



Section 9 – Bridge Bearings PTFE Spherical Bearing

XS Sheet Numbers

XS9-010 & XS9-020

Description of Component

Sliding (multidirectional) polytetrafluoroethylene (PTFE) spherical bearings allow horizontal movements in any direction. The PTFE Spherical sliding bearings transmit loads while accommodating translation and rotation. Sliding interfaces consist of woven PTFE. Woven PTFE fabric is used on top and bottom surfaces of the concave plate. The convex plate is made of solid stainless steel. The sliding at the bottom of the sole plate is also made of stainless steel welded to the sole plate. The remaining plates are made of carbon steel.

Standard Drawing Features

- The Sliding Bearing Table includes dimensions of the various bearing components for bearing fabrication
- Bearing loads are shown for bearing checking and future replacement.
- Details for correct bearing placement in the field are provided.
- Sliding bearing and jacking details show the correct position of the bearing with respect to superstructure.
- Details of the bearing components (Sole, Embed, Concave, Convex and Masonry Plates) are included.
- The masonry plate houses the convex plate and includes removal notches for convex plate removal. The convex plate is recessed to the masonry plate by $\frac{1}{4}$ inch. There is no welding between the convex and the masonry plate.

Design/General Notes

Multidirectional sliding spherical bearings are typically modeled as bi-directional rollers for analysis of conventional bridges. When used as elements of seismic isolation systems, these bearings are modeled as bi-directional frictional elements. If needed, external shear keys are used to restrict transverse movement.

Bearing components are intended to be replaceable as components wear out or get damaged, except for the masonry plate. An alternative design detail requires the use of an embed plate that is anchored to the bridge superstructure above and is bolted to the sole plate below.



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Maximum Contact Stress for Woven PTFE at the Service Limit State

--	Average Stress (ksi)		Edge Stress (ksi)	
	Permanent Loads	All Loads	Permanent Loads	All Loads
Minimum Value	1.5	--	--	--
Maximum Value	3.0	4.5	3.5	5.5

Note: Permanent Load is the dead load. All Loads are the combined dead and live loads. The limits are for unfactored loads.

For more information see MTD 7-1.

Contract Specifications

Standard Specifications Section 51-3 Bearings

Restrictions on Use of Standard Drawings

The typical load range for this type of bearing varies from 150 kips to 2500 kips with no translation or rotation limits.