How to use the Housing Provisions

This Section is for information only.

1.1 Introduction

The ABCB Housing Provisions contains *Deemed-to-Satisfy Provisions* that are considered to be acceptable forms of construction that meet the requirements for complying with Parts H1 to H8 of NCC Volume Two (i.e. they comply with the *Performance Requirements* listed in Parts H1 to H8 of NCC Volume Two).

There is no obligation to adopt any particular option contained in the ABCB Housing Provisions if it is preferred to meet the *Performance Requirements* some other way.

However, if one of the options described in the ABCB Housing Provisions or elsewhere in the *Deemed-to-Satisfy Provisions* of NCC Volume Two is not complied with, then the *appropriate authority* must be satisfied that the *Performance Requirements* have been met.

1.2 Application

This Housing Provisions must be applied in accordance with each of the following:

- Section A (Governing Requirements) of NCC Volume Two.
- Any conditions on the use of the ABCB Housing Provisions set out within the *Deemed-to-Satisfy Provisions* of NCC Volume Two where it is referenced.
- The Scope clause at the beginning of each Section of the ABCB Housing Provisions.

1.3 The scope of the ABCB Housing Provisions

In Section H of NCC Volume Two, some *Deemed-to-Satisfy Provisions* contain more than one compliance pathway. Usually, the first of these pathways will be by reference to a relevant Australian Standard (or similar) and the second will be by reference to a particular Section or Part of the ABCB Housing Provisions. In these cases, use of the ABCB Housing Provisions is one option for complying with the relevant *Deemed-to-Satisfy Provision*.

Other *Deemed-to-Satisfy Provisions* contain only one compliance pathway: either a reference to an Australian Standard (or similar), or a reference to a particular Section or Part of the ABCB Housing Provisions. In these cases, the ABCB Housing Provisions may only be used if it is referenced, and must be used if it is the only compliance option for the particular *Deemed-to-Satisfy Provision*.

If a *Deemed-to-Satisfy Provision* does not reference the ABCB Housing Provisions, then the ABCB Housing Provisions cannot be used as a compliance pathway for that particular *Deemed-to-Satisfy Provision*.

The ABCB Housing Provisions only contains content relevant to the *Deemed-to-Satisfy Provisions* in NCC Volume Two which call it up. Therefore, the ABCB Housing Provisions should not be interpreted as a comprehensive or complete manual for house building.

Section 2 of the ABCB Housing Provisions contains a number of structural design manuals which can be used to design building elements using engineering principles. There is no obligation for the provisions of Section 2 to be used apart from situations where a particular building, building element or component is required to comply with NCC Volume Two and is not within the scope of any other *Deemed-to-Satisfy Provisions*.

Section 12 contains additional construction requirements that are ancillary to the construction of a building or structure, such as the construction of *swimming pools*, heating appliances, fireplaces, methods of attaching decks and balconies to *external walls* or the like. Section 12 also contains special provisions for construction in *alpine areas*. Earthquake areas are addressed in Section 2 and *flood hazard areas* are addressed in the ABCB Standard for Construction of Buildings in Flood Hazard Areas, which is referenced directly by H1D10.

Situations where it is necessary for a mixed application of the ABCB Housing Provisions and other documents referenced in the *Deemed-to-Satisfy Provisions* of NCC Volume Two may be identified by reference to the differing components of the *Performance Requirements* (see A2G3).

1.4 Suitability of Performance Solutions

The options described in the *Deemed-to-Satisfy Provisions* are typical examples of national construction methods. They are not the only means available for complying with NCC Volume Two. The performance format of the NCC provides flexibility and allows the use of alternative construction methods to those described in the *Deemed-to-Satisfy Provisions*.

1.5 The use of maps

Maps have been used throughout NCC Volume Two, including in the ABCB Housing Provisions, to indicate areas where particular requirements apply. These maps are indicative and some variation in conditions will apply, especially on the border of marked areas.

It is recommended that the *appropriate authority* be consulted and in most cases they should be able to identify what conditions apply in such areas at the early stage of building design.

1.6 Consultation with appropriate authorities

When building in certain locations there may be local conditions or other site constraints that may limit the type of construction that can be used. This is particularly important with buildings that are constructed in areas subject to increased structural loading conditions that may occur due to geographical, topographical or climatic conditions and soil types.

Appropriate authorities have a wide range of experience and information on the geographical and topographical conditions found in their area of responsibility, and should be consulted during the initial design stage.

1.7 Layout of the ABCB Housing Provisions

Although they do not cover every aspect of housing construction, the ABCB Housing Provisions have nonetheless been organised in a manner that follows the logical construction sequence of a building. Table 1.7 outlines some of the more frequently used details and where they are located in the ABCB Housing Provisions or NCC Volume Two.

Table 1.7: Information guide

Stage	Relevant part	Reference(s)
Initial design considerations	Earthworks	3.2
	Fire Safety	9
	Facilities	10.4
	Room heights	10.3
	Light and ventilation	10.5, 10.6
	Stairway and ramp construction	11.2
	Energy efficiency	13
	Site preparation and drainage	3.1,3.3
	Footings and slabs	4
	Masonry	5
	Framing	6
	Roof cladding, gutters and downpipes and wall cladding	7
	Gutters and downpipes	7.4
	Glazing	8
	Barriers and handrails	11.3
	Livable housing design	H8 (NCC Volume Two)
Construction issues	Wet areas and external waterproofing	10.2
	Sound insulation	10.7
	Condensation management	10.8
	Swimming pools	H7D2 (NCC Volume Two)

Part 2.1 Scope and application of Section 2

2.1.1 Scope

[New for 2022]

(1) This Section sets out the *Deemed-to-Satisfy Provisions* for structural stability and resistance (see Part 2.2).

(2) For other structural provisions not included in this Section, refer to the following *Deemed-to-Satisfy Provisions* in NCC Volume Two:

- (a) Site preparation — see H1D3.
- (b) Footings and slabs — see H1D4.
- (c) Masonry — see H1D5.
- (d) Framing — see H1D6.
- (e) Roof and wall cladding — see H1D7.
- (f) Glazing — see H1D8.
- (g) Earthquake areas — see H1D9.
- (h) *Flood hazard areas* — see H1D10.
- (i) Attachment of decks and balconies to *external walls* of buildings — see H1D11.

