

necessary to complete the work. Modifications such as an increase or decrease in the size or number of grade beams, drilled shafts (caissons), or retaining walls, special anchorages, conflicts with utilities or other obstructions when the utilities or obstructions were noted in the Contract Documents, or any other modifications required due to the Contractor's selection of an alternate spacing, or a preapproved alternate noise wall when permitted, will be incidental to the item.

455.04.01 Noise Barrier System panels will be measured and paid for at the Contract unit price per square foot of wall including posts, panels, architectural and noise absorptive finishes, stains and coatings, base plates, anchor assemblies (except when noise barriers are mounted on retaining walls), construction templates, temporary supports, doors, fire hose connections, excavation, backfill, and hardware. Measurement will be based on the as-planned dimensions, using the length along the face of the wall times the panel height.

455.04.02 Grade Beams will not be measured but will be paid for at the Contract lump sum price, which shall also include excavation, reinforcement, concrete, and backfill.

455.04.03 Drilled Shafts (Caissons) will be measured and paid for as specified in 412.04.

455.04.04 Retaining walls will be measured and paid for as specified in 450.04.

SECTION 456 THRU 459 — RESERVED

SECTION 460 — EXPANSION JOINTS IN STRUCTURES

460.01 DESCRIPTION. This work shall consist of furnishing, fabricating, and installing preformed joint fillers, preformed elastomeric joint seals, troughs, structural steel and metal plates to be utilized in providing expansion and contraction capabilities in structures as specified in the Contract Documents.

460.02 MATERIALS.

Hardware for Drainage Troughs	909.06
Preformed Joint Fillers	911.02
Preformed Polychloroprene Elastomeric Compression Joint Seals	911.04

Lubricant Adhesive	911.04.03
Troughs	911.11
Structural Steel	A 709, Grade 36

All structural steel for drainage troughs shall be hot-dipped galvanized as specified in A 123.

Troughs shall be 1/4 in. thick. Joints or splices for drainage troughs are prohibited except as indicated on the Contract Documents.

460.02.01 Paint. The color of the finish coat shall conform to Federal Standard 595, Color No. 26440. The Contractor may substitute two coats of epoxy protective coating conforming to 917.01 in lieu of Coats II and III of any of the following paint systems:

- (a) **New Expansion Joints.** Paint shall conform to 912.05, System B.
- (b) **Existing Expansion Joints and New Portions.** Paint shall conform to 912.05, System E. The Contractor may substitute Coat I of System A in lieu of Coat I of System E for new portions of expansion joint widenings.

460.03 CONSTRUCTION. Expansion joint material delivered to the bridge site shall be stored under cover on platforms above the surface of the ground. It shall be protected at all times from damage and when placed it shall be free from dirt, oil, grease, or other foreign substances. All welding shall conform to AWS D1.1 unless otherwise specified in the Contract Documents. The Contractor shall have all material and installation methods approved by the Engineer prior to installation of any expansion joint material.

The preformed material shall consist of the longest length possible with a minimum of joints. Lengths less than 4 ft shall be one piece. The material shall be cut to a clean, true edge with a sharp tool. Care shall be taken to ensure straight lines at the joint.

When installing the seal, the Contractor shall not use any type of equipment that will damage the seal. If the seal is damaged during installation, the Contractor shall remove and replace the seal at no additional cost to the Administration.

New Expansion Joints. Prior to any shop painting operations, all surfaces of the expansion dam and backwall angles shall be cleaned as specified for nonweathering steel in 435.03.04. The prime coat shall be applied in the shop to the entire area of the backwall and expansion dam

angles including those areas in contact with concrete, except the portion which is masked to receive adhesive for the seal.

Existing Expansion Joints. Prior to any painting operations on existing expansion joints and new steel used to modify them, all surfaces of the expansion dam angles and backwall angles to be painted or receive adhesive for the seal shall be thoroughly cleaned to conform to a Near White condition as specified in 435.03.03(f) or (h). The area that will be in contact with the seal shall then be completely masked for full length and depth of seal.

The backwall and expansion dam angles shall have all prime coats applied to the entire area that will be exposed in the finished structure, both above and below the seal. These coatings shall be applied in the shop for new steel members.

Where the Contract Documents specify replacement or modification to existing expansion joints on bridges on which traffic will be maintained, the Contractor shall have available a supply of steel plates having minimum dimensions of 4 x 8 ft and 1 in. thick. These plates shall be placed over the joints if traffic has to be restored before the concrete has cured or at any time the unfinished work will interfere with traffic.

