

Ministerial Building Standard MBS 001

Upgrading health and safety in existing buildings

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PART 1 PRELIMINARY

101 Scope, purpose and application

- 101.1** This standard is published as a Ministerial Building Standard that forms part of the Building Rules under the *Planning, Development and Infrastructure Act 2016* (the *Act*) and must be read in conjunction with the requirements of the *Planning, Development and Infrastructure (General) Regulations* (the *Regulations*).
- 101.2** All new building work is required by the *Act* and *Regulations* to comply with the current *Building Rules*. However, with the exception of a few specific matters, retrospective upgrading of existing buildings is not *required* under legislation unless a *relevant authority* or an *appropriate authority* has identified that there are health and/or safety risks for the building occupants or (in some cases) access issues that need to be addressed.
- 101.3** **Table 101-1** below sets out the legislative circumstances in the *Act* and *Regulations* that can trigger the need to upgrade parts, elements or systems in an existing building to reduce any identified health and safety risks.
- 101.4** Without guidance on the extent of upgrading that may be required by an authority under these circumstances, interpretation of the legislation has been inconsistent and buildings have sometimes been *required* to be upgraded to an extent either above or below that which is considered necessary or reasonable for an existing building.
- 101.5** To address this anomaly, minimum acceptable performance standards for health, safety, amenity and access that an existing Class 2 to 9 building must meet under the *Act* and *Regulations* when it is undergoing a health and/or safety assessment by a *relevant authority* or an *appropriate authority* are herein defined. In addition, guidance is provided on acceptable practices that can be used to meet these performance standards.

Table 101-1 – Circumstances that trigger a health and/or safety assessment:

| Act or Reg. reference | Legislative circumstances that could trigger health and safety upgrading | Objective of requirement |
|-----------------------|---|---|
| Section 134 | When a building built before 1 January 2002 is undergoing <i>alterations</i> and a <i>relevant authority</i> (eg a council or private certifier) considers the building to be unsafe, structurally unsound, in an unhealthy condition or that access for persons with a disability is insufficient. | Additional building work can be required by a relevant authority to upgrade parts of the building to ensure that it is safe, structurally sound and in a healthy condition; or to make an <i>affected part</i> of the building accessible for a person with a disability. |
| Section 157 | An <i>appropriate authority</i> (ie a Council Building Fire Safety Committee) considers the fire safety of a building is not adequate. | Building owner to report to Council Building Fire Safety Committee on proposed work or other measures necessary to ensure that the fire safety of the building is adequate. |
| Reg 102 | When an application for a change of building classification is made to a <i>relevant authority</i> (council or <i>building certifier</i>). | Additional work may be necessary in order to satisfy the <i>relevant authority</i> that the building possesses the attributes appropriate to its present or intended use |

- 101.6** **Part 2** of this Standard contains the structural safety performance standards for existing Class 2 to 9 buildings, which a building may be required to satisfy when-
- (a) it is undergoing *alterations* and it was constructed before 1 January 2002; and/or
 - (b) it is undergoing a change of building classification.

101.7 **Part 3** of this Standard contains the fire safety performance standards for existing Class 2 to 9 buildings, which a building may be required to satisfy when-

- (a) it is undergoing *alterations* and it was constructed before 1 January 2002; or
- (b) it is undergoing a change of building classification; or
- (c) the fire safety of the building is not considered adequate.

101.8 **Part 4** of this Standard contains the health and amenity performance standards for existing Class 2 to 9 buildings, which a building may be required to satisfy when-

- (a) it is undergoing *alterations* and it was constructed before 1 January 2002; and/or
- (b) it is undergoing a change of building classification.

101.9 **Part 5** of this Standard contains additional provisions on the application of the health, safety and amenity performance standards when a building is undergoing a change of building classification.

102 **Application**

102.1 An existing Class 2 to 9 building that meets the performance standards for health, safety, and amenity set out in Parts 2, 3 and 4 of this Standard can be accepted by a *relevant authority* as having adequate health, safety, and amenity under section 134 of the *Act*.

