Bearings

BTN 024
Version 1.1 12 April 2022

1 Scope and Application

Bridge Technical Note BTN 024 – Bearings – states the Department of Transport's (DoT) requirements for the design and specification of bearings for bridges.

Bridge Technical Notes are a Code of Practice. Compliance with Bridge Technical Notes is mandatory.

This document is to be read in conjunction with the following DoT/VicRoads Standard Specification Sections:

- Section 610
- Section 652
- Section 653
- Section 656

Other than as stated in this document and the relevant DoT/VicRoads Standard Specification Sections, the provisions of AS5100:2017 must apply. Where this document differs from AS5100:2017, its requirements override those of AS5100:2017.

2 Bearing Design

Bearings must be designed in accordance with AS5100.4, EN1337 and relevant European Technical Approvals. The requirements of AS5100.4 take precedence over EN1337 where there is a conflict between the two standards.

Steel components of bearings must be designed in accordance with AS5100.6.

Plane sliding surfaces must be designed to accommodate ULS movements plus an additional movement of ± 50 mm.

Spherical sliding surfaces must be designed to accommodate ULS rotations plus an additional rotation of 0.01 radians, without exposing the smaller sliding surface.

Design of bearings must consider and address unintended unequal load distribution due to specified tolerances and misalignments.

For pot and spherical bearings, the supplier's name and the proprietary bearing type must be nominated on the drawings.

3 Restraint

Bearing restraints for elastomeric bearings must:

- Provide restraint to the top and bottom of the bearing.
- Be bolted to the bottom of the beam and to the bearing pedestal.
- Be hot dip galvanised steel.

Where bearings are installed on a horizontal plane and not on a sloping surface, and where earthquake forces are not required to be considered in accordance with AS5100.2 Clause 15.4 and BTN 030 – Earthquake Design Categories, the bottom bearing restraint may be omitted for:

- Strip bearings less than 25 mm in thickness.
- Laminated bearings with a height between 25 mm and 150 mm that satisfy the requirements of AS5100.4 Clause 12.6.7. In AS5100.4 Equation 12.6.7(1), f_o must be taken as being equal to zero.

Use of dowels to restrain bearings is not permitted due to the difficulty this can cause if bearing replacement is required.

Friction must not be relied upon to resist seismic and other short-term dynamic forces (e.g. vehicle collisions, impacts to the structure, etc.).

4 Bearing Pedestals

Bearings must be supported evenly over their entire area by provision of pedestals between the bearing and the supporting element.

Pedestals must extend in plan beyond the edge of the bearing (or bearing attachment plate) a minimum of 50 mm distance between the bearing and the top edge of the chamfer, in all directions, must be provided.

Bearing pedestals must be designed for all anticipated horizontal and vertical forces transferred through the bearing. Horizontal forces must not be smaller than the forces resulting from resistance to movements in accordance with AS5100.4. Physical gaps and

tolerances between the bearing and the adjacent structural members, bearing shear stiffness, and frictional characteristics of the bearing must be considered for this check. Variabilities in the shear stiffness and coefficient of friction must be taken into account.

Vertical loads must be distributed in accordance with AS5100.4 Clause 17.

Except as permitted by AS5100.4 Clause 17, bearing pedestals must be designed as reinforced concrete elements and include reinforcement which is suitably spliced into the supporting element.

Elastomeric bearing pedestals with a depth < 100 mm may be designed as plain concrete elements in accordance with AS5100.5, provided they are:

- constructed using either a non-shrink cementitious grout or low shrinkage mortar in accordance with DoT/VicRoads Standard Specification Section 610.28; and
- are recessed into the supporting element, in accordance with DoT/VicRoads Standard Specification Section 656.

Recessing is not required when pedestal reinforcement is spliced into the supporting element in accordance with this BTN.

The construction of the pedestals supporting elements must be prepared in accordance with DoT/VicRoads Standard Specification Sections 610.28 and 656.

Bearing pedestals must have a minimum of 25 mm x 25 mm chamfered edges.

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Bridge Technical Notes are subject to periodic review and may be superseded.

Document Control

This document is subject to periodic review and may be superseded. The revision date is listed in the footer of each page of the BTN.

Note that for projects tendered prior to the revision date of this document, there are no retrospective implications of this document unless agreed otherwise with DoT.

Version	Description	Revision	Approved by
1.0	General Amendments	January 2018	Principal Bridge Engineer
1.1	General Amendments Revision of Section 2 • Completed section was reworded. Revision of Section 3 • Restraint requirements added to allow omitting the bottom restraint. Revision of Section 4 • Bearing pedestal edge distance.	12 April 2022	Chief Engineer – Road