

Australian/New Zealand Standard™

Structural design actions

Part 2: Wind actions



AS/NZS 1170.2:2011

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee BD-006, General Design Requirements and Loading on Structures. It was approved on behalf of the Council of Standards Australia on 23 November 2010 and on behalf of the Council of Standards New Zealand on 10 December 2010. This Standard was published on 30 March 2011.

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Australian Steel Institute
Australasian Wind Engineering Society
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Concrete Masonry Association of Australia
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This Standard was issued in draft form for comment as DR AS/NZS 1170.2.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee, BD-006, General Design Requirements and Loading on Structures, to supersede AS/NZS 1170.2:2002.

This Standard incorporates Amendment No. 1 (September 2012), Amendment No. 2 (December 2012), Amendment No. 3 (July 2013), Amendment No. 4 (August 2016) and Amendment No. 5 (June 2017). 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 wind actions for use in the design of structures subject to wind action. It provides a detailed procedure for the determination of wind actions on structures, varying from those less sensitive to wind action to those for which dynamic response must be taken into consideration.

The objectives of this revision are to remove ambiguities, to incorporate recent research and experiences from recent severe wind events in Australia and New Zealand.

This Standard is Part 2 of the AS/NZS 1170 series *Structural design actions*, which comprises the following parts:

AS/NZS 1170, Structural design actions

Part 0: General principles

Part 1: Permanent, imposed and other actions

Part 2: Wind actions

Part 3: Snow and ice actions

AS 1170, Structural design actions

Part 4: Earthquake actions in Australia

NZS 1170, Structural design actions

Part 5: Earthquake actions—New Zealand

The wind speeds provided are based on analysis of existing data. No account has been taken of any possible future trend in wind speeds due to climatic change.

This edition differs from the previous edition as follows:

- (a) A torsional loading requirement in the form of an eccentricity of loading is prescribed for tall buildings greater than 70 m in height (see Clause 2.5.4).
- (b) Addition of windborne debris impact loading criteria (Clause 2.5.8).
- (c) Regional wind speeds V_1 , V_{250} , V_{2500} , V_{5000} and V_{10000} have been added for serviceability design requirements, and for compatibility with AS/NZS 1170.0 (see Clause 3.2).
- (d) Nominally closed doors, such as roller doors, to be treated as potential dominant openings unless it is shown that the doors and their supports and fixings are capable of resisting the applied wind loads and the impact of debris (see Clause 5.3.2).
- (e) Addition of a new clause requiring consideration of wind loads on internal walls and ceilings (see Clause 5.3.4).
- (f) Adjustment of internal pressure coefficients in Table 5.1(B) for dominant openings on leeward walls, side walls and roof, to more correctly reflect the relationship between internal and external pressures when multiple opening occur.

- (g) Clause 5.4.3 on the combination factor (K_c) has been changed to remove some ambiguities and confusion in the previous edition. An expanded Table 5.5 gives more examples of the use of this factor.
- (h) Several changes to Table 5.6 on local pressure factors have been made, including the following:
 - (i) A factor of 1.5 for small areas on windward walls.
 - (ii) A factor of 3.0 for small areas near the corners of roofs.
 - (iii) Case SA5 ($K_e = 3.0$) will, in future, not be required to be applied to those buildings greater than 25 m in height with low aspect ratios.
- (i) Values of maximum structural damping ratios for structures with dynamic response to wind have been made informative rather than normative.
NOTE: Users should seek other sources for advice on possible values of damping as a function of height of building and amplitude of vibration.
- (j) A note to Table C3, Appendix C, for shape factors for curved roofs has been added to cover the case of building height to rise greater than 2.
- (k) The load distribution specified in Paragraph D5, Appendix D, for cantilevered roofs has been revised to reflect recent research.
- (l) Drag coefficients for pentagonal sections have been added to Table E4, Appendix E.
- (m) Drag coefficients for sections of UHF television antennas Types 1 and 3 in Table E7, Appendix E, have been revised. The value of drag force coefficients for the Type 2 antenna have been removed from the Standard, since this type has not been used in Australia or New Zealand for many years.

The Joint Committee has considered exhaustive research and testing information from Australian, New Zealand and overseas sources in the preparation of this Standard. The design wind actions prescribed in this Standard are the minimum for the general cases described.

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.

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

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

The Joint Committee is currently considering possible amendments following recent severe wind events, including tropical cyclone Yasi in Australia.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

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SECTION 1 GENERAL

1.1 SCOPE

This Standard sets out procedures for determining wind speeds and resulting wind actions to be used in the structural design of structures subjected to wind actions other than those caused by tornadoes.

The Standard covers structures within the following criteria:

- A2 | (a) Buildings less than or equal to 200 m high.
 (b) Structures with maximum unsupported roof spans of less than 100 m.
 (c) Structures other than offshore structures, bridges and transmission towers.

NOTES:

- A2 | 1 This Standard is a stand-alone document for structures within the above criteria. It may be used, in general, for all structures but other information may be necessary.
 2 Where structures have natural frequencies less than 1 Hz, Section 6 requires dynamic analysis to be carried out (see Section 6).
 3 In this document, the words 'this Standard' indicate AS/NZS 1170.2, which is regarded as Part 2 of the AS/NZS 1170 series of Standards (see Preface).
 4 Further advice, which may include wind-tunnel testing, should be sought for geometries not covered in this Standard, such as unusual roof geometries or support systems, very large roofs, or the roofs of podiums at the base of tall buildings.

1.2 APPLICATION

This Standard shall be read in conjunction with AS/NZS 1170.0.

This Standard may be used as a means for demonstrating compliance with the requirements of Part B1 of the Building Code of Australia.

NOTE: Use of methods or information not given in this Standard should be justified by a special study (see AS/NZS 1170.0).

1.3 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

AS

- 4040 Methods of testing sheet roof and wall cladding
 4040.3 Part 3: Resistance to wind pressures for cyclone regions

AS/NZS

- 1170 Structural design actions
 1170.0 Part 0: General principles

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