



INTRODUCING THE

# 2017 Bridge design series

The highly anticipated 2017 version of the AS/(NZS) 5100 series, *Bridge design* (also known as the 'Bridge Code') is now available.

Through collaboration with a broad range of stakeholders and co-funding from Austroads, the Standards Australia technical committee BD-090, Bridge Design, revised all seven parts of the 2004 bridge design series. In addition to the revisions, two new parts (8 and 9) were published and part 6 is now a joint document with Standards New Zealand.

The 2017 series addresses areas such as change in the Australian climate, sustainability and safety-in-design. New bridge design loads such as light rail, fire, ship impact and loads from natural disasters including urban flooding were also introduced to reflect the needs of bridge designers. Rail loading provisions have been extensively revised to align with accepted international practice.

This brochure outlines the new structure of the AS/(NZS) 5100 series and the changes you can expect in the latest, 2017 version.



## Parts 1–7: What's changed?

### Part 1: *Scope and general principles*

- Road bridge barrier loads now align with current design philosophy
- Rail collision loads comprehensively redrafted
- Environmental factors have been introduced
- More comprehensive design detail for rail bridges
- New inclusion of light rail bridges
- Expanded hydraulics section with added clarity between flood immunity and serviceability design life

### Part 2: *Design loads*

- Increased design loads for road traffic barriers
- Addresses braking loads for both short and long rail bridges
- Clarification on distribution loads for open deck and ballasted deck steel bridges
- Expanded section on the protection of piers, vertical abutments and deflection walls
- New inclusion of light rail bridges
- Addresses displacement-based methods as well as force-based method in regards to earthquake analysis
- Other additions include:
  - Urban debris loads during flooding
  - Ship loads

- Air space development in close proximity to road or rail corridors

### Part 3: *Foundations and soil-supporting structures*

- Updated piling clauses (consistent with AS 2159:2009, Piling design and installation)
- Increased integrity testing and load testing of bored piles

### Part 4: *Bearings and deck joints*

- New provisions for large movement range modular deck joints
- Updated requirements for spherical approved sliding material (ASM) bearings using ultra-high molecular weight polyethylene as a replacement for polytetrafluoroethylene (PTFE)
- Modified requirements for the internal seals of pot bearings
- Consolidated set of design provisions for the load distribution from bearings to the adjacent concrete substrate
- Improved Bearing Performance Tables for laminated elastomeric bearings

*(continued overleaf)*

### **Part 5: Concrete**

- Introduction of steel fibre reinforced concrete
- Introduction of stainless steel reinforcement
- Amended design for shear and torsion rules
- New rules for the design of hydrocarbon fire
- Restrictions placed on the use of Class L reinforcement
- Enhanced durability requirements, particularly for specific aggressive exposure conditions
- Introduction of new concrete strength grades
  - 85 MPa
  - 100 MPa
- New section on strut-and-tie modelling
- Modified rules for the design for fatigue failure of concrete in compression

### **Part 6: Steel and composite construction**

- Now a joint standard with New Zealand
- Introduction of concrete compressive strengths up to 100 MPa together with quenched and tempered steels with a yield strength up to 690 MPa
- Updated design rules to address:
  - Resistance of headed stud connectors
  - Resistance and buckling strength of composite columns
  - Fatigue verification
- New appendix with rules for alternative steel products
- Provides reliability differentiation during fabrication and erection

### **Part 7: Bridge assessment**

- Clearer, more consistent methodology for bridge assessment
- New inclusion of cranes and heavy load platforms in assessment methodology

## Parts 8–9: All new

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### **Part 8: Rehabilitation and strengthening of existing bridges**

- Design clauses for the upgrade of existing timber bridges
- Provision for the use of Bridge Specific Assessment Live Loading (BSALL)
- Guidelines on the design and application of carbon fibre for strengthening existing timber bridges
- Requirements provided for cathodic protection of structures
- Procedures introduced for the assessment of fire damaged structures
- Guidance provided for the waterproofing of bridge decks
- Specific assessment procedures provided for concrete, steel masonry and timber bridges

- Guidance provided for the rehabilitation and replacement of bearings and deck joints
- Specific requirements provided for the assessment and rehabilitation of culverts

### **Part 9: Timber**

- Detailed provisions on strength and durability of modern timber bridges
- Covers engineered materials such as:
  - Glued-laminated timber (Glulam)
  - Laminated veneer lumber (LVL)
- Addresses modern methods such as:
  - Stress laminated timber decks
  - Dowelled fin plate connections

## How can I get a copy?

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