

SECTION 05831

EXPANSION JOINT MODIFICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Remove existing expansion joint system from bridge deck and install new expansion joint system.

1.2 RELATED SECTIONS

- A. Section 03055: Portland Cement Concrete.
- B. Section 03211: Reinforcing Steel and Welded Wire.
- C. Section 03310: Structural Concrete.
- D. Section 05120: Structural Steel.

1.3 REFERENCES

- A. AASHTO M 111: Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- B. AASHTO M 235: Epoxy Resin Adhesives.
- C. AASHTO M 270: Structural Steel for Bridges.
- D. AISC: American Institute of Steel Construction.
- E. ASTM C 578: Rigid, Cellular Polystyrene Thermal Insulation.
- F. ASTM D 395: Rubber Property-Compression Set.
- G. ASTM D 412: Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

- H. ASTM D 471: Rubber Property-Effect of Liquids.
- I. ASTM D 573: Rubber-Deterioration in an Air Oven.
- J. ASTM D 1149: Rubber Deterioration-Surface Ozone Cracking in a Chamber.
- K. ASTM D 2240: Rubber Property-Durometer Hardness.
- L. Federal Specification TT-S-00230:

1.4 FABRICATION

- A. Shop drawing requirements: Comply with Section 05120.
- B. Certification: Comply with Section 05120, except that AISC, Category I Certification or the Department's Quality Certification program is acceptable.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Portland Cement Concrete: Class AA(AE). Refer to Section 03055.
- B. Cement: Refer to Section 03055.
- C. Structural Steel: Galvanized all structural steel as specified. AASHTO M 111.
 - 1. Steel Extrusions: AASHTO M 270, Grade 36.
 - 2. Plates: AASHTO M 270, Grade 36.
 - 3. Round Bars: AASHTO M 270, Grade 36.
- D. Lubricating Material: Follow Federal Specification TTS-00230.
- E. Epoxy Resin Adhesive: Follow AASHTO M 235.
 - 1. Type II.
 - 2. Choose class rating consistent with the application temperature.
- F. Reinforcing Steel (Coated): Refer to Section 03211.
- G. Rigid Plastic Foam: Type 9, density of 2 lbs/ft³. ASTM C 578.

H. Neoprene Gland: Single convolution type with the following physical properties:

Table 1

Property Method	Requirements	ASTM
Tensile Strength, min. psi	2,000	D 412
Elongation at break, min. percent	250	D 412
Hardness, Type A Durometer (modified)	55 ± 5	D 2240
Compression Set, 70 hr. at 212 degrees F. Method B (modified)	40 percent	D 395
Oven Aging, 70 hr. at 212 degrees F. Tensile Strength. Loss, max. Elongation, loss, max.	20 percent 20 percent	D 573
Hardness, Type A Durometer (points change)	0 to + 10	
Oil Swell, ASTM Oil 3, 70 hr at 212 degrees F. Weight Change, max	45 percent	D 471
Ozone Resistance, 20 percent Strain, 300 pphm in air 70 hr. at 104 degrees F. (modified)	No cracks	D 1149

2.2 JOINT SYSTEMS

- A. Use only one brand of strip seal system on any single project.
- B. The following systems are acceptable for this project and are detailed in the plans.
 - 1. Wabo Strip Seal System
 - 2. Structural Accessories Strip Seal System
 - 3. D. S. Brown Strip Seal System

2.3 TOLERANCES

- A. After fabrication of the expansion joint and anchorage system, check the gland face and top of the extruded steel shape of each section for straightness. Use a string line stretched taut from curb angle point to curb angle point.

- B. Shop Tolerances:
 - 1. Steel surfaces are not to deviate from the string line by more than 1/8 inch.
 - 2. No surface is to deviate more than 3/32 inch when the string line is stretched between either end or crown point and the point of maximum departure from true.

- C. Field Tolerances: Recheck steel surfaces for straightness under shop tolerance requirements after installing joint system in its final position and before placing concrete.

- D. Final In-Place Tolerances:
 - 1. Re-check the extrusion gland face after concrete placement. It is not to deviate from the string line by more than 1/4 inch. The parallel extrusion faces are not to deviate from each other by more than 1/8 inch at any location.
 - 2. Place the top of the extrusion to meet the grade requirements shown on the plans.

PART 3 EXECUTION

3.1 PREPARATION

- A. Asphalt Removal
 - 1. Make saw cuts parallel to existing joints to define the removal area.
 - 2. Remove asphalt surfacing in such a manner that the concrete deck is not damaged.

- B. Concrete Saw Cuts
 - 1. Place the saw cuts at the offset shown on the plans and saw 1 inch deep in the concrete deck parallel to existing joints to define work area.

- C. Prevent debris from falling into streams, pedestrian areas, traffic areas and on railroad tracks.

3.2 CONCRETE REMOVAL

- A. Use jackhammer method to remove existing concrete.
 - 1. Partial Depth Removal: Use 30-pound class hand operated jackhammers or smaller.

2. Full Depth Removal: Use 90-pound class hand operated jackhammers or smaller.
 3. Operate jackhammers at an angle greater than 45 degrees as measured from the deck surface.
- B. Parapet:
1. Remove parapet concrete in the prescribed limits shown on the plans.
 2. Where existing electrical conduit is encountered, protect the conduit from damage.

3.3 REINFORCING STEEL

- A. Existing Reinforcing Steel: Clean steel that remains in place thoroughly of all corrosion and adhering materials by sandblasting.
- B. New Reinforcing Steel: Place coated reinforcing steel after sandblasting operations are complete.

3.4 SYSTEM INSTALLATION

- A. Install expansion joint system according to the manufacturer's recommendations.
- B. A factory-trained representative must be present during setting of the system, placement of concrete, installation of neoprene seal element, and during the watertight integrity test.

3.5 JOINT WIDTH

- A. Form the joint width, as shown on the plans, using rigid plastic foam. Anchor securely.
- B. Place rigid plastic foam between sections of concrete parapet to maintain separation of sections.

3.6 PLACE CONCRETE

- A. Clean concrete and steel surfaces before coating with an epoxy adhesive. Follow adhesive manufacturer's application instructions.
- B. Place Concrete according to Sections 03055 and 03310.

3.7 INSTALL JOINT GLAND

- A. Install the gland after the complete steel extrusion installation to ensure that the length of the joint has a continuous seal.
- B. Lubricate the steel extrusion cavity before installing the neoprene gland.
- C. Remove the foam used to form the joint opening and any other objects prior to watertight integrity test. Gland convolution should hang freely after installation.

3.8 WATERTIGHT INTEGRITY TEST

- A. Joint areas must be capable of holding water for 15 minutes without leaking.
- B. If joint areas fail the test, remove any leaking seals, clean steel extrusion grooves, and reinstall the seals.
- C. Install new seals when leakage persists.

END OF SECTION