(b) the head of each Commonwealth, State and Territory department, statutory body, division, or agency that has the relevant administrative responsibility for NCC matters; and

(c) a representative of the Australian Local Government Association (ALGA); and

(d) representatives of the building and construction industry, including one representative with plumbing expertise.

The Building Codes Committee (BCC) is the peak technical advisory body to the ABCB, with responsibility for technical matters associated with the BCA.

The BCC comprises—

(a) a representative~~the General Manager~~ of the ABCB; and

(b) one nominee each of the Australian, State and Territory Government members~~' and ALGA members~~ of the ABCB; and

(c) representatives of the building and construction industry.

THE BCA — CONTENT

GOALS

The goal of the BCA is to enable the achievement of nationally consistent, minimum necessary standards of relevant safety (including structural safety and safety from fire), health, amenity and sustainability objectives efficiently.

This goal is applied so that—

(a) there is a rigorously tested rationale for the regulation; and

(b) the regulation is effective and proportional to the issues being addressed such that the regulation will generate benefits to society greater than the costs (that is, net benefits); and

(c) there is no regulatory or non-regulatory alternative (whether under the responsibility of the Board or not) that would generate higher net benefits; and

(d) the competitive effects of the regulation have been considered and the regulation is no more restrictive than necessary in the public interest.

STATE AND TERRITORY VARIATIONS AND ADDITIONS

Each State's and Territory's legislation adopts the BCA subject to the variation or deletion of some of its provisions, or the addition of extra provisions. In the *Housing Provisions*, these are divided into two types:

(a) A variation to the *Housing Provisions* — these are identified following the provision that is being varied.

(b) Additional requirements — these are contained in Appendix A .

SCOPE OF THE HOUSING PROVISIONS

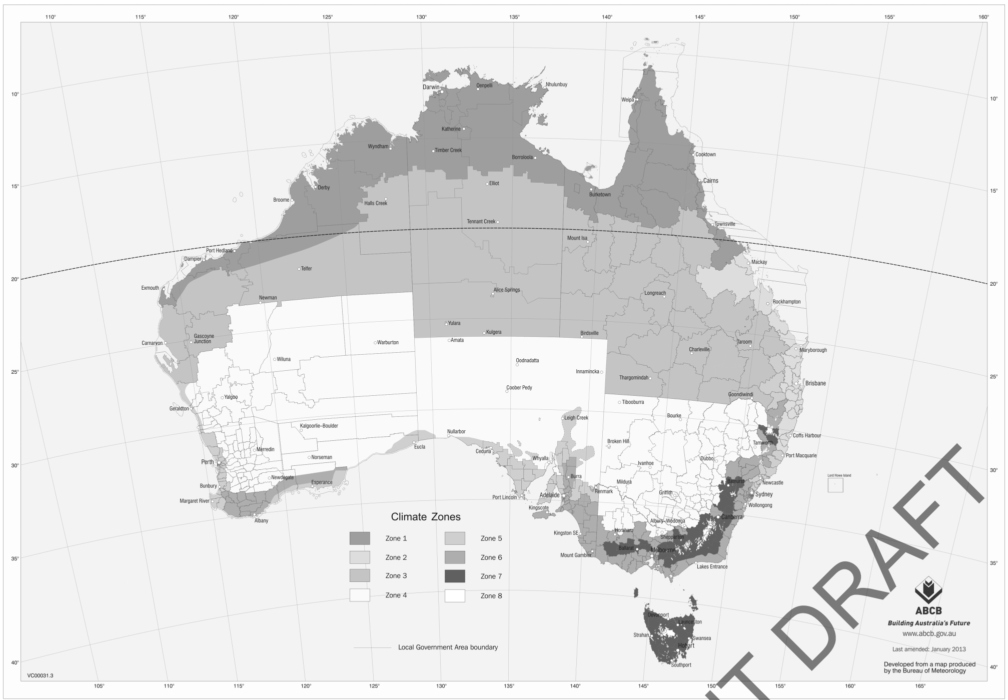
Users of the *Housing Provisions* need to be aware that the acceptable construction practices contained in this document do not cover all types of Class 1 and 10 buildings. The limitations of the acceptable construction practices are discussed in the introduction to Section 3.

DEFINITIONS

Words with special meanings are printed in italics and are defined in **1.1.1** or, if they are specific to a Part, at the start of that Part in Section 3. Defined terms which appear in

Figure 1.1.4

CLIMATE ZONES FOR THERMAL DESIGN



Notes:

1. This map can be viewed in enlargeable form on the Energy Efficiency page of the ABCB web site at www.abcb.gov.au.
2. A Zone 4 area in South Australia, other than a council area, at an altitude greater than 300 m above Australian Height Datum, is to be considered as Zone 5.

   These areas have been defined in an enlarged format on the following maps produced by the Department of Planning, Transport and Infrastructure:

   Adelaide Hills Council Climate Zone Map

   Barossa Council Climate Zone Map

   Regional Council of Goyder Climate Zone Map

   These maps can be viewed on the Government of South Australia website at www.sa.gov.au
3. Locations in *climate zone* 8 are in *alpine areas*.

Design wind speed means the design gust wind speed for the area where the building is located, calculated in accordance with AS/NZS 1170.2 or AS 4055 (see **Table 1.1.1** for ~~*Housing Provisions design wind speed* descriptions and equivalent values~~wind classes).

~~**Table 1.1.1 DESIGN WIND SPEED — EQUIVALENT VALUES**~~

~~**Housing Provisions Description**~~	~~**Wind Class — AS 4055**~~		~~Design gust wind speed (m/sec) Ultimate Limit State (Vh,u)~~	~~Ultimate Limit State wind speed (km/h)~~
	~~For non cyclonic regions A and B~~	~~For cyclonic regions C and D~~		
~~N1~~	~~N1~~		~~34~~	~~123~~
~~N2~~	~~N2~~		~~40~~	~~144~~
~~N3/C1~~	~~N3~~	~~C1~~	~~50~~	~~180~~
~~N4/C2~~	~~N4~~	~~C2~~	~~61~~	~~220~~
~~N5/C3~~	~~N5~~	~~C3~~	~~74~~	~~267~~
~~N6/C4~~	~~N6~~	~~C4~~	~~86~~	~~310~~

~~Notes:~~

1. ~~Wind classification map identifying wind regions is contained in **Part 3.10.1** (see **Figure 3.10.1.4**).~~
2. ~~Information on wind speeds for particular areas may be available from the *appropriate authority*.~~
3. ~~Shaded areas denote *design wind speed* areas covered by **Part 3.10.1**, High Wind Areas.~~
4. ~~"N" = Normal Winds and "C" = Cyclonic Winds.~~
5. ~~For Serviceability limit state design gusts refer to AS 4055.~~
6. ~~Unless otherwise specifically referring to non cyclonic winds, a reference to an N wind speed can be interpreted as a reference to the equivalent C wind speed, where such equivalence exists.~~

Table 1.1.1 WIND CLASSES

Wind Classes									
Non-cyclonic Region A and B						Cyclonic Region C and D			
N1	N2	N3	N4	N5	N6	C1	C2	C3	C4

Notes:

1. Wind classification map identifying wind regions is contained in **Part 3.10.1** (see **Figure 3.10.1.4**).
2. Information on wind speeds for particular areas may be available from the *appropriate authority*

3	Shaded areas denote wind classes covered by **Part 3.10.1**, High Wind Areas.
4.	"N" = non-cyclonic winds and "C" = cyclonic winds.

Domestic services means the basic engineering systems ~~of a house~~ that use energy or control the use of energy; and—

(a) includes— ~~heating, air-conditioning, mechanical ventilation, artificial lighting and hot water systems; but~~

(i) heating, air-conditioning, mechanical ventilation and artificial lighting; and

(ii) pumps and heaters for *swimming pools* and spa pools; but

(b) excludes cooking facilities and portable appliances.

Envelope , for the purposes of **Part 2.6** and **Part 3.12**, means the parts of a building's *fabric* that separate artificially heated or cooled spaces from—

(a) the exterior of the building; or

(b) other spaces that are not artificially heated or cooled.

Equivalent means equivalent to the level of health, safety and amenity provided by the *Deemed-to-Satisfy Provisions*.

Expert Judgement means the judgement of an expert who has the qualifications and experience to determine whether a *Building Solution* complies with the *Performance Requirements*.

External wall means an outer wall of a building which is not a *separating wall*.

Fabric , for the purposes of **Part 2.6** and **Part 3.12**, means the basic building structural elements and components of a building including the roof, ceilings, walls and floors.

Fire-resistance level (FRL) means the grading periods in minutes determined in accordance with **Specification A2.3** of BCA Volume One, for—

(a) *structural adequacy*; and

(b) *integrity*; and

(c) *insulation*,

and expressed in that order.

Explanatory information:

A dash means there is no requirement for that criterion. For example, 90/–/– means there is no FRL for integrity and insulation.

Fire-resisting , applied to a *structural member* or other part of a building, means having the FRL *required* for that *structural member* or other part.

Flammability Index means the index number determined under AS 1530.2.

PART 1.4 DOCUMENTS ADOPTED BY REFERENCE

1.4.1 Schedule of referenced documents

The documents listed in **Table 1.4.1** are referred to in the *Housing Provisions*.

Table 1.4.1: SCHEDULE OF REFERENCED DOCUMENTS

No.	Date	Title	BCA Clause(s)
~~AS 1056~~		~~Storage water heaters~~	
~~Part 1~~	~~1991~~	~~General requirements~~	~~3.12.5.6~~
		~~Amdt 1~~	
		~~Amdt 2~~	
		~~Amdt 3~~	
		~~Amdt 4~~	
		~~Amdt 5~~	
AS/NZS 1170		Structural design actions	
Part 0	2002	General principles	**3.10.1.0**, **3.11.2**
		Amdt 1	
		Amdt 3	
		Amdt 4	
Part 1	2002	Permanent, imposed and other actions	**3.9.2.3**, **3.11.3**
		Amdt 1	
		Amdt 2	
Part 2	2011	Wind actions	**1.1.1**, **3.10.1.0**, **3.11.3**
		Amdt 1	
		Amdt 2	
Part 3	2003	Snow and ice actions	**3.11.3**
		Amdt 1	
AS 1170		Structural design actions	
Part 4	2007	Earthquake actions in Australia	**3.4.4.1**, **3.10.2.0, 3.11.3**, **3.11.6**
AS/NZS 1200	2000	Pressure equipment	**3.7.3.0**
AS 1273	1991	Unplasticized PVC (UPVC) downpipe and fittings for rainwater	**3.5.2.2**

No.	Date	Title	BCA Clause(s)
AS/NZS 1276		Acoustics—Rating of sound installation in buildings and of building elements	
Part 1	1999	Airborne sound insulation [**Note:** Test reports based on AS 1276 — 1979 and issued prior to AS/NZS 1276.1 — 1999 being referenced in the BCA, remain valid. The STC values in reports based on AS 1276 — 1979 shall be considered to be equivalent to R_w values. Test reports prepared after the BCA reference date for AS/NZS 1276.1 — 1999 must be based on that version.]	V2.4.6, 3.8.6.2
AS 1288	2006	Glass in buildings—Selection and Installation Amdt 1 Amdt 2	3.6.0, 3.6.1, 3.6.3, 3.9.2.3, 3.10.1.0, 3.11.6
AS 1289		Methods of testing soils for engineering purposes	
Method 6.3.3	1997	Determination of the penetration resistance of a soil — Perth sand penetrometer test Amdt 1	3.2.2.2
~~**AS 1397**~~	~~2001~~	~~Steel sheet and strip — Hot-dipped zinc-coated or aluminium/zinc-coated~~	~~3.4.2.2, 3.5.1.3~~
AS 1397	2011	Continuous hot dip metallic coated sheet steel and strip - coatings of zinc and zinc alloyed with aluminium and magnesium	3.4.2.2, 3.5.1.3

No.	Date	Title	BCA Clause(s)
AS/NZS 1664		Aluminium structures	
Part 1	1997	Limit state design	3.11.6
		Amdt 1	
Part 2	1997	Allowable stress design	3.11.6
		Amdt 1	
~~**AS 1668**~~		~~The use of mechanical ventilation and air-conditioning in buildings~~	
~~Part 2~~	~~1991~~	~~Mechanical ventilation for acceptable indoor-air quality~~	~~3.8.5.0~~
AS 1668		The use of ventilation and airconditioning in buildings	
Part 2	2012	Mechanical ventilation in buildings	3.8.5.0
AS/NZS 1680		Interior lighting	
Part 0	2009	Safe movement	3.8.4.3

No.	Date	Title	BCA Clause(s)
AS 1684		Residential timber-framed construction	
Part 2	2010	Non-cyclonic areas	3.2.5.6, 3.4.0.2, 3.4.1.2, 3.4.3.0, 3.10.1.0
		Amdt 1	
Part 3	2010	Cyclonic areas	3.2.5.6, 3.4.0.2, 3.4.1.2, 3.10.1.0
		Amdt 1	
Part 4	2010	Simplified — Non-cyclonic areas	3.2.5.6, 3.4.0.2, 3.4.1.2, 3.4.3.0
		Amdt 1	
AS 1720		Timber structures	
Part 1	2010	Design methods	3.11.6
		Amdt 1	
		Amdt 2	
AS/NZS 1859		Reconstituted wood-based panels — Specifications	
Part 4	2004	Wet-processed fibreboard	3.5.3.3, 3.5.3.4
AS 1926		Swimming pool safety	
Part 1	2012	Safety barriers for swimming pools	3.9.3.0
Part 2	2007	Location of safety barriers for swimming pools	3.9.3.0
		Amdt 1	
		Amdt 2	
Part 3	2010	Water recirculation systems	3.9.4.0
		Amdt 1	
AS 2047	1999	Windows in buildings — Selection and installation	3.6.0, 3.6.1, 3.10.1.0, 3.11.6, 3.12.3.3
		Amdt 1	
		Amdt 2	
AS 2049	2002	Roof tiles	3.5.1.0, 3.5.1.2
		Amdt 1	
AS 2050	2002	Installation of roof tiles	3.5.1.0, 3.5.1.2
		Amdt 1	
		Amdt 2	

No.	Date	Title	BCA Clause(s)
AS 2159	2009	Piling — Design and installation Amdt 1	3.2.0, 3.11.6
AS/NZS 2179		Specification for rainwater goods, accessories and fasteners	
Part 1	1994	Metal shape or sheet rainwater goods and metal accessories and fasteners	3.5.2.2
AS/NZS 2269		Plywood — Structural	
Part 0	2008	Specifications	3.5.3.4
AS 2327		Composite structures	
Part 1	2003	Simply supported beams	3.11.6
AS 2870	2011	Residential slabs and footings	3.1.2.4, 3.1.3.2, 3.1.3.3, 3.1.3.5, 3.2.0, 3.2.1, 3.2.2.4, 3.2.2.6, 3.2.3.2, 3.2.4.1, 3.2.5, 3.2.5.2, 3.2.5.6, 3.11.6
AS/NZS 2904	1995	Damp-proof courses and flashings Amdt 1 Amdt 2	3.5.3.6
AS/NZS 2908		Cellulose cement products	
Part 2	2000	Flat sheets	3.5.3.3, 3.5.3.4, 3.5.3.5,
AS/NZS 2918	2001	Domestic solid fuel burning appliances — Installation	3.7.3.0, 3.7.3.4, 3.7.3.5
AS/NZS 3500		Plumbing and drainage	
Part 3	2003	Stormwater drainage Amdt 1 Amdt 2 Amdt 3	3.1.2.0, 3.1.2.4, 3.5.2.0, 3.5.2.5
~~Part 4~~	~~2003~~	~~Heated water services~~ ~~Amdt 1~~ ~~Amdt 2~~	~~3.12.5.0, 3.12.5.6~~
Part 5	2012	Housing installations	3.1.2.0, 3.1.2.4, 3.5.2.0, 3.5.2.5~~, 3.12.5.0~~
AS 3600	2009	Concrete structures	3.2.2.4, 3.2.3.1, 3.2.5.6, 3.11.6

No.	Date	Title	BCA Clause(s)
		Amdt 1	
AS 3660		Termite management	
Part 1	2000	New building work	3.1.3, 3.1.3.0, 3.1.3.2, 3.1.3.4
AS 3700	2011	Masonry structures	3.3.1.0, 3.3.2.0, 3.3.3.0, 3.3.4.0, 3.10, 3.10.1.0, 3.11.6
AS 3740	2010	Waterproofing of domestic wet areas Amdt 1	3.8.1.2
AS 3786	1993	Smoke alarms Amdt 1 Amdt 2 Amdt 3 Amdt 4	3.7.2.2
AS 3959	2009	Construction of buildings in bushfire-prone areas Amdt 1 Amdt 2 Amdt 3	3.7.4.0
~~**AS 4055**~~	~~2006~~	~~Wind loads for housing~~ ~~Amdt 1~~	~~1.1.1, 3.11.3~~
AS 4055	2012	Wind loads for housing	1.1.1, 3.11.3
AS 4072		Components for the protection of openings in fire-resistant separating elements	
Part 1	2005	Service penetrations and control joints Amdt 1 [**Note:** Systems tested to AS 1530.4 prior to 1 January 1995 need not be retested to comply with the provisions in AS 4072.1]	3.7.1.8
AS 4100	1998	Steel structures Amdt 1	3.2.5.6, 3.4.2.0, 3.4.4.0, 3.10.1.0, 3.11.6

