Acknowledgments

This Guide was prepared in consultation with individuals representing various industry and consumer groups. The Office of Fair Trading acknowledges and thanks the Housing Industry Association (Victoria) and the Housing Guarantee Fund Ltd for their work in developing the first “Guide to standards and tolerances” in 1992. The Office of Fair Trading also acknowledges the subsequent work of:

- Australian Institute of Building Surveyors
- Australian Society of Building Consultants
- Consumer Affairs Victoria
- Housing Guarantee Fund Ltd
- Housing Industry Association
- Insurance Council of Australia
- Master Builders Association of Victoria
- The Institution of Engineers (Australia)
- Building Commission Victoria
- Department of Infrastructure, Planning and Natural Resources

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ISBN 0 7347 6010 8
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Last revised July 2003
Introduction

The Guide to Standards and Tolerances is a valuable tool to clarify areas of building standards that are not prescribed in legislation.

Generally a builder and a building owner, parties to a building contract, can agree to apply the building standards they consider appropriate to a building project. But they may not agree to standards less than those prescribed by Government. Sometimes the agreed standards are detailed in the contract documents but often they are not.

The purpose of this Guide is to indicate the view of reasonable standards and tolerances for building work, where such standards and tolerances are not articulated by the contract documents and are not prescribed in:

- the Home Building Act 1989;
- the Home Building Regulation 1997;
- the Building Code of Australia (BCA); and
- the Australian Standards referenced in the BCA.

Where there is any contradiction or difference between the Guide and the BCA, relevant legislation or the building contract, the BCA, legislation or building contract will take precedence.

The standards and tolerances including those that relate to the passage of time are intended as a guide only. They may not apply to some building projects where the specific circumstances of the project or the contract conditions of that project require or imply other standards or tolerances.

The commencement of any time period mentioned in the Guide is to be taken from the date of the occupation certificate for a building project. Some information in this Guide has been extracted from the BCA or referenced Australian Standards to assist users.

This document is intended to serve as a general guide only, and is always subject to prevailing legislation and regulations.
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1. Application

The primary obligation of the holder of a contractor licence (licensee) issued under the Home Building Act 1989 (the Act) is to carry out residential building work in accordance with the Act, as detailed in any plans and specifications which form part of the contract. Further, as set out in Part 2C of the Act, statutory warranties are implied in every contract to do residential building work.

The contractual obligations and the statutory warranties require levels of performance from the licensee. The minimum levels of acceptable performance are normally set out in the building contract and the relevant building codes and standards in force at the time. Nevertheless, there are some particulars of performance that are not specified in any of these documents. It is the purpose of this Guide to indicate levels of performance which are considered acceptable by the Office of Fair Trading as well as assist builders and owners with matters commonly the subject of dispute.

The standards and tolerances referred to in this Guide only relate where the "Deemed-to-Satisfy" provisions of the Building Code of Australia (BCA) have been applied. Reference to the BCA in this Guide is to the Building Code of Australia 1996, Volume 2, Class 1 and Class 10 Buildings (Housing Provisions). The standards and tolerances in this Guide may not be applicable where a residential building contract involves the use of the performance standard of the BCA. However, this does not relieve the licensee from attaining any performance level required by the applicable building codes and standards.

This Guide does not provide standards and tolerances for Class 2 residential buildings. However, in some cases, the Australian Standards referenced in this Guide may contain standards and tolerances for those buildings.

Where there is any contradiction or difference between the Guide and the BCA, relevant legislation or the building contract, the BCA, legislation or building contract will take precedence.

Timing is sometimes an issue. Construction that may be considered a defect when observed soon after the building work is complete may be considered fair wear and tear sometime later. Building contracts normally include a defects liability clause specifying a period after completion when the builder will rectify defects that become apparent in that period.

Fittings and equipment are often supported by manufacturers’ warranties. The defects liability period stated in a contract and manufacturers’ warranties should be considered in association with this Guide.

Fair Trading recognises the dynamic nature of the residential building industry and to ensure acceptable practice and competency throughout the industry, it will regularly review this Guide.

Most Australian Standards that are referenced in this Guide are referenced in the BCA. The Standards are indicated by either "AS" or "AS/NZS" followed by the appropriate reference number, which includes the year of publication.

The tolerances specified herein are not applicable where second hand materials and products are proposed to be used with the structure of a new building, i.e. door and window clearance tolerances.

The Building Code of Australia

The primary vehicle responsible for setting standards for the design and construction of buildings is the Building Code of Australia (BCA) and its referenced documents.