2.1.2 Application

[New for 2022]

The application of Section 2 is subject to the following:

- (a) The Governing Requirements of NCC Volume Two.
- (b) The State and Territory variations, additions and deletions contained in the Schedules to the ABCB Housing Provisions and NCC Volume Two.

Explanatory Information

In NCC 2019, the content of Section 2 of the ABCB Housing Provisions (other than content added in NCC 2022 or later) was contained in Part 3.0 of NCC Volume Two.

Part 2.2 Structural provisions

2.2.1 Application of Part 2.2

[New for 2022]

Part 2.2 need not be complied with if, for the purposes of H1D2(b) only, the *Deemed-to-Satisfy Provisions* of H1D3 to H1D11 relating to structural elements are complied with.

2.2.2 Resistance to actions

[2019: 3.0.2]

The resistance of a building or structure must be greater than the most critical action effect resulting from different combinations of actions, where—

(a) the most critical action effect on a building or structure must be determined in accordance with 2.2.3 and the general design procedures contained in AS/NZS 1170.0; and

(b) the resistance of a building or structure is determined in accordance with 2.2.4.

Explanatory Information

A building or structure must be designed to resist the most critical effect resulting from different combinations of actions, taking into consideration—

- the probability of simultaneous occurrence of two or more actions; and
- the levels of reliability of the structure when subject to combined actions; and
- the characteristics of the action.

Determining the levels of reliability of the structure when subject to combined actions should be consistent with the levels of reliability implicit in the design events for natural phenomenon. When designing for the maximum combined actions, a principle frequently adopted is that the maximum is likely to occur when at least one of the actions is at its maximum value.

WA 2.2.3

2.2.3 Determination of individual actions

[2019: 3.0.3]

The magnitude of individual actions must be determined in accordance with the following:

(a) Permanent actions:
  (i) the design or known dimensions of the building or structure; and
  (ii) the unit weight of the construction; and
  (iii) AS/NZS 1170.1.

(b) Imposed actions:
  (i) the known loads that will be imposed during the occupation or use of the building or structure; and
  (ii) *construction activity actions*; and
  (iii) AS/NZS 1170.1.

(c) Wind, snow and earthquake actions:
  (i) the applicable annual probability of design event for safety, determined by—
    (A) assigning the building or structure an Importance Level in accordance with Table 2.2.3a; and
    (B) determining the corresponding annual probability of exceedance for safety in accordance with Table

2.2.3b; and

(ii) for wind actions, AS/NZS 1170.2 or AS 4055; and

(iii) for snow and ice actions, AS/NZS 1170.3; and

(iv) for earthquake actions, AS 1170.4.

(d) Actions not covered in (a), (b) and (c) above:

(i) the nature of the action; and

(ii) the nature of the building or structure; and

(iii) the Importance Level of the building or structure determined in accordance with Table 2.2.3a; and

(iv) AS/NZS 1170.1.

(e) For the purposes of (d) the actions include but are not limited to—

(i) liquid pressure action; and

(ii) ground water action; and

(iii) rainwater action (including ponding action); and

(iv) earth pressure action; and

(v) differential movement; and

(vi) time dependent effects (including creep and shrinkage); and

(vii) thermal effects; and

(viii) ground movement caused by—

(A) swelling, shrinkage or freezing of the subsoil; and

(B) landslip or subsidence; and

(C) siteworks associated with the building or structure; and

(ix) *construction activity actions*.

Table 2.2.3a: Importance Levels of buildings and structures

Importance Level	Building types
1	Buildings or structures presenting a low degree of hazard to life and *other property* in the case of failure.
2	Buildings or structures not included in Importance Level 1.

Table 2.2.3b: Design events for safety—annual probability of exceedance

Importance Level	Non-cyclonic wind	Cyclonic wind	Snow	Earthquake
1	1:100	1:200	1:100	1:250
2	1:500	1:500	1:150	1:500

Explanatory Information: Construction in cyclonic areas

The intent of building construction in cyclonic areas (see Figure 2.2.3) is to ensure the structure has sufficient strength to transfer wind forces to the ground with an adequate safety margin to prevent collapse of the building and the building being lifted, or slid off its foundations.

To resist these forces it is necessary to have—

- an anchorage system, where the roof is connected by the walls to the footings by a chain of connections; and
- a bracing system to prevent horizontal collapse due to wind forces; and
- continuity of the system where each structural element is interlocked to its adjoining structural element throughout the building.

Explanatory Information: Anchorage

Anchorage of the system is achieved by using a variety of connectors. Each connector must be capable of carrying the uplift force, because the ability of the building to resist the wind forces is directly related to its weakest link.

WA 2.2.4

2.2.4 Determination of structural resistance of materials and forms of construction

[2019: 3.0.4]

The following requirements, or any combination of them, must be used to determine the structural resistance of materials and forms of construction as appropriate:

(a) Earthworks: H1D3(1).

(b) Earth retaining structures: H1D3(2).

(c) Termite risk management: H1D3(3).

(d) Concrete construction (including slabs and footings, and reinforced and prestressed concrete structures): H1D4.

(e) Piled footings: H1D12.

(f) Post-installed and cast-in fastenings in concrete: AS 5216.

(g) Masonry (including masonry veneer, *unreinforced masonry* and *reinforced masonry*): H1D5.

(h) Steel construction (including steel framing and structural steel members): H1D6.

(i) Timber construction (including design of timber structures, timber framing and design of nail-plated timber roof trusses): H1D6.

(j) Composite steel and concrete: AS/NZS 2327.

(k) Aluminium construction:

  (i) AS/NZS 1664.1.

  (ii) AS/NZS 1664.2.

(l) Roof construction (including plastic sheeting, roofing tiles, metal roofing and terracotta, fibre-cement and timber slates and shingles): H1D7.

(m) Wall cladding: H1D7.

(n) Glazed assemblies: H1D8.

(o) Barriers and handrails (including stairway and ramp construction):

  (i) H5D3; and

  (ii) AS/NZS 1170.1 for the determination of loading forces on a barrier.

(p) Attachment of decks and balconies to *external walls* of buildings: H1D11.

(q) Garage doors and other large access doors in openings not more than 3 m in height in *external walls* of buildings determined as being located in wind region C or D in accordance with Figure 2.2.3: AS/NZS 4505.