No.	Date	Title	BCA Clause(s)
AS/NZS 4200		Pliable building membranes and underlays	
Part 1	1994	Materials	3.5.1.0
		Amdt 1	
Part 2	1994	Installation requirements	3.5.1.0
~~AS/NZS 4234~~	~~2008~~	~~Heated water systems — Calculation of energy consumption~~	~~V2.6.3, 3.12.5.6~~
		~~Amdt 1~~	
		~~Amdt 2~~	
AS 4254		Ductwork for air-handling systems in buildings	
Part 1	2012	Flexible duct	3.7.1.9, 3.12.5.3
Part 2	2012	Rigid duct	3.7.1.9, 3.12.5.3
AS/NZS 4256		Plastic roof and wall cladding material	
Part 1	1994	General requirements	3.5.1.0
Part 2	1994	Unplasticized polyvinyl chloride (UPVC) building sheets	3.5.1.0
Part 3	1994	Glass fibre reinforced polyester (GRP)	3.5.1.0
Part 5	1996	Polycarbonate	3.5.1.0
AS/NZS 4505	2012	Garage doors and other large access doors	3.11.6
AS 4586	2013	Slip resistance classification of new pedestrian surface materials	3.9.1.3

No.	Date	Title	BCA Clause(s)
		[Note: Test reports based on the 2004 edition of AS/NZS 4586 and issued prior to the 2013 edition of AS 4586 being referenced in the BCA remain valid. Test reports prepared after the BCA reference date of the 2013 edition of AS 4586 must be based on that version. For the purposes of assessing compliance, the slip-resistance classifications of V, W and X in reports based on the 2004 edition of AS/NZS 4586 may be considered to be equivalent to slip-resistance classifications of P5, P4 and P3 respectively in the 2013 edition of AS 4586]	
~~AS 4552~~	~~2005~~	~~Gas fired water heaters for hot water supply and/or central heating~~	~~3.12.5.6~~
AS/NZS 4600	2005	Cold-formed steel structures Amdt 1	**3.4.2.0**, **3.4.2.1**, **3.4.4.0**, **3.10.1.0**, **3.11.6**
AS 4654		Waterproofing membranes for external above-ground use	
Part 1	2012	Materials	**3.8.1.3**
Part 2	2012	Design and Installation	**3.8.1.3**
AS 4773		Masonry for small buildings	
Part 1	2010	Design Amdt 1	**3.3.1.0**, **3.3.2.0**, **3.3.3.0**, **3.3.4.0**, **3.10**, **3.10.1.0**, **3.11.6**
Part 2	2010	Construction	**3.3.1.0**, **3.3.2.0**, **3.3.3.0**, **3.3.4.0**, **3.10**, **3.10.1.0**, **3.11.6**
AS/NZS 4859		Materials for the thermal insulation of buildings	
Part 1	2002	General criteria and technical provisions Amdt 1	**3.12.1.1**, **3.12.1.5**, **3.12.5.1**
ASTM D3018-90	1994	Class A asphalt shingles surfaced with mineral granules	**3.5.1.0**

Explanatory information:

QLD P2.1.3(a) requires a termite management measure in Queensland to have a design life of at least 50 years unless it is easily and readily accessible for replenishment or replacement and is capable of being replenished or replaced. In recognition that some buildings other than non-temporary Class 1 buildings may be designed to last less than 50 years, the option of the termite management measure having a design life at least equal to that specified for the building is given. If this option is used, the design life of the building should be agreed upon by all relevant stakeholders at the design stage and should form part of the documentation kept by the *appropriate authority*. It should not be assumed that the design life of 50 years in **QLD P2.1.3(a)(i)** and **(ii)** applies to any other provisions of the BCA, unless stated.

An example of a termite management measure that may satisfy **QLD P2.1.3(a)(iii)** is a chemical ~~soil barrier~~ reticulation system beneath a concrete floor slab laid directly on the ground, provided that the system is easily and readily accessible for replenishment and is capable of being replenished.

An example of a termite management measure that may not satisfy **QLD P2.1.3(a)** for a non-temporary Class 1 building is a hand-sprayed chemical ~~soil barrier~~ beneath a concrete floor slab laid directly on the ground if the chemical does not have a design life of at least 50 years. The concrete floor slab being laid directly on the ground would prevent the area beneath the slab from being easily and readily accessible for replenishment or replacement of the termite management measure.

An example of a termite management measure being inadvertently bridged or breached is when a person places a garden or mulch over the top of or above the level of a termite management measure enabling termites to bypass the measure.

FUNCTIONAL STATEMENT

F2.4.1 Wet areas

A building is to be constructed to avoid the likelihood of—

(a) the creation of any unhealthy or dangerous conditions; or

(b) damage to building elements,

caused by dampness or water overflow from bathrooms, laundries and the like.

F2.4.2 Room heights

A building is to be constructed to provide height in a room or space suitable for the intended use.

F2.4.3 Facilities

A building is to be provided with suitable—

(a) space and facilities for personal hygiene; and

(b) space ~~and~~or facilities for laundering; and

(c) space and facilities for the preparation and cooking of food; and

(d) space or other means to permit an unconscious occupant to be removed from a *sanitary compartment*~~.~~; and

(e) adequate means for the hygienic disposal of waste water.

Application:

F2.4.3 only applies to a Class 1 building.

F2.4.4 Light

(a) A *habitable room* within a building is to be provided with openings to admit adequate natural light consistent with its function or use; and

(b) A space within a building used by occupants is to be provided with artificial lighting consistent with its function or use which, when activated in the absence of suitable natural light, will enable safe movement.

F2.4.5 Ventilation

A space used by occupants within a building is to be provided with adequate ventilation consistent with its function or use.

F2.4.6 Sound insulation

A building element which separates dwellings is to be constructed to prevent undue sound transmission between those dwellings.

PERFORMANCE REQUIREMENT

P2.4.1 Wet areas

To protect the structure of the building and to maintain the amenity of the occupants, water must be prevented from penetrating—

(a) behind fittings and linings; or

(b) into concealed spaces,

of sanitary facilities, bathrooms, laundries and the like.

P2.4.2 Room heights

A room or space must be of a height that does not unduly interfere with its intended function.

P2.4.3 Facilities

(a) Suitable sanitary facilities for personal hygiene must be provided in a convenient location within or associated with a building, appropriate to its function or use.

(b) * * * * *

This clause has been deliberately left blank.

(c) Laundering facilities or space for laundering facilities, and the means to hygienically dispose of waste water must be provided in a convenient location within or associated with a building, appropriate to its function or use.

(d) A food preparation facility must be provided which includes—

(i) a means for food rinsing, utensil washing and disposal of associated waste water ~~disposal~~; and

(ii) a means for cooking food; and

(iii) a space for food preparation.

(e) A *sanitary compartment* must be constructed with sufficient space or other means to enable an unconscious occupant to be removed from the compartment.

Application:

P2.4.3 only applies to a Class 1 building.

P2.4.4 Light

(a) A *habitable room* must be provided with *windows* so that natural light, when available, provides a level of *illuminance* appropriate to the function or use of that part of the building.

(b) Artificial lighting must be installed to provide a level of *illuminance* appropriate to the function or use of the building to enable safe movement by occupants.

PART 2.6 ENERGY EFFICIENCY

STATE AND TERRITORY VARIATIONS

1. In New South Wales, **Part 2.6** does not apply.

   Note: The New South Wales Additions contain energy efficiency measures that apply in New South Wales to support and complement BASIX.

2. In the Northern Territory, **Part 2.6** is replaced with BCA 2009 **Part 2.6**.

~~3.~~

~~In Tasmania, **Part 2.6** is replaced with BCA 2009 **Part 2.6**.~~

OBJECTIVE

O2.6

The *Objective* is to reduce greenhouse gas emissions.

STATE AND TERRITORY VARIATION

O2.6 is replaced in Victoria as follows:

O2.6

The *Objective* is to reduce greenhouse gas emissions and conserve water by efficiently using energy and water.

FUNCTIONAL STATEMENT

F2.6

To reduce greenhouse gas emissions, to the degree necessary—

(a) a building, including its *domestic services*, is to be capable of efficiently using energy; and

(b) a building's *domestic services* for heating are to obtain their energy from—

   (i) a low greenhouse gas intensity source; or

   (ii) an on-site *renewable energy* source; or

   (iii) another process as reclaimed energy.

Explanatory information:

The term “facilitate” is used in **P2.6.1** to highlight the need to consider the installation of energy efficiency measures in a building where there is a likelihood that an artificial heating or cooling system will be installed in the building irrespective of the initial design.

In **P2.6.1(d)** the term “permanent” is used to describe features that will have a long term impact on the building and includes natural features of the landscape, such as mountains and escarpments, while permanent man made features would be buildings likely to be in place for a long period of time.

STATE AND TERRITORY VARIATION

P2.6.1 is replaced in Victoria as follows:

P2.6.1 Building

A building must have, to the degree necessary, a level of thermal performance to facilitate the efficient use of energy for artificial heating and cooling and a level of water use performance to facilitate the efficient use of water, appropriate to—

(a) the function and use of the building; and
(b) the internal environment; and
(c) the geographic location of the building; and
(d) the effects of nearby permanent features such as topography, structures and buildings; and
(e) solar radiation being—
  (i) utilised for heating; and
  (ii) controlled to minimise energy for cooling; and
(f) the sealing of the building *envelope* against air leakage; and
(g) the utilisation of air movement to assist cooling; and
(h) water resources available; and
(i) pertinent water management measures of the responsible water authority.

P2.6.2 Services

~~A building's~~ ~~d~~D*omestic services*, including any associated distribution system and components must, to the degree necessary—

(a) have features that facilitate the efficient use of energy appropriate to—
  (i) the *domestic service* and its usage; and
  (ii) the geographic location of the building; and
  (iii) the location of the *domestic service*; and
  (iv) the energy source; and
(b) obtain heating energy from—
  (i) a source that has a greenhouse gas intensity that does not exceed

100 g CO_2-e/MJ of thermal energy load; or

(ii) an on-site *renewable energy* source; or

(iii) another process as reclaimed energy.

Explanatory information:

1. For **(a)(iv)** the energy source can be a consideration if, for example, *renewable energy* such as electricity from a photovoltaic panel or a wind turbine was used to meet or supplement the lighting or cooling electricity load. For **(b)(ii)** similar sources could meet or supplement the heating load.
2. The intent of **P2.6.2(b)** is to constrain the use of a high greenhouse gas intensity source of energy ~~for heating a conditioned space~~. It does not prevent the use of electricity because the greenhouse gas intensity is related to the thermal load rather than the energy consumption which is covered by **P2.6.2(a)**. **P2.6.2** also contains the qualification that it is to be applied "to the degree necessary", allowing electricity to be used, even by low efficiency plant when there are no reasonable alternatives.
3. For the purposes of **P2.6.2** the *renewable energy* source must be on-site (so not Greenpower) and includes, but is not limited to, solar, wind, hydroelectric, wave action and geothermal.

STATE AND TERRITORY VARIATION

In Victoria, P2.6.2 does not apply to a hot water supply system.

Note: In Victoria, the design and installation of a hot water supply system is regulated under the Plumbing Regulations 2008.

VERIFICATION METHODS

V2.6 Definitions

The following definitions are used in this Part:

Cooling load means the calculated amount of energy removed from the cooled spaces of the building annually by artificial means to maintain the desired temperatures in those spaces.

Heating load means the calculated amount of energy delivered to the heated spaces of the building annually by artificial means to maintain the desired temperatures in those spaces.

Reference building means a hypothetical building that is used to determine the maximum allowable *heating load* and *cooling load* for the proposed building.

radiation, wind speed, wind direction and cloud cover can be obtained from the Australian national climate database.

V2.6.3 ~~Verification for a heater in a hot water supply system~~* * * * *

This clause has deliberately been left blank.

Explanatory information:

The content of **V2.6.3**, which existed in BCA 2013, has been moved to **Part B2** of NCC Volume Three — Plumbing Code of Australia.

~~(a) Compliance with **P2.6.2** for a heater in a hot water supply system is verified when the annual greenhouse gas intensity of the water heater does not exceed 100 g CO_2-e/MJ of thermal energy load determined in accordance with AS/NZS 4234.~~

~~(b) The annual greenhouse gas intensity of the water heater in **(a)** is the sum of the annual greenhouse gas emissions from each energy source in g CO_2-e divided by the annual thermal energy load of the water heater.~~

~~(c) The annual greenhouse gas emission from each energy source in **(b)** is the product of—~~

~~(i) the annual amount of energy consumed from that energy source; and~~

~~(ii) the emission factor of—~~

~~(A) if the energy source is electricity, 272 g CO_2-e/MJ; or~~

~~(B) if the energy source is liquefied petroleum gas, 65 g CO_2-e/MJ; or~~

~~(C) if the energy source is natural gas, 61 g CO_2-e/MJ; or~~

~~(D) if the energy source is wood or biomass, 4 g CO_2-e/MJ.~~

~~**STATE AND TERRITORY VARIATIONS**~~

~~**V2.6.3(a) is replaced in South Australia as follows:**~~

~~(a) Compliance with **P2.6.2** for a water heater in a hot water supply system is verified when—~~

~~(i) for liquefied petroleum gas and natural gas powered water heaters, other than gas-boosted solar water heaters, the water heater has an energy rating of not less than 5 stars in accordance with AS 4552; and~~

~~(ii) for all other water heater types, the annual greenhouse gas intensity of the water heater does not exceed 100 g CO_2-e/MJ of thermal energy load determined in accordance with AS/NZS 4234.~~

~~**V2.6.3(b) is replaced in South Australia as follows:**~~

~~(b) The greenhouse gas intensity of the water heater in **(a)(ii)** is the sum of the annual greenhouse gas emissions from each energy source in g CO_2-e divided by the annual thermal energy load of the water heater.~~

~~V2.6.3 is deleted in Victoria.~~

PART 3.1 EXPLANATORY INFORMATION

Explanatory information:

These provisions relate to general *site* preparation for footings, services, drainage and installation of termite ~~barriers to assist in termite~~ management systems. It should be noted that other construction methods may be used to achieve the same results as specified in this Part provided they comply with the appropriate *Performance Requirement*.

Figure 3.1.2.2)—

(i) 25 mm over the first 1 m from the building in *low rainfall intensity areas* for surfaces that are reasonably impermeable (such as concrete or clay paving); or

(ii) 50 mm over the first 1 m from the building in any other case.

(b) Slab-on-ground — finished slab heights:

the height of the slab-on-ground above external finished surfaces must be not less than (see Figure 3.1.2.2)—

(i) 100 mm above the finished ground level in *low rainfall intensity areas* or sandy, well-drained areas; or

(ii) 50 mm above impermeable (paved or concreted areas) that slope away from the building in accordance with (a); or

(iii) 150 mm in any other case.

Explanatory information:

The appropriate slab height above finished ground level and the slope of the external finished surface surrounding the slab may vary depending on:

1. The local plumbing requirements; in particular the height of the overflow relief gully relative to drainage fittings and ground level (to work effectively they must be a minimum of 150 mm below the lowest sanitary fixture).
2. The run-off from storms, particularly in areas of high rainfall intensity, and the local topography.
3. The effect of excavation on a cut and fill *site*.
4. The possibility of flooding.
5. Termite ~~barrier~~risk management provisions.

(c) The ground beneath suspended floors must be graded so that the area beneath the building is above the adjacent external finished ground level and *surface water* is prevented from ponding under the building (see Figure 3.1.2.3).

PART 3.1.3 TERMITE RISK MANAGEMENT

Appropriate *Performance Requirements:*

Where an alternative termite ~~barrier or~~management system is proposed as an *Alternative Solution* to that described in **Part 3.1.3**, that proposal must comply with—

(a) *Performance Requirement* **P2.1.1**; and

(b) the relevant *Performance Requirements* determined in accordance with **1.0.10**.

Definitions

3.1

The following definitions are used in this Part:

Primary building element means a member of a building designed specifically to take part of the building loads and includes roof, ceiling, floor, stairway or ramp and wall framing members including bracing members designed for the specific purpose of acting as a brace to those members.

Explanatory information:

The loads to which a building may be subjected are dead, live, wind, snow and earthquake loads. Further information on building loads can be found in the 1170 series of Standards.

