AS/NZS 1554.1:2004
(Incorporating Amendment No. 1)

AS/NZS 1554.1:2004

Australian/New Zealand Standard™

Structural steel welding

Part 1: Welding of steel structures

STANDARDS AUSTRALIA

STANDARDS NEW ZEALAND
Paerewa Aotearoa

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee WD-003, Welding of Structures. It was approved on behalf of the Council of Standards Australia on 19 December 2003 and on behalf of the Council of Standards New Zealand on 5 March 2004.
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The following are represented on Committee WD-003:

Australian Chamber of Commerce and Industry
Australian Industry Group
AUSTROADS
Bureau of Steel Manufacturers of Australia
Electricity Supply Association of Australia
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New Zealand Heavy Engineering Research Association
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Australian/New Zealand Standard™

Structural steel welding

Part 1: Welding of steel structures

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WD-003, Welding of Structures, to supersede AS/NZS 1554.1—2000.

This Standard incorporates Amendment No. 1 (January 2005). 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.

The objective of this Standard is to provide rules for the welding of a wide range of steel constructions and while it is expected that its main use will be for statically loaded welds, it applies also to some welds subject to fatigue. Although this Standard has been specifically prepared for steel structures, it may be usefully applied to machine frames and other types of steel constructions.

A1 This edition incorporates the following major changes to the 2000 edition:

(a) *Amendments to the following Clauses*:

1.6(a)(i), 1.6(a)(ii), 1.6(b)(i), 1.6(b)(ii), 1.6(b)(iii), 1.7 (new NOTE), 1.8.2 (NOTE deleted), 1.8.3 (new Clause), 2.1 (last paragraph and NOTE), 2.3.4, 3.3.1 (first paragraph), 4.1.2 (first sentence), 4.3, 4.4(c), 4.5.5.1 (second paragraph), 4.5.5.3, 4.6.1.1, 4.7.1 (NOTE 1 deleted), 4.7.9 (second paragraph), 4.7.10 (second sentence), 4.11 (new NOTE), 4.12.1, 4.12.2(f)(ii), 4.12.2 (NOTE 2), 5.1.1 (last two sentences), 5.2.2 (second paragraph), 5.3.3, 5.8.1 (new NOTE), 5.8.4 (new NOTE), 7.2, B3.3, B4.2 (first paragraph), Appendix D (new Item (n)).

(b) *Amendments to the following Tables*:

3.3.5 (Title), 4.7.1, 4.11(A) (Items (b), (c), (e) and (k)), 4.12.2 (NOTE 2), 5.3.4(A), C2, E1 (drawings for joints B-C 8a and B-C 8b), E4 (new joints H-C 1c and H-C 1d).

(c) *Amendments to the following Figures*:

3.4.1(c), 4.5.5.2 (new), 4.5.5.3 (NOTES), 5.3.4(A).

The Standard requires that weld preparations, welding consumables and welding procedures be qualified before commencement of welding. Prequalified joint preparations, welding consumables and welding procedures are also given in the Standard.

The Standard, in catering for structures subject to fatigue conditions as well as statically loaded structures, provides two categories of welds with two differing levels of weld quality assurance associated with the different types of service to which the welds are subjected. The intention is that the designer select the category suited to the severity of the service and nominate this on the drawings. Where a structure contains both categories, this nomination of appropriate categories will ensure that appropriate levels of supervision and inspection will be applied to the relevant parts of the structure.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

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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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for the welding of steel structures made up of combinations of steel plate, sheet or sections, including hollow sections and built-up sections, or castings and forgings, by the following processes:

A1 (a) Manual metal-arc welding (MMAW).

(b) Submerged arc welding (SAW).

(c) Gas metal-arc welding (GMAW or MIG), including pulsed mode.

(d) Gas tungsten-arc welding (GTAW or TIG).

(e) Flux-cored arc welding (FCAW).

(f) Electroslag (including consumable guide) welding (ESW).

(g) Electrogas welding (EGW).

The Standard is limited to the welding of steel parent material with a specified minimum yield strength not exceeding 500 MPa.

The Standard applies to the welding of steelwork in structures complying with AS 3990, AS 4100, AS/NZS 4600 or NZS 3404.1. Where welded joints in these structures are governed by dynamic loading conditions, the Standard applies only to those welded joints that comply with the fatigue provisions of AS 3990, AS 4100 or NZS 3404.1, as limited by Item (ii) below, or the directly equivalent fatigue provisions of other application Standards.

Welded joints complying with the above requirements are those that are —

(i) not subject to fatigue conditions; or

(ii) subject to fatigue conditions, where—

(A) the stress range in the welded joint complies with the permissible stress range of stress categories C, D, E or F of AS 3990, or weld categories lower than or equal to detail category 112 of AS 4100 or NZS 3404.1; or

(B) the stress range in the welded joint is not more than 80% of the permissible stress range of stress category B of AS 3990.

In addition to the abovementioned structures the Standard applies to the welding of cranes, hoists and other dynamically loaded structures, the welding of road and pedestrian bridges and the welding of steelwork in applications other than structural.

NOTE: Further information on this Standard, which the drafting committee could not incorporate, is given in WTIA Technical Note 11.