The BCA is given legal effect in NSW through the Environmental Planning & Assessment Act 1979 (EP&A Act) and the EP&A Regulation 2000. The EP&A Act provides that all development consents are

Definitions
A Class 1 building is a single dwelling or a row of townhouses/terraces/villas joined by a fire resisting wall.
A Class 10 building is a non-habitable building/structure such as a garage/carport/shed/fence/swimming pool.
A Class 2 building is a high rise building containing two or more separate dwellings located one above the other.
subject to a prescribed condition that developments involving building work must be carried out in accordance with the requirements of the BCA.

A complying development certificate and a construction certificate, which approves the detailed design plans, can only be issued for building work if the certifying authority is satisfied that the proposed building will comply with the BCA, whether by the 'deemed-to-satisfy' or performance path.

Before an occupation certificate for a building can be issued, the EP&A Regulation requires that the certifying authority be satisfied that, among other things, the building is suitable for occupation or use in accordance with its classification under the BCA.

The goals of the BCA are to enable the achievement of acceptable standards of structural sufficiency, safety (including safety from fire), health and amenity for the benefit of the community now and in the future. These goals are applied so that the BCA extends no further than is necessary in the public interest, is cost effective, and not needlessly onerous in its application.

The BCA therefore sets minimum acceptable standards for the design and construction of buildings. Consent authorities in NSW, however, may require more than the BCA when circumstances warrant. It is not possible for a consent authority to specify a lower standard than the BCA.

The BCA contains technical provisions for matters such as structural sufficiency, fire safety, access for people with disabilities, safe movement, and health and amenity. These cover subjects such as damp and weatherproofing, light and ventilation, sanitary facilities, and sound insulation.

The BCA was converted to a fully performance based code in 1996 (BCA96). For each section of the BCA there is a series of statements expressing what a building must achieve in terms of its performance (i.e. the performance requirements). These provisions are accompanied by a set of prescriptive provisions that are 'deemed-to-satisfy' the performance requirements. An owner or applicant may choose to comply with the deemed-to-satisfy (DTS) provisions or may develop an alternative building solution that satisfies the performance requirements, or a combination of both.

**BCA 96 - Structure**

![Diagram of BCA 96 structure]

- **Objectives**
- **Functional Statements**
- **Guidance**
- **Performance Requirements**
- **Compliance**
- **Building Solutions**
  - Deemed-to-satisfy provisions (DTS)
  - Alternative Solutions

NB. Conclusive proof of compliance
2. Appliances
Defects occurring in appliances and/or fixtures will only be considered the builder's liability if the actions of the builder have contributed to the defect.

3. Masonry

Definition of masonry
The following definition of “Masonry” has been extracted from AS 3700 – 2001 Masonry Structures.

“Scope
This Standard sets out minimum requirements for the design and construction of masonry, including unreinforced, reinforced and prestressed, using manufactured units of clay, calcium silicate and concrete laid in mortar, autoclaved aerated concrete (AAC) laid in thin-bed mortar, and square-dressed natural stone laid in mortar.

The Standard does not give values or material properties for the design and construction of square-dressed natural stone.

Notes:
1. This Standard assumes that the structural design of masonry is entrusted to experienced structural engineers or similar appropriately qualified persons, and that the execution of such work is carried out under the direction of appropriately qualified persons who are experienced in masonry construction and who understand the structural requirements.
2. The Standard does not give specific requirements for prefabricated masonry panels or masonry in composite action with steel or concrete structural members. The principles of this Standard should be followed, as far as they are applicable, for such types of construction.

3. The provisions of this Standard do not include specification for design and construction of AAC laid in other than thin-bed mortar. However, for masonry so constructed the general principles of this Standard may be used.

Masonry distress
When distress is rated at Category 3 or more (i.e. more than 5mm; refer AS 2870 - 1996 Residential Slab & Footings Construction), appropriate rectification works will be required. If distress is Category 2 (between 1mm to less than 5mm) it is considered a defect, however, minor repairs would be acceptable e.g. repointing.

Refer to Table C1 in Clause 4 “Concrete Slab Distress”.

Refer to Notes in Table C2 in Clause 4 “Concrete Slab Distress”.

Bed joints and perpends
Where masonry matching is no longer appropriate a practical approach may be adopted in the case of renovations and or additions.
Notes:
1. Items H, I, J & K are not applicable to thin-bed mortar joints.
2. Items I & J are not applicable when perpend joints are not filled with mortar as is the case with some horizontally cored masonry that is not required to resist horizontal bending.
See Appendix B for diagrams explaining content of above table.

Masonry facing
Bricks shall generally be laid with true brick face outwards. Brick faces shall be cleaned and free of excess mortar unless otherwise specified.
When bricks in batches supplied from manufacturers vary in colour, they shall be mixed/distributed in accordance with manufacturers recommendations unless otherwise specified.