STATE AND TERRITORY VARIATIONS

In Queensland delete definition of primary building element and replace with the following:

Primary building element means—

(a) a member of a building designed specially to take part of the building loads and includes roof, ceiling, floor, stairway or ramp and wall framing members including bracing members designed for the specific purpose of acting as a brace to those members; and

(b) door jambs, window frames and reveals, architraves and skirtings.

3.1.3 Application of this Part

(a) The requirements of this Part apply when a *primary building element* of a Class 1 and 10 building is considered susceptible to termite attack.

(b) This Part does not apply to Class 1 and 10 buildings as follows (see also **Figure 3.1.3.1**):

(i) Buildings in areas where subterranean termites are not known to present a potential risk of attack to the *primary building elements* of the building.

Explanatory information:

Termites are not considered to be a risk in Tasmania and a lesser risk in parts of Victoria. The *appropriate authority* may have records of termite activity for each area and may be able to advise you on whether termite risk management is needed.

(ii) Buildings that have all their *primary building elements* constructed of one, or a combination of, the following materials:

(A) Steel, aluminium or other metals.

(B) Concrete.

(C) Masonry.

(D) Fibre-reinforced cement.

(E) Naturally termite resistant timber in accordance with Appendix C of AS 3660.1.

(F) Preservative treated timber in accordance with Appendix D of AS 3660.1.

(iii) Buildings in Tasmania.

Explanatory information:

Where individual *primary building elements* are susceptible to termite attack and the remainder of the *primary building elements* are constructed of termite resistant materials, only the susceptible elements need to be provided with a termite ~~barrier~~management system.

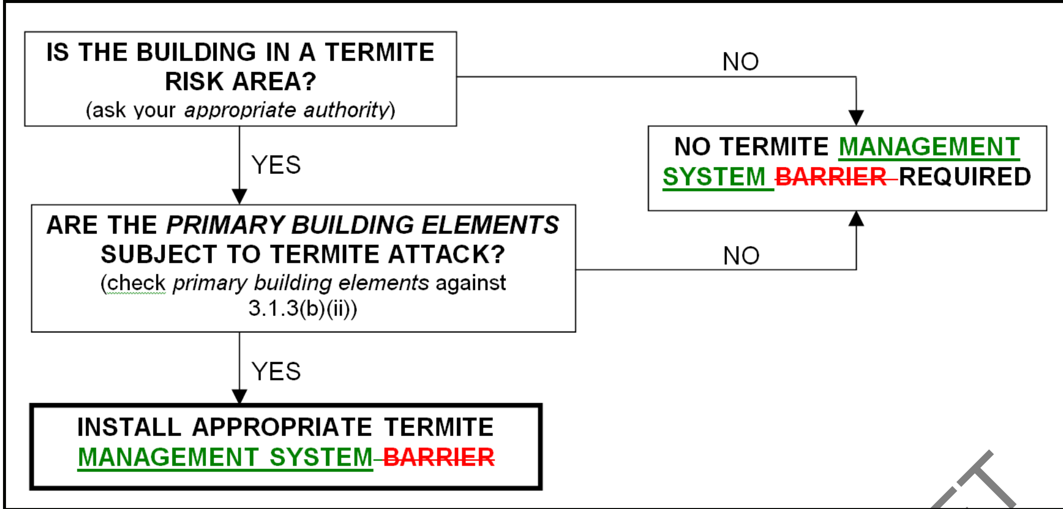
STATE AND TERRITORY VARIATIONS

3.1.3(b)(ii)(E) is replaced by the following clause in the Northern Territory:

(E) Naturally termite resistant timber in accordance with Appendix C of AS 3660.1 in areas where Mastotermes darwiniensis are not prevalent.

Figure 3.1.3.1

FLOW CHART FOR IDENTIFYING IF A TERMITE ~~BARRIER~~MANAGEMENT SYSTEM IS REQUIRED



A. Acceptable construction manual

3.1.3.0 Acceptable construction manual

Performance Requirement **P2.1.1** is satisfied for termite risk management if—

(a) a termite ~~barrier~~management system is installed in a Class 1 or 10 building to minimise the risk of termite attack to *primary building elements* in accordance with AS 3660.1 — Termite management — New building work; and

(b) a durable notice is installed in accordance with **3.1.3.2(b)**.

STATE AND TERRITORY VARIATIONS

In the Northern Territory delete 3.1.3.0(b) and insert 3.1.3.0(b) and (c) as follows:

(b) a durable notice is installed in accordance with **3.1.3.2(b)**; and

(c) additional termite risk management measures are used in areas where Mastotermes darwiniensis are prevalent.

STATE AND TERRITORY VARIATIONS

In Queensland delete 3.1.3.0 and replace with the following:

3.1.3.0 Acceptable construction manual

Performance Requirements **P2.1** and **P2.1.1** are satisfied for termite risk management if—

(a) a termite ~~barrier~~management system is installed in a Class 1 or 10 building to minimise the risk of termite attack to *primary building elements* in accordance with AS 3660.1; and

(b) the termite ~~barrier~~management system required by **(a)** has—

  (i) for a non temporary Class 1 building, a design life of at least 50 years; or

  (ii) for other than a non-temporary Class 1 building, a design life of at least 50 years or the specified design life of the building, whichever is the lesser; and

(c) a termite ~~barrier~~management system need not comply with **(b)** if it is easily and readily accessible for replenishment or replacement and is capable of being replenished or replaced; and

(d) where a chemical ~~soil barrier~~ is used as an external perimeter ~~barrier~~termite management system, it is—

  (i) installed by excavating trenches, treating the exposed trench and backfilling the trench with treated material; and

  (ii) covered by a 50 mm thick concrete cover strip not less than 300 mm wide measured from the *external wall* of the building; and

(e) durable notices are installed in accordance with **3.1.3.2(b)**.

B. Acceptable construction practice

3.1.3.1 Application

Compliance with this acceptable construction practice satisfies *Performance Requirement* **P2.1.1** for termite risk management.

Explanatory information:

The intent of these requirements is to provide for a termite ~~barrier~~management system that will ensure that termites will not enter a building by a concealed route. The installation of a termite ~~barriers~~management system will not stop termite activity from occurring on the *site*.

STATE AND TERRITORY VARIATIONS

In Queensland delete 3.1.3.1 and replace with the following:

3.1.3.1 Application

Compliance with this Part satisfies *Performance Requirements* **P2.1** and **P2.1.1** for termite risk management.

3.1.3.2 Installation of termite ~~barriers~~management systems

(a) A termite ~~barrier~~management system ~~or combination of barriers~~must be installed in accordance with—

(i) 3.1.3.3 for concrete slabs-on-ground; or

(ii) 3.1.3.4 for suspended floors.

(For ~~barrier~~termite management system options see **Table 3.1.3.1**).

(b) A durable notice must be permanently fixed to the building in a prominent location, such as in a meter box or the like, indicating—

(i) the method of termite risk management; and

(ii) the date of installation of the system; and

(iii) where a chemical ~~barrier~~ is used, its life expectancy as listed on the National Registration Authority label; and

(iv) the installer's or manufacturer's recommendations for the scope and frequency of future inspections for termite activity.

Explanatory information:

Durable notice

A durable notice must be fixed to the building in a prominent location advising the building occupants that the system should be inspected and maintained.

The notice should be clearly written, on a material that will not deteriorate or fade over time and be located in or near the meter box or similar location so that it can be easily seen and read by future owners of the building. Additional information may be included if desired by the person placing the notice.

STATE AND TERRITORY VARIATIONS

In Queensland delete 3.1.3.2 and replace with the following:

3.1.3.2 Installation of termite ~~barriers~~management systems

(a) A termite ~~barrier~~management system ~~or combination of barriers~~ must be installed in accordance with—

(i) AS 3660.1 subject to **Clause 3.1.3.0(b)**, **(c)** and **(d)**; or

(ii) 3.1.3.3 for concrete slabs-on-ground; or

(iii) 3.1.3.4 for suspended floors.

(For ~~barrier~~termite management system options, see **Table 3.1.3.1**)

(b) At least 2 durable notices must be permanently fixed to the building in prominent locations, such as in a meter box and a kitchen cupboard or the like, indicating—

(i) the method of termite risk management; and

(ii) the date of installation of the termite management measure; and

(iii) where a chemical ~~barrier~~ is used, its life expectancy as listed on the National Registration Authority label; and

(iv) the installer's or manufacturer's recommendations for the scope and frequency of future inspections for termite activity.

Explanatory information:

Durable notices

At least two durable notices must be fixed to the building in prominent locations advising the building occupants that the termite management measure should be inspected and maintained. The notices should be clearly written, on a material that will not deteriorate or fade over time and be located in or near the meter box and in a kitchen cupboard or similar location so that it can be easily seen and read by future owners of the building. Additional information may be included if desired by the person placing the notice.

STATE AND TERRITORY VARIATIONS

3.1.3.2(c) is added as follows in the Northern Territory:

3.1.3.2 Installation of termite ~~barriers~~management systems

(c) when a chemical ~~soil barrier~~ is used as an external perimeter ~~barrier~~termite management system for Mastotermes darwiniensis, it is—

(i) installed by excavating trenches, treating the exposed trench and backfilling the trench with treated material; and

(ii) covered by a 50 mm thick concrete cover strip not less than 300 mm wide measured from the external wall of the building.

Table 3.1.3.1 ACCEPTABLE TERMITE ~~BARRIERS~~MANAGEMENT SYSTEMS AND COMPONENTS

TERMITE MANAGEMENT SYSTEM OR COMPONENT (as per AS 3660.1)	FOOTING SYSTEM				
	Concrete slab-on-ground complying with AS 2870		Concrete slab-on-ground not complying with AS 2870		Suspended floors
	Penetrations and control joints	Slab perimeter	Beneath slab (includes penetrations and control joints)	Slab perimeter	
Slab edge exposure	Not suitable	Suitable	Not suitable	Suitable	Not applicable
Termite shielding	Not suitable	Not suitable	Not suitable	Not suitable	Suitable
Stainless steel mesh	Component~~Partial~~; or f~~F~~ull system	Component~~Partial~~; or f~~F~~ull system	Full system	Full system	Suitable
Graded stone	Component~~Partial~~; or f~~F~~ull system	Component~~Partial~~; or f~~F~~ull system	Full system	Full system	Component~~Partial~~; or f~~F~~ull system

TERMITE MANAGEMENT SYSTEM OR COMPONENT (as per AS 3660.1)	FOOTING SYSTEM				
	Concrete slab-on-ground complying with AS 2870		Concrete slab-on-ground not complying with AS 2870		Suspended floors
	Penetrations and control joints	Slab perimeter	Beneath slab (includes penetrations and control joints)	Slab perimeter	
Chemicals	Full system beneath slab	Perimeter system	Full system beneath slab	Perimeter system	Full system

Explanatory information:

A “component" of a~~partial~~ system~~”~~ as referred to in **Table 3.1.3.1** is one that when used in a combination with other components~~systems~~, will form a “full system”. ~~This is similar to 3.1.3.2 which refers to a “termite barrier or combination of barriers~~

For example, if a concrete slab is used as a ~~barrier~~component of a system, it in itself will not provide a complete ~~barrier to~~ termite~~s~~ management system. Then, depending on the construction methods and the site conditions, additional requirements will be necessary for service penetrations. Each of these are “components~~partial~~” ~~treatment~~, yet when integrated, will form a “full system”.

In addition to the acceptable termite management systems and components~~barriers~~ described in **Table 3.1.3.1**, other methods or systems can be used if it can be demonstrated that they meet the relevant *Performance Requirements* of the *Housing Provisions*. Forms of evidence of suitability are described in **Part 1.2** — Acceptance of design and construction.

STATE AND TERRITORY VARIATIONS

In Queensland delete Table 3.1.3.1 and replace with the following:

Table 3.1.3.1 ACCEPTABLE TERMITE ~~BARRIERS~~MANAGEMENT SYSTEMS AND COMPONENTS

TERMITE MANAGEMENT SYSTEM OR COMPONENT(as per AS 3660.1)	FOOTING SYSTEM				
	Concrete slab-on-ground complying with AS 2870		Concrete slab-on-ground not complying with AS 2870		Suspended floors
	Penetrations and control joints	Slab perimeter	Beneath slab (includes penetrations and control joints)	Slab perimeter	
Slab edge exposure	Not suitable	Suitable subject to **3.1.3.0(b)**	Not suitable	Suitable subject to **3.1.3.0(b)**	Not applicable
Termite shielding	Not suitable	Not suitable	Not suitable	Not suitable	Suitable subject to **3.1.3.0(b)**

TERMITE MANAGEMENT SYSTEM OR COMPONENT(as per AS 3660.1)	FOOTING SYSTEM				
	Concrete slab-on-ground complying with AS 2870		Concrete slab-on-ground not complying with AS 2870		Suspended floors
	Penetrations and control joints	Slab perimeter	Beneath slab (includes penetrations and control joints)	Slab perimeter	
Stainless steel mesh	Component~~Partial~~; or f~~F~~ull system subject to **3.1.3.0(b)**	Component ~~Partial~~; or f~~F~~ull system subject to **3.1.3.0(b)**	Full system subject to **3.1.3.0(b)**	Full system subject to **3.1.3.0(b)**	Suitable subject to **3.1.3.0(b)**
Graded stone	Component~~Partial~~; or f~~F~~ull system subject to **3.1.3.0(b)**	Component ~~Partial~~; or f~~F~~ull system subject to **3.1.3.0(b)**	Full system subject to **3.1.3.0(b)**	Full system subject to **3.1.3.0(b)**	Component~~Partial~~; or f~~F~~ull system subject to **3.1.3.0(b)**
Chemicals	Full system beneath slab subject to **3.1.3.0(b)** and **(c)**	Perimeter system subject to **3.1.3.0(b)** and **(d)**	Full system beneath slab subject to **3.1.3.0(b)** and **(c)**	Perimeter system subject to **3.1.3.0(b)** and **(d)**	Full system subject to **3.1.3.0(b)** and **(c)**

3.1.3.3 ~~Barriers~~Components of a termite management system for concrete slab-on-ground

(a) Where a concrete slab-on-ground is to be used as a component ~~part~~ of a termite ~~barrier~~management system, the slab must be designed and constructed to comply with AS 2870, and—

(i) monolithic slabs must have penetrations and the perimeter of the slab treated in accordance with **Table 3.1.3.1** (see **Figure 3.1.3.2**); and

(ii) non-monolithic slabs must have penetrations, control joints and the perimeter of the slab treated in accordance with **Table 3.1.3.1** (see **Figure 3.1.3.3**).

(b) Slabs not constructed in accordance with AS 2870 must have the full area beneath the slab and the perimeter treated in accordance with **Table 3.1.3.1**.

(c) The edge of a slab-on-ground may be used as a perimeter ~~barrier~~component of a termite management system provided—

(i) the slab edge is left exposed, not less than 75 mm above finished ground level; and

(ii) the face of the exposed edge is not rough or honeycombed and does not contain ripples caused by folds in vapour barrier or the like that could conceal termite activity; and

(iii) the exposed surface is not rendered, tiled, clad or concealed by *flashing*.

