QUEENSLAND BUILDING AND CONSTRUCTION COMMISSION

STANDARDS AND TOLERANCES GUIDE

QUEENSLAND | DECEMBER 2023

FOREWORD

This Guide has been compiled in response to community and industry concerns that identified a need to collate general building standards and tolerances into one, easy to read document. The tolerances and standards identified in this publication have not been created by the authors but have been sourced and collated from existing legislative provisions, the National Construction Code, Australian Standards, manufacturers installation requirements and other recognised industry standards in Queensland (e.g. Timber Queensland Technical Data Sheets).

It is hoped that the publication will provide an impartial, quick and easy first reference for clients and contractors in relation to applicable standards and tolerances in Queensland, thereby reducing the likelihood of disputation in relation to such standards and tolerances.

ACKNOWLEDGEMENTS

The contributions and assistance provided by the following agencies, organisations and individuals, in the preparation of this document, is gratefully acknowledged:

The Victorian Building Authority for their permission to use the Victorian, NSW and Tasmanian 2007 Guide to Standards and Tolerances as a template for drafting the Queensland edition of a similar document.

Standards Australia for their permission to print certain tables and information from relevant Australian Standards (AS).

The Australian Building Codes Board (ABCB) give their permission to reference the National Construction Code (NCC) Series, which includes the Building Code of Australia (BCA) (Volumes 1 and 2) and the Plumbing Code of Australia (Volume 3).
The digital NCC and individual volumes can be accessed for free from the ABCB at www.abcb.gov.au

The ABCB provides permission for the NCC to be referenced however does not endorse the Queensland Building and Construction Commission's, Queensland Standards and Tolerances Guide 2023 or provide a warranty or guarantee that the references within this publication are correct or complete.

The numerous individuals and organisations who have contributed their time and expertise to develop and review the Guide.

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INTRODUCTION

1.1 Authority of the Guide

The standards and tolerances identified in the Guide are only applicable to "building work" as defined in the *Queensland Building and Construction Commission Act 1991* (QBCC Act) and *Queensland Building and Construction Commission Regulation 2018*. Accordingly, tolerances and standards have not been included for constructions such as earthworks, electrical work, carpet, vinyl or floating floors that are excluded from the definition of "building work" provided in the above mentioned legislation.

Building standards are in the main described in the National Construction Code Series which includes the Building Code of Australia (BCA) (Volumes 1 and 2) and the Plumbing Code of Australia (Volume 3), which is adopted into law by regulation.

The standards and tolerances documented in the Guide are intended to be consistent with and complement other relevant Acts, Regulations, NCC requirements, Australian Standards and manufacturer's installation requirements. Where there is any difference or contradiction between the Guide and an Act, Regulations, the NCC, Australian Standards, manufacturer's installation requirements; all of these take precedence over the Guide. Where the contract may be inconsistent with the requirements of the Guide the contract takes precedence only to the extent that it is requiring a higher standard than that prescribed in the Guide.

The Guide has predominately been prepared to identify general standards and tolerances applicable to domestic building work, however where relevant, can similarly be applied to non-domestic constructions. Accordingly, unless noted otherwise, references in the Guide to the BCA refer to Volume 2 of the BCA which is applicable to Class 1 and 10 buildings.

The tolerances and standards identified in the Guide are applicable to new work and new materials and are only relevant and applicable within the time periods specified in Section 1.2 of the Guide. Accordingly, unless noted otherwise, they are not applicable to second-hand or recycled materials or products.

This document has primarily been drafted to enable builders, contractors and home owners to reference general building standards related to domestic construction and hopefully to minimise the likelihood of disputes in relation to the quality of building work occurring.

Inevitably however, some disputes in relation to quality of work will occur and in many instances will be referred to the Queensland Building and Construction Commission for assessment and determination.

In making its determination and in particular when deciding whether or not to issue a Direction to Rectify to a person, the Commission is required by Section 72 of the QBCC Act to take into consideration all the circumstances it considers are reasonably relevant. Accordingly, when making its determination, the Commission will take into account all the circumstances it considers is reasonably relevant in determining whether or not to issue a direction pursuant to section 72(3) of the QBCC Act, including whether it would be unfair to issue the direction in accordance with section 72(5) of the QBCC Act. The QBCC will consider the provisions of relevant documentation in relation to any matter such as:

- the Building Act
- the Queensland Development Code
- the National Construction Code
- relevant Australian Standards
- manufacturers installation instructions
- related engineering certificates
- QBCC's Rectification of Defective Building Work Policy

1.2 Time provisions and limitations

This edition of the Guide is valid from 1 May 2023 and has been compiled based upon the 2022 edition of the NCC and its referenced standards and other non-referenced Australian Standards and documents in force as at 1 May 2022.

Two time periods are relevant when identifying applicable standards and tolerances to identify defective work:

- 12 months from date of completion of the work;
- 6 years and 6 months from date of completion of the work.

Generally the 12 month time frame applies to non-structural building work and the 6 years and 6 month time frame to structural building work.

Generally, the date of completion is the day when the work carried out under the contract is completed in accordance with the terms of that contract, or the day the building owner is given the statutory permit or certificate that authorises the occupation of the building. Alternatively, a definition may be given in the contract associated with the building work.

Unless noted otherwise all standards and tolerances provided in the Guide are applicable for 6 years and 6 months from the date of completion of the work.

1.3 Measurement of tolerances

The tolerances in the Guide apply up to and including the length over which each tolerance is stated to apply. It is not intended that tolerances will be interpolated or proportioned to the actual length of building element measured. For example, where the Guide specifies a 4mm maximum deviation measured over a 2m length of wall surface, the Guide means that the same 4mm deviation is to be applied over a 1m wall surface or a 500mm wall surface. The tolerance cannot be interpolated to mean a 2mm deviation over a 1m wall surface or 1mm deviation over a 500mm wall surface. Similarly, deviations over longer wall surfaces would be defects if the deviation exceeded 4mm within any 2m length of that surface.

Horizontal, vertical and diagonal surface tolerances are to be interpreted in the same way.

Horizontal surfaces

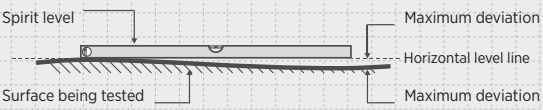
Deviations from a horizontal surface are to be measured from a datum nominated in the contract documents or inferred, if none is nominated. Where there is a nominated or inferred datum, the maximum deviation from that datum will not exceed the deviation stated in the Guide. Where no datum is nominated and a datum cannot be inferred, a datum level will be taken to be at the highest or lowest points in the building element, room or area being measured. Refer to Figure 1.3 A (i), (ii) and (iii) for method of measurement.

Vertical surfaces

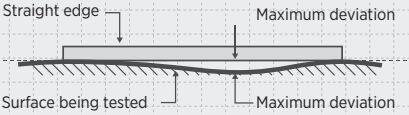
Deviations of a vertical surface from a true vertical plane are to be measured from a plumb line through a plan position or reference point nominated in the contract documents or inferred, if none is nominated. The maximum deviation of a vertical surface from that plumb line will not exceed the deviation stated in the Guide. Refer to Figure 1.3 B (iv), (v) and (vi) for method of measurement.

FIGURE 1.3A HORIZONTAL SURFACE TOLERANCES

i) MEASUREMENT OF DEVIATION FROM HORIZONTAL/LEVEL



ii) MEASUREMENT OF BOW



iii) MEASUREMENT OF BOW (HORIZONTAL FLATNESS)

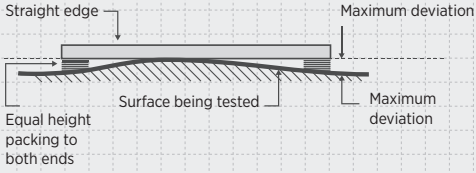
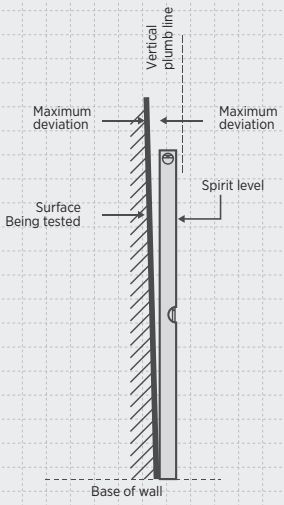
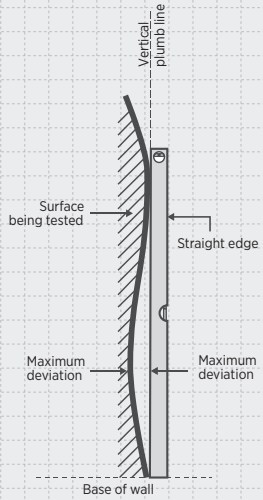


FIGURE 1.3B VERTICAL SURFACE TOLERANCES

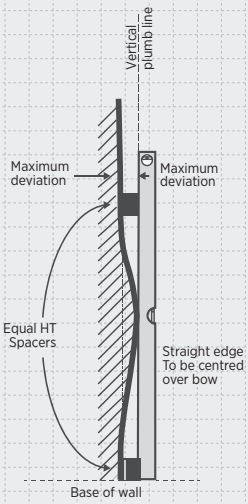
iv) MEASUREMENT OF DEVIATION FROM VERTICAL PLUMB



v) MEASUREMENT OF BOW (SURFACE FLATNESS)



vi) MEASUREMENT OF BOW (SURFACE FLATNESS)



1.4 Viewing and inspecting distances

Generally, variations in the surface colour, texture and finish of walls, ceilings, floors and roofs, and variations in glass and similar transparent materials are to be viewed where possible from a normal viewing position. A normal viewing position is looking from a distance of 1.5m or greater (600mm for appliances and fixtures and 3m for glass) with the surface or material being illuminated by "non-critical light". "Non-critical light" means the light that strikes the surface is diffused and is not glancing or parallel to that surface.

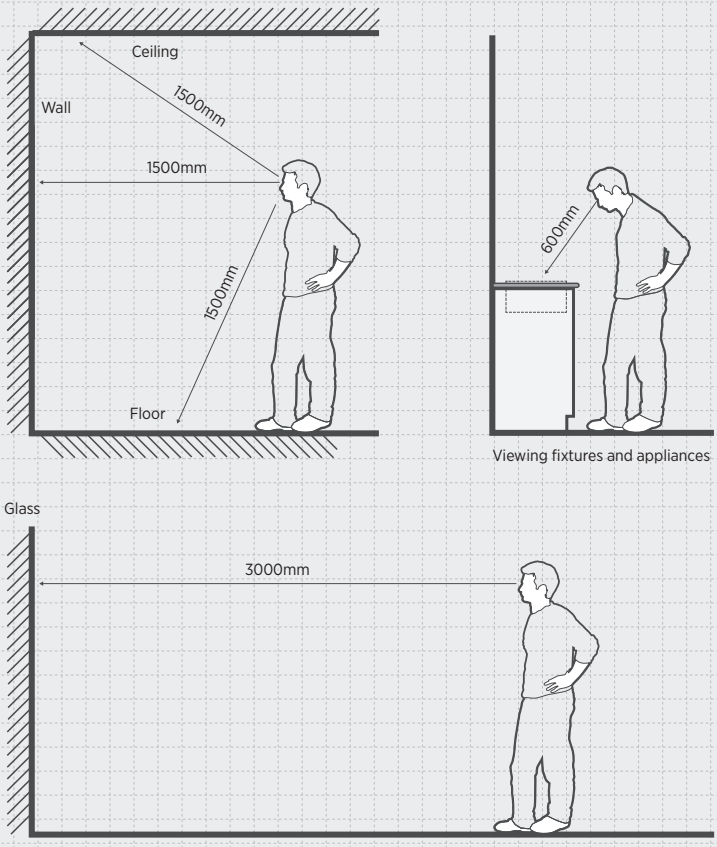
Slight variations in the colour and finish of materials do not constitute a defect.

1.5 Responsibility to rectify

Contractors do not have to rectify damage caused by the owner's actions or inactions or those of other people engaged by the owner.

Contractors will be liable to repair any consequential damage caused by, or as a consequence of carrying out building work on a residential building site or to a residential building on an adjacent site.

FIGURE 1.4 NORMAL VIEWING POSITIONS



Contractors will be liable to repair damage caused to property in the course of completing their building work.

For example:

A contractor **will not** have to repaint a poorly painted wall that was painted by the building owner.

A contractor **will not** have to repair a distorted gutter when the damage was caused by an owner placing a ladder against the gutter.

A contractor **will not** have to repair a storm water drain that was properly constructed and later blocked by tree roots.

A contractor **will** have to replace untreated pine in an external deck that was installed by the contractor instead of the durable timber required for this structure.

A contractor **will** have to repair an existing window in a house that the contractor accidentally damaged when constructing another part of the house.

A contractor **will** have to provide a remedy or repair an adjoining residential building suffering from subsidence caused by the lack of shoring or an effective ground retention system on a deep excavation constructed along the property boundary.