102.2 An existing Class 2 to 9 building that meets the fire safety performance standards set out in this Standard can be accepted by an *appropriate authority* as having adequate fire safety under section 157 of the *Act*.

102.3 The performance standards in this Standard can also be used to check if a building has appropriate health, safety, and amenity attributes when an application is made to a relevant authority for a change in building classification.

102.4 The performance standards in this Standard can be met by-

- (a) a building solution based on relevant acceptable practices outlined in this Standard; or
- (b) in relation to fire safety, a building solution based on relevant fire safety acceptable practices outlined in Part 3 of this Standard; or
- (c) a building solution based on relevant deemed-to-satisfy provisions of the *Building Code*; or
- (d) any other building solution that is validated as meeting the relevant performance standards through supporting documentation and evidence of suitability such as testing reports, fire engineering analysis and/or product/system certification or accreditation.

103 **General**

103.1 **Existing materials** - Materials and components already in use in a building that complied with the *Building Rules* in effect at the time of *building approval* can remain in use unless a *relevant authority* has determined that they are *unsafe*, *structurally unsound* or in an *unhealthy* condition.

103.2 New and replacement materials – Except as otherwise required by this Standard, in existing buildings-

104.2.1 Like materials can be used provided their use does not create a threat to occupant safety; and

104.2.2 Combustible materials must not be used in *alterations* unless they are permitted by the *Building Code* for new building work.

103.3 Compliance with the Act, the Regulations and the Building Code - When *alterations* are proposed to be made to an existing building, all new building work carried out as part of those *alterations* must comply with the performance requirements or deemed-to-satisfy provisions of the *Building Code*. However, where further building work is required by a *relevant authority* or an *appropriate authority* under the *Act* or *Regulations* to address health, safety or amenity inadequacies in an existing building, the performance standards identified in this Standard are the minimum standards to be met to ensure a building conforms to proper health, safety and amenity standards.

103.4 *Alterations* made to an existing building must not result in the building (including parts of the building not being altered) becoming less conforming to the *Building Rules* than the building did prior to the proposed *alterations*.

103.5 Generally, where no *alterations* or occupancy changes have been made to an existing building, that building cannot be *required* to be upgraded unless a *relevant authority* or an *appropriate authority* has identified through the circumstances listed in **Table 101-1** that the building has health, safety or amenity inadequacies that need to be addressed.

104 Definitions

104.1 For the purpose of this Standard, the following definitions apply.

Act means the *Planning, Development and Infrastructure Act 2016*.

Addition means an extension or increase in *floor area*, number of storeys, or height of a building or structure.

Alteration means any change to a building involving building work that is required by the *Regulations* to comply with the *Building Rules*. An *alteration* can include-

- an addition to a building;
- the rearrangement of any space by the construction of walls or partitions or by a change in ceiling height;
- the addition or elimination of any door or window;
- the extension or rearrangement of any system;
- the installation of any additional equipment or fixtures;
- work or actions that reduces the load-bearing capacity of a primary building element; and/or
- work or actions that impose additional loads on a primary building element; including an increase in the number of building occupants.

In this Standard *alterations* do not include-

- (a) repairs that restore worn, deteriorated or broken materials, systems or components to a good or sound condition; or

- (b) renovations that involve the removal and replacement or covering of existing interior or exterior finish, trim, doors, windows, or other materials that serve the same purpose, do not change the configuration of space or do not increase the fire hazard properties of a lining, material or assembly; or
- (c) replacement of fixtures and fittings, such as hand basins and toilet pan, which do not involve the reconfiguring of rooms and spaces.

Appropriate authority has the same meaning as defined in section 157(16) of the *Act*.

Building approval means any approval or permit to build issued under the *Act* or any previous Act governing the control of building work in South Australia and includes a development approval.

Building certifier has the same meaning as section 92 of the *Act*.

Building Code has the same meaning as defined in section 3 of the *Act*.

Building Rules has the same meaning as defined in section 3 of the *Act*.

