AS 5100.4:2017
AP-G51.4-17

AS 5100.4:2017

Australian STANDARD

Bridge design

Part 4: Bearings and deck joints

STANDARDS Australia

Austroads

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- Australian Industry Group
- Australian Steel Institute
- Austroads
- Bureau of Steel Manufacturers of Australia
- Cement and Concrete Association of New Zealand
- Cement Concrete & Aggregates Australia—Cement
- Concrete Institute of Australia
- Consult Australia
- Engineers Australia
- New Zealand Heavy Engineering Research Association
- Rail Industry Safety and Standards Board
- Steel Construction New Zealand
- Steel Reinforcement Institute of Australia
- Sydney Trains

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Australian Standard®

Bridge design

Part 4: Bearings and deck joints

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PREFACE

This Standard was prepared by the Standards Australia Committee BD-090, Bridge Design to supersede AS 5100.4—2004.

This Standard is also designated as Austroads publication AP-G51.4-17.

The objectives of the AS(AS/NZS) 5100 series are to provide nationally acceptable requirements for—

(a) the design of road, rail, pedestrian and cyclist-path bridges;

(b) the specific application of concrete, steel and composite steel/concrete construction, which embody principles that may be applied to other materials in association with relevant Standards; and

(c) the assessment of the load capacity of existing bridges.

The objective of this Part (AS 5100.4) is to specify requirements for the design and selection of bearings and deck joints for bridges in Australia.

The requirements of the AS(AS/NZS) 5100 series are based on the principles of structural mechanics and knowledge of material properties, for both the conceptual and detailed design, to achieve acceptable probabilities that the bridge or associated structure being designed will not become unfit for use during its design life.

Whereas earlier editions of the Bridge design series were essentially administered by the infrastructure owners and applied to their own inventory, an increasing number of bridges are being built under the design-construct-operate principle and being handed over to the relevant statutory authority after several years of operation. This Standard includes clauses intended to facilitate the specification to the designer of the functional requirements of the owner, to ensure the long-term performance and serviceability of the bridge and associated structure.

Significant differences between this Standard and AS 5100.4—2004 are the following:

(i) Tables of standard elastomeric bearing properties have all been updated to add additional numbers of elastomer layers in each plan size.

(ii) The requirements for the sealing rings of pot bearing have been modified.

(iii) Spherical advanced composite material bearings have been introduced.

(iv) The movement range deck joints need to be designed for have been modified.

(v) Load distribution from bearings to concrete surfaces has been introduced.

(vi) Project-specific requirements (Appendix E) have been added.

(vii) Provisions for modular bridge expansion joints (MBEJ) have been added.

In line with Standards Australia policy, the words ‘shall’ and ‘may’ are used consistently throughout this Standard to indicate, respectively, a mandatory provision and an acceptable or permissible alternative.

Statements expressed in mandatory terms in Notes to Tables are deemed to be requirements of this Standard.

The term ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of the Standard. An ‘informative’ appendix is only for information and guidance.

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1 SCOPE

This Standard sets out minimum design and performance requirements for bearings and deck joints for the articulation and accommodation of movements of bridge structures. It applies to elastomeric, pot, spherical and mechanical bearings and deck joints, all of which are locations where rotation or translation, or both, can take place. It does not apply to concrete hinges.

2 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard.

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

AS	
1683	Methods of test for elastomers
1683.11	Method 11: Tension testing of vulcanized or thermoplastic rubber
1683.12	Method 12: Rubber, vulcanized or thermoplastic—Determination of tear strength (trouser, angle and crescent test pieces)
1683.14.1	Method 14.1: Adhesive strength of vulcanized or thermoplastic rubber—One-plate method
1683.15.1	Method 15.1: International rubber hardness
1683.15.2	Method 15.2: Durometer hardness
1683.22	Method 22: Determination of vulcanization characteristics using the oscillating disc curemeter
1683.24	Method 24: Determination of the resistance of vulcanized or thermoplastic rubbers to ozone cracking—Static strain test
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5100.2	Part 2: Design loads
5100.5	Part 5: Concrete
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1554	Structural steel welding
1554.5	Part 5: Welding of steel structures subject to high levels of fatigue loading
2312	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
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5100.6	Part 6: Steel and composite construction
ISO	
815	Rubber, vulcanized or thermoplastic—Determination of compression set
815-1	Part 1: At ambient or elevated temperatures
13000	Plastics—Polytetrafluoroethylene (PTFE) semi-finished products
13000-1	Part 1: Requirements and designation