Mortar
Mortar shall generally be mixed in accordance with the requirements of the BCA as applicable. Part 3.3.1 (Clauses 3.3.1.6 and 3.3.1.7)

Masonry voids
Where masonry construction or cleaning results in obvious holes excepting weepholes, these are deemed to be a defect.
Making good is to be carried out so that any repair or the like is as close as practically possible to the existing mortar.

Dampproof courses
To be in accordance with the Part 3.3.4 of the BCA.
Raking of joints
Raking of mortar joints in masonry units shall not exceed 10mm depth and be consistent throughout. Mortar joints and the raking of mortar joints is to be in accordance with the Part 3.3.1 (Clause 3.3.1.7) of the BCA.

Brick sills - shrinkage allowance for timber framing
Reference to brick sills includes for sill tiles. Distortion of window frames and or dislodgment of sill bricks shall be a defect where such distortion and or dislodgment was caused by lack of initial sill brick clearance from the window sill refer to Part 3.3.1 of the BCA.

In masonry veneer walls a gap must be left between the timber frame and the top of the masonry wall, including window sills etc, to allow for initial settlement of the timber framing caused by timber shrinkage. These clearances must be provided at the time of construction and must not be not less than-
(i) 5mm at sills of lower and single storey windows; and
(ii)8mm at roof overhangs of single storey buildings and
(iii)10mm at sills of second storey windows; and
(iv)12mm at roof overhangs to two storey buildings.

The clearances described in (i)-(iv) above must be doubled if the timber framing is unseasoned hardwood.

Flashings

General
Flashings shall be provided in accordance with the requirements of the Part 3.5.3 Wall Cladding (Clause 3.5.3.6) and Part 3.3.4 Masonry, of the BCA.

Timber frames
Flashings should be provided to all timber windows in accordance with the Part 3.5.3 of the BCA and/or manufacturer’s specifications to prevent ingress of rain or moisture from reaching the inner face of a wall.

Aluminium frames
Aluminium windows and doors shall be installed according to manufacturer’s specifications unless otherwise specified.

Render and applied finishes for masonry

Cracking
Cracking of finishes to be assessed in accordance with Section 3 Masonry Distress. Obvious spot rust marks due to the composition of the material is considered a defect.

Matching colour and texture
When matching a finish, a practical approach must be adopted, and where possible a physical joint, a door/window, downpipe or other similar separating materials be incorporated. The purpose of this is to “break” the visual impact.

The builder should make every effort to match existing so as to be as close to a match as possible, where this is practicable. In some instances this may not be practical as the original finish may have significantly aged or chemical additives may have been used which are impossible to determine without expensive research.

Cracking at articulation joints
Provision for the control of cracking in articulation joints should be allowed for or otherwise specified.

If the owner or agent at the time of construction specifies construction that does not allow for movement, cracking will not be considered a defect.
4. Concrete slab distress

If distress is rated at less than Category 3, the defect is to be monitored for a period of twelve months. If, at the end of the monitoring period, the distress rating is assessed as greater than Category 2, this will be considered a defect. Where a residential slab designed in accordance with AS 2870 - 1996 or AS3600 - 2001 Concrete structures is to act as a termite barrier in accordance with AS 3660 - 2000 Termite management, shrinkage cracks through the slab are not to exceed 1.0 mm in width.

Extract from AS2870-1996 – Residential slabs and footings – construction

Table C1 Classification of damage with reference to walls (Appendix C of AS 2870 -1996)

<table>
<thead>
<tr>
<th>Description of typical damage and required repair</th>
<th>Approximate crack width limit (see Note 3)</th>
<th>Damage category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hairline cracks</td>
<td>&lt;0.1mm</td>
<td>0</td>
</tr>
<tr>
<td>Fine cracks which do not need repair</td>
<td>&lt; 1mm</td>
<td>1</td>
</tr>
<tr>
<td>Cracks noticeable but easily filled</td>
<td>&lt;5mm</td>
<td>2</td>
</tr>
<tr>
<td>Doors and windows stick slightly</td>
<td>5mm to 15mm (or a number of cracks 3mm or more in one group)</td>
<td>3</td>
</tr>
<tr>
<td>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.</td>
<td>15mm to 25mm but also depends on number of cracks.</td>
<td>4</td>
</tr>
</tbody>
</table>

Table C2 Classification of damage with reference to concrete floors (Appendix C of AS 2870 -1996)