Change of use means a change in the purpose or level of activity within a building. A *change of use* may or may not trigger a change of building classification to the one previously assigned to it and for which it was designed, constructed and occupied.

Evacuation route has the same meaning as defined in the *Building Code*.

Exit has the same meaning as defined in the *Building Code*

Excessive fire hazard means a building with a floor area more than 2000m² or a volume of more than 12 000m³ that contains hazardous processes or storage; or combustible goods with an aggregate volume exceeding 1000m³ stored to a height greater than 4m (further guidance can be found in Note 4 to Table E1.5 in the *Building Code*)

Fabric has the same meaning as defined in the *Building Code*.

Fire source feature has the same meaning as defined in the *Building Code*.

Floor area has the same meaning as defined in the *Building Code*.

Heritage building means a building or structure listed in the *South Australian Heritage Register* or in a local council development plan as a State or local heritage place or object that is protected under the *Heritage Places Act 1993* and the *Act*.

Minor alterations includes-

- (a) repairs to damaged materials, elements, equipment or fixtures necessary to maintain them in good or sound condition;
- (b) the removal and replacement or covering of existing materials, elements, equipment or fixtures using new materials, elements, equipment or fixtures that serve the same purpose; and
- (c) fit-outs to rooms and spaces that do not involve structural alterations or increase fire safety risks for the occupants;
- (d) the addition or elimination of any door or window, unless the door or window is in a wall that provides lateral load resistance;
- (e) the reconfiguration or extension of any existing system; and
- (f) the installation of additional equipment.

Primary building element means a structural element of a building designed specifically to withstand design loads or actions and includes a column or other supporting element, a roof, ceiling, floor, balcony, stairway or ramp, load-bearing wall and wall framing (including bracing members designed for the specific purpose of acting as a brace to those members).

Professional engineer has the same meaning as defined in the *Building Code*.

Rapid seismic assessment means a simplified seismic screening process to identify buildings that are, or have features that are, potentially seismically vulnerable and require further seismic assessment or action to reduce the risk they pose to occupant safety. The acceptable rapid seismic assessment process outlined in **Form A202** in **Appendix A** is based on the seismic hazard of the Adelaide region, which for the purposes of this Standard can also be applied to regional areas.

Regulations mean the *Planning, Development and Infrastructure (General) Regulations 2017*

Relevant authority has the same meaning as defined in section 3 of the *Act*.

Required means required as part of a *building approval* previously issued for the building or part of the building, or by the *Building Code* or this Standard as relevant.

Structurally unsound in relation to an existing building or part of an existing building means that the structure or individual structural members are no longer able to fully resist the loads and other actions to which they may reasonably be subjected. This could be because-

- (a) *alterations* have been made that have affected the structural capacity of the structure or individual structural members; or
- (b) additional loads have been placed on the structure or on individual structural members that exceed their design loads; or
- (c) the structural capacity of individual structural members or *primary building elements* has been reduced by termite damage, salt attack, corrosion, moisture ingress, earthquake, fire, foundation movement, deterioration or other adverse occurrence.

Technically infeasible means an *alteration* that has little likelihood of being accomplished because-

- (a) the proposed *alteration* would require the removal or alteration of an essential load-bearing structural frame member and to strengthen the building to accommodate its removal would cause unjustifiable hardship; or
- (b) other existing physical or site constraints prohibit modification or addition of elements, spaces or features necessary to fully comply with the minimum requirements of the *Building Code* (including access); or
- (c) the cost of upgrading an *affected* part and the principal entrance to be accessible will exceed 20% of the total cost of proposed *alterations* and other *alterations* carried out over the previous three years; or
- (d) the cost of providing accessible sanitary facilities will exceed 20% of the total cost of the proposed *alterations* and other *alterations* carried out over the previous three years.