1.6 References used in the Guide

Building Code of Australia (BCA) 2022 Edition – Volume 2.

The digital NCC Volume 2 can be accessed for from the ABCB at www.abcb.gov.au

2. SITEWORKS

2.1 Cracking in concrete paving

Cracking in concrete is common and is not always attributable to unsatisfactory workmanship. Common causes of cracking include shrinkage stress, stress due to trees, commercial or heavy vehicle traffic, soil movement due to changes in the moisture content due to garden watering or drainage problems.

Cracking not attributable to the workmanship of the builder (e.g. trees planted too close to paving, commercial or heavy duty vehicle traffic, excessive garden watering, etc.) is not a defect.

Within the first 12 months from completion of the work, cracking or movement in concrete verandahs, garages, carports, paving, patios, driveways etc., where the builder did not make allowances for shrinkage or general movement of the concrete (e.g. isolation joints where required around penetrations such as verandah posts, pipes, expansion joints, control joints and contraction joints), shall be assessed in accordance with Table 2.1 and is defective where the limits in that table are exceeded.

TABLE 2.1 ACCEPTANCE CRITERIA

CONDITION	MEASURE	LIMIT
Random cracking	Crack width	≤ 1mm
Design profile	Variation between actual surface profile and design profiles	≤ 15mm
Flatness	Maximum deviation from a 3m straight edge (see Note 1)	≤ 15mm
Stepping	Relative surface level of adjacent paving elements within the expanse of the main pavement (See Note 2 below)	≤ 5mm
Subsidence	Offset under 1.5m length of the design profile (see Note 3)	≤ 5mm
Based on *AS 3727* Part 1: Residential Table 2.2 Acceptance Criteria[1].		

Notes to table 2.1

1. The flatness condition shall apply only to that part of a pavement in which its surface has been intended to be designed in the one plane, and that plane is greater than 3m in diameter.
2. The stepping criteria apply only to steps within the surface of the main pavement. It shall not apply where the main pavement abuts other structures such as edging, drainage pits, service pits, minor pavements (such as a pathway adjacent to a driveway) and pavements constructed with materials of a different type.
3. The design profile shall be centred over the defect and supported at its ends by equal height spacers. The change in offset shall be then measured relative to this design profile.

[1] *Reproduced with permission from Standards Australia under licence CLT1123qbc.*

Within 6 years and 6 months from completion of the work, cracking in concrete verandahs, garages, carports, paving, patios, driveways etc. where the builder did not make allowances for shrinkage or general movement of the concrete, e.g. isolation joints where required around penetrations such as verandah posts, pipes, expansion joints, control joints and construction joints, shall be assessed in accordance with Table 2.1 and is defective where the limits in that table are exceeded and the defect constitutes a health and safety issue such as a trip hazard or renders the paving structurally unsound.

2.2 Finish to external concrete paving

Concrete paving finish is defective if, within 12 months from date of completion of the work, it is not consistent in colour, texture and general appearance. Minor variations in finish may occur and are not considered to be defective.

2.3 Site Drainage

Surface water is required to be directed away from the building and shaped to prevent ponding of water near or against the footings.

Part 3.3 of the NCC provides minimum surface water drainage requirements. In Queensland *AS 2870 Residential Slabs and Footings* is widely used as an acceptable construction manual. Site drainage requirements must comply with the *AS 2870* provisions and any relevant engineer design.

Site drainage will be defective if it is not in accordance with the above requirements.

2.4 Ground clearance for driveways

The ground clearance for driveways and the like shall be in accordance with *AS/NZS 2890.1 Parking Facilities - Off Street Parking Appendix C*. The template car is to be B85 for domestic properties.

3. FOOTINGS, SLABS AND SET OUT

3.1 Foundation and site drainage – maintenance after occupation

The contractor is not responsible for foundation movements caused by activities that were not evident at the time of entering into the contract or as a variation to that contract, or that are undertaken by the owner. These include paving, landscaping, planting trees and drainage works after the site is handed over to the owner.

The contractor is not responsible for foundation movements caused by the owner's failure to maintain drainage systems after the site is handed over to the owner.

Refer to the Queensland Building and Construction Commission publication *"A Simple Guide to Preventing Structural Damage to Your Home".*

3.2 Footings and slabs generally

In order for domestic footing designs to be practical and economical to construct, *AS 2870 - Residential Slabs and Footings* accepts that although usually no damage occurs during the life of the building some slight or minor damage to walls and floors due to footing movement is possible. This slight or minor damage is not a defect.

Slabs and footings are defective if they fail because they are not designed and constructed in accordance with the NCC *and/or AS 2870 – Residential Slabs and Footings.*

Slab and footing failures are defects when they are caused by foundation movements that are the result of localised drying and wetting caused by such factors as the effects of trees, excessive wetting or lack of site drainage when these factors were present during construction.

Slab and footing failures are also defects where they are caused by foundation movement that is the result of inadequate fill, or inadequate compaction of either fill or natural material irrespective of whether or not the fill may have been provided with a Level 1 Compaction Certificate.

3.3 Setting out the building on the site

A building set out is defective where the set out has failed to comply with the requirements of the approved drawings, the allotment Certificate of Title, planning or development approval, relevant planning overlays and schemes and building regulations.

Within the first 12 months from completion of the work and provided the building set out has complied with these regulated provisions, the set out for a building is defective if the building is more than 50mm from its correct position and such deviation adversely affects the safe use or reasonable amenity of the building.

3.4 External building dimensions

Within the first 12 months from completion of the work, departures from documented external dimensions of buildings are defects if they exceed L/200 where L is the documented overall length of wall, or 5mm, whichever is the greater and such deviation adversely affects the safe use or reasonable amenity of the building.

3.5 Measuring internal building dimensions

Unless shown otherwise, dimensions shown on drawings for internal walls always refer to the structure's dimensions. Structure means masonry and timber framing and does not include finishes such as plasterboard, render and skirtings. The internal room sizes will be different when thicknesses of internal finish materials are taken into account.

Ceiling height dimensions are defective if they do not comply with the requirements of the BCA. Within the first 12 months from completion of the work, ceiling height dimensions are defective if they do not comply with any greater height (in excess of BCA requirements) specified in the contract and such deviation adversely affects the safe use or reasonable amenity of the building.

3.6 Building dimensions

Within 12 months from completion of the work, departures from the documented set out for service rooms such as bathrooms, toilets, laundries, kitchens etc. are defects if they exceed L/200 or 5mm, whichever is the greater, where L is the documented dimension and such deviation adversely affects the safe use or reasonable amenity of the building.

Within 12 months from completion of the work, departures from the documented set out for habitable rooms and areas, such as bedrooms, dining rooms, lounge and living rooms, family rooms, studies, halls, entries and stairways, are defects if they exceed L/100 or 5mm, whichever is the greater, where L is the documented dimension and such deviation adversely affects the safe use or reasonable amenity of the building.

Within 12 months from completion of the work, departures from documented set out for external elements such as garages, carports, verandahs, decks, patios etc. are defects if they exceed L/100 or 5mm, whichever is the greater, where L is the documented dimension and such deviation adversely affects the safe use or reasonable amenity of the building.

Within 12 months from completion of the work, the set out is defective where a specific fixture or feature is required to be accommodated, and such documented dimensions to accommodate that fixture or feature are not provided and such deviation adversely affects the safe use or reasonable amenity of the building.

3.7 Finished floor levels

Finished Floor Levels (FFL) or Reduced Levels (RL) are defective where they do not comply with planning and building requirements, for example minimum levels in flood prone areas.

Within the first 12 months from completion of the work, Finished Floor Levels (FFL) or Reduced Levels (RL) are defective where:

- they depart from the documented FFL or RL by more than 40mm and such deviation adversely affects the safe use or reasonable amenity of the building; or
- floors that are documented to be on the same plane are constructed on different planes and such deviation adversely affects the safe use or reasonable amenity of the building; or
- the building work is an extension or addition and new floor levels do not match the existing building floor levels and such deviation adversely affects the safe use or reasonable amenity of the building.

3.8 Levelness of concrete floors

Except where documented otherwise, new floors are defective if within 12 months from completion of the work, they differ in level by more than 10mm in any room or area, or more than 12mm in any 3m length and such deviation adversely affects the safe use or reasonable amenity of the building. The overall deviation of floor level to entire building footprint shall not exceed 20mm within 12 months from date of completion of the work and such deviation adversely affects the safe use or reasonable amenity of the building.

3.9 Dimensions of building elements

Deviations from the documented height or cross-sectional dimension of building elements such as beams and posts are defective if the deviation renders them or the building structurally inadequate.

Within the first 12 months from completion of the work, deviations from the documented height or cross-sectional dimension of building elements such as beams and posts are defective if they exceed L/200 where L is the documented dimension or 5mm, whichever is the greater and such deviation adversely affects the safe use or reasonable amenity of the building.

Notwithstanding the above, timber members are not defective if the dimensional difference is due to timber shrinkage provided that shrinkage does not exceed 3% for seasoned timber and 10% for unseasoned timber or is the result of subsequent dressing to nominated nominal timber dimensions.

3.10 Cracks in concrete slabs

Refer to Table 3.10 for descriptions of categories of cracks. Category 3 and 4 cracks to slabs are defects. Category 1 and 2 cracks to slabs are not defects.

3.11 Domestic concrete slabs that form part of a termite management system

Where a domestic slab is designed in accordance with the NCC and is to act as part of a termite management system, cracks through the slab are not to exceed Category 1 width as set out in Table 3.10.

3.12 Finish to concrete slabs

Within the first 12 months from completion of the work, the finish to a concrete slab is defective if it is not suitable for the documented applied finishes such as tiles, polished concrete, carpet or sheet flooring, including set downs where required.

3.13 Repairs to exposed concrete slabs

Repairs, where failure has been due to cracking and/or movement, may involve the removal of the affected area. Within the first 12 months of completion of the repair work, the repair is defective if it does not, as closely as practicable, match the existing work in appearance, colour and texture. Minor variations in finish are not considered defective.

Where repairs are made to a domestic slab designed in accordance with the NCC to act as part of a termite management system, any repairs are defective, unless they ensure on completion that the termite management system is appropriately re-instated in accordance with the requirements of the NCC.

3.14 Slab edge dampness

The performance requirements of the NCC require, amongst other things, that buildings safeguard occupants from illness and injury and protect buildings from damage caused by surface water, external moisture entering a building and the accumulation of internal moisture in a building.

The Slab and footing system is defective, if it permits surface water, sub-surface water and other external moisture to enter a building to the extent that it compromises the health and safety of occupants or has the potential to damage the building or its contents. (e.g. permits mould growth or damages floor finishes, carpets etc.).

The work is not defective if such water penetration is caused by actions or inactions by the owner, or others outside of the contractor's control including such things as landscaping that directs water towards the building or restricts the free flow of water away from the building, excessive garden watering adjacent to the building and the subsequent construction of paving adjacent to the building that compromises the ability of the water to drain away from the building.

TABLE 3.10 CLASSIFICATION OF DAMAGE TO CONCRETE FLOORS

DESCRIPTION OF TYPICAL DAMAGE	APPROX. CRACK WIDTH LIMIT IN FLOOR	CHANGE IN OFFSET FROM 3m STRAIGHT EDGE PLACED OVER DEFECT (SEE NOTES)	DAMAGE CATEGORY
Hairline cracks, insignificant movement of slab from level	< 0.3mm	< 8mm	0 Negligible
Fine but noticeable cracks. Slab reasonably level	< 1.0mm	< 10mm	1 Very Slight
Distinct cracks. Slab noticeably curved or changed in level	< 2.0mm	< 15mm	2 Slight
Wide cracks. Obvious curvature or change in level	2mm to 4mm	15mm to 25mm	3 Moderate
Gaps in slab. Disturbing curvature or change in level	4mm to 10mm	> 25mm	4 Severe

Extract from AS 2870 - Residential Slabs and Footings[2]

Notes

1. The straight edge is centred over the defect, usually, and supported at its ends by equal height spacers. The change in offset is then measured relative to this straight edge, which is not necessarily horizontal.
2. Local deviation of slope, from the horizontal or vertical, of more than 1:100 will normally be clearly visible. Overall deviations in excess of 1:150 are undesirable.
3. Account should be taken of the past history of damage in order to assess whether it is stable or likely to increase.

[2] *Reproduced with permission from Standards Australia under licence CLT1123qbc.*

4. MASONRY

4.1 Masonry types

This section includes structural tolerances for the following generally-used types of masonry, including:

- clay and concrete brick construction
- clay and concrete brick veneer construction
- concrete block construction.

The structural tolerances for the above may not always be appropriate for some types of masonry construction, such as pre-fabricated masonry panels, aerated concrete blocks, irregular cut stone, rustic finish masonry with irregular edges and appearance etc. In these cases, the manufacturer's requirements must be followed.

Tolerances for face work for aesthetic reasons must be to the manufacturer's requirements.