<table>
<thead>
<tr>
<th>Description of typical damage</th>
<th>Approximate crack width limit</th>
<th>Change in offset from a 3m straight edge centred over defect (see Note 6)</th>
<th>Damage category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hairline cracks, insignificant movement of slab from level.</td>
<td>&lt;0.3mm</td>
<td>&lt;8mm</td>
<td>0</td>
</tr>
<tr>
<td>Fine but noticeable cracks. Slab reasonably level.</td>
<td>&lt;1.0mm</td>
<td>&lt;10mm</td>
<td>1</td>
</tr>
<tr>
<td>Distinct cracks. Slab noticeably curved or changed in level.</td>
<td>&lt;2.0mm</td>
<td>&lt;15mm</td>
<td>2</td>
</tr>
<tr>
<td>Wide cracks. Obvious curvature or change in level.</td>
<td>2mm to 4mm</td>
<td>15mm to 25mm</td>
<td>3</td>
</tr>
<tr>
<td>Gaps in slab. Disturbing curvature or change in level.</td>
<td>4mm to 10mm</td>
<td>&gt;25mm</td>
<td>4</td>
</tr>
</tbody>
</table>

Notes:
1. 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.
2. 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. 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.
4 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.

5 Account shall be taken of the past history of damage in order to assess whether it is stable or likely to increase.

6 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.

5. Condensation

Condensation on walls, windows and in bathrooms can be caused by conditions beyond the builder’s control and will not usually be considered a defect.

Roof condensation will be considered a defect if caused by incorrect positioning of sarking, or vapour barrier where installed. The effects of condensation will not be considered a defect if the builder has complied with the requirements of the BCA.

6. Doors

Door handles and latches

Door handles and latches installed shall be fit for purpose and will operate as intended by the manufacturer. Defects occurring in the first three months of completion shall be the responsibility of the builder. Thereafter defects occurring will only be considered the builder’s liability if the actions of the building have contributed to the defect.

Doors and door frames

This clause only applies to the 3 months maintenance period as specified under the contract.

Internal doors

Unless specified in the contract, or where an increased clearance is required for:

- removable toilet doors;
- return air ventilation for ducted heating or air-conditioning units;
- inlet ventilation to rooms where the only ventilation is provided by ventilated skylights and/or exhaust fans;
- between double swing doors and French doors.

Within the first three months, an even gap to the sides and top of individual doors shall be consistent throughout, to within 1mm and shall be not less than 2mm or exceed 5mm wide and a maximum gap of 20mm between the bottom of the door and the top of any finished floor covering unless otherwise specified.

External doors

External doors shall be appropriate for their intended purpose and shall be installed in accordance with the manufacturer’s recommendations.

General

Tolerances for twisting and bending in the first three months are as listed below.

1. Twist

Twist in a door shall not exceed 5mm.

2. Bending

Bending in a door shall not exceed the following:

(a) In the height of the door:

(i) up to and including 2150mm high – 4mm, or
(ii) over 2150mm and up to and including 2400mm high – 6mm.

(b) In the width of the doors up to and including 1020mm wide – 2mm.

Doors which bind or jam, as a result of the builder’s work, shall be considered defects.
7. Lightweight substrate with applied finishes

Applied finishes (excluding painting) to lightweight sheet substrate that have cracking or open joints greater than 1mm will be considered a defect within the first 12 months.

8. External mouldings

Cracking at joints or in external mouldings and architectural features greater than 2mm will be considered a defect within the first 12 months.

9. Articulation joints

Provision for the control of cracking in articulation joints should be allowed for or otherwise specified.

If the owner or agent at the time of construction specifies construction that does not allow for movement, cracking will not be considered a defect.

10. Internal fixing

Only gaps between mouldings, and between mouldings and other fixtures which exceed 1mm within the first 12 months will be considered defects.

11. Floor and wall tiling

11.1 General

Tiling will be considered defective where:

(a) the builder supplied, laid and constructed the sub-strata for the tiles; and

(i) any of the materials are defective, and/or

(ii) the application of adhesive, tiles or backing sheet is not carried out in accordance with manufacturer's instructions, and/or

(iii) there is unsatisfactory workmanship beneath the tiling system.

(b) the owner supplied materials and the builder laid the tiles and carried out preparatory works, and

(i) any materials not supplied by the owner are defective, and/or

(ii) application of adhesive, tiles or backing sheets is not carried out in accordance with manufacturer's instructions, and/or

(iii) there is unsatisfactory workmanship beneath the tiling system.

(c) the owner supplied and laid the tiles and the builder carried out preparatory works other than the tile laying, and there is unsatisfactory workmanship beneath the tiling system (e.g. faulty stud work and trimming, nogging work, or concrete slab failure)

Where the owner installs the substrate, it is the owner's responsibility to ensure that the substrate has been installed in accordance with the manufacturer's instructions and that the framing is satisfactory for the fixing of the substrate.

Cracked, loose or drummy tiles will be considered a defect if the cause is attributed to the builder. Subject to the above, these items will only be considered a defect if more than 10% of the tiled room or area is affected, whichever is applicable.

