

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Amendment No. 2
to
AS/NZS 1170.0:2002
Structural design actions
Part 0: General principles

REVISED TEXT

The 2002 edition of AS/NZS 1170.0 is amended as follows; the amendment(s) should be inserted in the appropriate place(s).

SUMMARY: This Amendment applies to the Clauses 1.4, 2.2 and 2.3, Section 3, and Appendices C and F (new). *This Amendment is not referenced by the BCA.*

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Page 7 Clause 1.4.23

Add the following:

1.4.23 Design working life

Duration of the period during which a structure or a structural element, when designed, is assumed to perform for its intended purpose with expected maintenance but without major structural repair being necessary.

NOTE: In the context of this Standard, the design working life is a 'reference period' usually stated in years. It is a concept that can be used to select the probability of exceedance of different actions.

1.4.24 Environmental influences

Chemical, biological or physical influences on a structure, which may deteriorate the materials constituting the structure, and which in turn may affect its reliability in an unfavourable way.

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Page 9 Clause 2.2

Delete Item (a) and *replace* with the following:

- (a) Adopt the importance level for the building or structure and the associated annual probability of exceedance (P) for wind, snow and earthquake as follows:
 - (i) For Australia—
 - (A) structures covered by the Building Code of Australia—as given in the Building Code of Australia.
 - (B) structures not covered by the Building Code of Australia and for which no design events are specified by the applicable legislation or by other Standards—as given in Appendix F.
 - (ii) For New Zealand—as given in Section 3.
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Page 9 Clause 2.3

Delete the Note and *replace* with the following:

NOTE: Guidelines for serviceability events and associated limits are given in Appendix C for loads associated with an appropriate annual probability of exceedance (P).

Page 11 Section 3

Delete Section 3 and *replace* with the following:

SECTION 3 ANNUAL PROBABILITY OF EXCEEDANCE (FOR STRUCTURES IN NEW ZEALAND ONLY)

3.1 GENERAL

This Section shall be used to determine the annual probability of exceedance of ultimate limit state loads for New Zealand. It does not form part of the Standard for use in Australia.

Structures of importance level 5 are outside the scope of this Standard and require the annual probability of load exceedance (design event) to be determined by a special study.

NOTE: For buildings within Australia, refer to the Building Code of Australia.

3.2 DESIGN REQUIREMENTS

A structure shall be designed and constructed in such a way that it will, during its design working life, with appropriate degrees of reliability sustain all actions and environmental influences likely to occur. In particular it shall be designed as follows:

- (b) To withstand extreme or frequently repeated actions, or both, occurring during its construction and anticipated use (resistance, deformability and static equilibrium requirements; that is, for safety).

Specifically, for earthquake actions for ultimate limit states this shall mean—

- (i) avoidance of collapse of the structural system;
 - (ii) avoidance of collapse or loss of support of parts of the structure representing a hazard to human life inside and outside the structure or parts required for life safety systems; and
 - (iii) avoidance of damage to non-structural systems necessary for the building evacuation procedures that renders them inoperative.
- (c) So that it will not be damaged to an extent disproportionate to the original cause, by events like fire, explosion, impact or consequences of human error (robustness requirement).
- (d) To perform adequately under all expected actions (serviceability requirement).

Structural design carried out using the procedures given in Clause 2.2 for ultimate limit states and Clause 2.3 for serviceability limit states is deemed to comply with this Clause.

NOTES:

- 1 Note that this Standard will not be called up in the New Zealand Building Code until Part 4 of NZS 4203:1992 *Code of Practice for General Structural Design and Design Loadings for Buildings* has been revised and issued as part of the AS/NZS 1170 series of Standards. Any attempt to use the AS/NZS 1170 series currently issued would be a special study and would still require reference to the earthquake requirements of NZS 4203:1992.

- 2 The design should include consideration of appropriate maintenance and the effects of environmental influences.

3.3 IMPORTANCE LEVELS

The importance level of the structure shall be determined in accordance with its occupancy and use, as given in Tables 3.1 and 3.2. The Table describes, in general terms, five categories of structure and gives some examples of each. For those buildings not specifically mentioned, the designer will need to exercise judgement in assigning the appropriate level.

Structures that have multiple uses shall be assigned the highest importance level applicable for any of those uses. Where access to a structure is via another structure of a lower importance level, then the importance level of the access structure shall be designated the same as the structure itself.

3.4 ANNUAL PROBABILITY OF EXCEEDANCE

3.4.1 Ultimate limit states

For ultimate limit states for structures of importance levels 1 to 4, the annual probability of exceedance (P) for wind, snow and earthquake loads shall be as given in Table 3.3.

The design working life of structures that are erected for a number of short periods of use and dismantled between each, is equal to the total of the periods of use.

3.4.2 Serviceability limit states

Serviceability limit states shall include—

- (a) SLSI—the structure maintains operational continuity after the SLSI earthquake; and
- (b) SLSII—the structure and the non-structural components do not require repair after the SLSII earthquake, snow or wind event.

For serviceability limit states for structures of importance levels 2 to 4, the annual probability of exceedance (P) for wind, snow and earthquake loads shall be determined as given in Table 3.3.

NOTE: Guidelines for limits associated with serviceability events are given in Appendix C.

TABLE 3.1
CONSEQUENCES OF FAILURE FOR IMPORTANCE LEVELS

Consequences of failure	Description	Importance level	Comment
Low	Low consequence for loss of human life, <i>or</i> small or moderate economic, social or environmental consequences	1	Minor structures (failure not likely to endanger human life)
Ordinary	Medium consequence for loss of human life, <i>or</i> considerable economic, social or environmental consequences	2	Normal structures and structures not falling into other levels
High	High consequence for loss of human life, <i>or</i> very great economic, social or environmental consequences	3	Major structures (affecting crowds)
		4	Post-disaster structures (post disaster functions or dangerous activities)
Exceptional	Circumstances where reliability must be set on a case by case basis	5	Exceptional structures