Unhealthy in relation to an existing building or part of an existing building means that there are conditions in the building that could be detrimental to the health and amenity of the building occupants. This can occur where-

- (a) sanitary facilities are not available for occupant use or are insufficient to satisfy occupational health and safety requirements;

- (b) insufficient natural light is available for occupant health;
- (c) insufficient lighting is available for safe movement;
- (d) insufficient ventilation is available to maintain adequate air quality; or
- (e) an unacceptable level of sound is being transmitted between sole-occupancy units that could cause illness or loss of amenity for residential occupants.

Unsafe in relation to an existing building or part of an existing building means that it no longer considered safe for the occupants of the building. This could be due to-

- (a) the building or part of a building having collapsed or being at risk of collapse or in an imminent state of collapse;
- (b) the structure is not capable of resisting the loads and actions to which it is likely to be subjected;
- (c) illegal or improper occupancy affecting structural capacity and safe egress;
- (d) exits and means of egress for safe evacuation being inadequate for the number, type and characteristics of the occupants;
- (e) occupants not able to find their way out of the building during a fire emergency and power failure;
- (f) occupants not being adequately protected against the effects of fire and/or smoke when evacuating the building;
- (g) occupants not having adequate early warning of fire so they can evacuate safely;
- (h) a fire hazard that poses a risk to occupant safety;
- (i) where fire brigade intervention is necessary for safe evacuation, a fire hydrant system is not available or is not suitable for the fire brigade to use;
- (j) essential safety provisions are not functioning or performing adequately; or
- (k) dilapidation, damage or deterioration of primary building elements or safety systems has occurred that poses a safety risk.

Vulnerable building elements means heavy unreinforced cladding and unreinforced or unbraced chimneys, parapets, gable walls, awnings or the like that could become falling hazards during an earthquake, and elements of the building *fabric* that have structural damage, which could affect its capacity to maintain structural stability during an earthquake.

Work area means that portion or portions of a building consisting of all reconfigured and/or structurally altered spaces as indicated on the construction documents submitted for *building approval*. *Work area* excludes other portions of the building where-

- (a) incidental work entailed by the intended work must be performed;
- (b) work not initially intended by the owner is specifically required by this Standard; or
- (c) work is being undertaken that does not require a *building approval*.

PART 2 STRUCTURAL SAFETY

Structure

201 Performance standards for structural safety

- PS 2.1** *Primary building elements* in an existing building must continue to be able to withstand the combination of loads and/or actions that they were designed to resist and to which they may reasonably be expected to be subjected.
- PS 2.2** Where an existing building undergoes a change of use, change of Importance level, or *alterations*, *primary building elements* must be able to withstand the combination of any changed loads and/or actions to which they may reasonably be expected to be subjected.
- PS 2.3** Where an existing building undergoes a *change of use*, a change in its Importance Level or *alterations*, potential high seismic hazards and *vulnerable building elements* that could fall and injure occupants who may be evacuating the building during an earthquake must be identified and strengthened at the earliest opportunity to reduce the risk of them falling appropriate to-
- (a) the degree of risk to occupants;
 - (b) the extent of *alterations* being undertaken; and
 - (c) the technical feasibility of undertaking upgrading or strengthening work; and
 - (d) the Importance Level of the building (refer **Table 202-1**).

202 Application of performance standards for structural safety:

- 202.1** An existing building undergoing *alterations* or a change of classification must satisfy performance standards **PS2.1** to **PS2.3** as applicable to the particular building and occupancy.
- 202.2** In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that **PS 2.1** to **PS 2.3** are not being met, primary building elements complying with the *Building Rules* that applied at the time the relevant *building approval* was issued are deemed to satisfy performance standards **PS 2.1**, **PS 2.2** and **PS 2.3**.
- 202.3** *Primary building elements* may not meet performance standards **PS 2.1**, **PS 2.2** or **PS 2.3** in situations where alterations or a *change of use* result in-
- (a) a substantial increase in any live or dead loads imposed on the building or a *primary building element* that could result in structural failure of that building or a *primary building element*; or
 - (b) a substantial reduction in the ability of a *primary building element* to withstand the combination of loads and other actions that they are required to resist or to which they may reasonably be subjected; or
 - (c) removal of a *primary building element* that is essential to the structural resistance of the building.

