



Concrete Structures – Bearings – PTFE Spherical Bearings

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	04-25-2023	Original Issue	Richard Foley

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Background

This process establishes Structure Construction (SC) responsibilities and procedures for review and facilitating the authorization of submittals, quality assurance testing, materials, construction, and payment for PTFE spherical bearings.

PTFE spherical bearings are specified for high load bearing locations and areas with the potential for significant seismic activity.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the [Contract Specifications](#) (CS), Section 51-3.03, *Concrete Structures – Bearings – PTFE Spherical Bearings*, that this BCM is based on as identified in the title block above. The information in the CS typically will not be repeated in the text of this BCM.

Additional unique guidance that supplements this process is detailed in:

- [BCM 59-2](#), *Structural Steel Coatings – Painting Structural Steel*, which discusses clean and paint metal bearing surfaces.

Process Inputs

1. Submittals
 - a. Shop drawings
 - b. Certificates of compliance (COC)

- c. Manufacturer qualifications
- d. Test reports for proof-tested bearings

Procedure

1. All work associated with this process is charged as [Project Direct – Construction](#).
2. Inspection of field work for this process is:
 - a. [Benchmark](#):
 - i. Inspect PTFE spherical bearings when they arrive at the jobsite to ensure conformity with authorized shop drawings.
 - ii. Verify correct final placement and absence of damage prior to concrete placement.
3. Before construction begins:
 - a. Review the contract documents for requirements related to PTFE spherical bearings, as well as guidance provided in the Materials Engineering and Testing Services (METS) Office of Quality Assurance & Source Inspection *Quality Assurance and Source Inspection (QASI) Manual* related to source inspection.
 - i. The [QASI Manual](#), Sections 51A, *Concrete Structures – General*, and 51D, *PTFE Spherical Bearings*, contains photographs of the PTFE spherical bearings and provides an overview of the METS review process, including how PTFE spherical bearings are tested and released by METS.
 - b. Review [Attachment 1](#), *PTFE Spherical Bearings Inspection Guidelines*.
 - c. Review and authorize the following PTFE spherical bearing submittals per CS, Section 5-1.23, *Control of Work – General – Submittals*:
 - i. Shop drawings. To assist Bridge Design in completing the review:
 1. Verify dimensions and locations of PTFE spherical bearings.
 2. Check for conflicts with reinforcement, restrainers, equalization bolts, drains, PTFE temporary supports, etc. If a conflict exists between the PTFE spherical bearings and other items of work, contact the Bridge Design Structure Project Engineer.
 3. Coordinate authorization with Bridge Design by providing review comments on the shop drawing submittal and any information pertaining to dimensional or field conflicts outlined in items (1) and (2) above. Involve the Assistant Structure Representative in the review.

- a. Note that the current practice is for the Contractor to email electronic copies of the shop drawing submittal to the [SC Office Associates](#), in lieu of OSD, Documents Unit.
4. Confirm the contractual review time which is dependent on whether the submittal is for a railway bridge.
5. Provide copies of authorized shop drawings to field inspection staff.
- ii. Manufacturer qualifications:
 1. Review and verify that the bearing manufacturer has the necessary experience required by the CS. Contact the [METS Rep](#) and/or Bridge Design if you have questions regarding the qualifications.
- iii. Certificate of compliance – informational submittal:
 1. COC should confirm that the materials used in the manufacture of the PTFE spherical bearings conforms to CS, Section 51-3.03B, *Concrete Structures – Bearings - PTFE Spherical Bearings – Materials*.
- iv. Proof testing – in the Engineer’s presence:
 1. The METS Rep will witness the proof testing of the PTFE spherical bearings as this work is performed in the fabricator’s shop.
 2. Review and verify proof test results; contact the METS Rep with any questions about the proof testing.
- d. Review related requirements in CS, Section 55-1.03C(3), *Steel Structures – Construction – Erection – Bearings and Anchorages*, for preparation of concrete surfaces to receive PTFE.
- e. Obtain the bearing seat elevations by using the 4-scale drawings and considering the overall dimensions of the bearing assembly from the authorized shop drawings.
4. During construction:
 - a. Verify rebar placement provides adequate clearances for PTFE bearings.
 - b. Verify grade and location of bearing seats for conformance with the contract plans and the 4-scale drawings, prior to concrete placement (line and grade).
 - c. Upon arrival of the PTFE spherical bearings at the jobsite, verify that PTFE bearings have been source inspected. Check for the Form TL-0624, *Inspection Release Tag* (orange tag) and the [Form TL-0029](#), *Report of Inspection Material*, and verify materials are not damaged during transport.
 - d. Bearings must be shipped as a unit and remain intact until installation.

- e. Verify that a qualified representative from the bearing manufacturer will be present during installation of the first bearing, as required by the CS.
 - f. Verify that bearing surfaces are protected from contamination and weather damage.
 - g. The CS requires the Engineer to be present if dismantling and reassembly of the PTFE spherical bearings is necessary. Verify the condition of PTFE spherical bearings during the process and that the bearing components are reassembled correctly.
 - i. If bearings are damaged, verify that resurfacing is performed at the bearing manufacturers plant per CS, Section 51-3.03C, *Concrete Structures – Bearings – PTFE Spherical Bearings – Construction*.
 - h. Verify concrete cannot enter PTFE spherical bearing area during concrete placement for bearing seats.
 - i. Verify PTFE spherical bearing is firmly secured during concrete placement. Do not disturb the bearing before casting in concrete (e.g., place load over, or walk on). When they are no longer necessary, and after the concrete pour, remove any temporary supports.
 - j. Document all inspection, construction, and quality assurance activities, pertinent to this BCM, in the daily reports per [BCM C-7](#), *Daily and Weekly Reports*.
5. File all project documentation (correspondence, test results, daily reports, etc.) in the appropriate category in the project records as specified in the *Construction Manual*, Chapter 5, [Section 5-102](#), *Contract Administration – Project Records and Reports – Organization of Project Documents*.

Process Outputs

1. Authorized PTFE spherical bearing shop drawings, manufacturer qualifications, certificates of compliance, and proof testing reports
2. Installed PTFE spherical bearing, conforming to contract requirements
3. Daily reports

Attachments

1. [Attachment 1](#), *PTFE Spherical Bearings Inspection Guidelines*