4.2 Damage to masonry walls

Refer to Table 4.2 for descriptions of categories of damage. Category 3 or greater damage to walls is a defect and requires investigation, stabilisation, monitoring and rectification work, which may include breaking out and replacing sections of the wall. Category 0, 1 and 2 cracks to walls are not defects. Category 2 damage is a defect if identified within 12 months from date of completion and requires minor repair work such as repointing.

TABLE 4.2 CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

DESCRIPTION OF TYPICAL DAMAGE AND REQUIRED REPAIR	APPROX. CRACK WIDTH LIMIT (SEE NOTE 1)	DAMAGE CATEGORY
Hairline cracks	< 0.1mm	0 Negligible
Fine cracks that do not need repair	< 1mm	1 Very Slight
Cracks noticeable but easily filled. Doors and windows stick slightly	< 5mm	2 Slight
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weather tightness often impaired	5mm to 15mm (or a number of cracks 3mm or more in one group)	3 Moderate
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15mm to 25mm but also depends on number of cracks	4 Severe

Extract from AS 2870 - Residential Slabs and Footings[3]

Notes

1. Where the cracking occurs in easily repaired plasterboard or similar clad-framed partitions, the crack width limits may be increased by 50% for each damage category.
2. Crack width is the main factor by which damage to walls is categorised. The width may be supplemented by other factors, including serviceability, in assessing category of damage.
3. In assessing the degree of damage, account shall be taken of the location in the building or structure where it occurs, and also of the function of the building or structure.

[3] *Reproduced with permission from Standards Australia under licence CLT1123qbc.*

4.3 Articulation in masonry walls

Masonry work is defective if articulation and movement control joints have not been provided as required by *AS 2870*, *AS 3700* or the contract. Articulation joints are defective if they do not comply with the following:

- be free of mortar
- be vertical and not toothed unless toothing is specifically considered in the design
- extend the full height of the masonry but may be omitted below the damp-proof course (DPC) if there is not more than 600mm of masonry below the DPC at the position of the joint
- the material used to fill the joint must be of a type that does not inhibit the performance of the joint
- be sealed with a suitable flexible sealant to match the colour of the adjacent masonry.

4.4 Masonry construction generally

Within the first 12 months from completion of the work, masonry work is defective if it exceeds the tolerances set out in Table 4.4 or the manufacturer's aesthetic requirements.

Within 6 years and 6 months from completion of the work, the masonry is defective if it exceeds the structural tolerances set out in Table 4.4 and as a result compromises the structural adequacy of the wall or building, allows water penetration into the building or compromises the health and safety of those who use the building.

TABLE 4.4 STRUCTURAL TOLERANCES IN MASONRY CONSTRUCTION

ITEM	TOLERANCE
a. Horizontal position of any masonry element specified or shown in plan at its base or at each storey level	±15mm (Refer Figure 4.4 A)
b. Relative displacement between loadbearing walls in adjacent storeys intended to be in vertical alignment	±10mm (Refer Figure 4.4 B)
c. Maximum deviation from plumb within a storey from a vertical line through the base of the member	The lesser of ±10mm per 3m of height or 0.05 times the thickness of the leaf (Refer Figure 4.4 C)
d. Maximum deviation from plumb in the total height of the building (from the base)	±25mm (Refer Figure 4.4 D)
e. Maximum horizontal or vertical deviation of a surface from a plane surface (bow)	±5mm (Refer Figure 1.3 A and 1.3 B
f. Deviation of bed joint from horizontal, or from the level specified or shown in elevation	±10mm in any 10m length, ±15mm in total (Refer Figure 4.4 E)
g. Deviation from specified thickness of bed joint	±3mm (Refer Figure 4.4 F)
h. Minimum perpend thickness	5mm
i. Deviation from specified thickness of perpend	±10mm max
j. Deviation from specified width of cavity	±15mm (Refer Figure 4.4 G)

Extract from AS 3700 - Masonry Structures[4]

[4] *Reproduced with permission from Standards Australia under licence CLT1123qbc.*

4.5 Durability requirements for masonry and built-in components

Masonry and/or built-in components are defective if they do not satisfy the durability requirements for the relevant exposure environments as required by *AS 3700 Masonry Structures*.

4.6 Blending and matching of masonry – repair work

If matching masonry in alteration and repair work is not reasonably possible, contractors should use a practical approach and, where possible, a physical joint, a door, a window, a downpipe or similar separator should be incorporated to lessen the impact of the new work. In the case of alteration and repair work however, failure to match the original masonry units is not considered a defect.

Mortar repairs should be carried out to match existing mortar as closely as practicable. A perfect colour match may not be possible and differences may diminish over time. Some variation of masonry features such as colour, texture and pattern are to be expected between batches and are not considered a defect.

4.7 Blending and matching of masonry – new work

To avoid inconsistency in appearance, wherever practicable, masonry units for buildings should be obtained from the same batch.

During the first 12 months from completion of the work, masonry areas that vary in colour are defective if the units are not mixed and/or distributed in accordance with the manufacturer's installation instructions or do not reasonably match masonry in display panels and display homes.

4.8 Masonry facing

Within the first 12 months from completion of the work, and unless documented otherwise, masonry is defective if it is not laid with true, fair or finish face outwards.

Within the first 12 months from completion of the work and unless documented otherwise, masonry faces are defective if they are not cleaned and free of excess mortar or stains when viewed from the normal viewing position.

4.9 Mortar for masonry

Within the first 12 months from completion of the work, mortar is defective if it is not in accordance with the requirements of the *AS 3700 Masonry Structures* and *AS 4773 Masonry for Small Buildings Parts 1 and 2*.

Within 6 years and 6 months from completion of the work, mortar for masonry is defective if it is not in accordance with the requirements of the *AS 3700 Masonry Structures* and *AS 4773 Masonry for Small Buildings Parts 1 and 2* and as a result compromises the structural adequacy of the wall or building, allows water penetration into the building or compromises the health and safety of those who use the building.

4.10 Voids and holes in mortar

Within the first 12 months from completion of the work, voids and holes in mortar in masonry walls, except weepholes and vents, are defects if they are visible from a normal viewing position.

FIGURE 4.4 STRUCTURAL TOLERANCES IN MASONRY CONSTRUCTION

DIAGRAM A

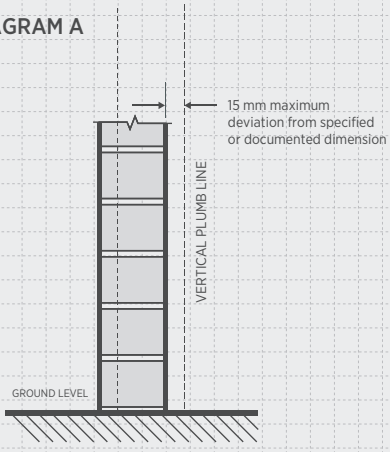


DIAGRAM B

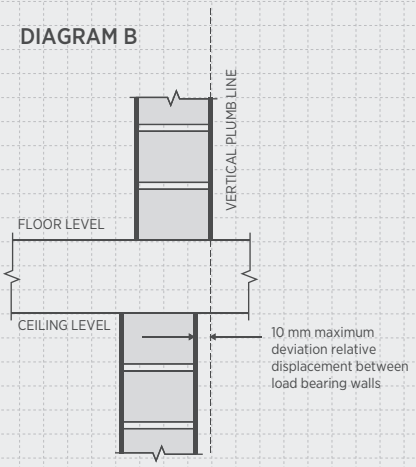
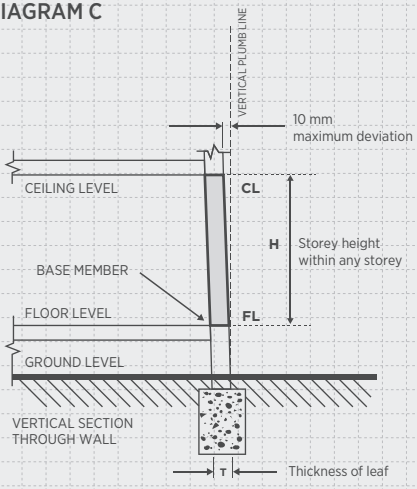


DIAGRAM C



FORMULA:

Maximum deviation from plumb within any storey

STRUCTURAL LESSER OF $\pm\left(\frac{10H}{3}\right)$ OR $\pm 0.05T$

H measured in metres (m)
T measured in millimetres (mm)

For example if a storey height, h=4000 mm and leaf thickness, t=190 mm.
Tolerance is lesser of 10 x 4.0 ÷ 3 = 13.3 mm or 0.05 x 190 = 9.5 mm
ie. 9.5 mm

DIAGRAM D

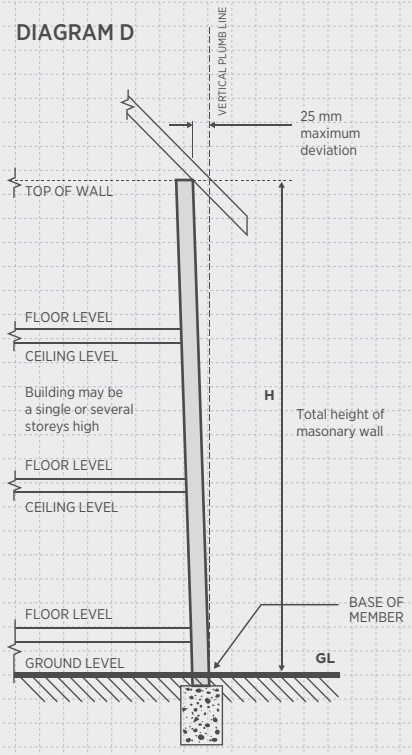


FIGURE 4.4 STRUCTURAL TOLERANCES IN MASONRY CONSTRUCTION CONTINUED.

DIAGRAM E

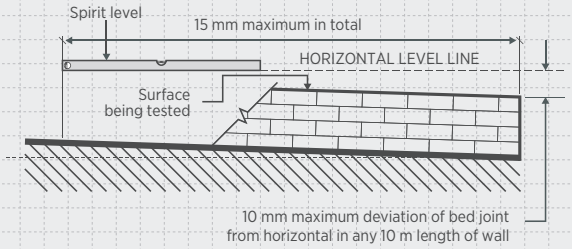


DIAGRAM F

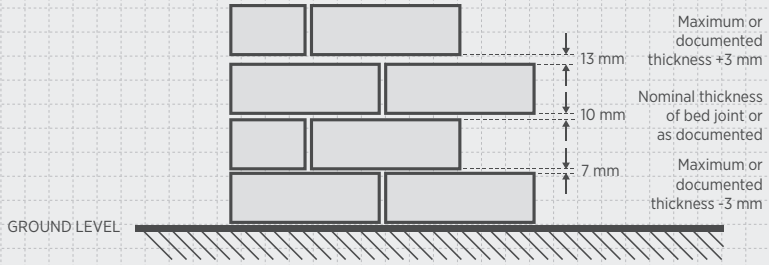
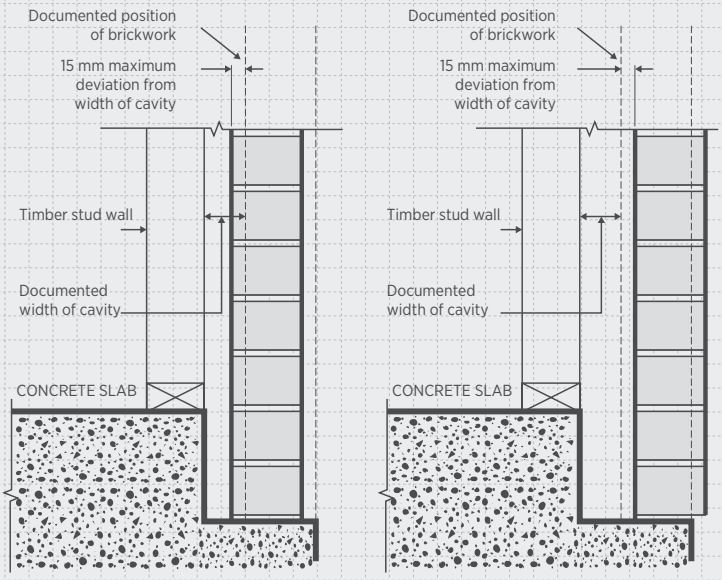


DIAGRAM G



NOTE: REFER BCA FOR MINIMUM CAVITY WIDTH

4.11 Cracked masonry unit

It is characteristic of some masonry units to have surface cracks or crazing as part of the manufacturing process. These are not defects unless they occur within the first 12 months of completion of the work and they result in the complete fracture of the unit.

4.12 Cleaning, mortar smears and stains

Within the first 12 months from completion of the work, stains, mortar smears and damage caused by cleaning are defects if they are visible from a normal viewing position.

4.13 Masonry inside garages and similar spaces and under applied finishes

Within the first 12 months from completion of the work, structural masonry that is visible inside a garage or similar space or through an applied finish is defective if it does not comply with the tolerances in Table 4.4, however, these tolerances do not apply to the non-face side of single skin masonry.