Where the owner lays and supplies floor tiles that are defective (i.e. cracked or loose) using a method of tiling application, adhesive and/or bedding not in conformity with the manufacturer's instructions then the builder's liability would only extend to where consequential damage had occurred due to the concrete slab distress as specified in this document. The owner has to prove the damage is attributable to the builder. The onus of proof is on the owner.

Tile matching

Where tile matching is no longer possible, a practical approach must be adopted and where possible, a slightly different tile may be used. A tile separation joint may be
provided – for example, by means of an aluminium channel of the shower screen, separating doorway, intersecting wall, change in wall direction or similar.

**Tiling workmanship**

A butting tiles shall be flush excepting for any distortion inherent in the manufacture of the supplied tiles. Grout lines/widths to tiling should be consistent as far as practicable unless otherwise specified.

### 12. Floors

Flooring is to be installed in accordance with Part 3.4 of the BCA.

**Gaps in exposed timber flooring**

The effects of sunlight, heating or other heat generating appliances are to be taken into consideration and if it is determined that they have contributed to the higher rate of shrinkage, then it is not considered a defect.

A gap of more than 2mm between adjacent boards will be considered a defect.

A total measurement of gaps between four consecutive boards in timber strip flooring of more than 5mm is a defect in areas other than those which may be affected by direct sunlight, heating or other heat generating appliances.

The builder shall not be liable for gaps considered as defects where the builder has made the owners aware, as acknowledged by them in writing, that the flooring system installed could suffer significant shrinkage leading to visually obvious movement resulting in gaps well in excess of the tolerances listed above.

If only one gap exists that is defective within the meaning of this section, and it extends over 1 metre in length, it is considered a defect.

**Plywood and particle board flooring**

Plywood and particle board flooring will be installed in accordance with Part 3.4 of the BCA and/or the manufacturer’s recommendations and data sheets. Where swelling occurs at joints to such an extent that it can be detected through normal floor coverings then it will be considered a defect.

**Nail popping**

If in timber floors nail heads can be detected through floor coverings or nail popping is clearly visible in exposed flooring, this will only be considered a defect if occurring within the first 24 months and only where the builder laid the floor covering or polished the floor as part of the contract.

Where owners have polished exposed flooring or laid floor coverings after completion of the builder’s works, due consideration shall be given by the owners in regards to the effects of shrinkage of the floor frame and the subsequent effects of nail popping.

**Squeaking floors**

If floors squeak in trafficable areas within the first 24 months then a defect exists. Normal timber shrinkage is not considered unsatisfactory workmanship of the builder.

**Floor levels – concrete and timber – as built**

Generally, the floor is to be within ±10mm of level over the entire room and at all times, within ±5mm of level over any 3 metre length within the first 24 months.
13. Footings and foundations

General

Natural movements of the site soils shall not exceed the parameters as outlined in AS 2870-1996. Surface movements shall be applicable to the site classification as identified by foundation data.

Foundation movements which are the result of localised drying caused by the effects of trees or excessive wetting caused by unsatisfactory workmanship or lack of site drainage by the builder will be considered a defect.

Foundation and site drainage - maintenance

Where defects have been caused by the lack of proper maintenance of foundations and/or site drainage (where not the responsibility of the builder) such defects shall not be attributed to unsatisfactory workmanship. The CSIRO publication Guide to Home Owners on Foundation Maintenance and Footing Performance (August 1996) shall be used as a guide.

Distress

Where natural movements of the soil do not exceed the parameters as referenced in AS 2870 -1996 and where such movements have caused distress to the fabric of the building, this will be considered to be a defect unless construction methods done in a workmanlike manner were adopted to accommodate those movements, such as the provision of isolation or movements joints.

14. Glazing

Scratched, fractured, chipped or blemished glazing which has resulted from the builder’s unsatisfactory workmanship will be considered a defect.

Assessment is to be based on the following:

- Scratches, fractures, chips or blemishes must be visible when viewed internally, from a line of sight measured 1.7m above the finished floor, and a minimum distance of 1.5m perpendicular to the face of the glass (see diagram) in normal daylight conditions.
- Minor scratches, fractures, chips or blemishes within 5mm of glass edge will not be deemed a defect. Minor is less than 10mm in length and not more than 3 per panel.

Glazing is to be installed in accordance with Part 3.6 of the BCA.
15. Lyctus borer
Evidence of Lyctus borer will not be considered a defect. This borer attacks the sapwood part of hardwoods.

16. Painting
Coatings used are to be suitable for the relevant conditions and relevant wear and tear. They are to be applied in a workmanlike manner and to manufacturer’s instructions unless otherwise specified.