In these situations, existing *primary building elements* must be strengthened, replaced or otherwise supported so that they are capable of resisting the loads or other actions to which they may be subjected to and ensure that performance standards **PS 2.1** and **PS 2.2** are met.

- 202.4** Where an existing building is subject to *alterations* or a *change of use* and a relevant authority identifies that the structural capacity of existing *primary building elements* has been substantially reduced by termite damage, salt attack, corrosion, moisture ingress, earthquake, fire or other adverse occurrence to a point that could result in structural failure, the affected *primary building elements* must be strengthened, replaced or otherwise supported with *primary building elements* that are capable of resisting relevant loads or other actions to which they may reasonably be subjected and ensure that performance standard **PS 2.1** will be met.
- 202.5** To meet performance standard **PS 2.2**, *alterations* made to an existing building-
- must not result in a *primary building element* having less resistance to earthquake action than it was capable of resisting prior to the *alterations*; and
 - must not reduce the ability of the building fabric to resist earthquake action, which could occur where walls, ceilings, roofs or floors, or part thereof, are removed or proposed to be removed; and
 - where appropriate due to the Importance Level of the building or the level of risk to occupant safety, must incorporate strengthening of existing *vulnerable building elements* and other seismic hazards that could fall or collapse during an earthquake and injure occupants evacuating the building.

Table 202-1 Importance levels of buildings and design events for safety

| Importance level | Building types | Annual probability of exceedance | |
|------------------|--|----------------------------------|------------|
| | | Wind (non-cyclonic) | Earthquake |
| 1 | Buildings presenting a low degree of hazard to life and other property in the case of failure, such as farm buildings, farm sheds, isolated minor storage areas and minor temporary facilities. | 1:100 | 1:250 |
| 2 | Buildings presenting a medium hazard risk in the case of failure such as low rise residential construction and those below the limits set for level 3 | 1:500 | 1:500 |
| 3 | Buildings presenting a high hazard risk in the case of failure, designed to contain a large number of people, such as- <ul style="list-style-type: none"> • buildings and facilities where more than 300 can congregate in one area; • schools and day care centres with capacity more than 250; • for adult education/training with capacity greater than 500; • for health care with a capacity of 50 or more residents but not having surgery or emergency treatment facilities; • jails and detention facilities; • any occupancy with an occupant load greater than 5000; and • power generating facilities, water treatment and waste water treatment facilities and any other public utilities not included in Importance level 4. | 1:1000 | 1:1000 |

| Importance level | Building types | Annual probability of exceedance | |
|------------------|---|----------------------------------|------------|
| | | Wind (non-cyclonic) | Earthquake |
| 4 | Buildings presenting very high hazard risk in the case of failure that are essential to post-disaster recovery or associated with hazardous facilities, such as- <ul style="list-style-type: none"> • buildings and facilities designated as essential facilities and facilities with post disaster functions; • medical emergency or surgery facilities; • emergency service facilities (fire, rescue, police); • designated emergency shelters; and • designated emergency centres and ancillary facilities. | 1:2000 | 1:1500 |

202.6 Where it is determined by structural engineering assessment that *alterations* will remove or alter *primary building elements* that contribute to the lateral stability and earthquake resistance of the structure, those elements must be replaced or strengthened as necessary to satisfy performance standard **PS 2.3**.

202.7 Where a building approved before 1 January 1995¹ was not designed and constructed to resist earthquake load and it is undergoing *alterations* or repairs to *vulnerable building elements* that could fall on persons evacuating the building during an earthquake, those *vulnerable building elements* must be strengthened as necessary to satisfy performance standard **PS 2.3**.