Figure 3.1.3.2

AREAS TO BE TREATED FOR CONCRETE SLAB-ON-GROUND

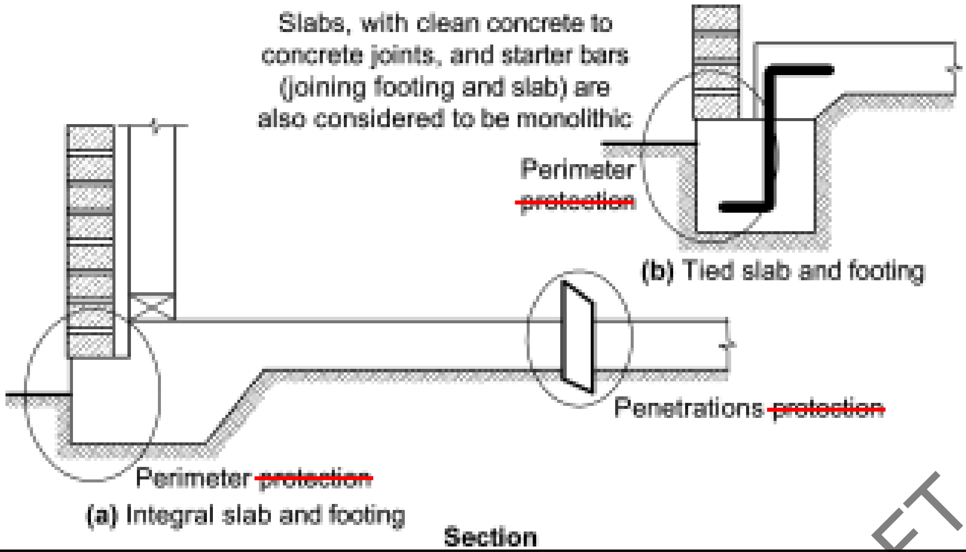
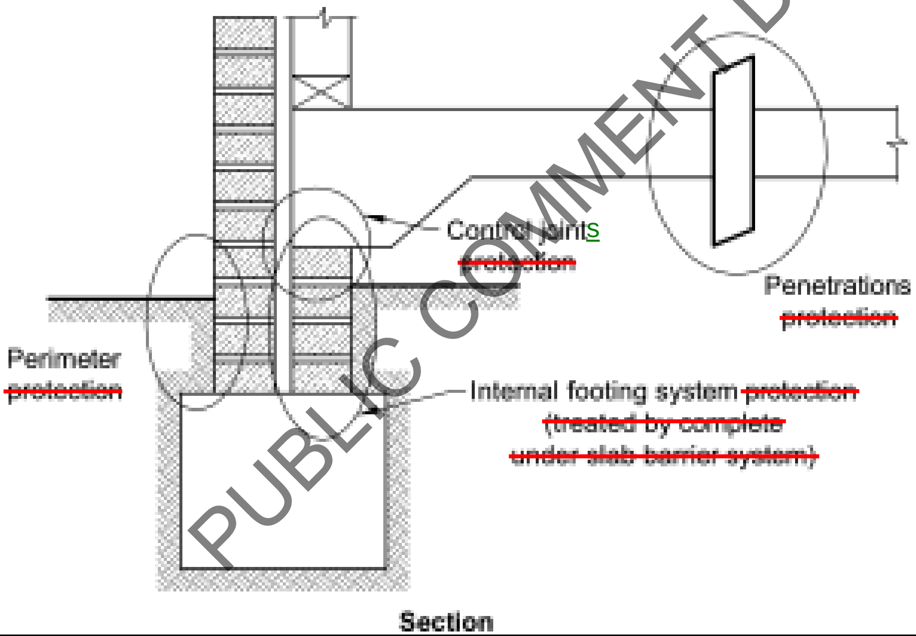


Figure 3.1.3.3

AREAS TO BE TREATED FOR CONCRETE SLABS



3.1.3.4 ~~Barriers~~Components of a termite management system for

suspended floors

The area beneath a suspended floor of a building must be treated—

(a) by installing a ~~barrier~~termite management system in accordance with **Table 3.1.3.1**; and

(b) by providing sub-floor ventilation in accordance with **Part 3.4.1**; and

(c) where a ~~barrier~~component of a termite management system that needs to be inspected is installed, by providing access to the area of the ~~barrier~~component that needs inspection in accordance with AS 3660.1.

3.1.3.5 Attachments to buildings

(a) Attachments to buildings such as downpipes and service pipes must have a gap to allow clear and uninterrupted visual inspection across the inspection zone.

(b) Structures such as steps, verandahs, porches, access ramps, carports, trellises, decks, heated~~ot~~ water systems, airconditioners, or the like which are not provided with one of the ~~barrier~~termite management systems described in this Part, must be separated from the building by a gap of not less than 25 mm, to allow clear and uninterrupted visual inspection across the inspection zone.

(c) Where attachments or structures, as outlined in **(a)** and **(b)**, abut a building and there is no clear gap, a ~~barrier~~termite management system must be provided to the attachment, regardless of the size of the attachment.

(d) For the purposes of this clause, an inspection zone is an unobstructed space which termites must cross or pass in order to gain access to a building or structure and, as a consequence, reveal their presence during visual inspection.

Explanatory information: Termites:

1. ~~Barriers —~~ Part of a system

   There are more than 350 species of termites in Australia, about 30 of which achieve economic importance by causing costly damage to building structures. Due to the nature of termites, it is extremely difficult to prevent them gaining access to a building.

   In addition to the correct installation of a termite ~~barrier~~management system, its effectiveness will rely on regular maintenance and competent inspection.

   The requirements in the BCA are minimum requirements and owners of buildings may choose to incorporate additional termite management systems in their buildings.

2. The slab as a ~~barrier~~component of a termite management system

   A concrete slab, designed and constructed in accordance with AS 2870, can form part of an acceptable termite ~~barrier~~management system. Cracking of the slab is common and does not necessarily indicate the failure of the ~~termite barrier~~component. Most cracks, including those that may appear quite wide on the surface do not necessarily extend for the full depth of the slab.

3. Slab edge exposure

   This approach is similar to that applied to termite shields in that termite activity is forced onto the exposed edge of the slab where with regular inspections termite ingress via the perimeter of the building can be detected.

The exposed edge of the slab should be kept clean. Debris such as leaves should be removed to ensure the full 75 mm of the slab is always visible.

4. Treatment of sub-floor areas

The area beneath a building requires special attention to ensure the effectiveness of the termite ~~barrier~~management system. The following points should be observed.

a. Sub-floor ventilation — In suspended floor areas it is important that termite activity is not encouraged by inadequate subfloor ventilation. In conjunction with physical or chemical ~~barriers~~termite management systems air flow is critical. Air flow will not only restrict the growth of fungus which attacks subfloor members (which makes them more susceptible to termite attack), but also creates a climatic atmosphere less conducive to termite activity.

b. Subfloor access — Termite shielding installed below suspended floors relies on access for both inspection and maintenance to be effective. Accordingly, minimum clearance heights will need to be achieved between the building structure (including ducts) and the ground to allow easy access to all areas where termite shields are used.

Perimeter access doors will also be needed where access is required for inspection and maintenance.

(A) Sand fill up to 800 mm deep — well compacted in layers not more than 300 mm deep by vibrating plate or vibrating roller.

(B) Clay fill up to 400 mm deep — well compacted in layers of not more than 150 mm by a mechanical roller.

(iv) *Rolled fill*:

(A) Sand fill up to 600 mm deep — compacted in layers of not more than 300 mm by repeated rolling by an excavator or other suitable mechanical equipment.

(B) Clay fill up to 300 mm deep — compacted in layers of not more than 150 mm by repeated rolling by an excavator or similar machine.

(b) * * * * *

(c) A level layer of clean quarry sand must be placed on top of the fill, with a depth of not less than 20 mm.

(d) A graded stone termite ~~barrier~~management system complying with **Part 3.1.3** may be substituted for the sand required in **(c)**.

3.2.2.3 Foundations for footings and slabs

Footings and slabs, including internal and edge beams, must be founded on soil with an allowable bearing pressure as follows:

(a) Slab panels, load support panels and internal beams — natural soil with an allowable bearing pressure of not less than 50 kPa or *controlled fill* or *rolled fill* compacted in accordance with **3.2.2.2**.

(b) Edge beams connected to the slab — natural soil with an allowable bearing pressure of not less than 50 kPa or *controlled fill* compacted in accordance with **3.2.2.2(a)(iii)** and extending past the perimeter of the building 1 m with a slope ratio not steeper than 2 horizontal to 1 vertical (see **Figure 3.2.2.1**).

(c) Pad footings, strip footings and edge beams not connected to the slab, must be—

(i) founded in natural soil with an allowable bearing pressure of not less than 100 kPa; or

(ii) for Class A and S *site*s they may be founded on controlled sand fill in accordance with **3.2.2.2(a)**.

3.2.2.4 Slab edge support on sloping sites

Footings and slabs installed on the low side of sloping *site*s must be as follows:

(a) Slab panels — in accordance with **3.2.2.3(a)**.

(b) Edge beams—

(i) supported by *controlled fill* in accordance with **3.2.2.3(b)** (see **Figure 3.2.2.1**, Option 1); or

(ii) supported by deepened edge beams or bulk piers designed in accordance with AS 3600 (see **Figure 3.2.2.1**, Option 2); or

(iii) deepened (as per AS 2870) to extend into the natural soil level with a bearing capacity in accordance with **3.2.2.3(b)** (see **Figure 3.2.2.1**, Option

PART 3.2.5 FOOTING AND SLAB CONSTRUCTION

Explanatory information:

The footings included in this Part reflect the requirements of AS 2870 and apply to the most common types of soil conditions. If the soil conditions on *site* are not covered by this Part then additional guidance can be obtained from AS 2870 or the *appropriate authority*.

These provisions are not meant to prohibit the use of alternative traditional footing methods found through experience to be suitable for local soil conditions (especially those used in stable soils). Such footings may be appropriate, provided they meet the relevant *Performance Requirements* listed in **Section 2**.

The diagrams in this Part reflect acceptable footing designs only. They do not provide details for termite ~~barriers~~management systems such as the correct placement of ant capping and slab edge exposure.

For details on termite ~~barriers~~management systems, see **Part 3.1.3**.

3.2.5.1 Footing and slab construction

(a) Footing and slab construction, including size and placement of reinforcement, must comply with the relevant provisions of this Part and the following details:

(i) Footings for stumps — the appropriate details in **3.2.5.6** and **Table 3.2.5.2**.

(ii) Stiffened raft Class A, S, M, M-D, H and H-D *sites* — the appropriate details in **Figure 3.2.5.3(a)** and **Figure 3.2.5.3(b)**.

(iii) Strip footing systems in Class A, S, M, M-D and H *sites* — the appropriate details in **Figure 3.2.5.4(a)** and **Figure 3.2.5.4(b)**.

(iv) Footing slabs for Class A *sites* — the appropriate details in **Figure 3.2.5.5**.

(b) Footings for *single leaf masonry*, *mixed construction* and *earth wall masonry* must comply with the equivalent footing construction set out in **Table 3.2.5.1**.

3.2.5.2 Footings and slabs to extensions to existing buildings

(a) Footings to extensions to Class 1 or 10 buildings may be of similar proportions and details to those used with an existing same Class of building on the same allotment provided—

(i) masonry and masonry veneer walls are articulated at the junction with the existing building; and

(ii) the performance of the existing building has been satisfactory, i.e. there has been no significant cracking or movement (see Section 2 of AS 2870 for acceptable footing performance); and

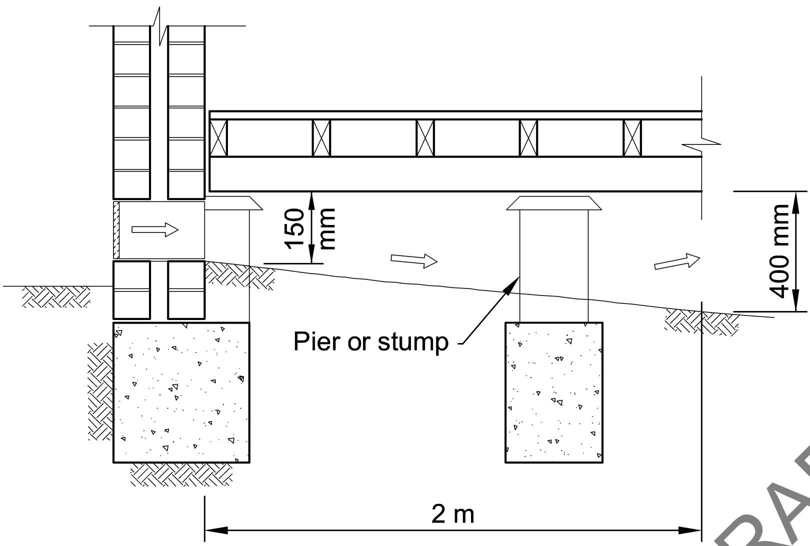
(iii) there are no unusual moisture conditions on the *site*.

(b) Class 10 buildings of *clad framed* construction may use footing systems

Figure 3.4.1

TYPICAL SUB-FLOOR VENTILATION DETAILS

Diagram b.	**Sub-Floor Clearance Requirements on a Sloping Site**



Notes:

1. 400 mm clearance *required* only where termite ~~barriers~~management systems are installed that need to be inspected (see Part 3.1.3); and
2. On sloping *sites* the 400 mm clearance *required* by (1) may be reduced to 150 mm within 2 m of *external walls* in accordance with Diagram b.

Explanatory information:

The weight of roof or ceiling insulation, particularly if additional ceiling insulation is used for compliance with the energy efficiency provisions, needs to be considered in the selection of plasterboard, plasterboard fixings and building framing.

3.4.2.2 General

(a) The steel frame must be protected from corrosion in accordance with the following:

(i) Where the steel frame is within the building envelope, in locations—

(A) more than 300 m from *breaking surf*; or

(B) not in a heavy industrial area; or

(ii) Where the steel frame is outside the building envelope, ~~—~~ in locations—

(A) more than 1 km from salt water which is not subject to *breaking surf*, such as a lake or protected bay; or

(B) more than 10 km from a coastal area with *breaking surf*; or

(C) not in a heavy industrial area,

~~the steel frame must have a minimum coating class in accordance with AS 1397 of Z275 (275 grams of zinc per square metre) or AZ150 (150 grams of aluminium/zinc per square metre) or AM150 (150 grams of aluminium/zinc/magnesium per square metre).~~

the steel frame must have a minimum coating class in accordance with AS 1397 of Z275 (275 grams of zinc per square metre) or AZ150 (150 grams of aluminium/zinc per square metre) or AM150 (150 grams of aluminium/zinc/magnesium per square metre).

Explanatory information:

AS 1397 requires the coating mass to be applied to both sides of the framing member. For example, AM 150 describes a total aluminium/zinc/magnesium coating mass of 150g/m^2 obtained from 75g/m^2 applied to each side.

(iii) In areas not specified in **(i)** or **(ii)**, a higher level of corrosion protection is *required*.

(b) The frame must be permanently electrically earthed on completion of fixing.

Explanatory information:

The steel frame requirements of this Part should be considered in conjunction with steel frame design and construction advice from the manufacturer.

For the purpose of **3.4.2.2**, the building *envelope* is deemed to be a space in the building where the steel frame does not have direct contact with the external atmosphere, other than for normal ventilation purposes. Examples of such locations are frames which are clad or lined on both sides or frames in masonry veneer construction. Areas not within the building *envelope* include floor framing members where there is no continuous perimeter sub-floor walling or verandah roof framing members with no ceiling lining.

Part 3.5.2 GUTTERS AND DOWNPIPES

Appropriate *Performance Requirements*:

Where an alternative gutter and downpipe system is proposed as an *Alternative Solution* to that described in **Part 3.5.2**, that proposal must comply with—

(a) *Performance Requirement* **P2.2.1**; and

(b) the relevant *Performance Requirements* determined in accordance with **1.0.10**.

A. Acceptable construction manuals

3.5.2.0

Performance Requirement **P2.2.1** is satisfied for gutters and downpipes if they are designed and installed—~~constructed in accordance with AS/NZS 3500.3 — Stormwater drainage, or AS/NZS 3500.5 — Domestic installations, Section 5 — Stormwater drainage.~~

(a) in accordance with AS/NZS 3500.3 or AS/NZS 3500.5; and

(b) where eaves gutters are used, to remove rainwater falling at the appropriate rainfall intensity listed in **Table 3.5.2.1** for a—

(i) 100 year *average recurrence interval*; or

(ii) 20 year *average recurrence interval*, if not less than one overflow measure per downpipe is installed in accordance with **Table 3.5.2.4** to remove the appropriate overflow volume in **Table 3.5.2.3**.

B. Acceptable construction practice

3.5.2.1 Application

Compliance with this acceptable construction practice satisfies *Performance Requirement* **P2.2.1** for gutters and downpipes provided the roof drainage system is connected to a stormwater drainage system that complies with **Part 3.1.2**.~~—~~

~~(a) the roof drainage system is connected to a stormwater drainage system that complies with **Part 3.1.2**; and~~

~~(b) the roof drainage system is designed so that any overflow during heavy rain~~

~~periods is prevented from flowing back into the building.~~

Explanatory information:

1. The requirement to install drainage systems from roofs and sub-soil drains should be confirmed with the *appropriate authority*. These provisions need only be applied when drainage systems are necessary.
2. Information on drainage requirements outside the allotment can be obtained from the *appropriate authority*.

3.5.2.2 Materials

Gutters, downpipes and *flashings* must—

(a) be manufactured in accordance with AS/NZS 2179.1 for metal; and

(b) be manufactured in accordance with AS 1273 for UPVC components; and

(c) be compatible with all upstream roofing materials in accordance with **3.5.1.3(c)**; and

(d) not contain any lead if used on a roof forming part of a potable water catchment area.

3.5.2.3 Selection of guttering

The size of guttering must—

(a) be in accordance with **Table 3.5.2.2**; and

(b) be suitable to remove rainwater falling at the appropriate rainfall intensity listed in **Table 3.5.2.1** as follows—

  (i) for eaves gutters — 20 year *average recurrence interval*, if not less than one overflow measure per downpipe is installed in accordance with **Table 3.5.2.4** to remove the appropriate overflow volume in **Table 3.5.2.3**; or

  (ii) for internal box, ~~and~~ valley gutters and eaves gutters without overflow measures — 100 year *average recurrence interval*.

3.5.2.4 Installation of gutters

(a) Gutters must be installed with a fall of not less than—

  (i) 1:500 for eaves gutters, unless fixed to metal fascias; and

  (ii) 1:100 for box gutters.