Within 6 years and 6 months from completion of the work, structural and non-structural masonry is defective if it exceeds the tolerances set out in Table 4.4 and as a result compromises the structural adequacy of the wall or building, allows water penetration into the building or compromises the health and safety of those who use the building.

When there is an applied finish such as render, where the joints are not intended to be visible, masonry need not be saw cut and 1/4 or 3/4 units may be used in lieu of full masonry units.

4.14 Vertical alignment of perpend joints

Within the first 12 months from completion of the work, a line of masonry perpends is defective if it exceeds a maximum deviation from vertical alignment of 15mm per 2m height of wall, measured from centre to centre of perpend joints.

4.15 Horizontal alignment of bed joints

Within the first 12 months from completion of the work, bed joints in walls including adjacent isolated piers and either side of openings and control joints are defective if they are not on the same horizontal plane, or do not comply with Table 4.4 of this Guide.

4.16 Base bed joint and base row of masonry

Within the first 12 months from completion of the work, exposed base bed joints above the finished ground level are defective if they exceed 20mm in thickness. Base bed joints that are not exposed above the finished ground level are defective if they are greater than 40mm in thickness.

Within 6 years and 6 months from completion of the work, the base bed joint and base row of masonry is defective if it exceeds 40mm in thickness and as a result compromises the structural adequacy of the wall or building, allows water penetration into the building or compromises the health and safety of those who use the building.

4.17 Masonry that overhangs concrete slabs

Within the first 12 months from completion of the work, the installation of a masonry course is defective if it is laid on a concrete slab or strip footing so as to project over the edge of the slab or footing by more than 15mm. Refer to Figure 5.11 in this Guide.

Within 6 years and 6 months from completion of the work, masonry that overhangs concrete slabs is defective if it projects over the edge of the slab or footing by more than 15mm and as a result compromises the structural adequacy of the wall or building, allows water penetration into the building or compromises the health and safety of those who use the building.

4.18 Damp proof courses

Damp proof courses are defective if they are not installed in accordance with the BCA and *AS 3700 Masonry Structures* and *AS 4773 Masonry for Small Buildings Parts 1 and 2.*

4.19 Raking of joints

Within the first 12 months from completion of the work and where documented, mortar joints in masonry units are defective if they are raked out to a depth of more than 10mm or are not consistent in depth throughout.

4.20 Brick sills, sill tiles and shrinkage allowance for timber framing

In masonry veneer walls a gap must be left between the timber frame and the top of the masonry wall, window sills etc., to allow for initial settlement of the timber framing caused by timber shrinkage. Refer to Figure 4.20 in this Guide.

Work that does not provide the following clearances and causes damage within the first 12 months from completion of construction is defective:

- 10mm at sills of windows; and
- 12mm at roof overhangs.

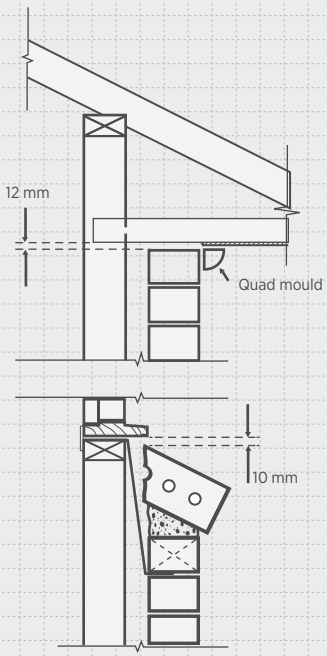
If unseasoned hardwood timber is used, clearances must be increased from these minimums to suit the particular timber species used.

4.21 Sealing of masonry articulation joints

Articulation joints in masonry veneer, single skin masonry or double skin masonry, are defective if they have not been sealed.

Within the first 12 months from completion of the work and unless documented otherwise, flexible mastic or sealant is defective if it does not match as close as practicable the colour of the adjacent surface, and has not been used in accordance with the manufacturer's installation instructions.

FIGURE 4.20 SHRINKAGE ALLOWANCE FOR TIMBER FRAMING



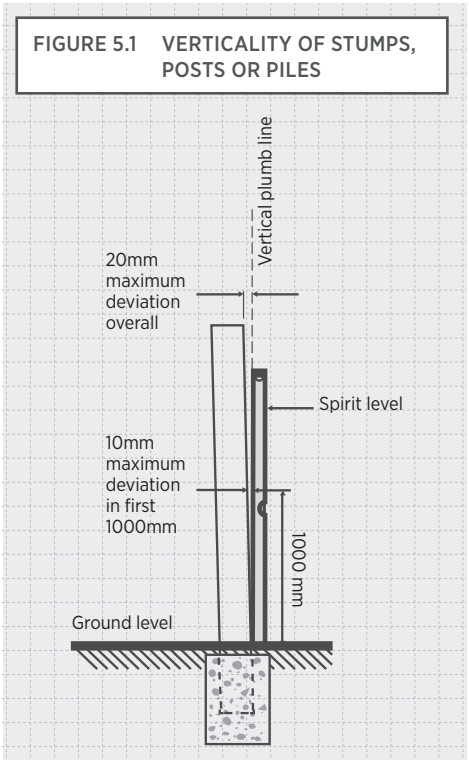
5. FRAMING

5.1 Verticality or plumbness of stumps or piles

Within the first 12 months from completion of the work, stumps or piles are defective if they deviate from vertical by more than 10mm in the first 1m or more than 20mm in total length, measured from ground level. Refer to Figure 5.1 in this Guide.

Within 6 years and 6 months from the completion of the work, stumps and piles are defective if they deviate from vertical by more than 10mm in the first 1m or more than 20mm in total length, measured from the ground and as a result compromises the structural adequacy of the stumps or piles, allows water penetration into the building, or compromises the health and safety of those who use the building.

FIGURE 5.1 VERTICALITY OF STUMPS, POSTS OR PILES



5.2 Verticality or plumbness of timber frames and exposed posts

Within the first 12 months from completion of the work, posts and wall frames are defective if they deviate from vertical by more than 4mm within any 2m height. Refer to Figure 1.3 B in this Guide for method of measurement.

Within 6 years and 6 months from completion of the work, posts and wall frames are defective if they deviate from vertical by more than 4mm within any 2m height and as a result compromises the structural adequacy of the wall or building, allows water penetration into the building or compromises the health and safety of those who use the building.

5.3 Straightness of timber frame surfaces

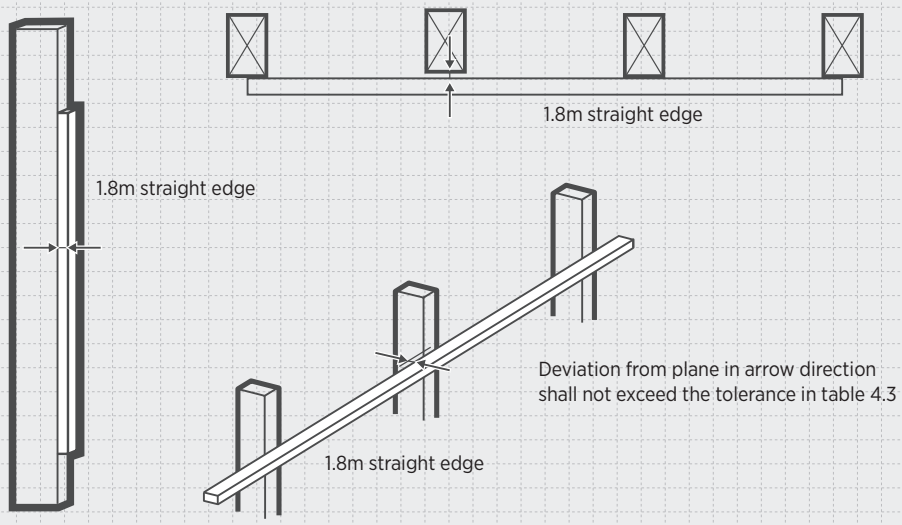
Within the first 12 months from completion of the work, frames are defective if they deviate from plane (horizontal or vertical bow) by more than 4mm in any 2m length of wall. Refer to Figure 1.3 A and B in this Guide for method of measurement.

Frames that will be subject to the subsequent fixing of plasterboard must be such that when a 1.8m straight edge is placed over the wall frame the maximum deviation from the straight edge must not exceed 4mm over 90% of the area and not exceed 5mm over the remaining area.

Within the first 12 months from completion of the work, frames that exceed these tolerances are defective. Refer Figure 5.3 which reproduces Table 4.2.2 from *AS 2589.*

FIGURE 5.3 DEVIATION IN THE POSITION OF THE BEARING SURFACE OF THE FINISHED FRAMING: DAMAGE WITH REFERENCE TO WALLS

SUBSTRATE TYPE	LEVELS 3 AND 4		LEVEL 5	
	DEVIATION OF 90% OF AREA (MM)	DEVIATION OF REMAINING AREA (MM)	DEVIATION OF 90% OF AREA (MM)	DEVIATION OF REMAINING AREA (MM)
Steel and timber framing and battened masonry	4	5	3	4



Extract from AS2589 - Gypsum lining: Application and finishings[5]

[5] *Reproduced with permission from Standards Australia under licence CLT1123qbc.*

5.4 Steel wall frames

Steel wall framing is defective if it does not comply with the NCC and one of the following: *AS 4100 – Steel structures*, *AS/NZS 4600 – Cold Formed Steel Structures*, or *NASH – Residential and Low-rise Steel Framing – Part 1 Design Criteria.*

Within the first 12 months from completion of the work, walls that are specified as straight are defective if they deviate by more than 5mm over a 3 metre wall length and where wall panels join to form a continuous wall, the critical face or faces of the panel are defective if they deviate by more than 2mm at the joint.

Within the first 12 months from completion of the work, frames that will be subject to the subsequent fixing of linings must be such that when a 1.8m straight edge is placed over the wall frame the maximum deviation from the straight edge must not exceed 3mm over 90% of the area and not exceed 4mm over the remaining area. Frames that exceed these tolerances are defective.

Within the first 12 months from completion of the work, walls must not deviate from vertical by more than H/600 where H is the height of the wall, or 3mm, whichever is the greater. Walls that exceed these tolerances are defective.

Within the first 12 months from completion of the work, loadbearing structural walls are defective if the gaps between the bottom plate and concrete slab are greater than 3mm and are not packed at each stud with load bearing shims or grout. Non-loadbearing walls are defective if gaps between the bottom plate and concrete slab exceed 3 mm and the gaps are not filled at each jamb stud and at points where fixed to the slab with load bearing shims or grout.

Within 6 years and 6 months from completion of the work, the wall frames are defective if they compromise the structural adequacy of the wall or building, allow water penetration into the building or compromise the health and safety of those who use the building.

5.5 Packing under timber bearers

Packing to stumps or piers under bearers is defective if it is not made of durable, non-compressible materials, such as engineered plastic packers, or does not provide the minimum bearing area required by the *AS 1684 – Residential Timber-framed Construction*, or is more than a total thickness of 20mm or is not fixed in a workman-like manner.

5.6 Attachment of joist, bearers and trusses to steel wall frames

Attachment of floor joists, bearers, trusses and rafters to walls is defective if the gap between these members and the wall exceeds 3mm and the gap is not packed with load bearing shims.

5.7 Timber shrinkage

Within the first 12 months from completion of the work, timber is defective if it has shrunk more than 10% if it is unseasoned or 3% if it is seasoned.

Within 6 years and 6 months from the completion of the work, timber is defective if it has shrunk more than 10% if it is unseasoned and 3% if it is seasoned and as a result compromises the structural adequacy of the timber, allows water penetration into the building, or compromises the health and safety of those who use the building.

5.8 Fixing timber stud walls to concrete slabs

Fixing of timber bottom plates is defective if it does not comply with the NCC, *AS 1684 – Residential Timber-framed Construction* and the fixing manufacturer's installation requirements.

5.9 Fixing metal stud walls to concrete slabs

Fixing of metal bottom plates is defective if it does not comply with the BCA and the fixing manufacturer's installation requirements.

5.10 Treads and risers in stairs

Stairs are defective if they do not comply with the requirements of the NCC. The top and bottom risers may be varied to allow for the installation of the approved documented floor finishes, to provide uniform and constant riser height throughout after the installation of the approved floor finishes.

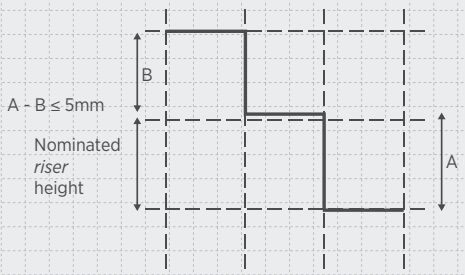
Stairs must be built with constant goings and risers except as permitted by the variations stated within the National Construction Code.

The variations are intended to account for conditions such as movement of materials due to atmospheric moisture changes or minor deviations in materials.

The finished going and riser dimensions however must not exceed the limitations for the maximum and minimum dimensions as stated in the code.

