

## **SECTION 461**

### **MULTIROTATIONAL BEARINGS**

#### **461-1 Description.**

Furnish and install multirotational bearings in accordance with the recommendations of the manufacturer and details shown in the Plans. Obtain all multirotational bearings on each bridge from the same manufacturer. This Section covers the following types of multirotational bearings:

1. pot bearings
2. disc bearings.

#### **461-2 Materials.**

Provide materials in accordance with the AASHTO LRFD Bridge Design Specifications and as follows.

##### **461-2.1 Structural Steel:**

Furnish structural steel conforming to ASTM A709 Grade 50W.

##### **461-2.2 Stainless Steel:**

Furnish stainless steel conforming to ASTM A240, Type 316, 16 gage minimum thickness.

##### **461-2.3 Metalizing Wire:**

Furnish metalizing wire in accordance with ASTM B833, having an 85% zinc/15% aluminum (Z30700) composition.

##### **461-2.4 Anchor Rods, Nuts and Washers:**

Furnish galvanized anchor rods, nuts and washers in accordance with Section 962.

#### **461-3 Design.**

Design bearings in accordance with the AASHTO LRFD Bridge Design Specifications. Design bearings to be replaceable without removing the masonry plate or sole plate.

Design guided bearings for the lateral load shown in the Plans or 10% of the vertical load capacity of the bearing shown in the Plans, whichever is greater.

For disc bearings, provide steel limiting rings around the top and bottom of the polyether urethane disc.

#### **461-4 Shop Drawings.**

Submit shop drawings in accordance with Section 5. Include design calculations, signed and sealed by a Specialty Engineer, confirming that all components are in conformance with the requirements of this Section. Include the following information on the shop drawings:

1. The name and address of the bearing manufacturer, including the physical address where the fabrication will be performed.
2. The bearing manufacturer's instructions for proper installation, including the proper positioning settings for a minimum 100°F temperature range.
3. A list of all materials, project specific details and dimensions, the bearing model number and the movement range.

#### **461-5 Fabrication.**

Fabricate bearings in accordance with the AASHTO LRFD Bridge Construction Specifications and the following requirements.

Shop metalize and seal all steel surfaces, except PTFE-stainless steel sliding surfaces, the insides of pots and the bottoms of pistons in accordance with SSPC-CS23.00/AWS C2.23M/NACE No. 12, "Specification for the Application of Thermal Spray Coatings (Metalizing) of Aluminum, Zinc, and Their Alloys and Composites for the Corrosion Protection of Steel". Prepare surfaces prior to metalizing to a "near white" metal condition in accordance with SSPC-SP10 using abrasives meeting the requirements of 560-2. Achieve a sharp angular blast anchor profile meeting the requirements of ASTM D4417, Method C, 3 mils plus or minus 1 mil (75  $\mu\text{m}$  plus or minus 25  $\mu\text{m}$ ). Provide a metalizing thickness of 10 mils minimum and 20 mils maximum. Prepare a sample coupon using the same processes used to prepare the surfaces and apply the coating to the bearing. Test the coating bond strength on the coupon in accordance with ASTM D4541. The bond strength must be a minimum of 700 psi. If the bond strength of the coating on the coupon is deficient, test the coating on the bearing. If the required bond strength is achieved, repair the coating on the bearing.

#### **461-6 Testing and Certification.**

Test the materials used to fabricate the bearings and the completed bearings themselves in accordance with the AASHTO LRFD Bridge Construction Specifications using the reactions, rotations and movements shown in the Plans for each type of bearing. Conduct the long-term deterioration test and the long-term proof load test on full size bearings on a per LOT basis.

#### **461-7 Installation.**

Store multirotational bearings delivered to the bridge site under cover on a platform above the ground surface. Protect bearings at all times from damage and ensure they are clean, dry and free from dirt, oil, grease or other foreign substances before placement. Install the bearings in accordance with the recommendations of the manufacturer, contract drawings, and as may be directed by the Engineer. If there is any discrepancy between the recommendations of the manufacturer, these Specifications, and Contract Drawings, the Engineer will be the sole judge in reconciling any such discrepancy.

Obtain the services of a qualified technical representative, employed by the manufacturer of the bearings, to supervise the first installation of each type of bearing (expansion pot, fixed pot, expansion disc, fixed disc or other type as defined by the Engineer) but for only one size of each type. Submit to the Engineer a certified statement from the manufacturer that its representative has the necessary technical experience and knowledge to supervise bearing installations and to train Contractor personnel about proper bearing installation procedures and methods. Do not install the bearings before the Engineer receives the certification and the representative is on the job site. Assume this responsibility at no further expense to the Department.

Perform any required touchup repair and field metalizing as directed by the Engineer.

#### **461-8 Method of Measurement.**

Quantities for fixed and expansion bearings will be the plan quantity number of each type of bearing constructed and accepted.

**461-9 Basis of Payment.**

**461-9.1 Basic Items of Bearings:** The Contract unit price per each for bearings will be full compensation for all work and materials necessary for the complete installation. Such price and payment will include, but not limited to, the following specific incidental work:

1. testing,
2. tools and equipment required for installation,
3. any work to replace and rejected bearings,
4. any repairs to the metalized coating on the bearings,
5. all costs associated with the manufacturer's installation technician.

**461-9.2 Payment Items:**

Payment will be made under:

Item No. 461-113-     Multirotational Bearing Assembly - Fixed - each.

Item No. 461-114-     Multirotational Bearing Assembly - Expansion - each.