202.8 Where a building approved before 1 January 1995 was not designed and constructed to resist earthquake load and the building is undergoing-

- (a) *alterations* that will raise the Importance Level of a building to a higher Importance Level (refer **Table 202-1**), either through it being assigned a new building classification or by an increase in the number of building occupants; or
- (b) structural *alterations* to any *primary building elements* that-
 - (i) contribute to the capacity of the building *fabric* to resist earthquake action; or
 - (ii) reduce the ability of the building *fabric* to withstand earthquake action; or
- (c) *alterations*, other than *minor alterations*, where the total *work areas* accrued over a 3 year period prior to an application for building rules consent for the proposed *alterations* comprises more than 50% of the total *floor area* of the existing building or more than 50% of the total volume of the existing building,

any potential high seismic hazards and *vulnerable building elements* must be identified and strengthened at the earliest opportunity to the extent necessary to provide a level of safety to satisfy the performance standard **PS 2.3** appropriate to the Importance Level of the building.

¹ The date from which all Class 2 to 9 buildings have been required to be designed to resist earthquake loads or actions under the *Building Code*.

203 Acceptable practice to meet performance standards for structural safety

- 203.1** *Primary building elements* and *vulnerable building elements* provided, replaced or strengthened in accordance with the deemed-to-satisfy structural provisions of the *Building Code* or relevant parts of this Standard can be used to satisfy performance standards **PS 2.1** to **PS 2.3** as appropriate.
- 203.2** Where glazing is to be replaced as part of proposed alterations, it will satisfy performance standard **PS 2.2** if it complies with the deemed-to-satisfy glazing requirements of the *Building Code*, otherwise existing glazing can remain in place until such time as it breaks or is to be replaced as part of proposed *alterations*.
- 203.3** A *rapid seismic assessment* of the building undertaken by a *professional engineer* or other suitably qualified person outlined in accordance with the process outlined in **Appendix A1** and complying with **203.4** to **203.8**, or a detailed seismic assessment undertaken by a *professional engineer* in accordance with processes outlined in **203.9** to **203.12** are acceptable methods for identifying potential high seismic hazards and *vulnerable building elements* that need to be strengthened in an existing building.
- 203.4** Results from a *rapid seismic assessment* must identify-
- (a) the building and its location;
 - (b) the type of structural system and construction used;
 - (c) the height of the building;
 - (d) any vertical irregularities;
 - (e) any horizontal irregularities;
 - (f) any *vulnerable building elements*;
 - (g) any evidence of significant damage or *alterations* to the structural system that have reduced its lateral load resisting capacity;
 - (h) any proposed *alterations* to parts of the building *fabric*, including new openings in floors or walls, removal of floors or walls, removal of ceilings etc;
 - (i) the date of assessment;
 - (j) the name, qualifications and signature of the person undertaking the assessment; and
 - (k) indicate the level of risk posed by the building (using the scoring system outlined in **Appendix A1**) and if further evaluation and detailed seismic assessment of the building is necessary and outlining remedial work proposed to address the risks.
- 203.5** Results from the *rapid seismic assessment* process must be submitted with the application for *building approval*, together with details of proposed remedial work.
- 203.6** Where a *rapid seismic assessment* indicates a score of 2.0 or more and-
- (a) no *vulnerable building elements* have been identified; and
 - (b) there are no structural *alterations* proposed to be made to the building *fabric*;
- no further seismic risk assessment is required.

203.7 Where a *rapid seismic assessment* indicates a score of 2.0 or more and that the building has-

- (a) *vulnerable building elements*;
- (b) evidence of significant damage to the building *fabric*; or
- (c) structural *alterations* are proposed to be made to the building *fabric*,

no further seismic risk assessment is necessary but remedial action must be taken to strengthen *vulnerable building elements* and/or the building fabric as necessary to satisfy performance standard **PS 2.3**.

203.8 Where a *rapid seismic assessment* indicates a score of less than 2.0, a further detailed seismic assessment of the building must be undertaken by a *professional engineer* to-

- (a) identify building elements that pose a high seismic hazard due to the likelihood of them collapsing and injuring building occupants during an earthquake;
- (b) identify the extent of the seismic hazards; and
- (c) detail remedial action to be undertaken to reduce the seismic hazard/s to an acceptable level of safety appropriate for the age of the building.

