

SECTION 07 95 40

WATERTIGHT EXPANSION JOINT SYSTEM

PART 1 - GENERAL

1.01 Work Included

- A. 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 are proprietary designs utilizing extruded elastomeric seals and flashing sheets, base angles, aluminum side rails, stainless steel retainer caps, anchorage systems and support plates where required.
- B. Related Work
 - Cast-in-place concrete
 - Miscellaneous and ornamental metals
 - Flashing and sheet metal
 - Sealants and caulking

1.02 Submittals

- A. Template Drawings - Submit typical expansion joint cross-section(s) indicating pertinent dimensioning, general construction, component connections, and anchorage methods.

1.03 Product Delivery, Storage and Handling

- A. Deliver products in each manufacturer's original, intact, labeled containers, pallets or bundles and store under cover in a dry location until installed. Store off the ground, protect from weather and construction activities.

1.04 Acceptable Manufacturers

- A. All joints shall be as designed and manufactured by Watson Bowman Acme Corp., a Degussa affiliate, 95 Pineview Drive, Amherst, NY 14228
- B. Alternate manufacturers and their products will be considered, provided they meet the design concept and are produced of materials that are equal to or superior to those called for in the base product specification.
- C. Any proposed alternate systems must be submitted and receive approval 21 days prior to the bid. All post bid submissions will not be considered. This submission shall be in accordance with MATERIALS AND SUBSTITUTIONS.
 - Any manufacture wishing to submit for prior approval must provide the following:
 1. A working 6 inch sample of the proposed system with a letter describing how the system is considered superior to the specified system.
 2. A project proposal drawing illustrating the recommended alternate system installed in the application, specific to the project.
 3. Verifiable list of prior installations showing prior and successful experience with the proposed system.
 4. Any substitution products not adhering to all specification requirements within, will not be considered.

1.05 Quality Assurance

- A. Manufacturer: Shall be ISO-9001:2000 certified and shall provide written confirmation that a formal Quality Management System and Quality Processes have been adopted in the areas of, (but not limited to) engineering, manufacturing, quality control and customer service for all processes, products and their components. Alternate manufacturers will be considered provided they submit written proof that they are ISO 9001:2000 certified prior to the project bid date. Manufacturers in the process of obtaining certification will not be considered.
- B. Warranty: The expansion control system shall be warranted when installed by the manufacturer's factory trained installer. Installation shall be in strict accordance with manufacturer's technical specifications, details, installation instructions and general procedures in effect for normal intended usage and suitable applications under specific design movements and loading conditions.
- C. Manufacturer: Shall have a minimum ten (10) years experience specializing in the design and manufacture of expansion control systems.
- D. Products: Expansion control systems shall be installed with manufacturer's blockout repair and infill materials.
- E. Application: The specified expansion control system(s) shall be installed by the manufacturer's factory trained installer.

PART 2 - PRODUCTS

2.01 General

- A. Provide watertight expansion control system that is capable of accommodating multi-directional movement. System shall consist of heavy duty extrusions typically cast into the structure by means of utilizing manufacturer's recommended concrete anchor studs. The aluminum side rail extrusions shall be designed to accept and mechanically lock manufacturer's elastomeric seal. Provide optional seal profiles that satisfy project requirements including movement and where required, utilize profile or cover plate that accepts pedestrian traffic.

2.02 Components and Materials

- A. Base Angle Steel Extrusions - Material to conform to properties of ASTM A 588. Extrusion shall be heavy duty and capable of accommodating various horizontal and vertical conditions and service load requirements. Provide extrusions as detailed on contract drawings. Utilize base angles for 3-1/2" and 4-1/2" system heights. Anchor using 3/8" by 3" long threaded concrete anchor spaced 18" o. c.
- B. Aluminum Side Rail Extrusions – Material to conform to properties of ASTM B 221, alloy 6063-T6.
 - 1. Utilize low height aluminum side rail for 1-1/2" system height. Utilize 1/4" by 1-3/4" Tapcon concrete anchors spaced 18" o.c. for fastening low height aluminum side rail.
 - 2. Utilize low height aluminum side rail in conjunction with 1" height aluminum bar stock for 2-1/2" system height. Aluminum bar stock to be supplied factory welded to low height aluminum side rail. Utilize 1/4" by 2-1/4" concrete anchors spaced 18" o.c. to fasten to concrete.
 - 3. Utilize standard aluminum side rail for 3-1/2" and 4-1/2" system heights. Standard rail shall contain a recessed channel to receive base angle steel extrusion. Standard rail is fastened to base angle using 1/4" zinc nut and washer.

The top surface of both the low height and standard aluminum side rail shall contain two channels, one for receiving the elastomeric seal and the second for receiving the flashing sheet. Top surface shall contain screw race for fastening of the stainless steel retainer cap.