(r) For *high wind areas*: requirements listed in (a) to (q) as appropriate or the Northern Territory Deemed to Comply

Standards Manual.

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.

2.2.5 Structural software

[2019: 3.0.5]

(1) Structural software used in computer aided design of a building or structure that uses design criteria based on the *Deemed-to-Satisfy Provisions* of NCC Volume Two and the ABCB Housing Provisions, including its referenced documents, for the design of steel or timber trussed roof and floor systems and framed building systems, must comply with the ABCB Protocol for Structural Software.

(2) The requirements of (1) only apply to structural software used to design steel or timber trussed roof and floor systems and framed building systems for buildings within the following geometrical limits:

  (a) The distance from ground level to the underside of eaves must not exceed 6 m.

  (b) The distance from ground level to the highest point of the roof, neglecting chimneys, must not exceed 8.5 m.

  (c) The building width including roofed verandahs, excluding eaves, must not exceed 16 m.

  (d) The building length must not exceed five times the building width.

  (e) The roof pitch must not exceed 35 degrees.

(3) The requirements of (1) do not apply to design software for individual frame members such as electronic tables similar to those provided in—

  (a) AS 1684 Parts 2, 3 and 4; or

  (b) NASH Standard Residential and Low-Rise Steel Framing, Part 2.

Explanatory Information

2.2.5 does not apply where a software package simply eliminates manual calculations and the process of the package requires identical methodology as that undertaken manually, e.g. AS 1684 span tables and bracing calculations.

Part 3.1 Scope and application of Section 3

3.1.1 Scope

[New for 2022]

(1) This Section sets out the *Deemed-to-Satisfy Provisions* for—

(a) earthworks — Part 3.2; and

(b) drainage — Part 3.3; and

(c) termite risk management — Part 3.4.

(2) For other site preparation provisions not included in this Section, refer to NCC Volume Two: H1D3(2) Earth retaining structures.

Explanatory Information

These provisions relate to general *site* preparation for footings, services, drainage and installation of 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*.

The provisions in Part 3.2 will enable earthworks associated with the construction of a building to be carried out safely and to avoid potential damage to the subject building, adjoining structures and property through the soil collapsing or subsiding. Exceptional *site* conditions (including the effects of torrential rain) may need special consideration and additional advice from appropriately qualified people should be considered.

State and Territory legislation may also have requirements that apply to earthworks, especially in relation to adjoining property and notification of owners of that property. Advice should be obtained from the *appropriate authority* before commencement of works.

The requirements of this Part are to be read in conjunction with H1D3(2) of NCC Volume Two where an earth retaining structure is installed.

NSW 3.1.2

3.1.2 Application

[New for 2022]

The application of this Section is subject to the following:

(a) The Governing Requirements of NCC 2022 Volume Two.

(b) Any conditions set out within the following *Deemed-to-Satisfy Provisions* of NCC Volume Two:

(i) H1D3(1), for earthworks.

(ii) H2D2, for drainage.

(c) The State and Territory variations, additions and deletions contained in the Schedules to the ABCB Housing Provisions and NCC Volume Two.

Explanatory Information

In NCC 2019, the content of Section 3 of the ABCB Housing Provisions (other than content added in NCC 2022 or later) was contained in the acceptable construction practices for Parts 3.1.1, 3.1.3 and 3.1.4 of NCC 2019 Volume Two.

NCC 2019 Volume Two did not include an acceptable construction practice for Part 3.1.2.

Part 3.2 Earthworks

3.2.1 Un-retained bulk earthworks – site cut and fill

[2019: 3.1.1.1, 3.1.1.2]

(1) A *site* cut using an un-retained embankment must be—

(a) within the allotment; and

(b) not within the zone of influence of any existing structure on the property, or the allotment boundary as defined in Table 3.2.1 and Figure 3.2.1a; and

(c) not deeper than 2 m from the natural ground level at any point.

(2) Fill, using an un-retained embankment must—

(a) be placed within the allotment; and

(b) be placed at a gradient which complies with Table 3.2.1 and Figure 3.2.1b; and

(c) be placed and mechanically compacted in layers not more than 150 mm; and

(d) be not more than 2 m in height from the natural ground level at any point; and

(e) where used to support footings or slabs, be placed and compacted in accordance with Part 4.2; and

(f) have *surface water* diverted away from any existing structure on the property or adjoining allotment in accordance with 3.3.3.

Table 3.2.1: Un-retained embankment slope ratios

Soil class (see 4.2.2 for material description)	Site cut (excavation) (maximum embankment slope ratio, angle of site cut H:L Note 1)	Compacted fill (maximum embankment slope ratio, angle of batter H:L Note 1)
Stable rock (Class A)	8:1	3:3
Sand (Class A)	1:2	1:2
Firm clay (Class M-E)	1:1	1:2
Soft clay (Class M-E)	2:3	Not suitable

Table Notes

(1) See Figures 3.2.1a and 3.2.1b for some examples of un-retained embankment slopes.

(2) Retaining walls must be installed in accordance with H1D3(2) where—

(a) the embankment slope is steeper than described in this Table; or

(b) the soil type is not described in this Table.

Part 3.3 Drainage

3.3.1 Application

[New for 2022]

(1) Part 3.3 is subject to the limitations set out in H2D2(b).

(2) Part 3.3 need not be complied with if H2D2(a) is complied with.

3.3.2 Drainage requirements

[2019: 3.1.3.2]

Drainage systems must be installed as follows:

(a) Areas adjoining and under buildings — *surface water* drainage in accordance with 3.3.3; and

(b) Where *site* conditions exist that create a need for subsoil water to be diverted away from footings, basements, retaining walls etc — sub-soil drainage in accordance with 3.3.4; and

(c) Where underground drainage from roof areas is *required* or permitted — underground stormwater drainage in accordance with 3.3.5; and

(d) Excavation for drains adjacent to existing footings must be within the area described in Figure 3.3.2 as being safe for excavation.