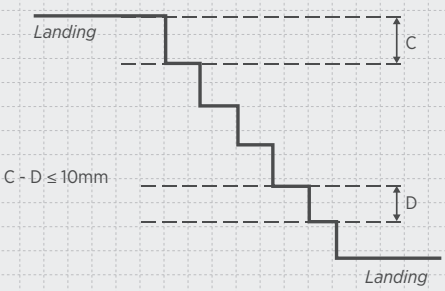
FIGURE 5.10 MINOR DEVIATIONS IN A STAIRWAY

Diagram a.
Deviation in adjacent risers



Notes:
1. A = larger *riser* of two adjacent *risers*.
2. B = smaller *riser* of two adjacent *risers*.
3. This diagram only shows deviations in *risers*, however the same principle can apply for *goings*.

Diagram b.
Deviations over a flight



Notes:
1. C = largest *riser* of the *flight*.
2. D = smallest *riser* of the *flight*.
3. This diagram only shows deviations in *risers*, however the same principle can apply for *goings*.

The allowable tolerances have two concurrent requirements:

- adjacent risers or adjacent goings must be within 5mm of each other; and
- the largest and smallest riser, or the largest and smallest going within a flight must be within 10mm of each other.

These tolerances shall not be applied to allow for poor construction practice.

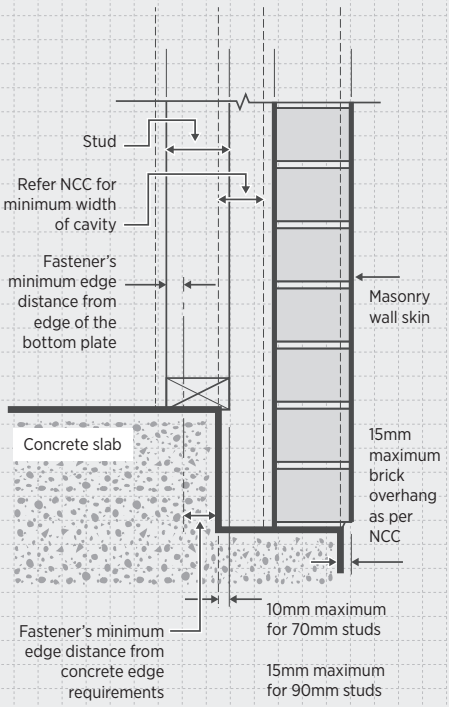
5.11 Bottom plates that overhang concrete slabs

Bottom plates that are at least 90mm wide and overhang concrete slabs by in excess of 15mm are defective and bottom plates that are 70mm wide and overhang slabs by in excess of 10mm are defective, refer to Figure 5.11. In each instance, these permissible overhangs, are subject to the minimum edge distance for both the bottom plate and the concrete slab fixing locations being satisfied and minimum cavity widths as required by the NCC also being maintained.

5.12 Timber durability

Timber used for structural purposes is defective if it does not have adequate durability for its relevant exposure conditions as defined in the NCC and *Queensland Government, Department of Agriculture, Fisheries and Forestry - Construction Timbers in Queensland.*

FIGURE 5.11
BOTTOM PLATES THAT OVERHANG CONCRETE SLABS



6. WALL CLADDING

6.1 Leaks in wall cladding

Completed wall cladding and accessories are defective if they leak under weather conditions anticipated by the NCC.

6.2 Wall cladding

Within the first 12 months of completion of the work, staining, folds, splits, dents, open joints between panels, cracking and other distortions in wall cladding, are defects if they are visible from a normal viewing position at ground level or an upper floor level.

Within 6 years and 6 months from completion of the work, the wall cladding is defective if it compromises the structural adequacy of the wall or building, allows water penetration into the building or compromises the health and safety of those who use the building.

7. ROOFING

7.1 Flashings and accessories

Completed flashings and accessories are defective if they leak under weather conditions anticipated by the NCC.

Inadequate construction of roof flashings such as cavity flashings, stepped flashings, parapet flashings, apron flashings and hip and valley flashings are a major cause of leaking roofs.

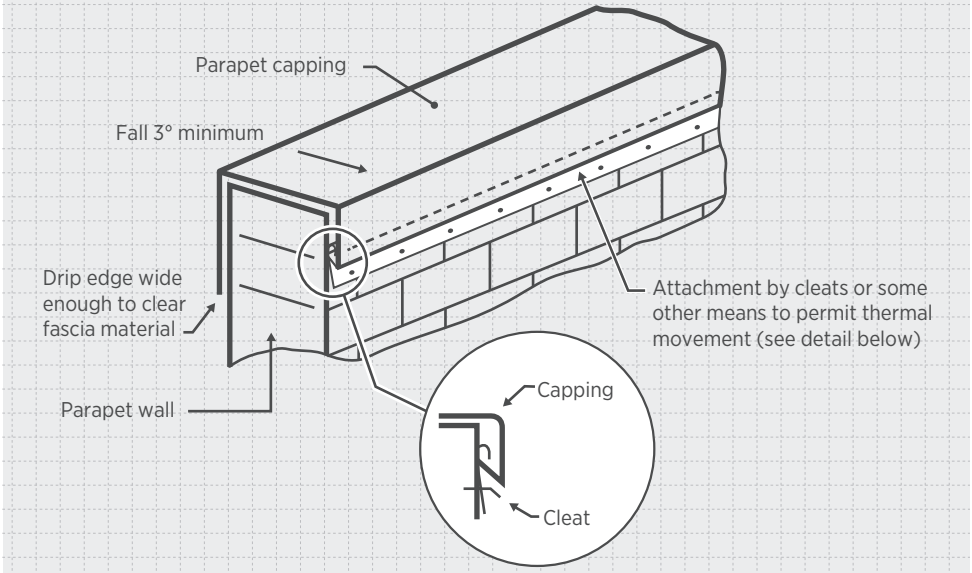
Some recommended flashings details sourced from the NCC, *AS Handbook HB39 – Installation Code for Metal Roofing and Wall Cladding* and manufacturer's installation recommendations, are provided in Figures 7.1 (A–F).

Where a membrane system is used on parapet walls these systems are defective if they are not installed in accordance with *AS 4654 – Waterproofing Membranes for External Above-ground Use.*

7.2 Leaks in roofing

Roofing and accessories are defective if they leak under weather conditions anticipated by the NCC.

FIGURE 7.1A PARAPET FLASHING (SOURCE HB39)



Extract from *AS Handbook HB39 - Installation Code for Metal Roofing and Wall Cladding*[6]

[6] *Reproduced with permission from Standards Australia under licence CLT1123qbc.*

FIGURE 7.1B PARAPET FLASHING SET INTO BRICKWORK OR ROOF TO WALL FLASHING (SOURCE NCC)

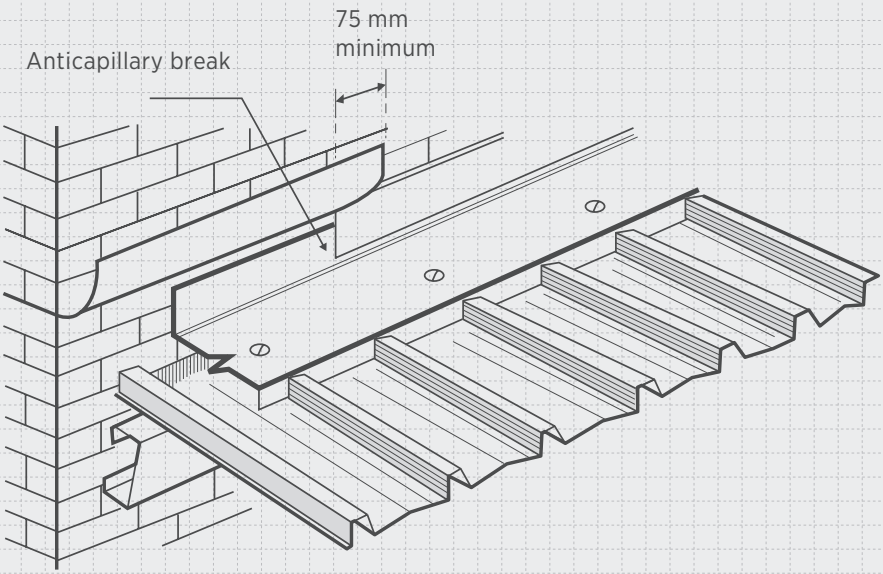


FIGURE 7.1C STEPPED CAVITY FLASHING

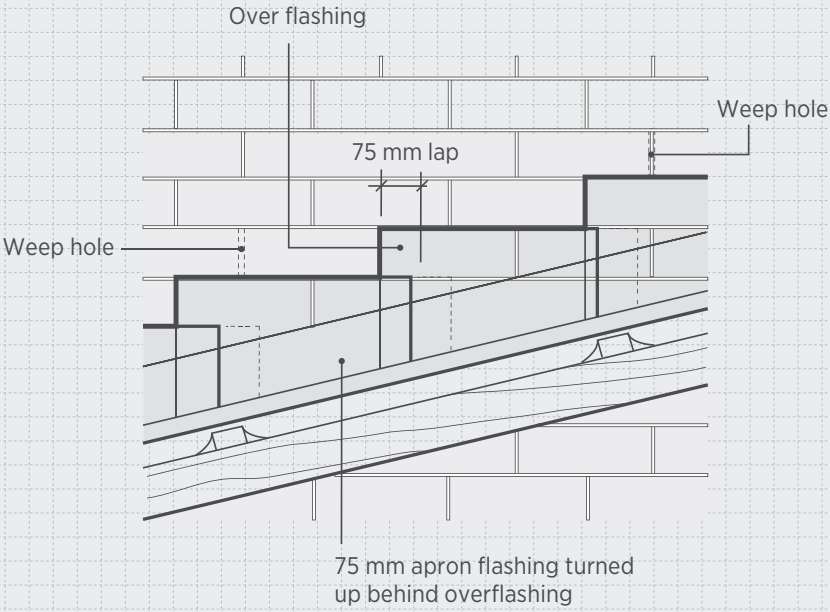


FIGURE 7.1D APRON/COVER FLASHING

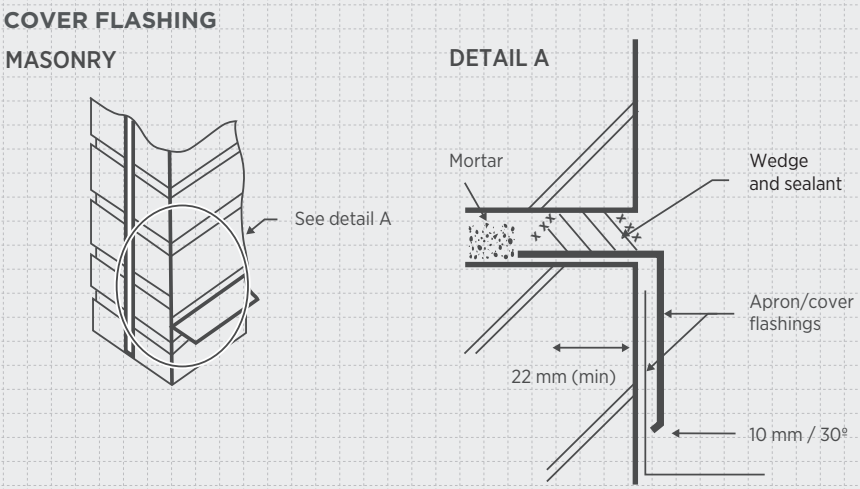


FIGURE 7.1E SKILLION PATIO ROOF EXTENSION TO EXISTING DWELLING

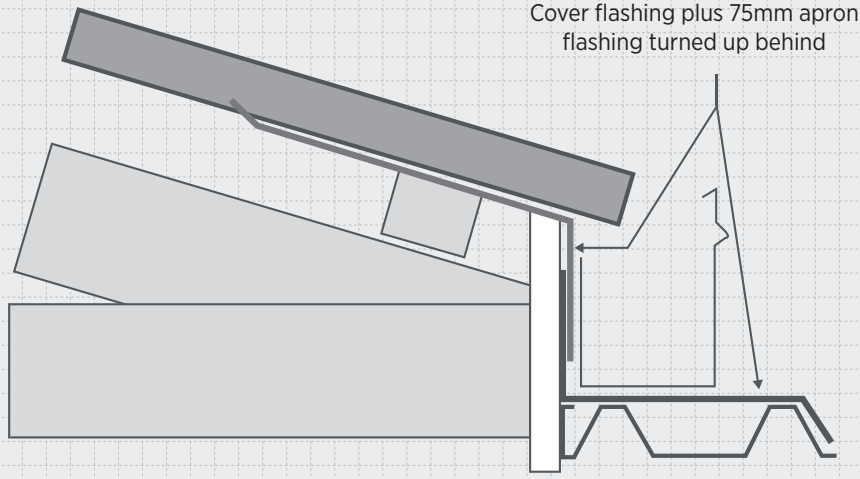
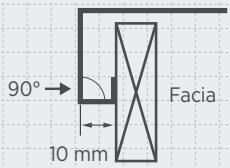
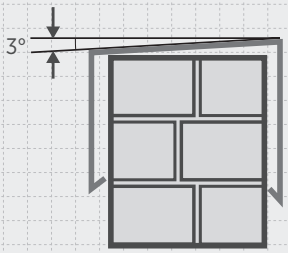