Where the Contract Documents specify modification to existing expansion joints, the concrete shall be removed in conformance with 405.03.

Where the Contract Documents only specify replacement of existing roadway joint seal, the work shall include cleaning and painting the joint.

All angles shall be cut with a saw. All holes and slots shall be drilled. Cutting with a torch is prohibited.

Any areas where the existing steel coating is damaged due to the installation of new troughs shall be power tool cleaned to bare metal and painted.

Paint. If this is the only portion of bridge to be painted, the paint need not be tested by the Laboratory if, prior to use, a copy of the certified test results has been furnished to the Engineer specifying that the paint conforms to Section 912.

The primer shall be applied on the same day that the blast cleaning takes place. The primer shall be spray applied in a single application with dry film thickness of 3 to 5 mils. All touch-ups may be applied by brush and shall have the same dry film thickness as the coat being repaired.

After the joints are complete in place and just prior to placing the compression seal, the masking tape shall be removed and the seal installed. The finish coat shall then be applied to the exposed portion of the angles above the seal.

Joint Seals in Bridge Decks. The transverse compression seals shall be one piece for the entire length of the roadway joint. Shop or field splices in the seal are prohibited. Compression seals for longitudinal bridge joints shall consist of the longest piece practical.

Lubricant adhesives shall be applied in conformance with the manufacturer's recommendations. If stretching of the seal in excess of five percent occurs, the Contractor shall remove and reinstall the seal as directed by the Engineer.

460.03.01 In-Place Testing. The completed joint shall be subjected to a water test to detect any leakage. The test shall be conducted a minimum of five days after completion of the joint. The Contractor shall provide all facilities required for the Engineer's inspections of the underdeck areas at no additional cost to the Administration. The roadway section of the joint from curb to curb, or parapet to parapet, shall be covered with a minimum of 1 in. of water. If this is not possible, the water test may be performed in part section along the joint. When testing subsequent part sections, the test shall overlap a minimum of 1 ft of the joint previously tested.

The ponding shall be maintained for a period of five hours for the entire roadway or each section of joint being tested. During and at the conclusion of the test, the underside of the joint shall be closely examined for leakage. The expansion joint seal shall be considered watertight if no obvious wetness is visible.

If the joint system exhibits evidence of water leakage at any point, the Contractor shall locate and repair all leaks at no additional cost to the Administration.

When repairs are required, a subsequent water test shall be performed.

If the joint leaks after the second test, the Contractor shall remove, replace and retest the seal at no additional cost to the Administration.

460.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for furnishing, fabricating, placing, etc., of structural steel, roadway seals, drainage troughs, catch basins, downspouts, cleaning, painting, and all material, labor, equipment, tools and incidentals necessary to complete the work.

460.04.01 Joints in structures will not be measured but the cost will be incidental to the pertinent Superstructure Concrete item.

460.04.02 When an item for Modifying Existing Bridge Roadway Joints is included in the Contract Documents, the cost of furnishing, fabricating, placing, etc., of new structural steel, new roadway seals, modifying existing joints on bridge roadway including saw cutting and removal of existing concrete, new concrete, steel plates, cutting of existing steel, welding, drainage troughs, catch basins, downspouts, etc., shall also be included in the Contract unit price per linear foot for the item. The measurement will include the horizontal distance from the inside face to inside face of parapets plus the vertical distance of the curb faces and parapets.

460.04.03 When an item for Drainage Trough for Bridge is included in the Contract Documents, the furnishing and placing of drainage troughs including catch basins, downspouts, structural steel and hardware will be measured and paid for at the pertinent Contract unit price per linear foot. This price will include cutting of angles, painting, drilling of concrete, expansion bolts, etc. The measurement will be the center line distance from end to end of the installed drainage trough fabric.

SECTION 461 — METAL RAILING

461.01 DESCRIPTION. This work shall consist of furnishing, fabricating, coating, and erecting of all metal railings as specified in the Contract Documents.

461.02 MATERIALS. Materials shall be as specified in the Contract Documents.

461.03 CONSTRUCTION. All railings shall be fabricated and erected as specified in the Contract Documents.

The Contractor shall furnish working drawings for approval by the Engineer.

461.03.01 Production, Handling and Shipment. Metal railings and incidental parts shall be carefully handled and stored on blocking, racks, or platforms to prohibit contact with the ground and shall be protected from corrosion or damage. Materials shall be kept free from dirt, oil, grease, and other foreign matter. Surfaces to be painted shall be carefully protected both in the shop and in the field. Damaged material shall be repaired or replaced as directed by the Engineer at no additional cost to the Administration.