Figure 3.3.2: Excavation for drains adjacent to footings

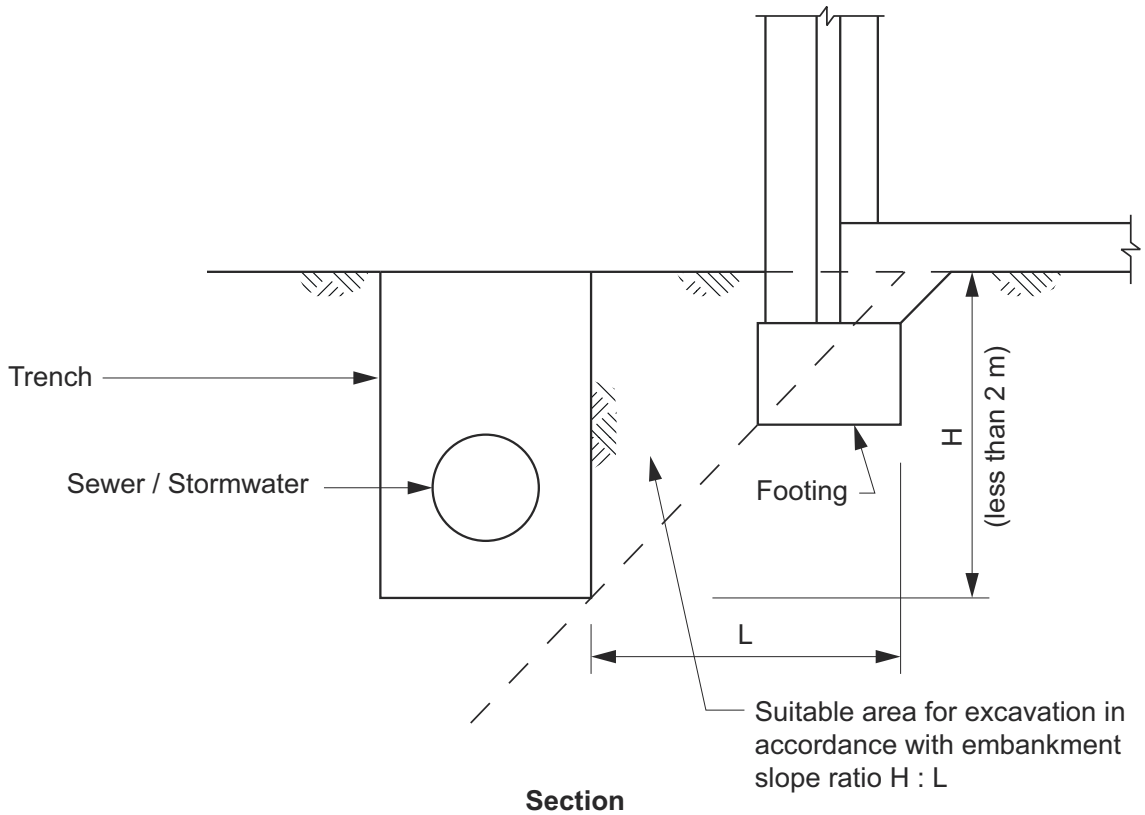

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Figure Notes

(1) Any excavation below the area defined as being safe for excavation will need additional protection measures to be determined by appropriately qualified persons.

(2) Slope ratio H:L is determined using Table 3.2.1.

3.3.3 Surface water drainage

[2019: 3.1.3.3]

Surface water must be diverted away from a Class 1 building as follows:

(a) Slab-on-ground — finished ground level adjacent to a building: the external finished surface surrounding the slab must be drained to move *surface water* away from the building and graded to give a slope of not less than (see Figure 3.3.3a) —

(i) 25 mm over the first 1 m from the building—

(A) in *low rainfall intensity areas* for surfaces that are reasonably impermeable (such as concrete or clay paving); or

(B) for any reasonably impermeable surface that forms part of an access path or ramp provided for the purposes of Clauses 1.1(2) or (4)(c) of the ABCB Standard for Livable Housing Design; 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 3.3.3a) —

(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 concrete) areas that slope away from the building in accordance with (a); or

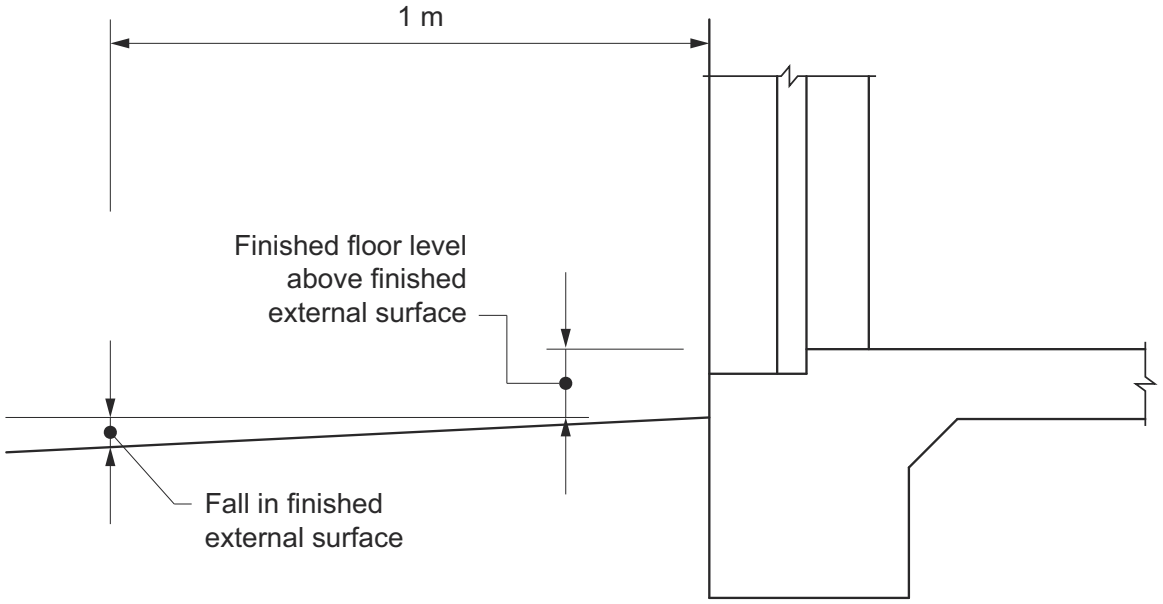
(iii) 150 mm in any other case.

(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 3.3.3b).

Limitations

3.3.3 does not apply to a landing area provided for the purposes of Clause 2.3 of the ABCB Standard for Livable Housing Design, except for a channel drain or drainage surface provided under Clause 2.4 of that standard.