(b) Eaves gutters must be supported by brackets securely fixed at stop ends and at not more than 1.2 m centres.

(c) Valley gutters on a roof with a pitch—

  (i) more than 12.5 degrees — must have width of not less than 400 mm and be wide enough to allow the roof covering to overhang not less than 150 mm each side of the gutter; or

  (ii) not more than 12.5 degrees — must be designed as a box gutter.

~~(d) Where high-fronted gutters are installed, provision must be made to avoid any overflow back into the roof or building structure by incorporating overflow measures or the like.~~

3.5.2.5 Downpipes — size and installation

Downpipes must—

(a) not serve more than 12 m of gutter length for each downpipe; and

Explanatory information:

A maximum 12 m gutter length served by each downpipe is to ensure effective fall and adequate capacity to discharge all water anticipated during a heavy rain period from a storm having an *average recurrence interval* of 20 years.

(b) be located as close as possible to valley gutters ~~and, if the downpipe is more than 1.2 m from a valley, provision for overflow must be made to the gutter~~; and

(c) be selected in accordance with the appropriate eaves gutter section as shown in **Table 3.5.2.2**.

Table 3.5.2.1 RAINFALL INTENSITIES

Locality	5 minute rainfall intensity (mm/h)			Locality	5 minute rainfall intensity (mm/h)		
	Average recurrence interval, once in—		Design overflow rainfall intensity		*Average recurrence interval*, once in—		Design overflow rainfall intensity
	20 years	100 years			20 years	100 years	
ACT				**SA**			
Canberra	137	194	57	Adelaide	123	186	63
				Mt Gambier	108	168	60
NSW				Murray Bridge	117	181	64
Albury	135	191	56	Port Augusta	124	189	65
Broken Hill	130	181	51	Port Pirie	125	201	76
Goulburn	145	197	52	Yorketown	118	197	79
Kiama	224	283	59				
Newcastle	181	233	52	**WA**			
Orange	152	214	62	Albany	142	217	75
Sydney	214	273	59	Broome	252	343	91
Tweed Heads	245	303	58	Bunbury	148	215	67
Wollongong	233	294	61	Derby	254	343	89

Locality	5 minute rainfall intensity (mm/h)			Locality	5 minute rainfall intensity (mm/h)		
	Average recurrence interval, once in—		Design overflow rainfall intensity		*Average recurrence interval*, once in—		Design overflow rainfall intensity
	20 years	100 years			20 years	100 years	
				Geraldton	132	173	41
VIC				Kalgoorlie	116	180	64
Ballarat	127	184	57	Perth	146	214	68
Benalla	133	187	54	Port Hedland	233	332	99
Geelong	118	172	54	Tom Price	164	222	58
Horsham	120	174	54				
Lakes Entrance	124	179	55	**TAS**			
Melbourne	127	186	59	Burnie	118	191	73
Mildura	125	174	49	Flinders Island	128	184	56
Stawell	127	185	58	Hobart	99	155	56
				Launceston	101	150	49
QLD				Queenstown	118	183	65
Brisbane	251	333	82	St. Marys	205	266	61
Bundaberg	241	318	77				
Cairns	282	368	86	**NT**			
Cape York	301	388	87	Alice Springs	139	204	65
Cloncurry	172	228	56	Darwin	285	366	81
Innisfail	254	323	69	Katherine	230	304	74
Mackay	273	363	90				
Mt Isa	169	223	54				
Noosa	253	320	67				
Rockhampton	248	336	88				
Toowoomba	189	251	62				
Townsville	260	346	86				
Weipa	293	370	77				

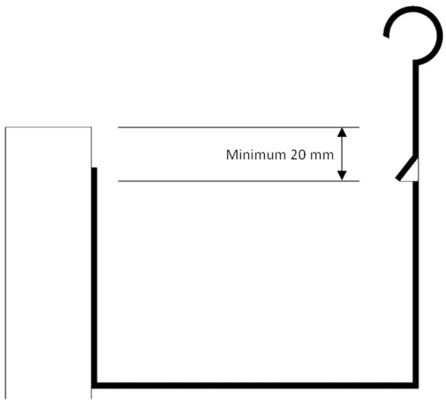
Table c. Downpipe selection					
Downpipe Section	**Gutter Sections — (as per Table b.)**				
	A	**B**	**C**	**D**	**E**
100 mm × 75 mm	Yes	Yes	Yes	Yes	Yes
Legend:	Yes—downpipe is suitable for the eaves gutter selection; and No—downpipe is not suitable for the eaves gutter selection.				

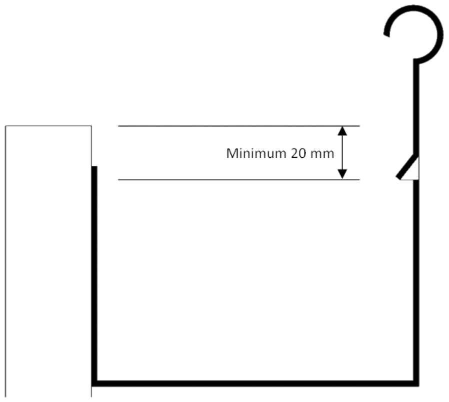
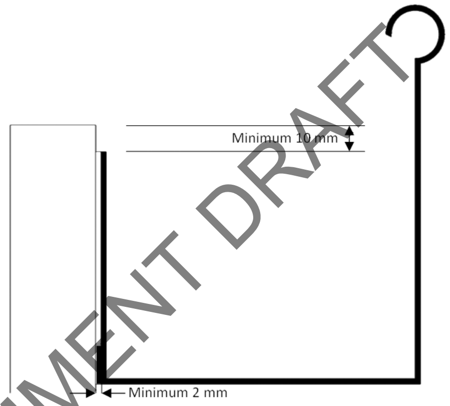
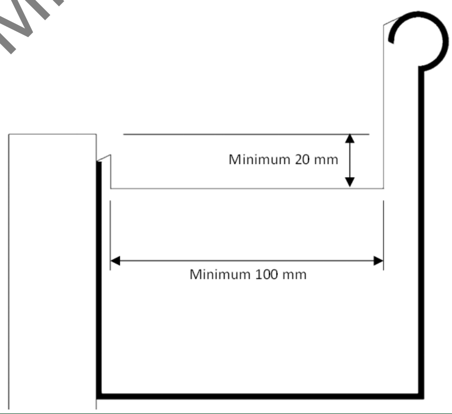
Table 3.5.2.3 DESIGN OVERFLOW VOLUME

Design overflow rainfall intensity (mm/h) (as per Table 3.5.2.1)	Roof catchment area per downpipe (m^2)				
	30	**40**	**50**	**60**	**70**
	Design overflow volume per downpipe (L/s)				
40	0.33	0.44	0.56	0.67	0.78
50	0.42	0.56	0.69	0.83	0.97
60	0.50	0.67	0.83	1.00	1.17
70	0.58	0.78	0.97	1.17	1.36
80	0.67	0.89	1.11	1.33	1.56
90	0.75	1.00	1.25	1.50	1.75
100	0.83	1.11	1.39	1.67	1.94

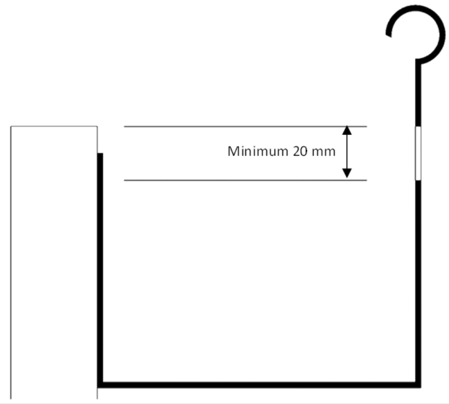
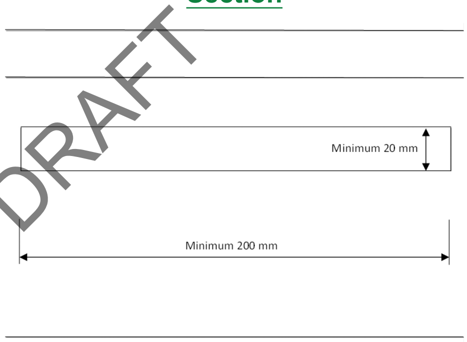
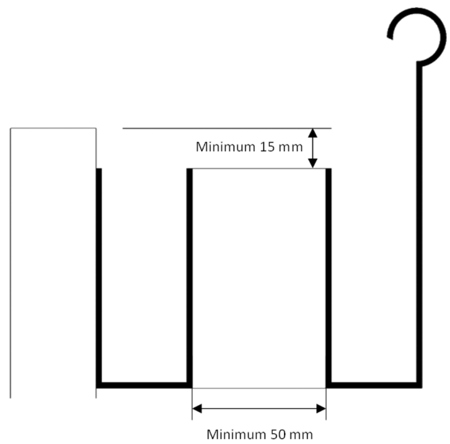
Note: Where the design overflow rainfall intensity is between the values stated, interpolation may be used to determine the adjusted minimum design overflow volume per downpipe.

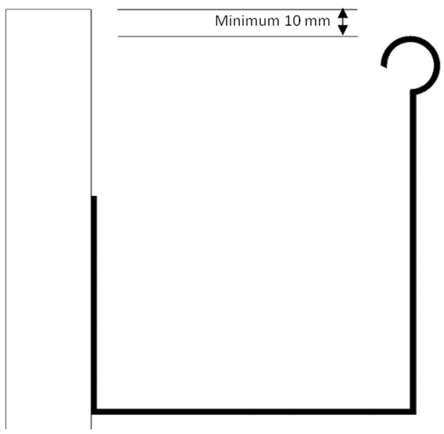
Table 3.5.2.4 OVERFLOW MEASURE SELECTION

Description	**Overflow capacity (L/s)**	**Construction**
Front face slotted gutter with— (a) a minimum slot opening area of 360 mm^2 per metre of gutter; and (b) the lower edge of the slots installed a minimum of 20 mm below the top of the fascia.	0.1 × gutter length in metres	

Description	**Overflow capacity (L/s)**	**Construction**
Front face slotted gutter with— (a) a minimum slot opening area of 720 mm^2 per metre of gutter; and (b) the lower edge of the slots installed a minimum of 20 mm below the top of the fascia.	0.2 × gutter length in metres	
Controlled back gap with— (a) a permanent, minimum 2 mm spacer installed at the base of the gutter at intervals of one spacer per gutter bracket; and (b) any spacer having a width no more than 50 mm; and (c) the back of the gutter installed a minimum of 10 mm below the top of the fascia.	0.3 × gutter length in metres	
End-stop weir (see Note) with— (a) a minimum clear width of 100 mm; and (b) the weir edge installed a minimum of 20 mm below the top of the fascia.	0.3	

Note: An end-stop weir is not suitable where the end-stop abuts a wall.

Description	Overflow capacity (L/s)	Construction
Front face weir with— (a) a minimum clear width of 200 mm; and (b) a minimum clear height of 20 mm; and (c) the weir edge is installed a minimum of 20 mm below the top of the fascia.	0.6	 Section  Elevation
Inverted nozzle installed within 500 mm of the gutter high point with— (a) a minimum nozzle size of 100 mm × 50 mm positioned lengthways in the gutter; and (b) the top of the nozzle installed a minimum of 15 mm below the top of the fascia.	0.5	

Description	Overflow capacity (L/s)	Construction
Controlled front bead height with the front bead of the gutter installed a minimum of 10 mm below the top of the fascia.	1.5 × gutter length in metres	

Explanatory information:

Stormwater drainage systems specified in the *Housing Provisions* are not designed to remove all of the water to an appropriate outfall during exceptionally heavy rain, especially in tropical areas. In particular, eaves gutter systems are typically designed to remove surface water arising from a storm having an *average recurrence interval* of 20 years. Accordingly, to achieve compliance with the *Performance Requirements* it is necessary to design and install the system to incorporate overflow measures so that when overflowing occurs any water is directed away in a manner which ensures it does not pond against, or enter into, the building.

~~This may be achieved by using overflow measures, oversized gutters and downpipes, locating the gutter so that it is below the top edge of the fascia or the installation of rainwater heads with overflows.~~

Insufficient and poorly located downpipes are a frequent cause of poor roof drainage performance. The installation of downpipes, especially near valley gutters, are designed to ensure rainwater from areas on the roof that have concentrated water flows ~~perform~~is adequately removed. ~~If downpipe spacings are to be increased, allowance for overflow should be considered.~~

Consideration needs to be given to box gutters, valley gutters etc. located above the internal areas of a building ~~and eaves gutters where overflowing rainwater can flow over the eaves lining and back into the building~~. In these situations if adequate overflow controls cannot be implemented there may be a need to increase the size and capacity of drainage components to remove all water anticipated during heavy rain periods.

There are many options available to designers using the requirements of the *Housing Provisions*, including oversized gutters and downpipes and a variety of overflow measures. The designer will need to choose an overflow system that will cope with the expected rain intensity~~, ie in heavy downpours a slotted gutter may be inadequate.~~

PART 3.5.3 WALL CLADDING

Appropriate *Performance Requirements*:

Where an alternative wall cladding is proposed as an *Alternative Solution* to that described in **Part 3.5.3**, that proposal must comply with—

(a) *Performance Requirement* **P2.1.1**; and

(b) *Performance Requirement* **P2.2.2**; and

(c) the relevant *Performance Requirements* determined in accordance with **1.0.10**.

A. Acceptable construction manual

3.5.3.0

Performance Requirements **P2.1.1** and **P2.2.2** are satisfied for metal wall cladding if it is designed and constructed in accordance with AS 1562.1.

B. Acceptable construction practice

3.5.3.1 Application

Compliance with this acceptable construction practice satisfies *Performance Requirements***P2.1.1** and **P2.2.2** for wall cladding provided—

(a) the building is located in an area with a *design wind speed* of not more than N3; and

Explanatory information:

1. Information on *design wind speed*s for particular areas may be available from the *appropriate authority*.
2. A map indicating cyclonic regions of Australia is contained in **Part 3.10.1**.
3. For wall cladding in areas with a *design wind speed* of more than N3 refer to the appropriate design manual listed in **Part 3.11**.

(b) wall cladding is installed in accordance with—

(i) **3.5.3.2** for timber weatherboard cladding; and

(ii) **3.5.3.3** for fibre-cement ~~planks~~ and hardboard wall~~weatherboard~~ cladding boards; and

(iii) 3.5.3.4 for fibre-cement, hardboard ~~sheet~~ and plywood sheet wall cladding; and

(c) fibre-cement sheet eaves are installed in accordance with 3.5.3.5; and

(d) openings in cladding are flashed in accordance with 3.5.3.6.

3.5.3.2 Timber weatherboard cladding

Timber cladding must be installed as follows:

(a) Splayed timber weatherboards must be fixed in accordance with **Figure 3.5.3.1** and with a lap not less than—

(i) 30 mm for hardwood, cypress and treated pine; and

(ii) 20 mm for western red cedar; and

(iii) 25 mm for baltic pine.

(b) Profiled timber boards must be—

(i) fixed with the overlap and groove closely fitted; and

(ii) with tongue and groove profile, fixed tongue edge up.

(c) Spacing of fixings must be—

(i) one nail per board at each stud at not more than 650 mm centres measured along the board; and

(ii) nailed so that they do not penetrate the tip or thinner edge of the board beneath, i.e. for 30 mm lap, nail 35 mm from the butt (see **Figure 3.5.3.1**).

(d) Nails used to fix timber cladding must comply with the following:

(i) Where nails are punched and filled prior to painting, with standard steel bullet-head nails.

(ii) Uncoated copper or steel nails must not be used for western red cedar (silicon bronze, monel metal, stainless steel or hot-dipped galvanised are suitable).

(iii) In all other cases, nails must be hot-dipped galvanised flat head or bullet head.

(e) Acceptable nail sizes are—

(i) for hardwood and cypress frames — 50×2.8 mm plain shank; and

(ii) for softwood frames — 50×3.15 mm annular threaded.

