AS 5100.3:2017
AP-G51.3-17

AS 5100.3:2017

Australian STANDARD

Bridge design

Part 3: Foundation and soil-supporting structures

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
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- 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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Part 3: Foundation and soil-supporting structures

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PREFACE

This Standard was prepared by the Standards Australia Committee BD-090, Bridge Design, to supersede AS 5100.3—2004.

This Standard is also designated as AUSTROADS publication AP-G51.3-17.

The objective of the AS(AS/NZS) 5100 series is 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 5100.3) is to specify the requirements and principles for the design of foundations for bridges and associated soil retaining structures 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* 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 its 2004 version, and earlier versions of *Bridge design*, are the following:

(i) *Definitions and notations* Brought into line with current Standards Australia practice.

(ii) *Piling clauses* Updated in line with AS 2159—2009, *Piling—Design and installation*.

(iii) *Anchorages* Testing requirements revised in line with current practice.

(iv) *Foundation design principles* In recognition that geotechnical engineering design principles differ from structural engineering design principles, the design procedures have been extensively revised. Designers are required to use geotechnical engineering methods appropriate to the foundation problem at hand, together with appropriate characteristic values and factors, when deriving economical and safe solutions. It is further required that designers apply engineering judgement to the application of sound rational design methods outlined in texts, technical literature and other design codes to supplement the design requirements of this Standard.

(v) *Design procedures* Substructures have been classified as either foundations, where most of the loads on the substructure come from the bridge structure and loads on it, or as soil-supporting structures, where most of the applied loads are from earth pressure. Different design procedures are required for each. The loads and resistances for a soil-supporting structure will largely depend on the soil properties, whereas the loads for a foundation will not be as dependent on the soil properties.

(vi) *Relevant Standard* The philosophy used for the design of earth-retaining structures in this Standard differs from that used in AS 4678, *Earth-retaining structures*, which was prepared by Standards Australia Committee CE-032. It is considered that for bridges and road-related structures, where soil/structure interaction occurs and the loads are predominantly soil-imposed, the design method adopted is more realistic. However, AS 4678 includes criteria that may be used to supplement the design of structures covered by this Standard.

The term 'shall' has been used in this Standard for mandatory requirements and the term 'should' has been used for desirable (best practice) and/or other measures which, while recommended, are not mandatory.

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.

CONTENTS

Page