The minimum durability e.g. lifting, blistering, flaking etc. required is as follows:

- Exterior finishes
  - Acrylics - 3 years
  - Enamel - 2 years
  - Semi transparent stains - 1 year
  - Clear finishes - not recommended

- Interior finishes
  - Acrylics, enamels, stains and clear finishes - 3 years

17. Paving and driveways
For verandahs, carports, paving, patios, driveways etc., any uncontrolled cracking of concrete will be considered a defect if the builder did not make allowance for shrinkage or general movement of the concrete (i.e. slip joints around verandah posts, control joints, isolation joints etc.) or where uncontrolled cracking is the result of unsatisfactory workmanship.

Cracking resulting from causes not attributable to unsatisfactory workmanship (e.g. trees planted too close to paving, commercial/ heavy vehicle traffic, use of sprinkler systems etc.) are not a defect.

Cracking resulting from trees planted or sprinkler systems installed by others after construction and not part of the builder’s obligations are not a defect.

Notes:
1. The figures in the table below are additional to the construction tolerances used at the time of construction.
2. The design profile is centred over the defect and supported at its ends by equal height spacers. The change in offset is then measured relative to this design profile.
3. Shrinkage cracking in reactive subgrades can lead to loss of bedding sand under segmental pavements. A geotextile separation layer will prevent sand from entering the shrinkage cracks.
4. Cracking in this context applies to bound pavements and not to segmental pavements.
5. The stepping criterion applies only to steps within the surface of the main pavement. It shall not be applied 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.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Measure</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cracking in bound pavements</td>
<td>Crack width</td>
<td>≤1.5mm</td>
</tr>
<tr>
<td>Subsidence</td>
<td>Offset under 1.5 m length of the design profile (See Note 2 above)</td>
<td>≤15mm</td>
</tr>
<tr>
<td>Stepping</td>
<td>Relative surface level of adjacent paving elements within the expanse of the main pavement.</td>
<td>≤5mm</td>
</tr>
</tbody>
</table>
18. Plasterboard

General
Installation and jointing of plasterboard will conform with the manufacturer’s recommendations and data sheets.

Peaking or jointing
If plaster peaking or jointing is obvious in normal daylight conditions, it will be considered a defect. CSIRO Report No L8 (1960) Illumination and decoration of flat surfaces will be used as a guide.

Plasterboard cracking
(a) Cracking less than 1mm is not a defect except where such cracking occurs in recessed and butt joints.
(b) Diagonal cracking, except for cracks less than 1mm, will be considered a defect and the cause will be investigated.

Nail popping
Nail popping will be considered a defect within the first 24 months only if evidence exists that such is caused by unsatisfactory workmanship. Normal timber shrinkage is not considered to be unsatisfactory workmanship of the builder.

Matching existing plaster and texture
Refer to Section 3 – Matching Colour and Texture (Masonry).

19. Hard plaster
Cracking of more than 1mm will be considered a defect in rendered finishes.

Provision for the control of cracking in articulation joints should be allowed for or otherwise specified.

If the owner or agent at the time of construction specifies construction that does not allow for movement, cracking will not be considered a defect.

20. Restumping works

Consequential damage
The builder will not be responsible for any consequential damage caused by the builder’s restumping, if the builder can show in writing, signed by the owner, that the owners had been sufficiently informed by the builder of the likelihood and nature of such consequential damage arising as a result of the builder’s restumping works.

Notwithstanding the above, the builder will be responsible for consequential damage caused by unsatisfactory workmanship.

Floor levels
Re-levelling of the floor levels within an existing dwelling shall be within ±15mm over any room unless physical or statutory restrictions exist.

Re-levelling of existing structures shall be carried out having regard to limitations imposed by:
• existing structural conditions
• fixed points
• attached buildings
• extensions to the dwelling
• plumbing installations
• or any other factor which may restrict the re-levelling process.

Packing material
Packing material should be a suitable non-compressible material.
21. Roofing systems

Metal roofing/components
Installation will be in accordance with the manufacturer's recommendations and data sheets and in accordance with Part 3.5.1 of the BCA (Clause 3.5.1.3).
Rectification of pre-colour coated components shall be carried out in accordance with the manufacturer's recommendations.

Tiled roofing
The installation of roof tiling is to be in accordance with Part 3.5.1 of the BCA (Clause 3.5.1.2).

Pointing
If pointing becomes dislodged or washed out, it will be a defect if caused by unsatisfactory workmanship or materials. Minor cracking of pointing is not a defect.

Roof batten alignment
Battens shall be aligned to within a tolerance of ±20mm in 4m. Refer to AS 2050 -1995 Installation of roof tiles.
Refer to Appendix A for an illustrative example of the interpretation of tolerances.

Roof batten spacing
Spacing of tiling battens shall be in accordance with manufacturer's requirements. However AS 2050 -1995 allows a tolerance of ±5mm.
Battens over 75mm in thickness shall be blocked or otherwise restrained from overturning. (Refer to AS 2050 -1995).

