

AS 1170.1—1989

Australian Standard[®]

SAA Loading Code

**Part 1: Dead and live loads and
load combinations**

This Australian Standard was prepared by Committee BD/6, Loading on Structures. It was approved on behalf of the Council of Standards Australia on 26 January 1989 and published on 20 March 1989.

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Association of Consulting Engineers, Australia
Association of Consulting Structural Engineers, Australia
Australian Clay Brick Association
Australian Construction Services (Department of Administrative Services)
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James Cook University of North Queensland
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Australian Road Research Board
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Australian Standard[®]

**Minimum design loads on
structures (known as the SAA
Loading Code)**

**Part 1: Dead and live loads and
load combinations**

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PREFACE

This Standard has been prepared by the Standards Australia Committee for Loading on Structures to supersede AS 1170.1–1981, *Minimum design loads on structures, Part 1: Dead and live loads*. This edition is presented in limit states format.

This is the first part of the Standard for minimum design loads on structures, which comprises the following parts:

Part 1: Dead and live loads and load combinations.

Part 2: Wind loads.

Part 3: Snow loads.

Part 4: Earthquake loads (not yet published).

Explanatory material for this Standard are given in Appendices D to G, which correspond to Sections 2 to 5.

This edition incorporates the following principal changes:

- (a) The Standard has been revised in limit states format.
- (b) A new Section on load combinations has now been included as Section 2.
- (c) The clauses relating to impact and inertia loads, and braking and horizontal impact in car parks (now Clauses 4.4 and 4.5) have been expanded.
- (d) The clause on thermal and movement effects has been revised, taking note of recent work in this area and included as a new Section 5.
- (e) In Appendix A, the density and mass of materials are given in terms of kilonewtons for convenience in design calculations.
- (f) The lay-out of Appendix B is now in the order of different occupancies (as opposed to alphabetical order in the 1981 edition) and all the values of floor live loads have been reviewed.

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STANDARDS AUSTRALIA

Australian Standard

Minimum design loads on structures

Part 1: Dead and live loads and load combinations

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard sets out requirements for establishing the minimum dead, live, wind, and snow loads, as well as load combinations to be used in the limit state design of structures and members.

This Standard does not provide criteria on load combinations for permissible stress design. For permissible stress design, the dead loads and live loads given in Sections 3 and 4 are used unfactored.

1.2 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS	
1170	SAA Loading Code
1170.2	Part 2: Wind loads
1418	SAA Crane Code
1657	SAA Code for Fixed Platforms, Walkways, Stairways and Ladders
1720	SAA Timber Engineering Code
1735	SAA Lift Code
2121	SAA Earthquake Code
ISO	
4356	Bases for the design of structures — Deformations of buildings at the serviceability limit states
ANZRC	Railway bridge design manual
AUSTROADS	Bridge design specification

1.3 DEFINITIONS. For the purpose of this Standard, the definitions below apply.

Action — a cause of stress, dimensional change, or displacement in a structure or a component of a structure.

Action effect — the internal force, moment, deformation, crack, or the like effect caused by one or more actions.

Dead load — the load determined in accordance with this Standard, imposed by components of the building or structure including the forces imposed by all walls, floors, roofs, suspended ceilings, permanent partitions, permanently fixed machinery and other permanent construction (including reticulated services).

Design load (action) — the appropriate combination of loads (actions) and load factors as specified in this Standard.

Limit state — any limiting condition for which structures are designed.

NOTE: The limit states in design considered in this Standard are strength limit state, stability limit state, serviceability limit state and fire limit state.

Live load — the load as defined in this Standard assumed to arise from the intended use or occupancy of the building or structure, including distributed,

concentrated, impact, and inertia loads, but excluding wind, snow, and earthquake loads.

Load factor — a factor specified in this Standard for structural design to be used with loads (or actions) in deriving design loads (or actions).

Load (action) — magnitude of loads.

Strength limit state — a limit state of collapse or loss of structural integrity.

Stability limit state — a limit state corresponding to the loss of static equilibrium of a structure or part of structure considered as a rigid body.

Serviceability limit state — a limit state of acceptable in-service conditions.

Fire limit state — a limit state of collapse or loss of structural integrity due to fire.

Wind loads — see AS 1170.2.

1.4 NOTATION. Unless otherwise stated, the notation used in this Standard has the following meaning:

A = sum of all area supported by a structural member

F = impact or braking force

F_{ep} = earth pressure and/or ground water pressure load

F_{eq} = earthquake loads calculated in accordance with AS 2121

F_{lp} = liquid pressure load

F_t = thermal or movement effects

G = dead load

G^R = part of the dead load tending to resist instability

m = gross mass of the vehicles

Q = live load (including impact, if any)

R = live load reduction

s = mean of the adjoining spans

V = velocity of the vehicles

W_s = wind load for the serviceability limit state

W_u = wind load for the strength limit state

Δ = deceleration length

ϕ = capacity factor

ϕR = design capacity of the structural component

ψ_c = live load combination factor used in assessing the design load for strength limit state

ψ_s = the short-term live load factor used in assessing the design load for serviceability limit state

ψ_l = the long-term live load factor used in assessing the design load for serviceability limit state