Figure 3.3.3a: Site surface drainage



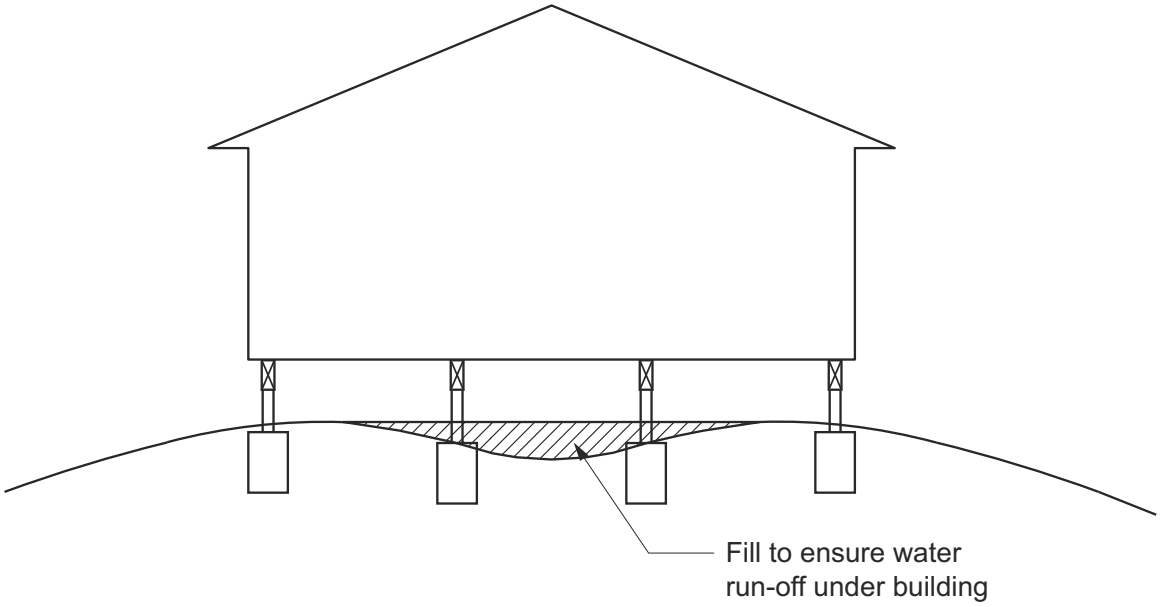
Elevation

Figure Notes

(1) For fall in finished external surface, see 3.3.3(a).

(2) For finished floor level above finished external surface, see 3.3.3(b).

Figure 3.3.3b: Grading of ground under suspended floors



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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 the following:

- 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).
- The run-off from storms, particularly in areas of high rainfall intensity, and the local topography.
- The effect of excavation on a cut and fill *site*.
- The possibility of flooding.
- Termite risk management provisions.

Clearances between wall cladding and the finished ground level are provided in 7.5.7.

3.3.4 Subsoil drainage

[2019: 3.1.3.4]

Where a subsoil drainage system is installed to divert subsurface water away from the area beneath a building, the subsoil drain must—

(a) be graded with a uniform fall of not less than 1:300; and

(b) discharge into an external silt pit or sump with—

(i) the level of discharge from the silt pit or sump into an impervious drainage line not less than 50 mm below the invert level of the inlet (see Figure 3.3.4); and

(ii) provision for cleaning and maintenance.

Part 3.4 Termite risk management

3.4.1 Requirements for termite management systems

[2019: 3.1.4.2]

(1) The requirements of this Part apply where:

(a) a Class 1 or 10 building is constructed in an area where subterranean termites are known to present a potential risk of attack; and

(b) a *primary building element* of a Class 1 or 10 building is considered susceptible to termite attack.

NT 3.4.1(2)

(2) For the purposes of (1), a *primary building element* consisting entirely of, or a combination of, any of the following materials is considered not subject to termite attack:

(a) Steel, aluminium or other metals.

(b) Concrete.

(c) Masonry.

(d) Fibre-reinforced cement.

(e) Timber — naturally termite resistant in accordance with Appendix C of AS 3660.1.

(f) Timber — preservative treated in accordance with Appendix D of AS 3660.1.

QLD 3.4.1(3)

QLD 3.4.1(4)

QLD 3.4.1(5)

QLD 3.4.1(6)

Explanatory Information

- 3.4.1(1): 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 on whether termite risk management is needed.
- 3.4.1(2): 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 management system.
- 3.4.1(2)(c): states that masonry is not subject to termite attack, however termites may gain entry through mortar and other joints.
- Explanatory Figure 3.4.1 provides a flowchart for identifying if a termite management system is *required*.

Figure 3.4.1 (explanatory): Flow chart for identifying if a termite management system is required