Undulating roof lines
Undulations due to unsatisfactory workmanship or loose truss chords will be considered a defect when the deflection exceeds ±20mm in any 4m length.
Notwithstanding, consideration shall be given to the effects of long term deflection of roof frame members.
Refer to Appendix A for an illustrative example of the interpretation of tolerances.

22. Shower enclosures

Shower screens
Fair wear and tear of shower screen components will not be considered a defect. Cracking of shower screens and cracking of shower glass will not be considered to be a defect where such cracking has been caused by factors other than unsatisfactory workmanship or a manufacturing process. The installation of shower doors, shower screens and bath enclosures is to be in accordance with Part 3.6 of the BCA (Clause 3.6.9).

Shower bases
The installation of shower bases is to be in accordance with Part 3.8 of the BCA. Shower bases which crack, leak or do not perform as intended will not be considered to be a defect where such cracking has been caused by factors other than unsatisfactory workmanship or a manufacturing process.

23. Gutters and downpipes
Generally gutters shall not retain more than 10mm of water. Leaking of joints in gutters may be considered a defect where such defect has been caused by unsatisfactory workmanship.

24. Steel framing
Steel framing is to be installed in accordance with Part 3.4.2 of the BCA. Steel framing shall be suitable for the particular application and installed in accordance with the manufacturer's specifications. Where defects arise due to the effects of thermal/structural movements of the framing members and no allowance has been made for such movements then the consequential damage shall be attributed to the builder's unsatisfactory workmanship.
25. Stormwater systems
Stormwater systems are to be installed in accordance with Part 3.1.2 and Part 3.5.2 of the BCA. Stormwater drainage systems shall function as intended. Where stormwater drainage systems fail to perform as intended and the failure is attributable to unsatisfactory workmanship, then a defect exists.
Defects caused by factors beyond the builder’s control such as intrusion of tree roots etc will not be attributed to unsatisfactory workmanship.
Where new stormwater systems are connected to existing stormwater drainage systems in the case of renovations or additions, then unless the contract allows for any works to the existing system the builder shall only be liable for any defects that arise for works carried out under the contract.

26. Straightness/plumbness of walls
Generally walls are to be within ±5mm from the vertical over any 3 metre height. Refer to Appendix A for an illustrative example of the interpretation of tolerances.

27. Termites (white ants)
Evidence of termites will not be considered a defect in areas not designated by local councils as termite prone areas.
In termite designated areas, evidence of termite activity will be considered a defect if the builder did not comply with the Termite Risk Management Requirements listed in Part 3.1.3 of the BCA, unless the relevant building authority approved otherwise.

28. Timber shrinkage and splitting
Up to 10% shrinkage will be accepted for unseasoned timber. For seasoned timbers, a maximum of 3% shrinkage will be accepted.
Timber stairs may have the following tolerances, and not be considered a defect, when applied where conditions such as movement of materials due to atmospheric moisture changes (i.e. cupping of timber stair treads) affect finished stair dimensions:
- Variation in the tread/going no greater than 5mm
- Variation in a riser height no greater than 5mm.
These tolerances should not be applied to allow poor construction practice.

29. Water hammer
Any water hammer is a defect.

30. Water leaks
Roofs, gutters, flashings, skylights, window frame joints or window seals which leak under normal weather conditions for the particular terrain, will be considered a defect.
A defect will not exist if the roofing system has not been regularly maintained by the owner or where the owner has failed to maintain the protective coating system to timber window frames.
Appendix A

Interpretation of ± tolerances given in Australian Standards Codes.

Introduction: some tolerances that occur in the Guide to Standards and Tolerances are expressed in terms of ± measurements. The question of the definition of this terminology has not been addressed.

This Appendix seeks to provide this definition. This advice has been prepared in consultation with Standards Australia.

Case examples: for a tolerance of ±5mm over 3 metres

(A) Less than or equal to 5mm

(B) Less than or equal to 5mm

This element is ≤ 5mm out of vertical

Case (A) is acceptable

Case (B) is acceptable
Appendix B

Engineering Diagrams explaining content of Table in Clause 3.3 - Bed Joints and Perpends relating to AS 3700 - 2001 Masonry structures.

These diagrams have been prepared in consultation with Standards Australia.

Key diagram showing views

A Horizontal position of any masonry element specified or shown in plan
B  Relative displacement between load bearing walls

\[ \pm 10 \text{mm Max} \]

Vertical section through wall

C  Maximum deviation from plumb within a storey

Non-structural facework  \( \pm 10 \text{mm Max} \)

\[ h = \text{Storey height (metres)} \]

Structural lesser of \( \pm \left( \frac{10h}{3} \right) \) OR \( \pm 0.05 t \)

For example, if storey height, \( h = 4.0 \text{m} \) and leaf thickness, \( t = 190 \text{mm} \). Tolerance is the least of

\[ \frac{\pm 10 \times 4.0}{3} = 13 \text{mm} \quad \text{or} \quad \pm 0.05 \times 190 = 9 \text{mm} \quad \text{ie} \quad \pm 9 \text{mm} \]

Vertical section through wall
**D Maximum deviation from plumb in total height**

+25mm Max

Top of wall

Building may be several storeys high

Base

Vertical section through wall

**E Maximum horizontal or vertical deviation of surface (bow)**

2000

+5mm Structural masonry

+3mm Non-structural facework

Must comply when measured horizontally or vertically

Vertical section through wall
F Deviation step of exposed surface

Non-structural facework only

Vertical section through wall

G Deviation of bed joint from horizontal etc.

Level bed joint

Specified bed joint level

Actual bed joint profile

Actual bed joint profile

Elevation A on face
H Tolerance on bed joint width

Specified thickness (normally 10mm)

3mm Max

Bed joint

3mm Max

Bed joint

Elevation on face

I Minimum perpend thickness

5mm Min

Perpend joint

Elevation on face

J Deviation from specified thickness of perpend

Average thickness of perps

Specified thickness

5mm Max

Non-structural facework tolerance

Average thickness of perps

Specified thickness (normally 10mm)

5mm Max

Structural tolerance

Elevation on face
K  **Maximum difference in perpend thickness**

\[(\text{max-min}) \leq 8\text{mm}\]

Non-structural facework only

**Elevation on face**

L  **Deviation from specified cavity width**

**Section through cavity wall**
Home Building Service

The Home Building Service (HBS) was launched in February 2003. It is the result of structural changes within the Office of Fair Trading, which brings together all building-related functions, for example licensing, compliance and operation of the private home warranty insurance scheme. It also establishes some new functions such as dispute resolution, building inspectors, training and education. Regional operations of HBS will operate out of the state-wide network of Fair Trading Centres.

The Service

• Has responsibility for the licensing of builders and tradespeople in the home building industry and a number of specialist trade categories across all industries.
• Maintains a public register of licence holders.
• Provides a disputes resolution system for both consumers and industry (from 1 July 2003).
• Conducts compliance and/or technical investigations into licensed and unlicensed home builders and tradespeople. It also conducts investigations into home building market practices.
• Facilitates prosecutions, civil litigation and other disciplinary enforcement action.
• Administers Government funded consumer protection insurance schemes.

These schemes closed for new policies in May 1997 and will be wound up in May 2004. Private insurance companies now provide this insurance to protect consumers against insolvency or incomplete work by licensed builders and contractors.

• Administers the Government funded Building Insurer’s Guarantee Corporation (BIG Corp) which was established as part of the NSW Government rescue package to assist victims of the HIH collapse.
• Monitors the present Home Warranty Insurance Scheme.
• Oversees the implementation of building reforms, co-ordinates ongoing reviews of home building laws and the implementation of proposed reforms.
• Assists industry to improve its standards through Training and requirements, programs and initiatives.

Key home building legislation

The Home Building Act 1989 prescribes the conditions for licensing, contracts, dispute resolution and disciplinary process.

Home building publications

We have publications on a range of useful home building topics, such as:
• post-construction home maintenance
• resolving a building dispute
• home warranty insurance
• home building contracts
and many more.

Where to get more information

For more information on the Home Building Service or a copy of any building publication, call:
1300 554 668
or go to
For help on any fair trading issue call your nearest Fair Trading Centre, or call the specialist service listed below which is relevant to your inquiry. A range of Fair Trading services are also available via Government Access Centres (GACs) and other agency locations throughout regional New South Wales. For details, visit the Web site www.fairtrading.nsw.gov.au

Fair Trading Centres – call 13 32 20 for general enquiries

Visit the Home Building Service Web site


where you can:

- search the public register on-line to see if a contractor’s licence is valid and current before entering into a contract, and
- find helpful information for homeowners, builders and tradespeople on home building matters.

Specialist Services

Tenancy Inquiries .......................... 9377 9100 ...................1800 451 301 (outside Sydney)

.................................................. 9377 9099 (*TTY)

Strata Schemes ............................ 9338 7900 ...................1800 451 431 (outside Sydney)

Aboriginal ................................... 9377 9200 ...................1800 500 330 (outside Sydney)

Business Licences .......................... 9619 8722 ...................1800 463 976 (outside Sydney)

Consumer, Trader and Tenancy Tribunal (CTTT) ............... 1300 135 399

TTY .......................................... 9338 4943

* Telephone service for the hearing impaired.

Language assistance

Ring the telephone interpreting service on 13 14 50 and ask for an interpreter in your language. The interpreter can then contact the Office of Fair Trading.

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