

Australian/New Zealand Standard™

Cold-formed steel structures



AS/NZS 4600:2005

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The following are represented on Committee BD-082:

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Australian Building Codes Board
Australian Chamber of Commerce and Industry
Australian Steel Institute
Bureau of Steel Manufacturers of Australia
Engineers Australia
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee BD-082, Cold-formed Steel Structures, to supersede AS/NZS 4600:1996.

This Standard incorporates Amendment No. 1 (August 2010). 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 designers of cold-formed steel structures with specifications for cold-formed steel structural members used for load-carrying purposes in buildings and other structures.

This edition incorporates the following major changes to the previous edition:

- (a) Alignment of terminology with AS/NZS 1170 series for structural design actions.
- (b) The acceptance of welding of G450 steel to AS 1397 using existing rules with a minor change in capacity factors. This circumvents the confusion for welding of G450 steel.
- (c) Increase in the design stress of G550 steel to AS 1397, less than 0.9 mm thick and greater than or equal to 0.6 mm thick, from 75% to 90%, and 75% for thickness less than 0.6 mm of the specified values of yield stress and tensile strength.
- (d) The addition of web with holes to allow for holes in webs in shear and bearing.
- (e) A new set of design rules for unstiffened elements and edge stiffeners under stress gradient.
- (f) Minor modifications to the rules for uniformly compressed elements with edge and intermediate stiffeners to remove a discontinuity in the equations which formerly existed.
- (g) A new approach for edge-stiffened elements with intermediate stiffeners.
- (h) A new approach for multiple intermediate stiffeners in compression flanges where the stiffeners no longer need to be fully effective.
- (i) The significant liberalization of the lateral buckling rules for beams to allow the AISI design curve to be used with a rational buckling analysis. This will significantly increase the capacity of purlins throughout Australia and New Zealand.
- (j) The introduction of a whole new set of equations for web crippling (bearing) of webs without holes and removal of unconservatism in the previous edition which was discovered by Australian research.
- (k) Bearing of nested Z-section.
- (l) The removal of $l/1000$ for angle sections in compression which are fully effective.
- (m) Additional design rules for fillet welds, flare welds and resistance welds.
- (n) Modification of the bearing coefficient for bolts to be a function of d/t for high values of d/t and a separate bearing capacity given for bolts where bolt hole deformation is considered.
- (o) Significant reduction in the edge distance provision from $3.0d$ to $1.5d$ for screw fasteners and blind rivets.
- (p) The addition of a new section on fatigue of cold-formed members.
- (q) Inclusion of new direct strength method as an alternative to the effective width method of design.

(r) Alignment of testing provisions with AS/NZS 1170.0.

This Standard will be referenced in the Building Code of Australia 2006, thereby superseding AS 4600—1996, which will be withdrawn 12 months from the date of publication of this Standard.

Notes to the text contain information and guidance. They are not an integral part of the Standard.

A statement expressed in mandatory terms in a note to a table is deemed to be a requirement 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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Cold-formed steel structures

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out minimum requirements for the design of structural members cold-formed to shape from carbon or low-alloy steel sheet, strip, plate or bar not more than 25 mm in thickness and used for load-carrying purposes in buildings. It is also applicable for structures other than buildings provided appropriate allowances are made for dynamic effects.

This Standard does not apply to the design of structures subject to fire and brittle fracture.

1.2 NORMATIVE REFERENCES

Documents referred to in this Standard are listed in Appendix A and are indispensable for the application of this document.

1.3 DEFINITIONS

For the purpose of this Standard, the definitions below apply. Definitions peculiar to a particular clause or section are also given in that clause or section.

1.3.1 Action

Set of concentrated or distributed forces acting on a structure (direct action), or deformation imposed on a structure or constrained within it (indirect action).

1.3.2 Action effect (internal effects of actions, load effects)

Internal forces and bending moments due to actions (stress resultants).

1.3.3 Arched compression element

A circular or parabolic arch-shaped compression element having an inside radius-to-thickness ratio greater than 8, stiffened at both ends by edge stiffeners. (See Figure 1.3(d).)

1.3.4 Assemblage of elements

A system of interconnected cold-formed steel elements that act together to resist earthquake action in such a way that the strength and deformation capacity of the system is not adversely affected by the buckling or crippling of any one element of the assemblage.

1.3.5 Bend

Portion adjacent to flat elements and having a maximum inside radius-to-thickness ratio (r/t) of 8. (See Figure 1.1.)

1.3.6 Braced member

Member for which the transverse displacement of one end of the member relative to the other is effectively prevented.