

TO: All Design Section Staff
FROM: Bijan Khaleghi
DATE: September 11, 2015
SUBJECT: Seismic Isolation Bearings Submittals and Review Process

This design memorandum describes WSDOT's policy and submittal review process for seismic isolation bearings. The usage and design of isolation bearings shall conform to the requirements of WSDOT Bridge Design Manual Section 9.2, and the AASHTO Guide Specifications for Seismic Isolation Design.

WSDOT inspectors shall be provided access to observe the isolation bearing manufacturing and testing process for the subject project in accordance with WSDOT Standard Specification Section 1-05.6. Isolation bearing materials, material specifications and testing processes shall be reviewed for acceptance by the Engineer and WSDOT inspectors.

The manufacturer shall design, develop and submit isolation bearing shop drawings to WSDOT for review. Design and shop drawings shall be based upon the loads, movement demands, and schematic details depicted in the contract drawings and the Special Provisions. These documents serve as the primary basis for evaluating the accuracy and adequacy of the calculations and shop drawings. All materials used in bearing manufacturing shall be properly specified in the shop drawings for Engineer's acceptance.

This design memorandum is pertinent to all isolation bearings regardless of contracting method or sole source procurement.

Review of Design Calculations and Submittals Process:

The manufacturer shall submit calculations and shop drawings to the Engineer for review prior to fabrication. The Engineer is responsible for reviewing the contract drawings and Special Provisions to become acquainted with the design, fabrication, and inspection / acceptance criteria. The Engineer should:

- Verify that all load cases identified in the contract drawings are represented appropriately in the design. This includes service load and strength load cases.
- Verify that all displacements and rotations identified in the contract drawings are incorporated appropriately into the design.
- Verify that allowable stresses are consistent with LRFD provisions.

Review of Shop Drawings Requirements:

Review of the shop drawings submittal includes, at a minimum, the following:

- Verify that stamped and signed calculations and shop drawings are provided.
- Verify that shop drawings include plan and elevation views of the assembled bearing and details of each of its constituent components, showing dimensions and tolerances.
- Verify that all component materials conform to the requirements of the Special Provisions.
- Verify that component flatness tolerances and surface roughness requirements are shown on the shop drawings and are consistent with the Special Provisions.
- Verify that appropriate corrosion protection system details (galvanization, paint) on steel components, bolts, and washers are designated on the shop drawings and are in conformance with the Special Provisions and the Standard Specifications.
- Verify that the bearings have been detailed to accommodate full inspection and removal and replacement of all components that are subject to wear.
- Verify that adequate clearances, including tolerances, are provided between components to accommodate all movements.
- Verify that positive connections are provided between all components to assure individual components will not separate under unanticipated (seismic) movements. Verify that these connections have been designed to accommodate the loads shown on the contract drawings.
- Verify that the shop drawings stipulate handling and storage requirements for both shipment and jobsite storage.
- Verify that masonry and sole plates and their appropriate connections are integrated into the bearing design.
- Verify the specific directives provided for setting the bearings as a function of bridge temperature. This includes a rational method for assessing the temperature of the superstructure.
- Verify that the grouting procedure and shim requirements underneath the masonry plate are clearly depicted on the shop drawings.
- Verify that the shop drawings note that all bearings shall be marked for location and orientation as required by the Special Provisions.

Background:

This policy memorandum is to ensure that isolation bearings used for WSDOT projects are properly designed, manufactured, and inspected in accordance with project requirements. All materials used in bearing manufacturing, dimensions, coating, sealing, etc. shall be clearly specified in the contract document for future repairs and replacement if necessary. This is regardless of project contracting method or sole source procurement.

If you have any questions regarding this policy memorandum, please contact Ralph.Dornsife@wsdot.wa.gov at 705-7199, or John.Olk@wsdot.wa.gov at 705-7395, or Bijan.Khaleghi@wsdot.wa.gov at 705-7181.

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