3.5.3.3 ~~Fibre-cement planks and weatherboard~~Wall cladding boards

Wall cladding boards~~Fibre-cement plank and weatherboard cladding~~ must— ~~be installed as follows:~~

(a) for 7.5 mm (minimum) thick fibre-cement ~~planks and weatherboards must be~~ — comply with AS/NZS 2908.2 or ISO 8336; and

~~(i) manufactured in accordance with AS/NZS 2908.2 or ISO 8336; and~~

~~(ii) fixed with a lap of not less than 25 mm (see **Figure 3.5.3.1**).~~

(b) for 9.5 mm~~7.5 mm~~ (minimum) thick hardboard — comply with AS/NZS 1859.4; and~~fibre-cement planks and weatherboards must be fixed in accordance with Figure 3.5.3.1 with a stud spacing of not more than 600 mm.~~

(c) be fixed in accordance with **Table 3.5.3.1** and **Figure 3.5.3.1**.~~Acceptable fixings for 7.5 mm fibre-cement planks and weatherboards are—~~

~~(i) for timber studs — 40×2.8 mm galvanised fibre-cement nails; and~~

~~(ii) for steel studs — 8–18×35 mm self embedding head screws (see **Figure 3.5.3.1**).~~

Table 3.5.3.1 FIXING REQUIREMENTS FOR WALL CLADDING BOARDS

Material	**Maximum stud spacing (mm)**	**Minimum lap (mm)**	**Stud fixings (mm)**	
			Timber	**Steel**
Minimum 7.5 mm thick fibre-cement	600	25	40×2.8 G	(8–18)×35 S
Minimum 9.5 mm thick hardboard	600	20	50×2.8 GC	(8–18)×35 S

Legend:

G = Galvanised fibre-cement nail

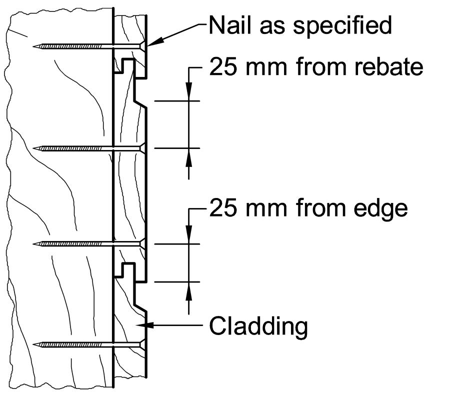
GC = Galvanised clout or flathead nail

S = Self embedding head screw

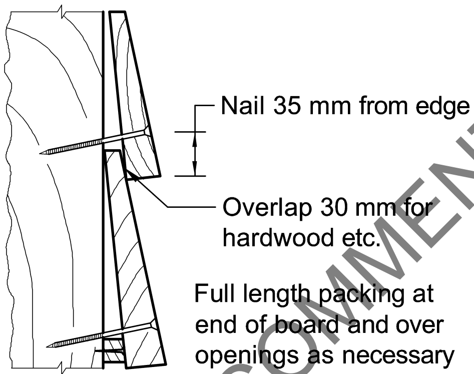
Figure 3.5.3.1

FIXING OF WALL CLADDING

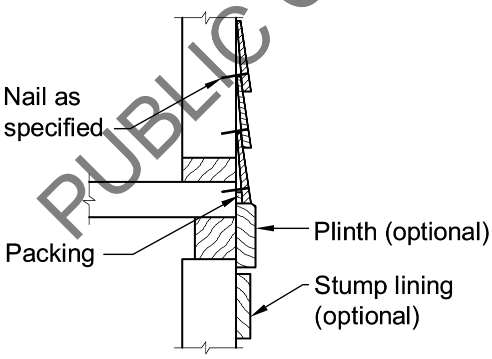
Diagram a.	**Timber Cladding**	**Diagram b.**	**Wall Cladding Boards~~Fibre-cement Planks and Weatherboards~~**



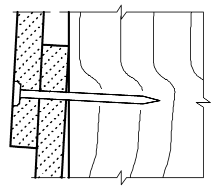
(a) (i) Shiplap weather board



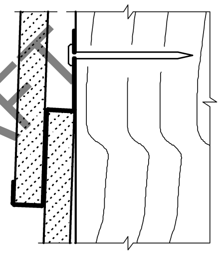
(a) (ii) Splayed weather board



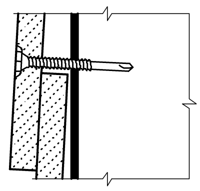
(a) (iii) Section at lower part of weatherboard building



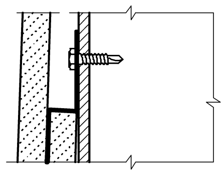
(b) (i) Timber stud nailing



(b) (ii) Timber stud clip



(b) (iii) Steel stud screwing



(b) (iv) Steel stud clip

3.5.3.4 ~~Fibre-cement s~~Sheet wall cladding

(a) Fibre-cement sheet~~s~~ wall cladding must— ~~comply as follows:~~

(i) comply with AS/NZS 2908.2 or ISO 8336; and~~Fibre-cement sheets used as external wall cladding must be fixed in accordance with Table 3.5.3.21 and Figure 3.5.3.2.~~

(ii) be fixed in accordance with **Table 3.5.3.2** and **Figure 3.5.3.2**; and~~Where the external cladding also acts as structural sheet bracing, the lesser of the stud and fixing spacings for both applications must be used.~~

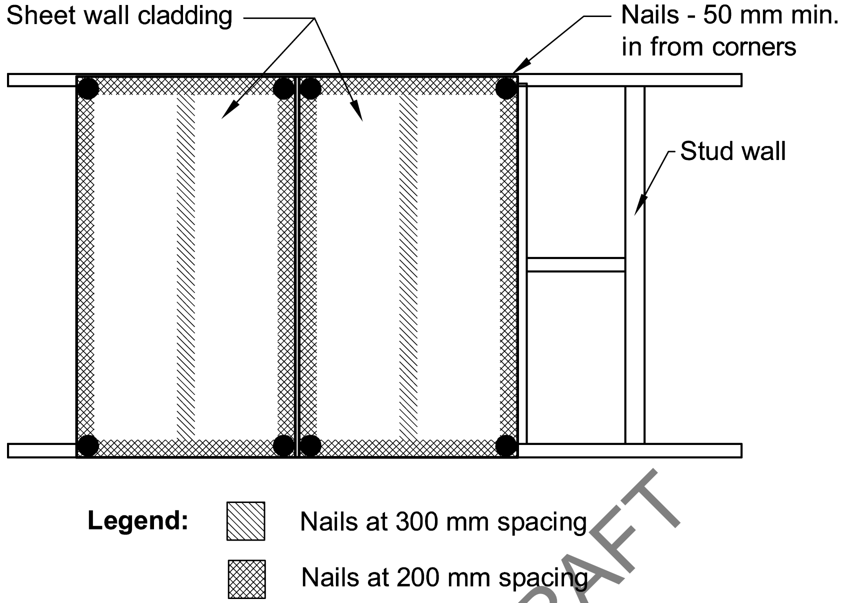
(iii) where also acting as structural bracing, be installed using the lesser of the stud and fixing spacings for both applications.~~External fibre-cement sheets and claddings must comply with AS/NZS 2908.2 or ISO 8336.~~

Table 3.5.3.2~~1~~ STUD AND ~~WALL~~FIXING SPACINGS FOR 6 mm FIBRE-CEMENT SHEET WALL CLADDING

Design wind speed	Maximum stud spacing~~STUD SPACING~~		Maximum nail spacing~~NAIL SPACING~~ (2.8 mm fibre-cement nails)			
	Within 1~~.~~200 mm of ~~ends~~the external corners of the building	Elsewhere	Within 1~~.~~200 mm of ~~ends~~the external corners of the building		Elsewhere	
			Body	Edges	Body	Edges
N1	600	600	300	200	300	200
N2	600	600	200	200	300	200
N3	450	600	200	200	200	200

Figure 3.5.3.2

SHEET FIXING DETAIL



(b) Hardboard sheet wall cladding must—

(i) comply with AS/NZS 1859.4; and

(ii) be fixed in accordance with **Table 3.5.3.3**; and

(iii) where also acting as structural bracing, be installed using the lesser of the stud and fixing spacings for both applications.

Table 3.5.3.3 STUD AND FIXING SPACINGS FOR 9.5 mm HARDBOARD SHEET WALL CLADDING

Design wind speed	**Maximum stud spacing**		**Maximum nail spacing (2.8 mm galvanised clouts or flat head nails)**			
	Within 1200 mm of the external corners of the building	**Elsewhere**	**Within 1200 mm of the external corners of the building**		**Elsewhere**	
			Body	**Edges**	**Body**	**Edges**
N1	600	600	300	150	300	150
N2	600	600	300	150	300	150
N3	600	600	300	150	300	150

Note: Fixings must be positioned a minimum of 12 mm from the edge of the sheet.

(c~~b~~) Structural plywood wall~~external~~ cladding must— ~~comply as follows:~~

(i) ~~Structural plywood cladding must~~ comply with AS/NZS 2269~~.~~; and

(ii) be fixed in accordance with the following: ~~Where structural plywood acts as cladding and combined structural bracing it must comply with **Table 3.5.3.2**.~~

(A) Where structural plywood acts as combined cladding and structural bracing it must comply with **Table 3.5.3.4**.

(B) Sheets not more than 9 mm thick must be fixed using 2.8 or 3.5×30 mm long galvanised clouts or flat head nails spaced at—

(aa) 150 mm centres along sheet edges; and

(bb) 300 mm for intermediate fixings.

(C) Sheets more than 9 mm thick must be fixed with 2.8 or 3.5 mm galvanised clouts or flat head nails with a length calculated using the following formula:

MIN NAIL LENGTH L = PL + 10 Da

Where PL = Plywood thickness and

Da = Diameter of nail

(D) The fixings must be located not less than 9 mm from the edge of the sheet.

~~(iii) Sheets, not more than 9 mm thick must be fixed using 2.8/3.5×30 mm long galvanised clouts or flat head nails spaced at—~~

~~(A) 150 mm centres along sheet edges; and~~

~~(B) 300 mm for intermediate fixings; and~~

~~(iv) Sheets thicker than 9 mm must be fixed with 2.8 or 3.5 mm galvanised clouts or flat head nails with a length calculated using the following formula:~~

~~MIN NAIL LENGTH L = PL + 10 Da~~

~~Where PL = Plywood thickness and~~

~~Da = Diameter of nail~~

~~(v) The fixings must be located not less than 9 mm from the edge of the sheet.~~

Explanatory information:

The above formula is applied as follows:

For 12 mm plywood and 2.8 mm diameter nail.

L = 12 + 28 mm; therefore the nail length must be 40 mm.

Table 3.5.3.4~~2~~ MINIMUM STRUCTURAL PLYWOOD THICKNESS FOR COMBINED

BRACING AND EXTERNAL CLADDING (mm)

Plywood stress grade	Stud spacing (mm)					
	Plywood face grain parallel to studs			Plywood face grain at right angles to studs		
	450	600	900	450	600	900
F8	9	12	16	7	9	12
F11	8	12	16	6	8	12
F14	7	12	16	6	7	12

3.5.3.5 Eaves and soffit linings

External fibre-cement sheets and linings used as eaves and soffit linings must—

(a) comply with AS/NZS 2908.2 or ISO 8336; and

(b) be fixed in accordance with **Table 3.5.3.5~~3~~** and **Figure 3.5.3.3** using—

(i) 2.8×30 mm f~~F~~ibre-cement nails; or

(ii) No. 8 w~~W~~afer head screws (for 4.5 mm and 6 mm sheets only); or

(iii) No. 8 s~~S~~elf embedding head screws (for 6 mm sheets only).

Table 3.5.3.5~~3~~ TRIMMER AND FASTENER SPACINGS FOR 4.5 AND 6 mm FIBRE-CEMENT EAVES AND SOFFIT LININGS

Maximum eaves width	*Design wind speed*	Maximum trimmer spacings (mm)		Maximum fastener spacings (mm)	
		Within 1200 mm of the external corners of the building	~~Remainder of sheet~~Elsewhere	Within 1200 mm of the external corners of the building	~~Remainder of sheet~~Elsewhere
600	N1	600	900	200	300
	N2	600	800	200	300
	N3	500	700	200	300
1200	N1	600	750	200	300
	N2	600	700	200	300
	N3	500	650	200	300

Part 3.8.2 ROOM HEIGHTS

Appropriate *Performance Requirements*:

Where an alternative ceiling height is proposed as an *Alternative Solution* to that described in **Part 3.8.2**, that proposal must comply with—

(a) *Performance Requirement* **P2.4.2**; and

(b) the relevant *Performance Requirements* determined in accordance with **1.0.10**.

Acceptable construction practice

3.8.2.1 Application

Compliance with this acceptable construction practice satisfies *Performance Requirement* **P2.4.2** for room heights.

3.8.2.2 Ceiling heights

Ceiling heights (see **Figure 3.8.2.1**) must be not less than—

(a) in a *habitable room* excluding a kitchen — 2.4 m; and

(b) in a kitchen — 2.1 m; and

(c) in a corridor, passageway or the like — 2.1 m; and

(d) in a bathroom, shower room, laundry, *sanitary compartment*, airlock, pantry, storeroom, garage, car parking area or the like — 2.1 m; and

(e) in a room or space with a sloping ceiling or projections below the ceiling line within—

(i) a *habitable room*—

(A) in an attic — a height of not less than 2.2 m for at least two-thirds of the floor area of the room or space; and

(B) in other rooms — a height of not less than 2.4 m over two-thirds of the floor area of the room or space; and

(ii) a non-*habitable room* — a height of not less than 2.1 m for at least two-thirds of the floor area of the room or space,

and when calculating the floor area of a room or space, any part that has a ceiling height of less than 1.5 m is not included; and

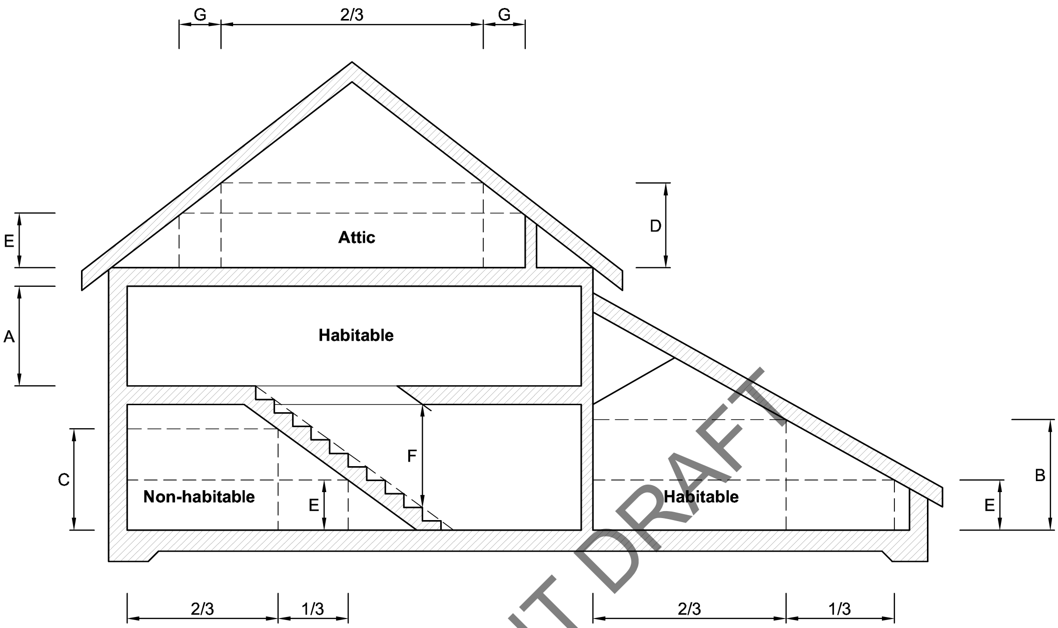
Explanatory information:

When measuring the height of a room, allowances should be made for floor finishes such as tiles or carpet to ensure that the minimum ceiling height is achieved.

(f) in a stairway — 2.0 m measured vertically above the nosing line.

Figure 3.8.2.1

MEASUREMENT OF ACCEPTABLE CEILING HEIGHTS



Note: The letters in the diagram represent the following minimum dimensions:

A =	2.4 m	In a *habitable room* (excluding a kitchen).
B =	2.4 m	In a *habitable room* with a sloping ceiling for at least two-thirds of the floor area of the room or space.
C =	2.1 m	In a non-*habitable room* with a sloping ceiling for at least two-thirds of the floor area of the room or space.
D =	2.2 m	In an attic with a sloping ceiling for at least two-thirds of the floor area of the room or space.
E =	1.5 m	For the purpose of calculating the floor area of a room or space, any ceiling height of less than 1.5 m is excluded.
F =	2.0 m	In a stairway (measured vertically above the nosing line).

The combined dimensions of G must not exceed one-third of the floor area (See E above) of the room or space.

Part 3.8.3 FACILITIES

Appropriate *Performance Requirements*:

Where an alternative arrangement for facilities is proposed as an *Alternative Solution* to that described in **Part 3.8.3**, that proposal must comply with—

(a) *Performance Requirement* **P2.4.3**; and

(b) the relevant *Performance Requirements* determined in accordance with **1.0.10**.

Acceptable construction practice

3.8.3.1 Application

Compliance with this acceptable construction practice satisfies *Performance Requirement***P2.4.3** for facilities.

Explanatory information:

Additional requirements relating to facilities for people with a disability in Class 1b and Class 10a buildings are contained in Volume One of the BCA. These requirements are based on the Disability (Access to Premises – Buildings) Standards which are available from the Australian Government Attorney-General's Department website at www.ag.gov.au.