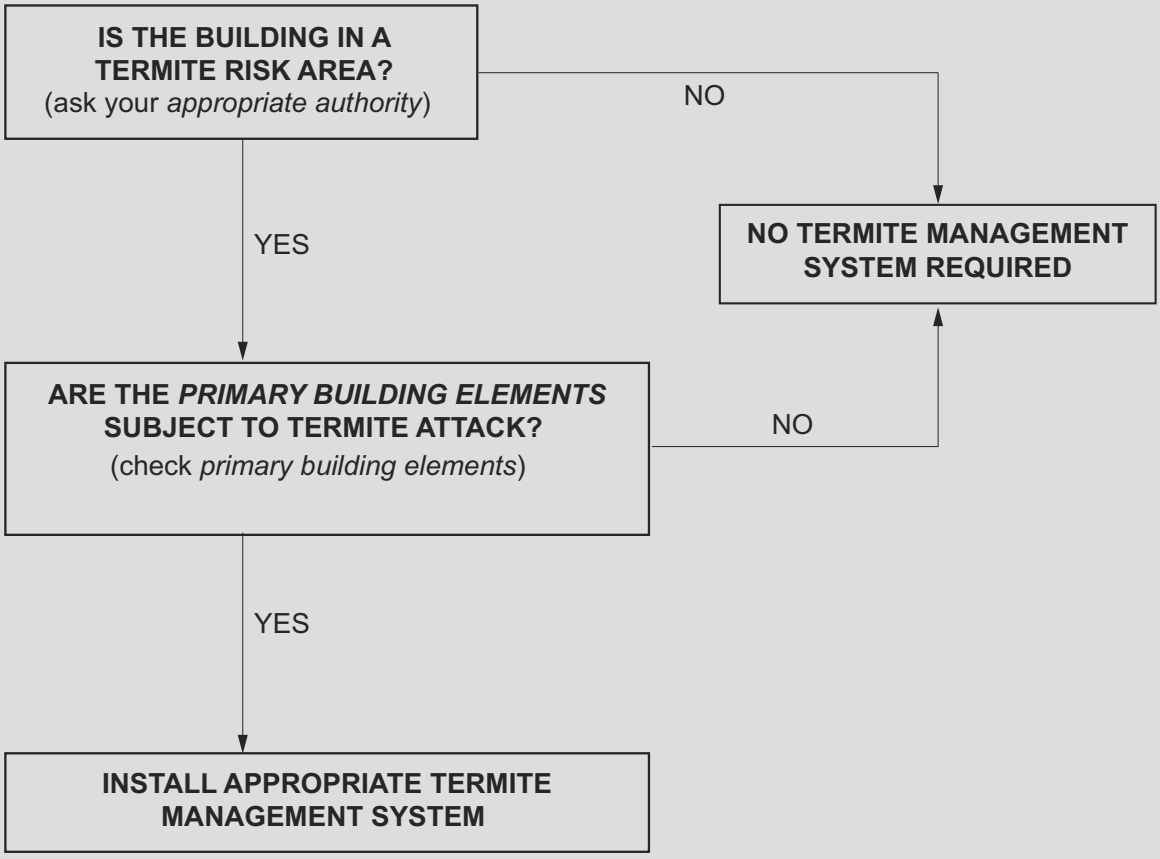


Figure Notes

To check *primary building elements*, see 3.4.1(2).

NT 3.4.2

QLD 3.4.2

3.4.2 Termite management systems

[2019: 3.1.4.3]

Where a termite management system is required it must—

(a) be selected appropriate to Table 3.4.2; and

(b) comply with—

(i) AS 3660.1; or

(ii) have been tested and passed the tests *required* by Section 5 of AS 3660.3; and

(c) have a durable notice installed in accordance with 3.4.3; and

(d) where a chemical termite management system is used, the chemical must be included on the *appropriate authority's* pesticides register.

Table 3.4.2: Acceptable termite management systems and components

Building element	Termite management system or component options
Concrete slab-on-ground: slab perimeter or *external wall* perimeter	Slab edge exposure
	Sheet material
	Granular material
	Chemical

Building element	Termite management system or component options
Concrete slab-on-ground: penetrations/control joints/area beneath the slab (see Note)	Sheet material
	Granular material
	Chemical
Suspended floors	Sheet material
	Granular material
	Chemical
Attachments to buildings	Termite management system to the attachment
	Inspection zone between attachment and building

Table Notes

The entire area beneath the slab must be treated when the slab-on-ground is not designed and constructed in accordance with AS 2870 or AS 3600.

Explanatory Information: Validity of test results

3.4.2(b)(ii) provides the option of having a chemical termite management system tested to AS 3660.3. In order for the test results to remain valid, the system would then have to be installed as tested.

Explanatory Information: Component

A component of a system as referred to in Table 3.4.2 is one that, when used in combination with other components, will form a 'full system'.

For example, if a concrete slab is used as a component of a system, it in itself will not provide a complete termite management system. Depending on the construction methods and the *site* conditions, additional requirements will be necessary for service penetrations through the concrete slab. Each of these are 'components', when integrated, will form a 'full system'.

Explanatory Information: Integrity of the termite management 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 correct installation of a termite management system, its effectiveness will rely on regular maintenance and competent inspection.

Explanatory Information: Attachments to buildings

Attachments referred to in Table 3.4.2 include downpipes, service pipes, steps, verandahs, porches, access ramps, carports, trellises, decks, *heated water* systems, air-conditioners and the like.

3.4.3 Durable notice

[2019: 3.1.4.4]

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

(a) the termite management system used; and

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

(c) where a chemical is used, its life expectancy as listed on the *appropriate authority's* register label; and

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

Part 4.1 Scope and application of Section 4

4.1.1 Scope

[New for 2022]

This Section sets out the *Deemed-to-Satisfy Provisions* for footings and slabs.

Explanatory Information

This Section specifies the requirements for the excavation and filling for the footing or slab together with the construction of various alternative concrete slab and footing configurations. The slab and footing configurations detailed in this Section are only suitable for the specified soil classifications. The requirements contained in the remainder of this Section are more general and may be applied to all slab and footing construction.

The requirements of this Section are to be read in conjunction with Part 6.2. The Part 6.2 subfloor ventilation requirements apply to the subfloor space of all suspended floors of a building or deck, including but not limited to, timber and steel-framed subfloors and suspended concrete slabs.

4.1.2 Application

[New for 2022]

The application of this Section is subject to the following:

(a) The Governing Requirements of NCC 2022 Volume Two.

(b) Any conditions set out within the following *Deemed-to-Satisfy Provisions* of NCC Volume Two: H1D4(2), for footings and slabs.

(c) The State and Territory variations, additions and deletions contained in the Schedules to the ABCB Housing Provisions and NCC Volume Two.

Explanatory Information

In NCC 2019, the content of Section 4 of the ABCB Housing Provisions (other than content added in NCC 2022 or later) was contained in the acceptable construction practices for Part 3.2 of NCC 2019 Volume Two.

4.1.3 Explanation of terms

[New for 2022]

Figures 4.1.3a, 4.1.3b and 4.1.3c depict footing and slab members and associated terminology used to describe them in Part 4.2 of the ABCB Housing Provisions.

Part 4.2 Footings, slabs and associated elements

4.2.1 Application

[New for 2022]

Part 4.2 is subject to the limitations set out in H1D4(2).

4.2.2 Site classification

[2019: 3.2.4.1]

The *foundations* where footings and slabs are to be located must be classified in accordance with AS 2870.

Explanatory Information

Explanatory Table 4.2.2 provides a general description of *foundation* soil types that will assist in the classification of a *site*. More detailed information, including differentiation between classifications, can be found in AS 2870 or alternatively contact the *appropriate authority*.

Due to the limitations of this Part, if a *site* is classified H, E or P then reference must be made to AS 2870 for design and construction information.

