



*Florida Department of Transportation*

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GOVERNOR

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KEVIN J. THIBAUT, P.E.  
SECRETARY

July 2, 2020

Khoa Nguyen  
Director, Office of Technical Services  
Federal Highway Administration  
3500 Financial Plaza, Suite 400  
Tallahassee, Florida 32312

Re: State Specifications Office  
Section: **461**  
Proposed Specification: **4610100 Multirotational Bearings.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Dennis Golabek by the Structures Design Office to update the language to meet the current AASHTO LRFD Bridge Construction Specifications and industry practices.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to [daniel.strickland@dot.state.fl.us](mailto:daniel.strickland@dot.state.fl.us)

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on file

Daniel Strickland, P.E.  
State Specifications Engineer

DS/rf

Attachment

cc: Florida Transportation Builders' Assoc.  
State Construction Engineer

## MULTIROTATIONAL BEARINGS (REV 5-8-20)

ARTICLE 461-1 is deleted and the following substituted:

### 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 from a fabricator that is currently on the Department's Production Facility Listing. Provide bearings on each bridge from the same manufacturer. This Section covers the following types of multirotational bearings:

1. pot bearings.
2. disc bearings.

ARTICLE 461-3 is deleted and the following substituted:

### 461-3 Design.

Design bearings in accordance with the AASHTO LRFD Bridge Design Specifications. Design bearing connections to allow for bearing replacement without having to remove the masonry plate or sole plate. Detail all steel bearing components with sliding surfaces (e.g., stainless-steel plates or PTFE plates), masonry plates and elastomeric components to be replaceable. Welded attachments are not considered a replaceable connection.

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 except if using the following: a minimum 62 Type (Shore) D durometer disc, a shear restraint device, and surface friction between the disc and steel plates.

ARTICLE 461-4 is deleted and the following substituted:

### 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~~ Items listed in AASHTO LRFD Bridge Construction Specifications Article 18.1.1.
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~~ Items required in 461-6.1.

ARTICLE 461-5 is deleted and the following substituted:

**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.

Prior to shipment, bearings shall be packaged in such a manner to ensure that during shipment and storage the bearings will be protected against damage from handling, weather, or any normal hazard. Secure bearing assemblies in the fabrication plant with temporary metal bolts or straps to avoid separation during transport and installation.

ARTICLE 461-6 is deleted and the following substituted:

**461-6 Testing and Certification.**

**461-6.1 General:**

~~—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. Submit all test results including visual documentation of the bearing both during testing and upon disassembly after testing to the Engineer.~~

461-6.2 Long-Term Proof Load Test: Conduct long-term proof load testing on full-size bearings on a per LOT basis using the reactions, rotations and movements shown in the Plans for each type of bearing.

461-6.3 Long-Term Deterioration Test: Long-term deterioration testing requirements will be considered satisfied by either of the following:

1. Testing of full-size bearings on a per LOT basis.
2. Prequalification in accordance with Materials Manual Chapter 11.1. The capacity of successfully tested bearings must be within 25% of the required demand specified in the Plans (reactions and resultant compressive stresses, rotations, and movements) for prequalification testing to be considered satisfied for a project. Test results for bearings of a given type and configuration are valid for five years from the original date of testing.

Production bearings must be manufactured using the same materials, methods, and quality control procedures as those used for testing.

## **MULTIROTATIONAL BEARINGS (REV 5-8-20)**

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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.

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1. Items listed in AASHTO LRFD Bridge Construction Specifications Article 18.1.1.
2. The bearing manufacturer's instructions for proper installation, including the proper positioning settings for a minimum 100°F temperature range.
3. Items required in 461-6.1.

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Test the materials used to fabricate the bearings and the completed bearings themselves in accordance with the AASHTO LRFD Bridge Construction Specifications. Submit all test results including visual documentation of the bearing both during testing and upon disassembly after testing to the Engineer.

**461-6.2 Long-Term Proof Load Test:** Conduct long-term proof load testing on full-size bearings on a per LOT basis using the reactions, rotations and movements shown in the Plans for each type of bearing.

**461-6.3 Long-Term Deterioration Test:** Long-term deterioration testing requirements will be considered satisfied by either of the following:

1. Testing of full-size bearings on a per LOT basis.
2. Prequalification in accordance with Materials Manual Chapter 11.1. The capacity of successfully tested bearings must be within 25% of the required demand specified in the Plans (reactions and resultant compressive stresses, rotations, and movements) for prequalification testing to be considered satisfied for a project. Test results for bearings of a given type and configuration are valid for five years from the original date of testing.

Production bearings must be manufactured using the same materials, methods, and quality control procedures as those used for testing.