3.8.3.2 Required facilities

(a) A Class 1 building must be provided with—

(i) a kitchen sink and facilities for the preparation and cooking of food; and

(ii) a bath or shower; and

(iii) clothes washing facilities, comprising at least one washtub and space in the same room for a washing machine; and

(iv) a closet pan and washbasin.

(b) If any of the facilities in **(a)** are detached from the main building, they must be set aside for the exclusive use of the occupants of the building.

Explanatory information:

A kitchen sink or washbasin must not be counted as a laundry washtub. However, a laundry washtub is considered to provide the necessary means to dispose of waste water as *required* by **P2.4.3.**

with—

(i) the provisions of this Part; or

(ii) AS 1657.

3.9.1.3 Stair construction

Stairs must be constructed in accordance with the following:

(a) Each *flight* must have not more than 18 nor less than 2 *risers*.

(b) The nominal dimension of *goings* and *risers* of a stair must be constant throughout each stair *flight* except that the *going* of *winders* in lieu of a quarter or half *landing* may vary from the *going* of the straight treads within the same *flight* provided that the *going* of all such *winders* is constant.

(c) Treads must be of solid construction (not mesh or other perforated material) if the stairway is more than 10 m high or connects more than 3 storeys.

(d) A *flight* of stairs must not have more than 3 *winders* in lieu of each quarter *landing* or 6 *winders* in lieu of each half *landing*.

(e) The *riser* opening must not allow a 125 mm sphere to pass through between the treads.

(f) * * * * *

(g) Treads must have— ~~a slip-resistant finish or a suitable non-skid strip near the edge of the nosings.~~

(i) a surface with a slip-resistance classification complying with **Table 3.9.1.1** when tested in accordance with AS 4586; or

(ii) a nosing strip with a slip-resistance classification complying with **Table 3.9.1.1** when tested in accordance with AS 4586.

Table 3.9.1.1 SLIP-RESISTANCE CLASSIFICATION

Application	Surface conditions	
	Dry	**Wet**
Tread surface	P3 or R10	P4 or R11
Nosing strip	P3	P4

Explanatory information:

To determine the appropriate surface of a tread, it is necessary to determine the likely conditions the tread will be subject to over the life of the building. This can either be dry, wet or both.

A dry surface is one that is not normally wet or likely to be made wet other than by an accidental spill.

A wet surface is one that is normally wet or likely to be made wet, including areas exposed to weather.

(h) *Landings* must—

(i) be not less than 750 mm long and where this involves a change in direction, the length is measured 500 mm from the inside edge of the *landing* (see **Figure 3.9.1.5**, Diagram a); and

(ii) have a gradient not steeper than 1:50; and

(iii) be provided where the sill of a threshold of a doorway opens on to a stair that provides a change in floor level or floor to ground level greater than 3 *risers* or 570 mm (see **Figure 3.9.1.5**, Diagram b)~~.~~; and

(iv) extend across the full width of a doorway.

Explanatory information:

3.8.2.2 contains the *required* height for a ceiling in a stairway, measured vertically from the nosing line.

3.9.1.4 Riser and going dimensions

The *riser* and *going* dimensions for each *flight*, except for the *going* of *winders* in lieu of a quarter or half *landing*, must comply with the following:

(a) The *going* (G), *riser* (R) and slope relationship quantity (2R+G) must be in accordance with **Figure 3.9.1.2**.

(b) The point for measurement of the *going* (G) in the slope relationship quantity as described in **Figure 3.9.1.3** must be—

(i) for *tapered treads* (other than treads in a *spiral stair*)—

(A) not more than 1 m wide, the middle of the unobstructed width of the stair (see **Figure 3.9.1.3**, Diagram b); and

(B) more than 1 m in width, 400 mm from the unobstructed width of each side of the stair (see **Figure 3.9.1.3**, Diagram c); and

(ii) for treads in *spiral stairs*, the point seven tenths of the unobstructed distance from the face of the centre pole or support towards the handrail side (see **Figure 3.9.1.4**).

Figure 3.9.1.2
STAIR RISER AND GOING DIMENSIONS (mm)

STAIR TYPE	RISER (R) (see Figure below)		GOING (G) (see Figure below)		SLOPE RELATIONSHIP (2R+G)	
	Max	Min	Max	Min	Max	Min
Stairs (other than spiral)	190	115	355	240	700	550
Spiral	220	140	370	210	680	590

terminate where the balustrade is allowed to terminate. This would allow for designer or geometric balustrades which may finish a few treads from the bottom of the stairway.

4. An example of where a handrail is not *required* would be a *flight* consisting of 5 *risers* as the change in elevation is less than 1 m.

5 A handrail is not *required* for winders if a newel post is installed to provide a handhold.

3.9.2.5 Protection of openable windows

(a) A window opening must be provided with protection, if the floor below the window in a bedroom is 2 m or more above the surface beneath.

(b) Where the lowest level of the window opening is less than 1.7 m above the floor, a window opening covered by **(a)** must comply with the following:

(i) The openable portion of the window must be protected with—

(A) a device to restrict the window opening; or

(B) a screen with secure fittings.

(ii) A device or screen *required* by **(i)** must—

(A) not permit a 125 mm sphere to pass through the window opening or screen; and

(B) resist an outward horizontal action of 250 N against the—

(aa) window restrained by a device; or

(bb) screen protecting the opening; and

(C) have a child resistant release mechanism if the screen or device is able to be removed, unlocked or overridden.

(c) A barrier with a height not less than 865 mm above the floor is *required* to an openable window—

(i) in addition to window protection, when a child resistant release mechanism is *required* by **(b)(ii)(C)**; and

(ii) ~~for openable windows~~where the floor below the window is 4 m or more above the surface beneath if the window is not covered by **(a)**.

(d) A barrier covered by **(c)** must not—

(i) permit a 125 mm sphere to pass through it; and

(ii) have any horizontal or near horizontal elements between 150 mm and 760 mm above the floor that facilitate climbing.

Explanatory information:

The intent of **3.9.2.5**is to limit the risk of a person (especially a young child) falling through an openable window. Where the floor level below an openable window is less than 2 m there are no specific requirements. For an openable window in a bedroom 2 m or more above the surface beneath, openable windows are *required* to restrict passage of a 125 mm sphere using any one of the following design solutions:

1. The window be designed such that any opening does not allow a 125 mm sphere to pass through (e.g. louvres).
2. The window be fitted with a fixed or dynamic device that is capable of restricting the window opening so it does not allow a 125 mm sphere to pass through and is difficult for a young child to operate. The restricting device must be capable of restricting a 250 N force when directed against the window such as a casement window or in attempting to push a sliding window open. An internal screen with similar parameters may be installed.
3. The window be fitted with an internal or external screen that does not allow a 125 mm sphere to pass through and which must resist a horizontal outward force of 250 N.

If the openable part of the window is at least 1.7 m above the floor, no further protection is *required*.

3.9.2.5(b)(ii)(C) relates to a screen or window restricting device protecting an openable window in a bedroom. The screen or opening restricting device may be installed in a manner that allows it to be removed, unlocked or overridden in the event of a fire or other emergency to allow safe egress. In these situations the unlocking device must be child resistant. ~~**3.9.2.5(c)** in addition prescribes that an 865 mm barrier (sill) would be required as well. A wall beneath an openable window can be considered as the barrier if the criteria in **(d)** are met.~~

Child resistance could be achieved by the need to use a tool, key or two hands.

There are a number of hardware options available. Short chain winders and barrier screens will allow windows to comply with the new requirements. Sliding window locks may lock a sash so a 125 mm sphere cannot pass through. Where provision is made to fully open the window beyond 125 mm then the child resistant release mechanism is *required* in addition to the device resisting a 250 N force as *required* by **3.9.2.5(b)(ii)(B)**.

3.9.2.5(c) in addition prescribes that an 865 mm barrier (sill) would be *required*. A wall beneath an openable window can be considered as the barrier if the criteria in **(d)** are met.

3.9.2.5(c)(ii) relates to the height of a barrier under an openable window in a room that is not a bedroom in a Class 1 building or a window in a Class 10 building.

The term 'window' is not italicised in **3.9.2.5** and as such, is not restricted to the definition of 'window' in the BCA. The reason for this is to also capture windows that may let in air but not light, e.g. metal louvres. A metal louvre or openable panel would not fit in the BCA definition of window but is subject to the window barrier provisions.

PART 3.12 ENERGY EFFICIENCY

Appropriate *Performance Requirements*:

Where an alternative energy efficiency design is proposed as an *Alternative Solution* to that described in **Part 3.12**, that proposal must comply with—

(a) *Performance Requirement* **P2.6.1**; and

(b) *Performance Requirement* **P2.6.2**; and

(c) the relevant *Performance Requirements* determined in accordance with **1.0.10**.

STATE AND TERRITORY VARIATIONS

1. In New South Wales, **Part 3.12** does not apply.

   Note: The New South Wales Additions contain energy efficiency measures that apply in New South Wales to support and complement BASIX.

2. In the Northern Territory, **Part 3.12** is replaced with BCA 2009 **Part 3.12**.

~~3.~~

~~In Tasmania, **Part 3.12** is replaced with BCA 2009 **Part 3.12**.~~

~~4~~3. In South Australia, a sunroom or the like is deemed to be a Class 10a building and must comply with **3.12.1.6**.

Definitions

3.12

The following definitions are used in this Part:

Conditioned space means a space within a building that is heated or cooled by the building's *domestic services*, excluding a non-*habitable room* in which a heater with a capacity of not more than 1.2 kW or 4.3 MJ/hour is installed.

House energy rating software means software accredited under the Nationwide House Energy Rating Scheme and is limited to assessing the potential thermal efficiency of the dwelling envelope.

Explanatory information:

The Nationwide~~al~~ House Energy Rating Scheme (NatHERS) refers to the Australian governments' scheme that facilitates consistent energy ratings from software tools which are used to assess the potential thermal efficiency of ~~the~~ dwelling envelopes.

$E_{W1, W2\ etc}$ = the winter exposure factor for each *glazing* element obtained from **Table 3.12.2.2a**.

(b) The aggregate solar heat gain of the *glazing* in each storey, including any mezzanine, of a building must—

(i) not exceed the allowances resulting from multiplying the area of the storey, including any mezzanine, measured within the enclosing walls, by the constant C_{SHGC} obtained from **Table 3.12.2.1**; and

(ii) be calculated in accordance with the following calculation—

$(A_1 \times SHGC_1 \times E_{S1}) + (A_2 \times SHGC_2 \times E_{S2}) + ...$

where—

$A_{1, 2, etc}$ = the area of each *glazing* element; and

$SHGC_{1, 2, etc}$ = the *Total System SHGC* for each *glazing* element; and

$E_{S1, S2, etc}$ = the summer exposure factor for each *glazing* element obtained from **Table 3.12.2.2b**.

Explanatory information:

1. The conductance formula for *climate zone* 1 differs from the formula for all other *climate zones* because there is little or no need for heating at any time of the year in *climate zone* 1. The conductance allowance is calculated to limit the rate of heat conduction through *glazing* into an air conditioned interior from a hotter outside environment. The limit is set at a level that allows the use of basic *glazing* systems in dwellings with average *glazing* areas whether or not they are air conditioned.
2. The conductance formula for *climate zones* 2 to 8 is based on wintertime conditions to account for the balance between potential solar gains and heat loss by conduction through *glazing*. The calculation favours orientations with higher potential solar gains in winter and the use of shading rather than glass toning. The improved insulation performance of *glazing* resulting from the calculations will also be beneficial under summertime conditions when outside temperatures exceed inside temperatures.
3. By referring to "*glazing* elements", **3.12.2.1** requires *Total System U-Values* and *Total System SHGCs* to be assessed for the combined effect of glass and frames. The measurement of these *Total System U-Values* and *Total System SHGCs* is specified in the Technical Protocols and Procedures Manual for Energy Rating of Fenestration Products by the Australian Fenestration Rating Council (AFRC).

   Various assessors using AFRC procedures might refer to their published performance values by slightly different terms including "U-factor" or "Uw" for Total System U-Value or "SHGC" for Total System SHGC. Such values can be used under **3.12.2.1** provided they measure the combined glass and frame performance according to AFRC requirements.
4. *Total System U-Values* and *Total System SHGCs* are shown for some simple types of *glazing* elements in the table below (smaller numbers indicate better *glazing* element performance). The table gives worst case assessments, which can be improved by obtaining generic or custom product assessments from

Part 3.12.5 SERVICES

3.12.5 Application

This Part applies to—

(a) a Class 1 building; and

(b) a Class 10a building; and

(c) a Class 10b *swimming pool* associated with a Class 1 or 10a building.

A. Acceptable construction manuals

3.12.5.0 * * * * *

This clause has deliberately been left blank.

~~(a) A hot water supply system must be designed and installed in accordance with Section 8 of AS/NZS 3500.4 or clause 3.38 of AS/NZS 3500.5.~~

~~(b) A solar hot water supply system in *climate zones* 1, 2 and 3 is not *required* to comply with **(a)**.~~

Explanatory information:

The acceptable construction manuals for hot water supply, which existed in BCA 2013, have been moved to **Part B2** of NCC Volume Three — Plumbing Code of Australia.

~~**Explanatory information:**~~

~~See **Part 2.6** for the relevant *Performance Requirement* that is satisfied by compliance with **3.12.5.0**.~~

~~**STATE AND TERRITORY VARIATIONS**~~

~~1. **In Victoria, delete 3.12.5.0**~~

~~2. **In South Australia, 3.12.5.0 is replaced with the following:**~~

~~**SA 3.12.5.0**~~

~~A heated water service must be designed and installed in accordance with the Waterworks Act 1932 and the Waterworks Regulations 1996.~~

~~**Explanatory information:**~~

~~The design and installation of heated water services in South Australia is regulated by Directions issued by the South Australian Water Corporation pursuant to Regulation 17 of the Waterworks Regulations 1996.~~

B. Acceptable construction practice

3.12.5.1 Insulation of services

Thermal insulation for central heating water *piping* and heating and cooling ductwork must—

(a) be protected against the effects of weather and sunlight; and

(b) be able to withstand the temperatures within the *piping* or ductwork; and

(c) use thermal insulation material in accordance with AS/NZS 4859.1.

Explanatory information:

~~The Acceptable Construction Manuals described in **3.12.5.0** is for use with hot water systems that provide hot water for general domestic use in areas such as bathrooms, kitchens, laundries and the like.~~

The central heating water *piping* provisions apply to ~~hot water~~ systems designed to heat the building via water.

3.12.5.2 Central heating water piping

Central heating water *piping* that is not within a *conditioned space* must be thermally insulated to achieve the minimum material *R-Value* in accordance with **Table 3.12.5.1**.

Table 3.12.5.1 CENTRAL HEATING WATER PIPING—MINIMUM MATERIAL R-VALUE

***Piping* to be insulated**	**Minimum material *R-Value*for eachclimate zone**		
	1, 2, 3 and 5	**4, 6 and 7**	**8**
1. Internal *piping*			
(a) All flow and return *piping* that is— (i) within an unventilated wall space; or (ii) within an internal floor between storeys; or (iii) between ceiling insulation and a ceiling. (b) All heated~~ot~~ water *piping* encased within a concrete floor slab (except that which is part of a floor heating system).	0.2	0.2	0.2
2. *Piping* located within a ventilated wall space, an enclosed building sub-floor or a roof space			
(a) All flow and return *piping*. (b) Cold water supply *piping* — within 500 mm of the connection to the central water heating system. (c) Relief valve *piping* — within 500 mm of the connection to the central water heating system.	0.3	0.45	0.6
3. *Piping* located outside the building or in an unenclosed building sub-floor or roof space			
(a) All flow and return *piping*. (b) Cold water supply *piping* — within 500 mm of the connection to the central water heating system. (c) Relief valve *piping* — within 500 mm of the connection to the central water heating system.	0.3	0.6	0.6

Explanatory information:

1. The insulation levels in the following table are typical examples of materials that can be used to insulate central heating water *piping*. Other methods are available for meeting the *R-Valuesrequired* by **Table 3.12.5.1**.
2. The material *R-Value* of plastic pipe can contribute to the *required* material *R-Value*.
3. *Piping* within a timber member, such as that passing through a wall stud, is

Item		Description	*Illumination power density* adjustment factor
Daylight sensor and dynamic lighting control device – dimmed or stepped switching of lights adjacent *windows*	(a)	Lights within the space adjacent to *windows* other than *roof lights* for a distance from the *window* equal to the depth of the floor to *window* head height.	0.5 Note 5
	(b)	Lights within the space adjacent to *roof lights*.	0.6 Note 5

Notes:

1. Manual dimming is where lights are controlled by a knob, slider or other mechanism or where there are pre-selected scenes that are manually selected.
2. Programmed dimming is where pre-selected scenes or levels are automatically selected by the time of day, photoelectric cell or occupancy sensor.
3. Dynamic dimming is where the lighting level is varied automatically by a photoelectric cell to either proportionally compensate for the availability of daylight or the lumen depreciation of the lamps.
4. Fixed dimming is where lights are controlled to a level and that level cannot be adjusted by the user.
5. The *illumination power density* adjustment factor is only applied to lights controlled by that item. This adjustment factor does not apply to tungsten halogen or other incandescent sources.