Table 4.2.2 (explanatory): General definition of site classes

Class	*Foundation*
A	Most sand and rock *sites* with little or no ground movement from moisture changes
S	Slightly reactive clay *sites* with only slight ground movement from moisture changes
M	Moderately reactive clay or silt *sites* which can experience moderate ground movement from moisture changes
H	Highly reactive clay *sites* which can experience high ground movement from moisture changes
E	Extremely reactive clay *sites* which can experience extreme ground movement from moisture changes
A to P	Filled *sites* — see AS 2870
P	*Sites* which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive *sites* subject to abnormal moisture conditions or *sites* which cannot be classified otherwise.

Table Notes

(1) For Class M, further division based on the depth of expected movement is *required*.

(2) For deep-seated movement, characteristic of dry climates and corresponding to a design depth of suction change H_S, equal to or greater than 3 m, the classification must be M-D.

(3) If classification M-D is established due to further division, design of footings and slabs is beyond the scope of the ABCB Housing Provisions and reference must be made to AS 2870 for design and construction information.

NSW 4.2.3

4.2.3 Excavation for footings

[2019: 3.2.2.1]

(1) Excavation for footings, including thickenings for slabs and pads must be clean cut with vertical sides, wherever possible.

(2) The base of the excavation must be—

(a) for flat *sites*, generally level but may slope not more than 1:40 to allow excavations to drain; and

(b) for sloping *sites* at an angle of not more than 1:10; and

(c) for stepped footings in accordance with 4.2.7.

(3) Footing excavations must be free of loose earth, tree roots, mud or debris.

(4) Topsoil containing grass roots must be removed from the *site* of the *foundation*.

(5) Excavation depths and soil cuts must comply with Part 3.2.

(6) On loose sand *sites* or *sites* subject to wind or water erosion, the depth below *finished ground level* to the bottom of footings must be not less than 300 mm.

(7) The height of a finished slab-on-ground must be in accordance with 3.3.3(b).

4.2.4 Filling under concrete slabs

[2019: 3.2.2.2]

Filling placed under a slab (except where the slab is suspended) must comply with the following:

(a) Filling must be either *controlled fill* or *rolled fill* as follows:

(i) Sand used in *controlled fill* or *rolled fill* must not contain any gravel size material and achieve a blow count of 7 or more per 300 mm using the test method described in AS 1289.6.3.3.

(ii) Clay used in *controlled fill* or *rolled fill* must be moist during compaction.

(iii) *Controlled fill*:

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

(c) A graded stone termite management system complying with Part 3.4 may be substituted for the sand *required* in (b).

4.2.5 Foundations for footings and slabs

[2019: 3.2.2.3]

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 4.2.4.

(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 4.2.4(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 4.2.5).

(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 sites they may be founded on controlled sand fill in accordance with 4.2.4(a).

Figure 4.2.5: Foundations for footings and slabs

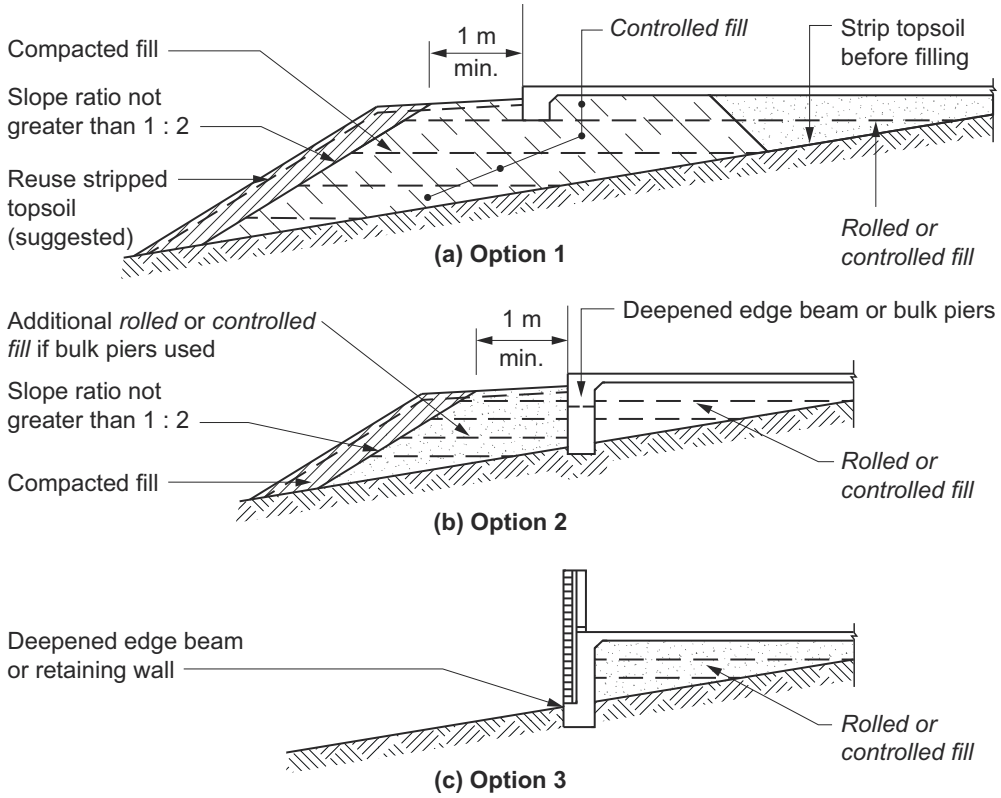


Figure Notes

Compacted fill must be in accordance with 4.2.4.

Explanatory Information

The *foundations* of a building are critical to its successful performance. As such, the soil must have the strength or bearing capacity to carry the building load with minimum movement.

The bearing capacity of a soil varies considerably and needs to be determined on a *site* by *site* basis. For this to occur, the appropriate people need to be consulted. These people may include a qualified engineer or experienced engineering geologist, or it may be determined by a person with appropriate local knowledge. The minimum bearing capacity (soil strength rating) may depend on the *site* conditions. The soil may be naturally undisturbed or be disturbed by building work or the like. Where soil is disturbed by building work and the like, the bearing capacity can be dramatically altered. This is typically the case for sloping *sites* where cut and fill procedures are used. In these situations the soil needs to be consolidated, generally via compaction, to achieve the *required* bearing capacity.

There are a number of alternatives for working on cut and filled *sites*. These are described in Figure 4.2.5.