FIGURE 7.1F ANTI-CAPILLARY BREAKS

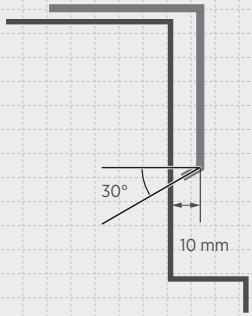
FACIA FLASHING



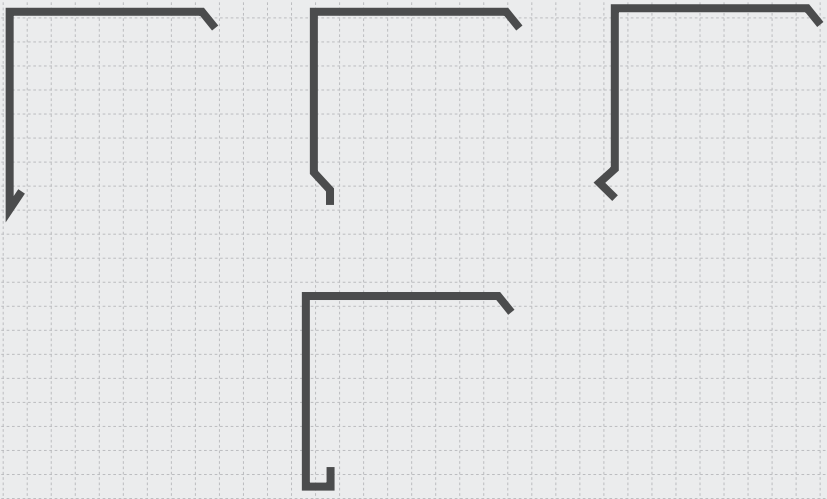
BRICK PARAPET



COVER FLASHING



RETURN TO SUIT PROFILE DEPTH



7.3 Roof cladding

Within the first 12 months from completion of the work, staining, folds, splits, dents, open joints between panels, cracking and other distortions in roof cladding are defects if they are visible from a normal viewing position at ground level or an upper floor level, unless these imperfections were caused by actions or inactions of the owner, or other persons outside of the contractor's control (e.g. installation on the roof of satellite TV).

Any corrosion of roof cladding is a defect unless caused by actions or inactions of the owner (e.g. inadequate maintenance).

Roof cladding and/or flashings, screws and other fixings are defective if they do not comply with the corrosion resistance provisions of the NCC for the exposure conditions of the site.

Roof cladding and/or flashings, screws and other fixings are defective if they have not been installed in accordance with the requirements of the NCC and manufacturer's installation instructions.

7.4 Roof tiles

Roof tiles are defective if they have not been supplied and fixed in accordance with the NCC, *AS 2049 – Roof Tiles and AS 2050 – Installation of Roof Tiles* and manufacturer's installation instructions.

Within the first 12 months from completion of the work, roof tiles are defective if they do not conform to the manufacturer's sample.

Within the first 12 months from completion of the work, irregularities in tiles are defects if they are visible from a normal viewing position at ground or upper floor levels.

Minor surface marks or blemishes arising from the tile manufacturing process are not defects.

7.5 Roof tile pointing

Unless documented otherwise, the absence of pointing where required by the NCC, *AS 2050 - Installation of Roof Tiles* or the Manufacturer's installation instructions is a defect. Within the first 12 months of completion of the work, pointing is defective if it becomes dislodged or washed out. Minor cracking of pointing is not a defect.

Within the first 12 months of completion of the work, pointing is defective if it is not uniform in colour, texture and trowelled off to provide a neat appearance. The rectification of pointing shall match the existing colour and texture as close as practicable.

7.6 Overhang of roofing (tiles and sheet roofing)

Tiled roofing is defective if tiles overhang the inside face of a gutter by less than 35mm or by more than 65mm.

Sheet roofing is defective if it overhangs the inside face of a gutter by less than 50mm or by more than 65mm. Refer to Figure 7.6 in this Guide.

7.7 Cutting of roof tiles

Within the first 12 months from completion of the work, tiles are defective if they are not cut neatly to present a straight line at ridges, hips, verges and valleys.

7.8 Dry valley construction

Dry valleys, where they are documented, are defective if they are not constructed in accordance with the NCC or the manufacturer's installation instructions.

7.9 Undulating tiled roof lines

Within the first 12 months of completion of the work, undulations in the line of roof tiles are defects if the variation exceeds 20mm in any 4m length measured in the roof plane.

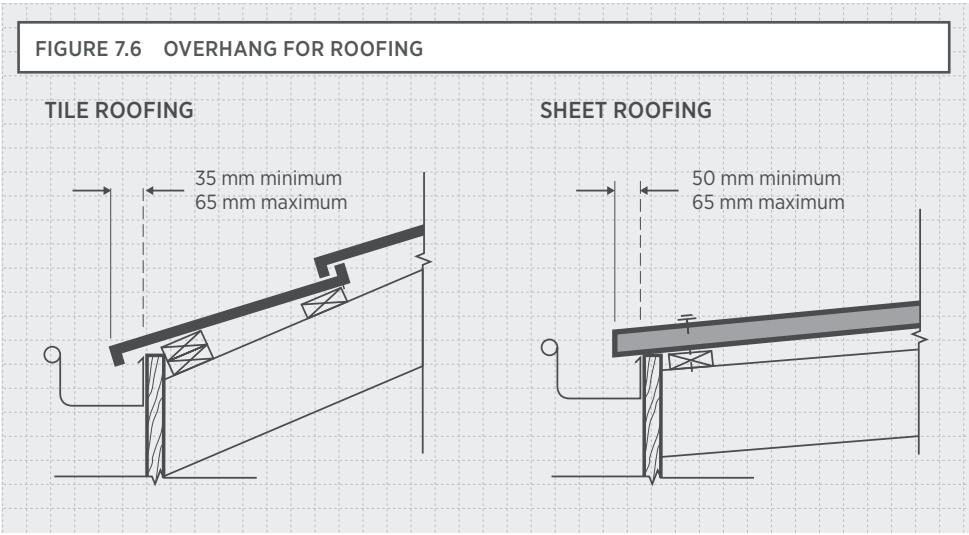
7.10 Alignment of trusses

Trusses or chords of trusses that bow more than the lesser of L/200 or 50mm are defective, where L is the length of the truss or chord.

7.11 Verticality or plumbness of trusses

Trusses or parts of trusses that are erected with a vertical deviation more than the lesser of H/50 or 50mm are defective, where H is the height of the truss.

FIGURE 7.6 OVERHANG FOR ROOFING



8. PLUMBING

8.1 Plumbing general

Any plumbing work is defective if it does not comply with relevant provisions of the NCC, *Plumbing Drainage Act 2018* & Regulations.

8.2 Design of gutters and downpipes

Gutters and pipes that are not designed and installed in accordance with the NCC are defective.

Downpipes are inadequate and defective if they serve more than 12m of gutter length for each downpipe.

8.3 Water retention in gutters

Gutters are defective if they retain a depth of more than 10mm of water.

8.4 Joints in gutters

Unless documented otherwise, gutters are defective if:

- joints are lapped less than 25mm;
- laps are not in the direction of flow to the outlet; or
- joints leak.

8.5 Fixing of gutters and downpipes

Gutters are defective if they are not securely fixed at stop ends and fixed at not more than 1.2m centres. Downpipes are defective if they are not securely fixed.

8.6 Flashings

Flashings are defective if they are not provided in accordance with the requirements of the NCC. Wall and step flashings, and sloping flashings cut into walls are defective if they do not incorporate weathering folds, anti-capillary breaks and sealing.

8.7 Water hammer

Within the first 12 months from completion of the work, water hammer is a defect unless it is caused by the use of solenoid or ceramic valves in appliances.

8.8 Pipe penetrations through external walls and inside cupboards

Within the first 12 months from completion of the work, plumbing holes are defective if they are not properly grouted as appropriate, or in the case of cabinet work, fitted through neat minimum size penetrations, or fitted with tight fitting cover plates or collars with penetrations kept to the smallest size practicable.

8.9 Water discharge from outlets

Water discharge from outlets is defective if it does not drain properly and clears the surrounds of vessels such as baths, basins, troughs or sinks, unless the inability to drain has been caused by actions or inactions of the owner, or other person outside of the contractor's control.

9. WINDOWS AND DOORS

9.1 Installation of external windows and doors

Unless documented otherwise, external windows and doors are defective if they are not installed and flashed to the relevant provisions of the NCC, applicable Australian Standards and the manufacturer's installation instructions.

9.2 Weather-tightness of windows, doors and window and door frames

Window and door frame installations are defective if they allow water to penetrate to rooms in weather conditions anticipated by the NCC.

Windows and doors are defective if, when closed, they allow the entry of water to rooms in weather conditions anticipated by the NCC.

Water entry through doors is not a defect if they are not intended to prevent water entry. For example, vehicle access doors.

Where external membrane systems are used as part of the weatherproofing system these installations are defective if they are not installed in accordance with *AS 4654 – Waterproofing Membranes for External Above-ground Use.*

9.3 Door handles, locks and latches

Within the first 12 months of completion of the work, handles, locks and latches are defective if they do not operate as intended by the manufacturer.

9.4 Internal door clearances

With the exception of fire doors and unless documented otherwise, the installation of doors is defective, if within the first 12 months of completion of the work, clearances between door leaves and frames and between adjacent door leaves are not uniform and within 1mm of the documented dimension.

Within the first 12 months after completion and if not otherwise documented:

- A clearance between door leaves or between a door leaf and the frame is defective if it is less than 2mm or greater than 4mm in width
- Unless additional clearance is required for removable toilet door, make up air or air ventilation, a clearance between, the door and the floor finish is defective if it is greater than 15mm after installation of the floor covering.

Note: Clearances under doors will generally be determined by the nominated floor coverings.

9.5 Distortion of doors

Door leaves are defective if, within the first 12 months of completion of the work, they twist or bend to the extent that the door will not properly close, latch or lock.

Door leaves are defective if they allow water penetration into the building under weather conditions anticipated by the NCC.

9.6 Sealing of door edges

Within the first 12 months from completion of the work, door leaves are defective if they do not have all sides, top and bottom edges sealed in accordance with manufacturer's recommendations.

9.7 Operation of windows and doors

Within the first 12 months from completion of the work, doors and windows are defective if they bind or jam as a result of the contractor's poor workmanship.

9.8 Bowed window heads, sills and jambs

Work is defective if all clearances around window heads, jambs and sills are not sufficient to enable installation of the windows to be plumb, level and prevent loads from being imposed on the windows.

Refer also to Section 4.20 Brick sills, sill tiles and shrinkage allowances for timber framing.

9.9 Window barriers

Windows to be protected

Windows are defective if they do not comply with NCC requirements that requires a window opening must have protection if the floor below the window in a bedroom is 2m or more above the surface beneath.

Window openings that are located 1.7m above the floor level are not required to be protected.

Refer to Figure 9.9 in this Guide.

Type of protection

Windows requiring protection are defective if they are not fitted with a device to restrict the window opening or a screen, with secure fittings. The device or screen, where required, is defective if it permits a 125mm sphere to pass through the window or screen or is unable to resist an outward horizontal action of 250 N.

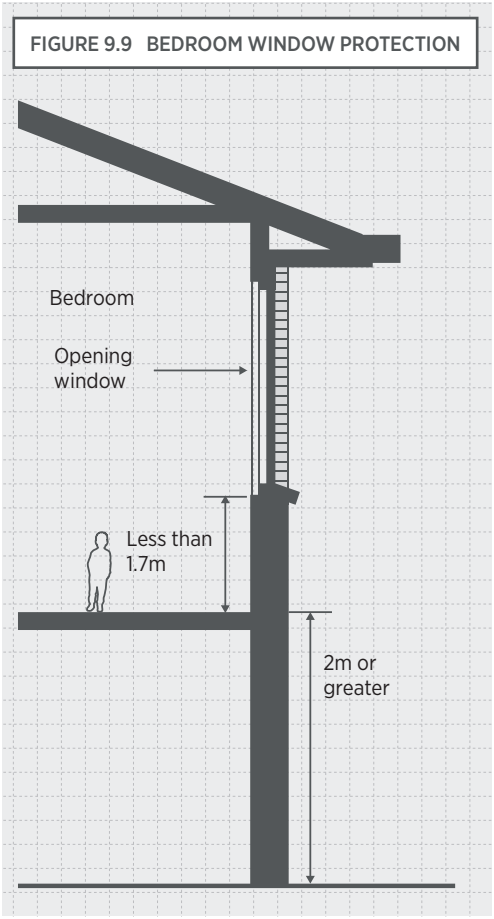
In cases where the screen or device can be removed, unlocked or over ridden, the installations are defective if they are not fitted with a child resistant release mechanism.

