AS 5100.1:2017
AP-G51.1-17

AS 5100.1:2017

Australian STANDARD

Bridge design

Part 1: Scope and general principles

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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PREFACE

This Standard was prepared by the Standards Australia Committee BD-090, Bridge Design to supersede AS 5100.1—2004.

This Standard is also designated as AUSTROADS publication AP-G51.1-17.

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

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

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

(c) the assessment of the load capacity of existing bridges; and

(d) the strengthening and rehabilitation of existing bridges.

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.

Significant differences between this Standard and AS 5100.1—2004 are the following:

(i) *Bridge barriers* The clauses for both the performance level definition and selection and design of road bridge barriers have been revised. With the increasing concerns about objects being thrown from bridge walkways and pedestrian bridges, clauses have been included for the design of appropriate restriction barriers.

(ii) *Environmental impacts* Environmental issues that could have an impact on bridge concepts have been included to ensure their consideration in the design process.

(iii) *Collision protection* The clauses for collision from rail traffic have been revised to bring the loading in line with international practice, and to clarify the requirements.

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 ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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1 SCOPE

This Standard sets out requirements for the design of new bridges and other structures, and provides guidance on the assessment of existing bridges and modification to existing bridges. It covers the following:

(a) *Bridges*:

(i) The design of road, rail, light rail, pedestrian and cyclist path bridges.

(ii) Assessment of the load capacity of existing bridges.

(iii) Strengthening and rehabilitation of existing bridges.

(b) *Other structures*:

(i) Road sign and lighting structures, noise barriers and protection screens.

(ii) Retaining structures and deflection walls.

(iii) Culverts, and structural components related to tunnels, except those covered specifically by other Australian Standards.

(iv) Structures built over rail tracks.

2 APPLICATION

A number of clauses of the Standard nominate that some of the requirements of those clauses shall be confirmed as accepted by the relevant authority for a bridge or other structure before the design process is commenced. These clauses form part of the requirements of this Standard and are listed in Clause 6.

Existing bridges and subsequent modifications were designed to the relevant Standard of the time. There is no requirement under this Standard to upgrade a bridge to the current Standard. However, change in use of a bridge may result in an assessment of the bridge in accordance with this Standard, subject to the requirements of the relevant authority who will consider risk, remaining life and the cost.

For bridges with spans greater than 100 m, rail bridges for train speeds greater than 160 km/h, or unusual or more complex bridges (including cable stayed and suspension bridges), the provisions of this Standard shall be supplemented by other appropriate Standards and specialist technical literature.

NOTE: Wave action on bridges is not covered in the Standard and specialist technical literature should be consulted.