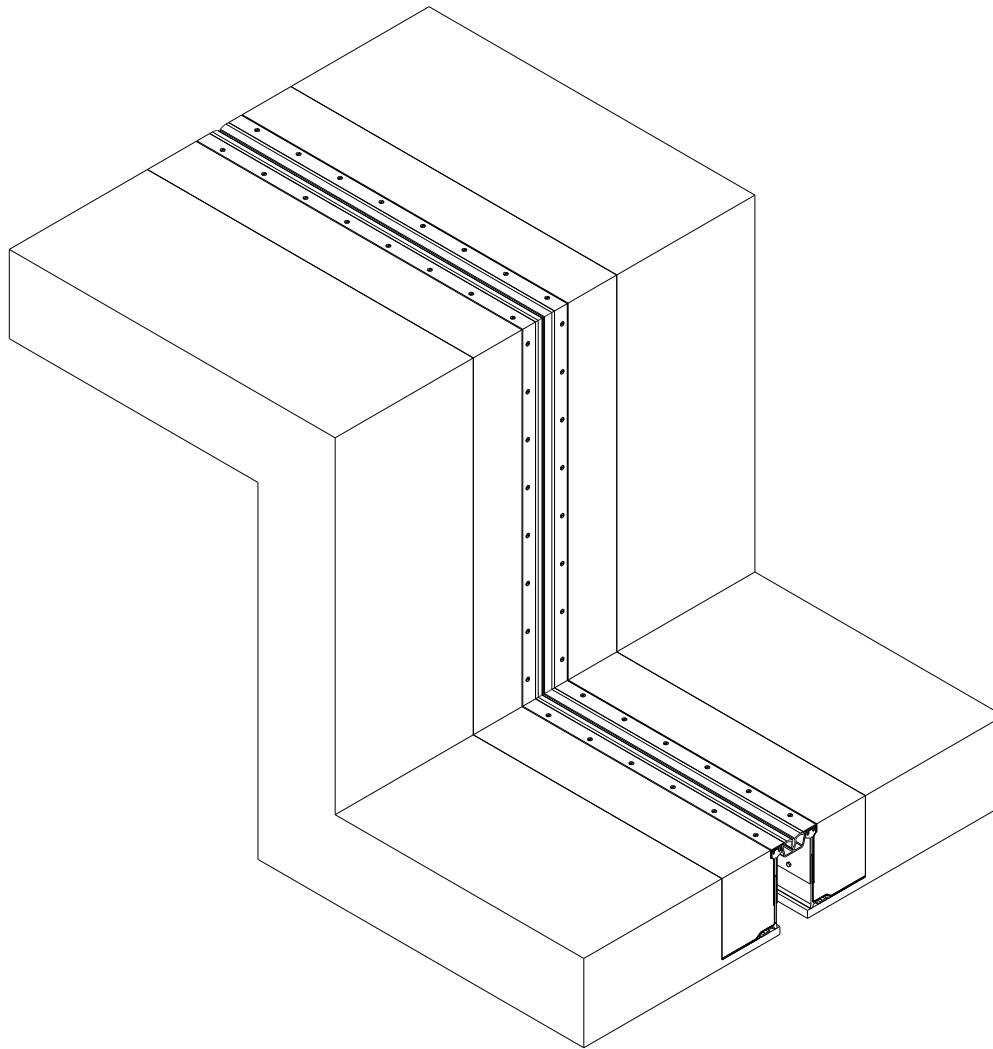


13311 Main Road • Akron • New York • 14001  
 Phone (716) 542-3991 • Fax (716) 542-3996 • E-mail sales@eriemetal.com

**PROJECT:**

**TITLE:** DD-400 Standard Details

Detailed by: AWG	Date: 10/9/00
Checked By: LJB	Date: 10/21/00
Scale: NTS	EMS Job #:
Sheet No.: 1 of 1	Drawing No.: CD-107



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**PROJECT:**

**TITLE: DD-400 HP SYSTEM- CURB**

Detailed by: GMH

Date: 6-26-07

Checked by:

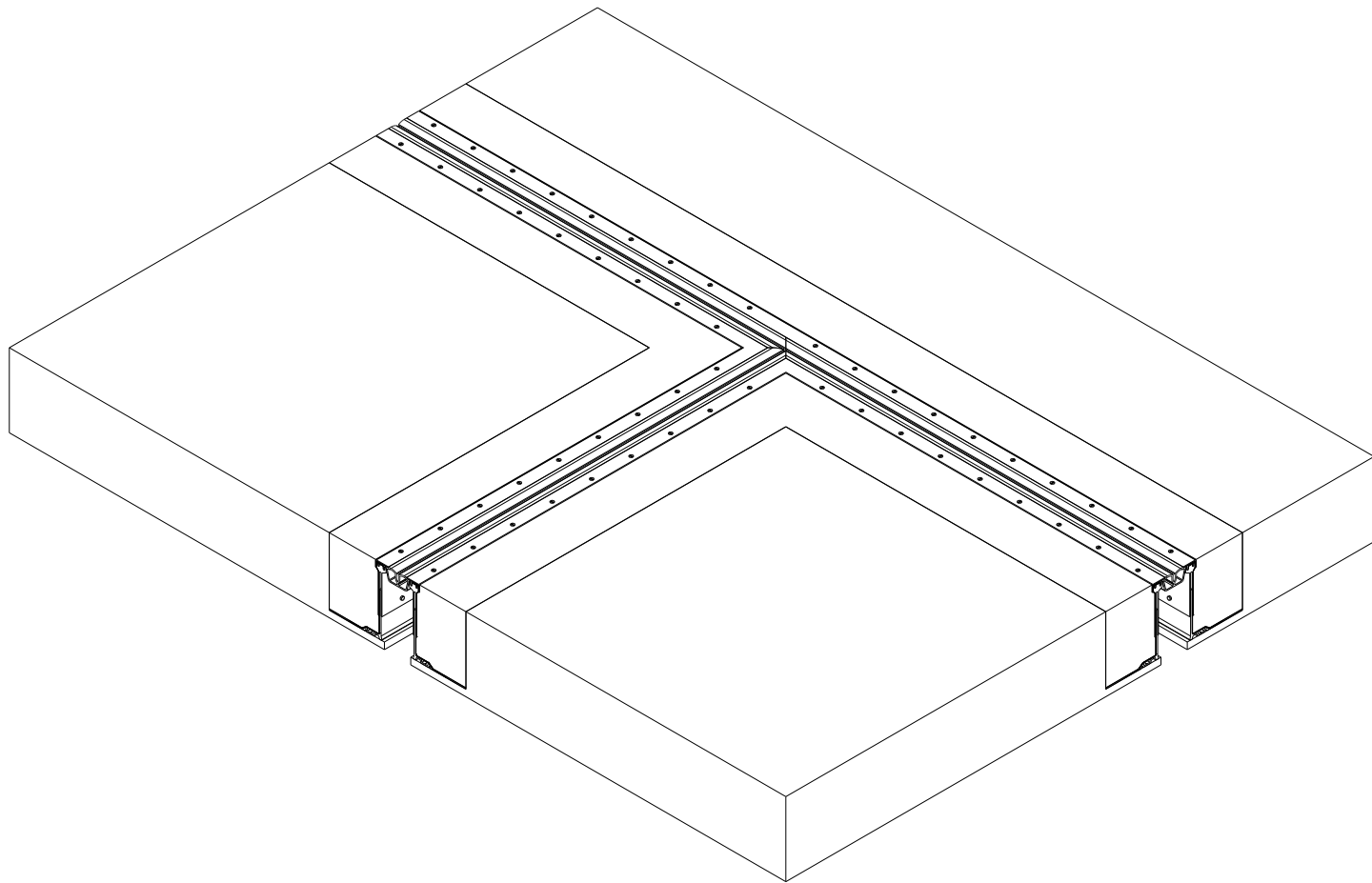
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Drawing #:



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**PROJECT:**

**TITLE: DD-400 HP SYSTEM- T INTERSECTION**

Detailed by: GMH

Date: 6-26-07

Checked by:

Date: 6-26-07

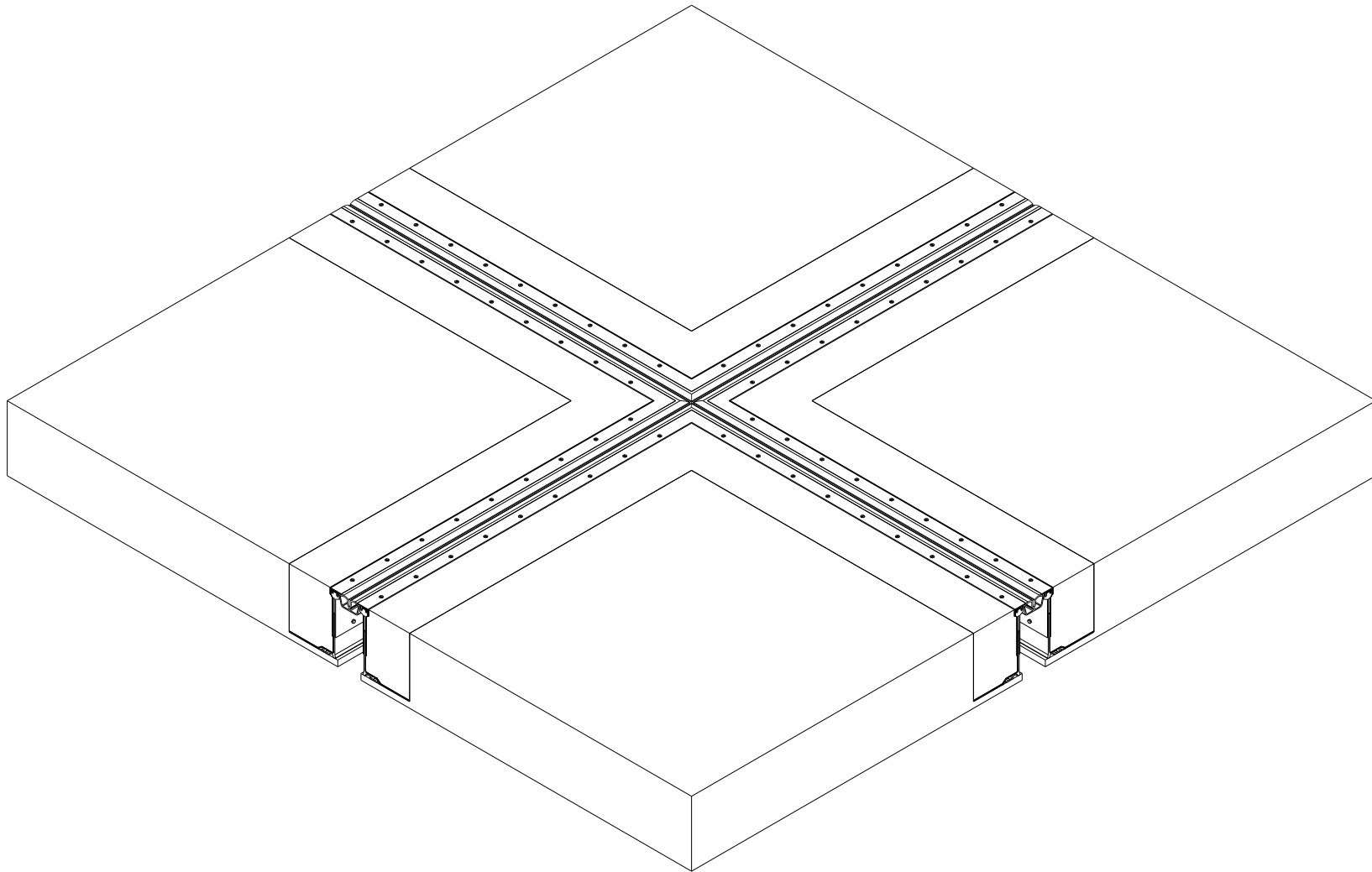
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EMS Job #:

Sheet #:

Drawing #:





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**PROJECT:**

**TITLE: DD-400 HP SYSTEM- CROSS INTERSECTION**

Detailed by: GMH

Date: 6-26-07

Checked by:

Date: 6-26-07

Scale: NTS

EMS Job #:

Sheet #:

Drawing #: