Australian/New Zealand Standard™

Structural steelwork—Fabrication and erection





AS/NZS 5131:2016

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee BD-001, Steel Structures. It was approved on behalf of the Council of Standards Australia on 21 November 2016 and by the New Zealand Standards Approval Board on 17 November 2016.

This Standard was published on 8 December 2016.

The following are represented on Committee BD-001:

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This Standard was issued in draft form for comment as DR2 AS/NZS 5131:2016.

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First published as AS/NZS 5131:2016. Reissued incorporating Amendment No. 1 (August 2020).

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ISBN 978 1 76035 629 3

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee BD-001, Steel Structures. The objective of this Standard is to provide best practice requirements for fabrication and erection of structural steel members, components and structural assemblies used for load-carrying purposes in buildings, bridges and other structures.

This Standard incorporates Amendment No. 1 (August 2020). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This Standard is based on the published joint Australian Steel Institute/Steel Construction New Zealand/Heavy Engineering Research Association (HERA) document 'Structural Steelwork Fabrication and Erection Code of Practice', 1st edition, 2014. Reference was made to EN 1090-2:2008, Execution of steel structures and aluminium structures, Part 2: Technical requirements for steel structures in the development of this Standard.

The Standard introduces the fundamental concept of 'construction category' (CC), which is a risk-based fit-for-purpose categorization of a structure or parts thereof. It is expected the CC categorization will be implemented in other related Standards, such as AS 4100, *Steel structures*, in due course.

It is the intention of Committee BD-001 to revise AS 4100 to align with AS/NZS 5131, principally through removal of material that is covered in AS/NZS 5131 and inclusion of guidance on the assessment of the construction category in AS 4100.

In the interim development period for this Standard, the International Standards Organization (ISO) commenced development of ISO 17607, *Steel structures*, which also makes reference to EN 1090-2, *Execution of steel structures and aluminium structures*, Part 2: *Technical requirements for steel structures*. Committee BD-001 has worked to ensure alignment where possible with ISO/CD 17607.

- A1 | Amendment No. 1:2020 includes the following major changes:
 - (a) Revisions throughout the document to the wording to reflect Australian Building Codes Board (ABCB) requirements for documents referenced under the National Construction Code (NCC).
 - (b) Modifications to the definitions (Section 4) and application (Section 5) of traceability to better align with international practice.
 - (c) Normative reference is made to AS/NZS ISO 3834 in Section 7.
 - (d) Standard test for evaluation of slip factor, formerly in Appendix G, was moved back to AS 4100 and reference is made to AS 4100.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard Structural steelwork—Fabrication and erection

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SECTION 1 SCOPE, INCLUSIONS AND EXCLUSIONS

1.1 SCOPE

This Standard sets out minimum requirements for the construction of structural steelwork involving fabrication, preparation of steel surfaces for corrosion protection, corrosion protection comprising painting and galvanizing, erection and modification of steelwork. It applies to complete structures, individual members and components, and manufactured components pre-fabricated for inclusion in a steel structure.

This Standard specifies requirements for the construction of structural steelwork produced from the following:

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Hot-rolled and welded structural steel sections, flat bars and plates including those (a) with a yield stress used in design of 690 MPa or less, which comply with one of the material Standards listed in Section 2 and which were designed using AS 4100 or AS 5100.6 or NZS 3404.

(b) Cold-formed structural hollow sections, including hollow sections manufactured by welding, which comply with AS/NZS 1163 and which were designed using AS 4100 or AS 5100.6 or NZS 3404.

Weathering steel members and components complying with AS/NZS 3678 and (c) AS/NZS 1594.

(d) Steel members in composite steel and concrete structures designed using AS 2327.1 A1 or AS 5100.6 or NZS 3404, including beams, columns, composite slabs and decking.

Cold-formed purlin and girt members and decking designed using AS/NZS 4600. (e)

This Standard applies to all types of buildings, general structures, crane runway girders, monorails, roadway bridges, rail bridges and pedestrian bridges. Its application includes complete structures, individual members and manufactured components subject to seismic actions or to fatigue.

Some requirements are expressed in terms of construction categories.

NOTE: Guidance on construction categories is provided in Appendix C.

Provisions on inspection of welding and bolting applying to New Zealand only are covered in Appendix I.

1.2 STRUCTURAL ELEMENTS INCLUDED

This Standard applies to the elements of structural steelwork that are shown and sized on the structural design drawings, essential to support the design loads and described as follows:

- (a) Structures and substructures—
 - (i) bin support structures;
 - (ii) [text deleted]
 - (iii) conveyor support structures;
 - (iv) door frames, if made up from standard rolled shapes or welded from plates and if part of the structural steel frame;

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- (v) structural steel frames generally;
- (vi) floor opening frames, if made up from standard rolled shapes or welded from plates and if part of the structural steel frame;
- (vii) bridges;
- (viii) cranes;
- (ix) gantries;
- (x) wharves, jetties and piers;
- (xi) lighting supports;
- (xii) masts and poles, including flagpoles;
- (xiii) roof and wall opening frames if made up from standard rolled shapes or welded from plates and if part of the structural steel frame;
- (xiv) screen support frames if made up from standard rolled shapes or welded from plates;
- (xv) sign supports;
- (xvi) silo support structures;
- (xvii) stairs;
- (xviii) towers; and
- (xix) walkways.
- (b) Elements—
 - (i) base plates that are attached to columns;
 - (ii) anchor rods and footing bolts that will receive the base plates;
 - (iii) roof and wall battens attached to purlins and girts;
 - (iv) balustrading and handrailing;
 - (v) members made up from standard rolled shapes or welded from plates;
 - (vi) bearing plates, if part of the structural steel frame;
 - (vii) permanent and temporary bracing;
 - (viii) columns and posts made up from standard rolled shapes or welded from plates;
 - (ix) connection components manufactured from plate or flat bar, for framing structural steel to structural steel;
 - (x) crane runway girders and crane stops made up from standard rolled shapes or welded from plates;
 - (xi) embedded structural steel components that will receive structural steel;

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- (xii) fasteners, shop and field bolts, nuts and washers, screws and pins, levelling nuts and washers, and associated plates;
- (xiii) floor plates, if attached to the structural steel frame;
- (xiv) finger plate expansion joints cut from steel plate;
- (xv) girts, if made up from standard rolled shapes or welded from plates or cold-formed C or Z or hat sections;
- (xvi) grillage beams;
- (xvii) hangers, if made up from standard rolled shapes or welded from plates and framing structural steel to structural steel;
- (xviii) lintels that are part of the structural steel frame;
- (xix) machinery supports, if made up from standard rolled shapes or welded from plates and if part of the structural steel frame;
- (xx) mechanical and chemical anchors;
- (xxi) monorail beams, if made up from standard rolled shapes or welded from plates and if part of the structural steel frame;
- (xxii) purlins, if made up from standard rolled shapes or welded from plates or cold-formed C and Z or hat sections;
- (xxiii) sag rods and tie rods, if part of the structural steel frame and connecting structural steel to structural steel;
- (xxiv) stud connectors for composite steel-concrete action;
- (xxv) shims and wedges, if permanent;
- (xxvi) struts and stanchions, if permanent and part of the structural steel frame;
- (xxvii) trusses, if made up from standard rolled shapes or welded from plates;
- (xxviii) temporary works such as falsework but excluding scaffolding; and
- (xxix) bridge barriers, including safety protection screens.

1.3 STRUCTURES AND ELEMENTS EXCLUDED

This Standard does not apply to the following structures and elements of structural steelwork:

- (a) Stainless steel members, components and fasteners.
- (b) Castings.
- (c) Forgings.
- (d) Wire and cable elements.
- (e) Hot driven rivets.
- (f) Proprietary structural bearings for girders, trusses or bridges.
- (g) Proprietary expansion joints for bridges or building.
- (h) Crane rails and crane rail fixings.
- (i) Roof and wall sheeting.
- (j) Frames manufactured from light-gauge cold-formed sections, other than hollow sections to AS/NZS 1163.
- (k) Concrete formwork.