- C. Stainless Steel Retainer Cap – Material to conform to properties of ASTM A 167, Type 304 with 2B finish. Secure to aluminum side rails with ¼” by ¾” zinc plated sheet metal steel screws 12” o. c. Retainer cap shall be removable to access the elastomeric seal for repair and/or replacement.
- D. Elastomeric Seal - Material shall typically be a flexible, extruded Santoprene compound exhibiting the physical properties listed in the table below. Utilize manufacturer’s alternate materials and seal profiles selected from their standard product offering to meet the requirements of product application. All seals shall incorporate a unique locking lug on the underside of seal that mechanically snaps into the aluminum side rail channel to ensure watertightness and proper joint performance. Gland shall have flanges that extend beyond locking lug and overlap the flashing sheet to provide for a watertight seal. Gland shall be secured in a compressed state through the use of a stainless steel retainer cap. Where required, provide manufacturer’s seal profile that accepts pedestrian traffic.

The thermoplastic rubber seal element shall be sized to accommodate the total range of movement as dictated by the specifier at each joint location. Sizing shall be made in such a way as to ensure that the elastomeric membrane seal will remain under a degree of compression throughout the full movement cycle. The contractor will provide evidence utilizing manufacturer’s product data that the membrane seal will comply with this requirement.

PHYSICAL PROPERTIES OF ELASTOMERIC SEAL

<u>PHYSICAL PROPERTIES</u>	<u>ASTM TEST METHOD</u>	<u>REQUIREMENT</u>
Shore A Hardness	D-2240	67 ± 3
Tensile Strength, min	D-412	850 psi
Ultimate Elongation, min	D-412	300%
100% Modulus	D-412	385 ± 95 psi
Ozone Resistance	D-1171	No Cracks
UV Resistance	SAE J1960	Pass
Staining Resistance	ASTM D925	No Staining
Tension set, average	D-412	10%
Tear strength, average	D-624	140 pli @ 73°F 58 pli @ 212°F
Compression Set, average, 168 hours	D-395	23% @ 73°F
Brittle point, average	D-746	< -76°F

- E. Flashing sheet

Neoprene: Provide 0.062” thick by 12” width single ply fabric reinforced continuous Neoprene sheet in accordance with the following properties

Fabric Type:	4 ounce polyester cloth
Temperature Range:	-30F to +200F
Hardness Shore A	70 +/-5
Tensile, PSI	1000
Elongation, %	250
Tear, Die C, PPI	150

Flashing sheet shall be sandwiched between two layers of the deck waterproofing system. Utilize stainless steel retainer cap to lock flashing sheet in place. Flashing sheet must have a short-term temperature resistance for incorporation with hot-applied deck waterproofing systems.

- F. Cover Plate – Material to conform to properties of ASTM B 221, alloy 6063-T6.
- G. Fire Barrier Assembly - Designed for blackout condition only and for indicated or required dynamic structural movement without material degradation or fatigue. Tested in maximum joint width conditions with a field splice as a component of the expansion joint cover in accordance with ASTM E-119 at full rated period by a nationally recognized testing and inspecting organization. Supply Watson Bowman Acme FireFlex Fire Barrier as governed by joint opening and fire rating.

2.03 Fabrication

- A. Thermoplastic Rubber Membrane Seal - Ship in the longest practical continuous length in manufacturer's standard shipping carton or on wooden pallets shrink wrapped.
- B. Joint Seal Directional Changes - At all horizontal changes in direction provide seals with factory heat welded splices such as 90° corners, tees and crosses. The seal shall extend a minimum of 2'-0" in each direction from the factory splice.

Only straight, butt splice connections shall be allowed on the jobsite following manufacturers written instructions utilizing specialty heat fusing equipment.

All factory and field fused connections shall incorporate bonding of the complete seal profile. This includes fusing of all internal and external web configurations.

- C. Base steel angle and aluminum extrusions to be shipped in manufacturer's standard lengths and shall be cut to exact length on jobsite where required. Extrusions shall be miter cut in the field to conform to directional changes unless otherwise contracted with expansion joint manufacturer to provide factory manufactured transitions.
- D. Elastomeric seals shall be shipped in the longest practical continuous length in manufacturer's standard shipping carton or on wooden pallets wrapped in plastic sheet good. Miter cut in the field to conform to directional changes unless otherwise contracted with expansion joint manufacturer to provide factory manufactured transitions.
- E. Fire Barriers (if required) - Ship manufacturer's standard assembly for the required hourly rating. Assemblies shall be miter cut in the field to accommodate changes in direction.

2.04 Finishes

- A. Stainless steel retainer cap shall be provided in standard 2B finish.
- B. Elastomeric seals shall be supplied in standard color offering: black.

PART 3 - EXECUTION

3.01 Installation

- A. Utilize a suitable high strength, high flow epoxy grout to level the expansion joint system on both sides of the expansion joint opening.
- B. Protect all expansion joint component parts from damage during placement of concrete, work in adjacent areas, construction traffic and thereafter until completion of structure.
- C. Expansion joint systems shall be set to the proper width for the ambient temperature at the time of installation. Properly align all steel base angles and aluminum side rails prior to anchoring to ensure proper joint performance and watertightness.
- D. 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 profiles and 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.

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