Barrier

In addition to window protection, windows are defective if a barrier is also not installed below the window whenever a child resistant release mechanism is required to be installed in a bedroom; or for all openable windows, in any room, that has a floor level located 4m or more above the surface beneath, if the window is not protected.

The barrier is defective if it permits a 125mm sphere to pass through it or if it has any horizontal or near horizontal elements between 150mm and 760mm above the floor that can facilitate climbing.

FIGURE 9.9 BEDROOM WINDOW PROTECTION



10. PLASTERING, RENDERING AND PLASTERBOARD

PLASTERING AND RENDERING

10.1 Matching and repairing existing rendered surfaces

Within the first 12 months from completion of the work, repaired work is defective if it does not match as close as possible to existing work. In some instances this may not be possible as the original finish may have significantly aged or the material composition may be impossible to determine without expensive research.

When matching an existing finish, a practical approach must be adopted. Where possible, a physical joint, a door, a window, a downpipe or other similar separator should be incorporated to lessen the visual impact of the new work. Where this is not possible, the whole of that wall from corner to corner should be re-finished.

Generally, painting pre-coloured render to hide defects is not recommended as this significantly changes texture and appearance.

10.2 Cracking and other blemishes in external rendered surfaces on masonry substrate

Assess crack categories and defects in external rendered surfaces on masonry substrate in accordance with Table 4.2. Category 0 and 1 cracks are not defects. Category 2 cracks are defects if they are identified within 12 months from the date of completion of the work.

Within the first 12 months from completion of the work, obvious spot rust marks, due to the composition of the material and other blemishes, are defects if they are visible from a normal viewing position.

10.3 Articulation or control joints – provision and cracking

Unless documented otherwise within the first 12 months from completion of the work, cracks in external rendered surfaces are defects if control joints in the substrate have not been carried through the render or if control joints have not been installed in accordance with the render or coating manufacturer's recommendations.

Unless documented otherwise, within 6 years and 6 months from completion of the work, cracks in external rendered surfaces are defective if they allow water penetration into the building or compromise the health and safety of those who use the building.

With the exception of paint and recommended mastic sealants, render or other applied finishes are defective if they cover articulation or control joints.

10.4 Covering articulation or control joints and damp-proof courses

Mouldings and inflexible covering strips are defective if they are installed across articulation or control joints and are fixed or restrained on both sides.

Applied finishes are defective if they impede the performance of any damp-proof course or sub-floor ventilation required in accordance with the NCC.

Within the first 12 months from completion of the work and unless documented otherwise, flexible mastic or sealant is defective if it does not match as close as practicable the colour of the adjacent surface and has not been used in accordance with the manufacturer's installation instructions.

10.5 Cracking in external applied finishes used over lightweight substrate

Cracks or open joints in external finishes applied to lightweight substrate are defects if they are greater than 1mm and are visible from a normal viewing position within 12 months after completion of the work.

Cracks or open joints in external finishes (excluding painting) applied to lightweight sheet substrate are defects if they allow the ingress of water.

10.6 Cracks in internal rendered finishes including hard plaster

Assess crack categories and defects in internal rendered surfaces on masonry substrate in accordance with Table 4.2. Category 0, 1 and 2 cracks are not defects. Category 3 and 4 cracks are defects.

10.7 Cracking in external mouldings

Cracks in mouldings and/or other architectural features, including joints between those features and adjacent surfaces, are defects if they are greater than 1mm and are visible from a normal viewing position within the first 12 months of completion of the work.

10.8 Verticality or plumbness of internal and external wall surfaces

Within the first 12 months from the completion of the work, wall surfaces are defective if they deviate from vertical by more than 4mm within any 2m height. For tolerances in masonry refer to Table 4.4 in this Guide.

10.9 Straightness of internal and external wall surfaces

Within the first 12 months from completion of the work, walls are defective if they deviate from plane (bow) by more than 4mm within any 2m length of wall. This tolerance includes internal walls with a build up of plaster at internal and external corners of the plasterwork.

PLASTERBOARD AND OTHER SHEETING

10.10 Plasterboard sheeting

Within the first 12 months from completion of the work, the installation and jointing of plasterboard sheeting systems is defective if it does not conform to *AS/NZS 2589.1 - Gypsum Linings - Application and Finishing* and the manufacturer's installation instructions.

Within 6 years and 6 months from the completion of the work, the installation and joining of a plasterboard sheeting system is defective if it compromises the health and safety of those who use the building.

10.11 Defects in other sheeting systems

Defects in the installation of other sheeting systems such as fibre cement sheeting shall be assessed in the same manner as plasterboard sheeting.

10.12 Back blocking

Within the first 12 months from completion of the work, plasterboard ceilings and walls are defective if they have not been back blocked in accordance with *AS/NZS 2589.1 - Gypsum Linings - Application and Finishing.*

In particular Level 4 ceilings in any area that contains three or more recessed joints must be back blocked in accordance with *AS 2589.*

10.13 Level of finish for plasterboard

Within the first 12 months from completion of the work, unless documented otherwise, a plasterboard finish is defective if a Level 4 finish (as defined below) is not provided.

Notwithstanding the above, unless documented otherwise, plasterboard in areas not readily visible such as non-walk-in cupboards, concealed storage areas such as under stairs and non-liveable attics, a Level 3 finish is acceptable.

LEVEL OF FINISH

A Level 4 finish shall be the default level for gypsum lining, unless specified otherwise. Flat or low sheen paints shall be used for this Level 4.

All joints and interior angles shall have tape embedded in jointing cement/jointing compound and a minimum of two separate coats of jointing cement/jointing compound applied over all joints, angles, fastener heads and accessories.

All jointing compound shall be finished evenly and be free of tool marks and ridges in preparation for decoration.

NOTES:

1. In critical lighting conditions, surface imperfections may still be apparent in a Level 4 surface finish.
2. Where gloss, semi-gloss and deep tone paints are used, surface imperfections will be more evident.

* *[AS/NZS 2589 Gypsum linings - Application and Finishing - Clause 3.1.4 - Level 4] - Reproduced with permission from Standards Australia under licence CLT1123qbc.*

10.14 Cracking in plasterboard, hard plaster and other plaster elements

Within the first 12 months from completion of the work, cracking in walls, ceilings and bulkheads is a defect if it is visible from a normal viewing position.

Within the first 12 months from completion of the work, cracking in recessed and butt joints is a defect if it is visible from a normal viewing position.

Cracking after the initial 12 month period shall be assessed in accordance with Table 4.2. Category 0, 1 and 2 cracks are not defects. Category 3 and 4 cracks are defects.

10.15 Cracking in cornices

Within the first 12 months from completion of the work, cracking of cornice joints such as butt joints and mitres, and at junctions with walls and ceilings is a defect if it is visible from a normal viewing position.

Cracking after the initial 12 month period shall be assessed in accordance with Table 4.2. Category 0, 1 and 2 cracks are not defects. Category 3 and 4 cracks are defects.

10.16 Cracking at junctions of dissimilar materials

Within the first 12 months of completion of the work, cracking at junctions between dissimilar materials is a defect if it is visible from a normal viewing position.

Cracking after the initial 12 month period shall be assessed in accordance with Table 4.2. Category 0, 1 and 2 cracks are not defects. Category 3 and 4 cracks are defects.

10.17 Straightness and alignment of plaster cornices

Within the first 12 months from completion of the work, plaster cornices are defective if they deviate from a straight line greater than 4mm over a length of up to 2m.

10.18 Peaking or jointing in plasterboard

Within the first 12 months from completion of the work, plaster peaking or jointing is a defect if it is visible from a normal viewing position.

10.19 Nail popping in plasterboard

Nail popping in plasterboard sheeting is a defect if it occurs within the first 12 months of completion of the work or if it occurs within 6 years and 6 months from completion of the work and has the potential to cause collapse.

11. INTERNAL FIXING

11.1 Gaps associated with internal fixing

Within the first 12 months from completion of the work, and unless documented otherwise, gaps between mouldings or between mouldings and other fixtures, at mitre or butt joints, or at junctions with a wall or other surfaces, are defects if they exceed 1mm in width and are visible from a normal viewing position.

11.2 Joints in fixing of internal mouldings

Within the first 12 months from completion of the work, and unless documented otherwise, the faces of architraves and skirtings are defective if they are not aligned and flush at mitres and butt joints and the misalignment can be seen from a normal viewing position.

11.3 Architrave quirks

Within the first 12 months from completion of the work, and unless documented otherwise the width of the quirk (setback from the edge) of each length of an architrave is defective if it is not consistent and where the irregularity can be seen from a normal viewing position.

11.4 Cabinet doors and door fronts

Within the first 12 months from completion of the work, and unless otherwise specified, cabinet door and drawer fronts are defective if they are not aligned, or do not have consistent gaps between doors and between drawers.

11.5 Natural materials

Materials such as timber, granite and marble are natural products that may have blemishes and variations in pattern and colour that are natural characteristics of the material. Stone materials are often brittle and may be easily cracked. Polished stone surfaces can be porous and subject to staining.

11.6 Natural stone surfaces

Within the first 12 months from completion of the work, any cracking, displacement, pitting or similar blemishes in natural stone, marble or similar materials are defects if they are caused by the contractor and can be seen from a normal viewing position.

11.7 Replacing defective work of natural stone or similar materials

Within the first 12 months from completion of the work, replacement stone or similar material is defective if the replacement material does not match the adjacent areas. If matching of stone is not possible, the whole area of stone shall be replaced.

11.8 Joints in timber, stone and laminated bench tops

Within the first 12 months from completion of the work, bench tops of timber, laminate, natural stone or similar materials are defective if they have joints that are not uniform, close-fitted, aligned and in the same plane. These requirements also apply to vertical surfaces of similar material and finish. Joints are defective if they are not sealed or flush-filled with a suitable flexible sealant of matching colour.

11.9 Sealing around benches and items installed in benches

Within the first 12 months from completion of the work and where required, junctions between bench tops and adjoining surfaces are defective if they are not sealed with an agreed or suitable flexible sealant of matching colour. Within the first 12 months from completion of the work, sealing around items such as sinks, hand basins etc., is defective if the joint leaks, or if it is not carried out in accordance with the manufacturer's installation instructions.

12. FLOOR AND WALL TILING

12.1 Floor and wall tiling

Unless documented otherwise, tiling work and materials must comply with *AS 3958.1: Ceramic Tiles – Guide to the Installation of Ceramic Tiles, AS 3958.2: Ceramic Tiles – Guide to the Selection of a Ceramic Tiling System* and the manufacturer's installation instructions for the materials selected.

In renovation, alteration or repair work where new tiles are to be used to match existing tiles, it may be impossible to match the new to existing work. The use of a tile that is slightly different in colour, size, texture etc. is not a defect.

Where non-matching tiles have to be used, a joint location such as the aluminium channel of a shower screen, a separating doorway, an intersecting wall, a change in wall direction or similar should be selected to separate the different tiles.

12.2 Floor and wall tiling where the contractor supplies the tiles

Where the supply and laying of tiles is by the contractor as part of the building contract, the failure of the tiles, substrate, adhesive or grout is a defect.

Tiles supplied by the contractor are defective if they do not comply with *AS ISO 13006 Ceramic Tiles - Definitions, Classification, Characteristics and Markings* and *AS 4459 Methods for Sampling and Testing Ceramic Tiles.*

Tiles supplied by the contractor are defective if they are not fit for their intended purpose (e.g. wall tiles must not be installed on the floor etc.)

Tiles used in wet areas are defective if they exhibit reverse water staining.

12.3 Floor and wall tiling where the owner supplies the tiles for laying by contractor

Within the first 12 months from completion of the work, faulty installation of tiles is defective if caused by the contractor's workmanship.

Any fault in the tiles is the responsibility of the owner - except where faults in the tiles should have been apparent to the contractor at the time of laying.

12.4 Cracked, pitted, chipped, scratched, or loose tiles

Within the first 12 months of completion of the work, tiles are defective if they are cracked, pitted, chipped, scratched, or loose unless such cracking, pitting, chipping or scratching has been caused by actions or inactions of the owner or others outside of the contractor's control.

Within 6 years and 6 months from the completion of the work, cracked, pitted, chipped, scratched or loose tiles are defective if they allow water penetration into the building, or compromise the health and safety of those who use the building.

12.5 Grout

Within the first 12 months of completion of the work:

- Grouting is defective if it is not installed to the requirements of *AS 3958.1 Ceramic Tiles – Guide to the Installation of Ceramic Tiles*.
- Grout lines are defective if they are not, as far as practicable, of consistent width.
- Finished grout is defective if it is not uniform in colour and is not smooth, without voids, pinholes or low spots and finished to the cushion on cushion edged tiles and flush with square edge tiles, except for tooling in accordance with *AS 3958.1 - Ceramic Tiles – Guide to the Installation of Ceramic Tiles*.
- Grout is defective if it becomes loose or dislodged.