3.12.5.6 ~~Water heater in a hot water supply system~~* * * * *

This clause has deliberately been left blank.

Explanatory information:

The content of **3.12.5.6**, which existed in BCA 2013, has been moved to **Part B2** of NCC Volume Three — Plumbing Code of Australia.

~~(a) A water heater in a hot water supply system must be—~~

~~(i) a solar heater complying with (b); or~~

~~(ii) a heat pump heater complying with (b); or~~

~~(iii) a gas water heater complying with (c); or~~

~~(iv) an electric resistance heater only in the circumstances described in (d); or~~

~~(v) a wood fired thermosiphon water heater or direct-fired water heater each complying with AS/NZS 3500.4.~~

~~(b) A solar heater and a heat pump heater must have the following performance:~~

~~(i) For a building with 1 or 2 bedrooms—~~

~~(A) at least 14 *Small-scale Technology Certificates* for the zone where it is being installed; or~~

~~(B) an energy saving of not less than 40% in accordance with AS/NZS 4234 for a "small" load system.~~

~~(ii) For a building with 3 or 4 bedrooms—~~

~~(A) at least 22 *Small-scale Technology Certificates* for the zone where it is being installed; or~~

~~(B) an energy saving of not less than 60% in accordance with AS/NZS 4234 for a "medium" load system.~~

~~(iii) For a building with more than 4 bedrooms—~~

~~(A) at least 28 *Small-scale Technology Certificates* for the zone where it is being installed; or~~

~~(B) an energy saving of not less than 60% in accordance with AS/NZS 4234 for a "large" load system.~~

~~**Explanatory information:**~~

~~In colder climates the performance of some heat pumps may diminish.~~

~~**STATE AND TERRITORY VARIATIONS**~~

~~**3.12.5.6(b) is replaced in South Australia as follows:**~~

~~(b) A solar water heater and heat pump water heater must have the following performance:~~

~~(i) An electric boosted solar heated water service or heat pump heated water service (air source or solar boosted) with a single tank and a volume of 400 litres or more and not more than 700 litres—~~

~~(A) at least 38 *Small-scale Technology Certificates* in zone 3; and/or~~

~~(B) at least 36 *Small-scale Technology Certificates* in zone 4.~~

~~(ii) An electric boosted solar heated water service or heat pump heated water service (air source or solar boosted) with a single tank and a volume of more than 220 litres and less than 400 litres—~~

~~(A) at least 27 *Small-scale Technology Certificates* in zone 3; and/or~~

~~(B) at least 26 *Small-scale Technology Certificates* in zone 4.~~

~~(iii) An electric boosted solar heated water service or heat pump heated water service (air source or solar boosted) with a single tank and a volume of not more than 220 litres—~~

~~(A) at least 17 *Small-scale Technology Certificates* in zone 3; and/or~~

~~(B) at least 16 *Small-scale Technology Certificates* in zone 4.~~

~~(iv) An electric boosted preheat solar heated water service with a series connected instantaneous booster or a second tank and a preheat tank volume of 200 litres or more and not more than 350 litres—~~

~~(A) at least 38 *Small-scale Technology Certificates* in zone 3; and/or~~

~~(B) at least 36 *Small-scale Technology Certificates* in zone 4.~~

~~(v) An electric boosted preheat solar heated water service with a series connected instantaneous booster or a second tank and a preheat tank volume of more than 110 litres and less than 200 litres—~~

~~(A) at least 27 *Small-scale Technology Certificates* in zone 3; and/or~~

~~(B) at least 26 *Small-scale Technology Certificates* in zone 4.~~

~~(vi) An electric boosted preheat solar heated water service with a series connected instantaneous booster or a second tank and a preheat tank volume of not more than 110 litres—~~

~~(A) at least 17 *Small-scale Technology Certificates* in zone 3; and/or~~

~~(B) at least 16 *Small-scale Technology Certificates* in zone 4.~~

~~(vii) A natural gas or LPG boosted solar heated water service with a total tank volume of not more than 700 litres and at least 1 or more *Renewable Energy Certificates* in any zone.~~

~~(viii) A wood combustion boosted solar water heater, with no additional heating mechanism and a total tank volume not more than 700 litres.~~

~~**Notes:**~~

~~1. The zones referred to in **3.12.5.6(b)** are the climate zones used in Figure A1 of AS/NZS 4234 for identifying load conditions for heated water services.~~

~~2. In **3.12.5.6(b) (i)** to **(vi)** above, a heated water service that meets either the requirement in (A), the requirement in (B), or both may be installed regardless of the actual zone in which the heated water service is to be installed.~~

~~(d) An electric resistance water heater with no storage or a hot water delivery of not more than 50 L in accordance with AS 1056.1 may be installed when—~~

~~(i) the building has—~~

~~(A) not more than 1 bedroom; and~~

~~(B) not more than 1 electric resistance water heater installed; or~~

~~(ii) the building has—~~

~~(A) a water heater that complies with **(b)** or **(c)**; and~~

~~(B) not more than 1 electric resistance water heater installed; or~~

~~(iii) the greenhouse gas emission intensity of the public electricity supply is low.~~

~~**STATE AND TERRITORY VARIATIONS**~~

~~**3.12.5.6(d) is replaced in South Australia as follows:**~~

~~(d) An electric resistance water heater may be installed when—~~

~~(i) the building has—~~

~~(A) a water heater that complies with **(b)** or **(c)**; and~~

~~(B) not more than 1 electric resistance water heater is installed; and~~

~~(ii) the electric resistance water heater—~~

~~(A) has no storage capacity or a hot water delivery of not more than 50 litres in accordance with AS 1056.1; and~~

~~(B) it does not supply heated water to more than one room; and~~

~~(C) it does not supply heated water to a bath or a shower.~~

~~**In Tasmania, delete 3.12.5.6(d).**~~

3.12.5.7 ~~H~~Swimming pool heating and pumping ~~of a swimming pool or spa pool~~

(a) Heating for a *swimming pool* ~~other than a spa pool~~ must be by— ~~a solar heater not boosted by electric resistance heating.~~

(i) a solar heater not boosted by electric resistance heating; or

(ii) a heater using reclaimed energy; or

(iii) a gas heater; or

(iv) a heat pump; or

(v) a combination of **(i)** to **(iv)**.

~~(b) Heating for a spa pool that shares a water recirculation system with a *swimming pool* must be by—~~

~~(i) a solar heater; or~~

~~(ii) a gas heater; or~~

~~(iii) a heat pump; or~~

~~(iv) a combination of 2 or more of **(i)**, **(ii)** and **(iii)**.~~

~~(c) Where some or all of the heating *required* by **(b)** is by a gas or heat pump, a spa *pool* must have—~~

~~(i) a cover; and~~

~~(ii) a push button and a time switch to control the operation of the heater.~~

(b) Where some or all of the heating *required* by **(a)** is by a gas heater or a heat pump, the *swimming pool* must have—

(i) a cover unless located in a *conditioned space*; and

(ii) a time switch to control the operation of the heater.

(c~~d~~) A time switch must be provided to control the operation of a circulation pump for a *swimming pool* ~~other than a spa pool with capacity of less than 680 L~~.

(d) For the purposes of **3.12.5.7**, a *swimming pool* does not include a spa pool.

Explanatory information:

Some jurisdictions may have requirements for a pool cover under the Smart Approved Water Mark Scheme.

3.12.5.8 Spa pool heating and pumping

(a) Heating for a spa pool that shares a water recirculation system with a *swimming pool* must be by—

- (i) a solar heater; or
- (ii) a heater using reclaimed energy; or
- (iii) a gas heater; or
- (iv) a heat pump; or
- (v) a combination of **(i)** to **(iv)**.

(b) Where some or all of the heating *required* by **(a)** is by a gas heater or a heat pump, the spa pool must have—

- (i) a cover; and
- (ii) a push button and a time switch to control the operation of the heater.

(c) A time switch must be provided to control the operation of a circulation pump for a spa pool having a capacity of 680 L or more.

12.0 Adoption of BCA 2014

(a) The 2014 edition of the BCA was adopted by the Commonwealth, States and Territories as set out in **Table 12.0**.

Table 12.0 History of adoption of BCA 2014

Administration	Adoption Date
Australian Government	1 May 2014
Australian Capital Territory	1 May 2014
New South Wales	1 May 2014
Northern Territory	1 May 2014
Queensland	1 May 2014
South Australia	1 May 2014
Tasmania	1 May 2014
Victoria	1 May 2014
Western Australia	1 May 2014

(b) The purpose of BCA 2014 is to—

(i) update references to other documents; and

(ii) quantify slip resistance on stair treads in Class 1 buildings; and

(iii) quantify the amount of overflow that must be accommodated by an eaves gutter system; and

(iv) remove the energy efficiency provisions for heated water systems as a result of the relocation of provisions to NCC Volume Three - Plumbing Code of Australia; and

(v) expand the energy efficiency heating options for swimming pools and associated spa pools; and

(vi) include a new acceptable construction practice for hardboard cladding; and

(vii) include minor technical changes.

LIST OF AMENDMENTS - NCC 2014 - HOUSING PROVISIONS

This set of notes has been prepared by the Australian Building Codes Board to assist NCC users in identifying changes incorporated in the 2014 edition of the Housing Provisions (Volume Two of the NCC).

The notes provide a description of major changes made from the previous edition of the Housing Provisions.

While the Australian Building Codes Board has attempted to include all major changes made from the previous edition of the Housing Provisions, the Board does not give any warranty nor accept any liability in relation to the contents of this list of amendments.

Reference	**Changes and Commentary**	
Introduction		
The wording has been amended to reflect changes to the membership of the Building Codes Committee.		
Part 1.1		
1.1.1.2	The following definitions have been inserted or amended:	
	Climate zone	The climate zone map has been amended to incorporate changes to local government areas in Western Australia.
	Design wind speed	The defined term, including Table 1.1.1, has been amended to clarify that non-cyclonic (N) and cyclonic (C) region wind classes are not equivalent due to inherent differing wind pressure coefficients.
	Domestic service	The defined term has been amended to include pumps and heaters for swimming pools and spa pools. As a consequence of consolidating heated water requirements into the Plumbing Code of Australia, the reference to hot water systems has been deleted.
Part 1.4		
Table 1.4.1	The following references have been inserted or amended:	
	AS 1056.1	Reference to AS 1056 - Part 1 'Storage water heaters — General requirements' has been deleted as a consequence of consolidating heated water requirements into the Plumbing Code of Australia.
	AS 1397	Reference to the 2001 edition of AS 1397 'Steel sheet and strip — Hot-dipped zinc-coated or aluminium/zinc-coated' has been removed as a consequence of the completion of a 24 month transition period between the 2001 and 2011 editions.

Reference	Changes and Commentary	
	AS 1668.2	Reference to the 1991 edition of AS 1668 - Part 2 'The use of mechanical ventilation and air-conditioning in buildings — Mechanical ventilation for acceptable indoor-air quality' has been removed as a consequence of the completion of a 12 month transition period between the 1991 and 2012 editions.
	AS/NZS 1859.4	The 2004 edition of AS/NZS 1859 - Part 4 'Reconstituted wood-based panels — Specifications — Wet-processed fibreboard' has been referenced as a consequence of including hardboard as an acceptable wall cladding.
	AS/NZS 3500.4	Reference to AS/NZS 3500 - Part 4 'Plumbing and drainage — Heated water services' has been deleted as a consequence of consolidating heated water requirements into the Plumbing Code of Australia.
	AS 4055	The 2006 edition of AS 4055 'Wind loads for housing' has been removed as a consequence of the completion of a 12 month transition period between the 2006 and 2012 editions.
	AS/NZS 4234	Reference to AS/NZS 4234 'Heated water systems — Calculation of energy consumption' has been deleted as a consequence of consolidating heated water requirements into the Plumbing Code of Australia.
	AS 4552	Reference to AS 4552 'Gas fired water heaters for hot water supply and/or central heating' has been deleted as a consequence of consolidating heated water requirements into the Plumbing Code of Australia.
	AS 4586	The 2013 edition of AS 4586 'Slip resistance classification of new pedestrian surface materials' has been referenced as a consequence of the quantification of slip resistance requirements for stairway treads.
Part 2.4		
F2.4.3	The Functional Statement has been amended to recognise the need for a building to be provided with adequate means for the disposal of waste water.	
P2.4.3	The Performance Requirement has been amended to recognise the need for a building to be provided with adequate means for the disposal of waste water.	
Part 2.6		
V2.6.3	The Verification Method has been deleted as a consequence of consolidating heated water requirements into the Plumbing Code of Australia.	
Part 3.1		

Reference	Changes and Commentary
3.1.3	The term 'termite barrier' has been changed to 'termite management system' to better reflect the range of physical and chemical options currently available. The term has also been changed where it appears in all other provisions.
Part 3.5	
3.5.2.0	The provision has been restructured and amended as a consequence of including requirements that quantify the amount of overflow that must be accommodated by an eaves gutter system.
3.5.2.1	The provision has been restructured and amended as a consequence of including requirements that quantify the amount of overflow that must be accommodated by an eaves gutter system.
3.5.2.3(b)(i) and (ii)	The provisions have been amended as a consequence of including requirements that quantify the amount of overflow that must be accommodated by an eaves gutter system.
3.5.2.4(d)	Sub-clause (d) has been deleted as a consequence of including requirements that quantify the amount of overflow that must be accommodated by an eaves gutter system.
3.5.2.5(b)	Sub-clause (b) has been amended as a consequence of including requirements that quantify the amount of overflow that must be accommodated by an eaves gutter system.
Table 3.5.2.1	The Table has been amended as a consequence of including requirements that quantify the amount of overflow that must be accommodated by an eaves gutter system.
Table 3.5.2.3	A new Table has been inserted to include requirements that quantify the amount of overflow that must be accommodated by an eaves gutter system.
Table 3.5.2.4	A new Table has been inserted to detail different types of measures that can be used in an eaves gutter system to accommodate different overflow amounts.
3.5.2.5 Explanatory Information	The explanatory information has been amended as a consequence of including requirements that quantify the amount of overflow that must be accommodated by an eaves gutter system.
3.5.3.1(b)(ii) and (iii)	The provisions have been amended to include hardboard as an acceptable wall cladding.
3.5.3.3	The provisions have been restructured and amended to include hardboard as an acceptable wall cladding.
Table 3.5.3.1	A new Table 3.5.3.1 has been included for the fixing requirements of wall cladding boards.
3.5.3.4	The provisions have been restructured and amended to include hardboard as an acceptable wall cladding.
Table 3.5.3.3	A new Table 3.5.3.3 has been included for the fixing requirements of hardboard sheet wall cladding.

Reference	Changes and Commentary
Part 3.8	
3.8.2.2 Explanatory information	Explanatory information has been included to clarify that ceiling heights are measured from the finished floor level.
3.8.3.2 Explanatory information	The explanatory information has been amended to clarify that a laundry washtub provides the necessary means to dispose of waste water.
Part 3.9	
3.9.1.3(g)	Sub-clause (g) has been amended as a consequence of the quantification of slip resistance requirements for stairway treads.
Table 3.9.1.1	A new Table has been inserted as a consequence of the quantification of slip resistance of stairway treads.
3.9.1.3(h)	A new sub-clause has been inserted to clarify that a landing must extend across the full width of a doorway.
3.9.2.5(c)(ii)	Sub-clause (ii) has been amended to clarify the openable windows that the provision applies to.
3.9.2.5 Explanatory information	Explanatory information has been included on the term 'child resistant release mechanism'.
Part 3.12	
3.12.2.1 Explanatory information	The explanatory information has been amended to clarify the methodology for the measurement of Total System U-Values and Total System SHGCs.
3.12.5.0	The Acceptable Construction Manuals have been deleted as a consequence of consolidating heated water requirements into the Plumbing Code of Australia.
3.12.5.6	The provision has been deleted as a consequence of consolidating heated water requirements into the Plumbing Code of Australia.
3.12.5.7	The provision has been restructured and amended to only apply to a swimming pool and to allow heating for a swimming pool to also be by a heater using reclaimed energy, a gas heater or a heat pump.
3.12.5.8	A new 3.12.5.8 has been included to separate the heating and pumping provisions of swimming pools and spa pools.
History of BCA Adoption	
12.0	New provision added in order to set out the adoption date of the 2014 edition of the Housing Provisions in each State and Territory and to summarise the purpose of the changes from the 2012 edition.