Option 1 of Figure 4.2.5 refers to the *controlled fill* process which involves the compaction of fill in layers to achieve the bearing capacity described in 4.2.5. The depth of fill for each layer is specified to ensure effective compaction. Fill beyond these depths will need to be installed in accordance with H1D4(1).

Option 2 and 3 of Figure 4.2.5 refer to edge beams that extend through the fill into undisturbed soil which provides the 4.2.5 *required* bearing capacity. In this situation the fill is essentially only taking the internal slab loads.

4.2.8 Vapour barriers

[2019: 3.2.2.6]

(1) A vapour barrier must be installed under slab-on-ground construction for a Class 1 building and for a Class 10 building where the slab is continuous with the slab of a Class 1 building in accordance with (2), (3), (4) and (5).

(2) Materials: A vapour barrier must be—

(a) 0.2 mm nominal thickness polyethylene film; and

(b) medium impact resistant,

determined in accordance with criteria specified in clause 5.3.3.3 of AS 2870.

(3) A vapour barrier must be branded continuously “AS 2870 Concrete underlay, 0.2 mm Medium impact resistance”.

(4) Installation: A vapour barrier must be installed as follows:

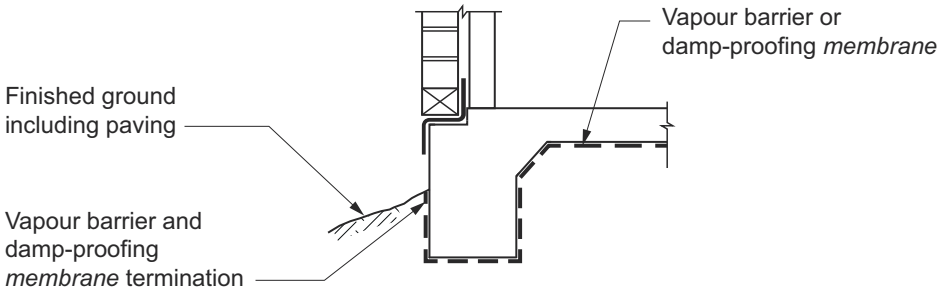
(a) Lap not less than 200 mm at all joints.

(b) Tape or seal with a close-fitting sleeve around all service penetrations.

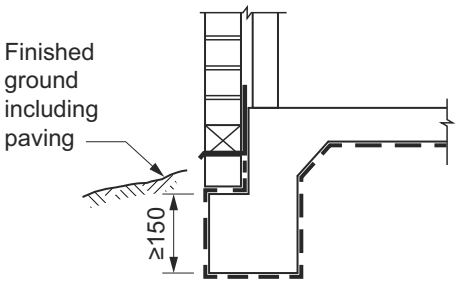
(c) Fully seal where punctured (unless for service penetrations) with additional polyethylene film and tape.

(5) The vapour barrier must be placed beneath the slab so that the bottom surface of the slab is entirely underlaid and must extend under internal and edge beams to finish at ground level in accordance with Figure 4.2.8.

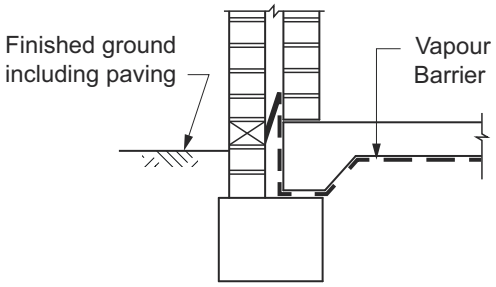
Figure 4.2.8: Acceptable vapour barrier and damp-proofing membrane location



(a) Minimum rebate for cavity masonry or veneer wall



(b) Deep edge rebate alternative



(c) Masonry alternative

Figure Notes

All dimensions in millimetres.

4.2.9 Edge rebates

[2019: 3.2.2.7]

Edge rebates for slab-on-ground and stiffened raft with masonry *cavity* or veneer construction must comply with the following:

(a) The rebate must not be less than 20 mm.

(b) The edge rebate must be flashed and drained in accordance with H2D4 and where it cannot be flashed, it must be filled with mortar.

Explanatory Information

See 4.2.21 for minimum edge beam details. For single skin or framed walls with external cladding, rebates are not required.

SA 4.2.10

4.2.10 Concrete

[2019: 3.2.3.1]

Concrete must comply with the following:

(a) Concrete must comply with AS 3600; and—

(i) have a strength at 28 days of not less than 20 MPa (denoted as N20 grade); and

(ii) have a 20 mm maximum nominal aggregate size; and

(iii) have a nominal 100 mm slump.

(b) Water must not be added to the mix to increase the slump to a value in excess of that specified.

(c) Concrete must be placed, compacted and cured in accordance with good building practice.

Explanatory Information

- Complete discharge of the concrete from the truck should be made within one and a half hours of initial mixing with water unless a suitable retarder has been specified.
- Compacting concrete by vibration removes air pockets and works the concrete thoroughly around reinforcement, service penetrations etc. and into corners of formwork to increase durability and resistance to termite infestation and salt damp attack. Care should be taken not to over-vibrate. The finishing and curing of slab edges provides an improved edge finish which is resistant to edge dampness.
- Care should be taken when using chemical curing methods, because some products may not be compatible with adhesives used to fix surface finishes to the slab.

4.2.11 Steel reinforcement

[2019: 3.2.3.2]

(1) Materials used for reinforcing steel must comply with AS 2870 and be—

(a) welded wire reinforcing fabric; or

(b) trench mesh; or

(c) steel reinforcing bars.

(2) Steel reinforcing bars may be substituted for trench mesh in accordance with Table 4.2.11a.

(3) Minimum laps for reinforcement as shown in Table 4.2.11b and Figure 4.2.11a must be provided where reinforcing is used.

(4) Any slab in H1D4 with a re-entrant corner must have—

(a) two strips of 3-L8TM; or

(b) one strip of 3-L11TM; or

(c) 3-N12 bars,

not less than 2 m in length and placed at an angle of 45° across the corner such that the centre of the 2 m length is at the location of the internal angle of the slab in accordance with Figure 4.2.11b.

(5) Footings and slabs-on-ground must have concrete cover between the outermost edge of the reinforcement (including ligatures, tie wire etc.) and the surface of the concrete of not less than—

(a) 40 mm to unprotected ground; and