12.6 Flexible sealants to junctions

Within the first 12 months of completion of the work, flexible or waterproof sealants to junctions are defective if they are not installed when required by the NCC and *AS 3958.1 Ceramic Tiles – Guide to the Installation of Ceramic Tiles*, or in accordance with the requirements of the manufacturer.

12.7 Uneven tiling

Within the first 12 months of completion of the work, except where tiles have distortions inherent in the manufacture, tiling is defective if it has joints that are not uniform, of even width, aligned or in the same plane. Large tiles could present problems when required to fall and drain to a floor outlet and may need to be cut to achieve required falls.

Within the first 12 months from completion of the work, tiling is defective if, when measured with a straight edge, the finished surface is not flat or true within a tolerance of plus or minus 4mm in 2m from the required plane.

Within the first 12 months, lippage between two adjacent tiles is defective if it exceeds 2mm and for tiles where the surface has been ground flat, e.g. polished tiles; tiles are defective if the lippage exceeds 1.5mm, and for joint widths of 3mm or less, 1mm.

12.8 Control joints

Floor tiling is defective if it has not been installed with movement or control joints as required by *AS 3958.1* including at the following locations:

- Joints located above movement or control joints in the substrate
- Joints that separate the tiled elements from fixed elements such as column and walls
- Intermediate joints that sub-divide large tiled areas into smaller sections:
  - In internal floors not subject to sunlight where any dimension of the floor exceeds 9m and should be evenly spaced at 4.5m.
  - In internal floors subjected to sunlight where any dimension exceeds 6m and should be evenly spaced at 4.5m centres.
  - In external floors where any dimension exceeds 4.5m and should be evenly spaced at 4.5m centres.

13. PAINTING

13.1 Standard of painting

Coatings used are to be suitable for the relevant conditions and relevant wear and tear. Unless documented otherwise, within the first 12 months from completion of the work, painting is defective if it does not comply with the manufacturer's installation instructions or *AS/NZS 2311 - Guide to the Painting of Buildings.*

13.2 Surface finish of paintwork

Within the first 12 months from completion of the work, paintwork is defective if application defects or blemishes such as paint runs, paint sags, wrinkling, dust, bare or starved painted areas, colour variations, surface cracks, irregular and coarse brush marks, sanding marks, blistering, uniformity of gloss level and other irregularities are visible in the surface from a normal viewing position.

Within the first 12 months from completion of the work, excessive over-painting of fittings, trims, skirtings, architraves, glazing and other finished edges is a defect.

13.3 Nail and screw fixings

Within the first 12 months from completion of the work, fixings or unfilled depressions caused by fixings are defects in painted or stained surfaces if they can be seen from a normal viewing position.

13.4 Mechanical damage and natural defects in surfaces

Within the first 12 months from completion of the work, holes and any other unfilled depressions in painted or stained timber such as surface defects caused by mechanical damage, natural characteristics such as gum pockets or surface splits are defects if they can be seen from a normal viewing position.

13.5 Paint durability

With the exception of exterior semi-transparent and exterior clear finishes and unless documented otherwise, coatings are defective if a large proportion (in excess of 10%) of the painted area fails by lifting, blistering, flaking or allows water penetration into the building.

14. WET AREAS, DECKS AND BALCONIES

14.1 Wet areas

Waterproofing to internal wet areas is defective if not installed in accordance with the requirements of the NCC and *AS 3740 Waterproofing of Domestic Wet Areas*. Internal wet areas are not defective if the leak or poor performance is caused by actions or inactions of the owner or other persons outside of the control of the contractor.

14.2 Flashings generally

Flashings are defective if they are not installed in accordance with the requirements of the NCC.

14.3 Shower recess and components

Any shower component that allows a fully enclosed shower recess to leak during normal usage is defective.

Within the first 12 months from completion of the work, shower recess and components are defective if they crack or don't perform as intended and cracks in shower bases, screens and glass are defects if they are visible from normal viewing position.

14.4 Leaks in waterproof decks and balconies

Waterproof decks and balconies are not defective if the leak or poor performance is caused by actions or inactions of the owner or other persons outside of the control of the contractor.

Waterproof decks and balconies are defective if they leak or if the waterproofing system is not installed in accordance with the NCC, *AS 4654 Part 1 Waterproofing Systems for External Above-ground Use – Materials* and *Part 2 Waterproofing Systems for External Above-ground Use – Design and Installation* and the manufacturer's installation instructions.

14.5 Waterproof decks and balconies substrate

Waterproof decks and balconies are defective if they are not constructed in accordance with the NCC and *AS 4654.2*.

Waterproof decks and balconies are defective if the waterproofing system is not installed with the manufacturer's installation requirements.

14.6 Decks and balcony freeboard outside windows and doors

Unless documented otherwise, waterproof decks and balconies are defective if they do not have a membrane and drainage system sufficient to withstand wind-driven water to the extent that it is anticipated by the NCC and *AS 4654* surging from the deck or balcony and penetrating the building.

14.7 Leaking and ponding of waterproof decks and balconies

Waterproof decks and balconies are defective if they leak, pond water and/or do not drain to the outer edge, or storm water outlet. They are not defective if residual water remains due to surface tension.

14.8 Calcification and efflorescence associated with decks and balconies

Within the first 12 months from completion of the work, calcification or efflorescence caused by water coming from a deck or balcony that occurs on walls below or beside the deck or balcony, or that appears in the mortar joints of the deck or balcony tiling, is a defect.

15. FLOORS

15.1 Solid timber flooring

Timber flooring will shrink or swell according to its internal moisture content, timber species used and the installation environment. The internal moisture content will adjust to the surrounding atmosphere after the timber is installed and this may lead to permanent or seasonal swelling or shrinkage gaps at board edges.

Care should be taken to adjust the moisture content of the timber, as far as practical, to the likely in-service conditions before installation in accordance with the manufacturer's installation instructions. Even so, some minor movement is to be expected.

Exposure to sunlight, cooling, heating or other heat generating appliances is likely to cause localised shrinkage of timber that cannot be allowed for at the time of construction. This is to be taken into consideration when determining if there is defective workmanship.

15.2 Structural timber flooring generally

Flooring, including tongue and groove strip flooring; structural plywood and particleboard sheet flooring, is defective if it is not installed to joists in according to *AS 1684 – Residential Timber Framed Construction* and the manufacturer's installation instructions.

15.3 Gaps in exposed solid timber flooring

Except where affected by exposure to sunlight, cooling, heating or other heat generating appliances, within the first 12 months from completion of the work, flooring is defective if it has a gap of more than 2mm between adjacent boards that extend for more than 1m. Within the first 12 months from completion of the work, flooring is defective if it has gaps of more than 5mm in total of three gaps between four consecutive boards.

15.4 Swelling in solid timber, plywood and particleboard flooring

Within the first 12 months from completion of the work, joints in plywood and particleboard floors are defective if they can be detected through normal floor coverings.

Within 6 years and 6 months of the completion of the work, swelling in tongue and groove strip timber flooring is a defect if it causes boards or subfloor to be dislodged or movement of perimeter restraints such as walls.

15.5 Nail popping in solid timber, plywood and particleboard floors

Within the first 12 months from completion of the work, nail heads that can be detected through floor coverings or nail popping that is clearly visible in exposed flooring are defects.

Nail heads or popped screws are defects for 6 years and 6 months from completion of the work if they compromise the health and safety of occupants or visitors to the residence.

15.6 Squeaking structural floors

Within the first 12 months from completion of the work, floors that squeak excessively in trafficable areas are defective.

15.7 Springy floors

Floors that bounce in a way that can be detected by a person walking normally across the area are defective unless the substructure has been constructed in accordance with the NCC, and:

- *Timber Sub-frame – AS 1684 – Residential Timber-framed Construction* or,
- *Steel Sub-frame - AS 4100 – Steel Structures, AS/NZS 4600 – Cold-formed Steel Structures, NASH – Residential and Low-rise Steel Framing – Part 1 Design Criteria.*

15.8 Timber floor levels

Within the first 12 months from completion of the work, floor levels within a room or area are defective if they differ by more than 10mm in any room or area, or more than 4mm in any 2m length and such deviation adversely affects the safe use or reasonable amenity of the building.

Refer to Section 3.7 of this Guide where the new floor is to join an existing floor.

15.9 Splitting of timber decking

Within the first 12 months from completion of the work, splits in timber decking that extend to the end or side edge of the timber are defects if they are due to the fixing method or workmanship of the builder (e.g. fixings too close to the ends of boards).

16. POOLS AND SPAS

16.1 Concrete pools and spas

Concrete pools and spas are defective if they are not installed in accordance with *AS 2783* including *Amendments 1 and 2 - Use of Reinforced Concrete for Small Swimming Pools* and with the relevant engineer's design.

16.2 Premoulded fibre-reinforced plastic pools and spas

Premoulded pools and spas are defective if they are not installed in accordance with *AS/NZS 1839 – Swimming Pools - Premoulded Fibre-reinforced Plastics – Installation.*

16.3 Variations from documented dimensions in concrete pools

Departures from the documented set out for concrete pools are defects if they exceed L/100, where L is the documented dimension, or 5mm, whichever is the greater and such deviation adversely affects the safe use or reasonable amenity of the pool or spa.

16.4 Variations from documented datum in concrete pools and spas

Set outs that depart from documented levels by more than 40mm, are defective if such deviation adversely affects the safe use or reasonable amenity of the pool or spa.

17. TERMITE MANAGEMENT SYSTEMS

17.1 Termites

Termites are a widespread problem in all areas of Australia and it is the owner's responsibility to regularly inspect the property, including sub-floor inspections, to detect evidence of termite activity.

Termites can circumvent properly executed termite management systems by, for example, building tunnels around barriers. Tunnels can be identified through regular inspections and, if found, the termite nest should be located and destroyed by suitably qualified pest controllers.

Termite infestation caused by the building owner's failure to undertake appropriate inspection and maintenance of termite management systems is not a defect.

17.2 Termite damage

Building work is defective if a termite management system is required in accordance with the NCC and has not been installed in accordance with the NCC or *AS 3660.1 Termite Management – New Building Work*.

Note: In Queensland "primary building elements" are defined by the NCC as "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 designed for the specific purpose of acting as a brace to those members; and door jambs, window frames and reveals, architraves and skirtings."

17.3 Inspection zone

Where a termite management system is required, most, though not all systems rely on a 75mm visual perimeter inspection zone as part of the termite management system. This visual inspection zone enables termite activity to be identified when termites and/or their tunnels are forced into view in order for the termites to get around the various barrier systems.

Where an inspection zone is required, work is defective if the inspection zone has not been provided in accordance with the NCC, *AS 3660.1 Termite Management – New Work*, or the manufacturer's installation instructions.

Work is not defective where the inspection zones have been breached or obstructed from view by actions of the owner or persons outside of the control of the contractor.

18. GENERAL

18.1 Appliances and fittings

The owner is responsible for organising warranty service for faults in appliances and fittings supplied as part of the building contract where the contractor has provided the warranty documents to the owner. Service outside the warranty period is the responsibility of the owner.

Within the first 12 months, damages to appliances and fittings supplied as part of the building contract are defects if it is due to the contractor's workmanship.

18.2 Condensation

Condensation is a common problem in buildings, particularly in bathrooms and laundries, and can occur on windows, under unlined roofs or elsewhere. Where the requirements of the NCC have been complied with, the responsibility for controlling condensation by maintaining adequate ventilation through the installation and use of exhaust fans or other means is the responsibility of the owner.

Condensation is a defect if the contractor has not complied with the relevant clauses of the NCC.

18.3 Glazing

Within the first 12 months from completion of the work, scratches, fractures, chips or other blemishes on glazing and mirrors are defects if they are caused by the contractor and can be seen from a normal viewing position as per Figure 1.4.

Glass shall be inspected in a vertical position at an angle perpendicular (90 degrees) to the surface under natural day lighting conditions, the glass shall not be in direct sunlight during the inspection.

Imperfections such as scratches, scars and rubs shall not be visible from a distance of 3 metres and the maximum allowable imperfections shall be in accordance with *AS 4667 Quality Requirements for Cut-to-size and Processed Glass.*

18.4 Lyctus borer

Within the first 12 months from completion of the work, timber is defective if it shows evidence of lyctus borer attack.

18.5 Water leaks

Roofs, gutters, flashings, skylights, window and door frame joints or seals are defective if they leak under weather conditions anticipated by the NCC, providing they have been properly maintained by the owner.

APPENDIX A

History of Editions

The Standards and Tolerances Guide dated May 2014 published on 1 May 2014 to 3 February 2016.

The Standards & Tolerances Guide dated February 2016 published on 4 February 2016 to 30 April 2019.

This edition of the Standards & Tolerances Guide published December 2023.

TECHNICAL LINKS

Australian Buiding Codes Board

www.abcb.gov.au/

Queensland Development Code

www.business.qld.gov.au/industries/building-property-development/building-construction/laws-codes-standards/queensland-development-code

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