203.9 A detailed seismic design assessment of an existing building carried out in accordance with the requirements of the 2007 edition of AS 1170.4 – *Structural design actions. Earthquake actions in Australia* will satisfy performance standard **PS 2.3**, except that for Importance Level 2 and 3 buildings the most critical action effect used in the assessment can be 67% of the earthquake actions determined in accordance with the 2007 edition of AS 1170.4 – *Structural design actions. Earthquake actions in Australia*.

203.10 When undertaking a detailed seismic assessment of a building, the condition of existing building materials must be assessed to identify any deterioration that could jeopardise the capacity of the vertical or horizontal load resisting system. If their condition is deemed adequate, the deemed-to-comply material properties and strengths specified in section 3 of the 1998 edition of AS 3826 – *Strengthening Existing Buildings for Earthquake* or higher values determined from appropriate tests, can be used in the design of further seismic upgrading.

203.11 Where a building with an Importance Level of 4 (or will have an Importance Level of 4 as the result of an assignment of a new building classification) was not designed and constructed to resist earthquake load and it is undergoing-

- (a) structural *alterations* to any *primary building elements* that contribute to the capacity of the building *fabric* to resist earthquake action; or
- (b) *alterations*, other than *minor alterations*, where the total *work areas* accrued over a 3 year period prior to an application for building rules consent for the proposed *alterations* comprises more than 50% of the total *floor area* of the existing building or more than 50% of the total volume of the existing building,

a detailed seismic assessment of the building must be carried out by a *professional engineer* in accordance with the 2007 edition of AS 1170.4 – *Structural design actions. Earthquake actions in Australia*, with no reduction to any of the critical design actions to identify any potential seismic hazards.

- 203.12** Building elements that have previously been strengthened in accordance with AS 3826 using a threshold load value of one-third of the earthquake actions determined in accordance with the 1993 edition of AS 1170.4 - *Structural design actions. Earthquake actions in Australia*, are deemed to satisfy performance standard **PS 2.3** until such time as they are undergoing *alterations* that will reduce the ability of any *primary building elements* or the building *fabric* to resist earthquake action and further strengthening is necessary.
- 203.13** For an existing building with an Importance Level of 2 or 3, the strengthening of *vulnerable building elements* and other building elements designed in accordance with one of the following procedures, will satisfy performance standard **PS 2.3**-
- 203.13.1 the design and detailing procedures in the 1998 edition of AS 3826 – *Strengthening Existing Buildings for Earthquake*, except that the acceptable seismic design threshold actions used to determine seismic resistance adequacy shall be 67% of the design earthquake action determined in accordance with the 2007 edition of AS 1170.4 – *Structural design actions. Earthquake actions in Australia*; or
- 203.13.2 the design procedures in the 2007 edition of AS 1170.4 – *Structural design actions. Earthquake actions in Australia* except that the acceptable seismic demand threshold actions used to determine seismic resistance adequacy can be 67% of the design earthquake action; or
- 203.13.3 the design procedures in the 2007 edition of AS 1170.4 – *Structural design actions. Earthquake actions in Australia* with no reduction in the seismic resistance demand actions.
- 203.14** For an existing building with an Importance Level of 4, the strengthening of *vulnerable building elements* and other building elements designed to fully resist 100% earthquake design actions determined in accordance with the 2007 edition of AS 1170.4 – *Structural design actions. Earthquake actions in Australia* will satisfy performance standard **PS 2.3**.

PART 3 FIRE SAFETY

301 General requirements for fire safety

301.1 This Part of the Standard contains performance standards for fire safety in existing buildings. These are the minimum performance standards that an existing building must meet in order to be considered adequate by a *relevant authority* under section 134 of the *Act* or by an *appropriate authority* under section 157 of the *Act*.

301.2 The fire safety of an existing building is not considered adequate and will therefore not meet the relevant fire safety performance standards if-

- (a) building occupants are not able to evacuate safely during a fire, due to-
 - (i) blocked or obstructed *exits*;
 - (ii) obstructions in *exits* and paths of travel to *exits*;
 - (iii) width of *exits* and paths of travel to *exits* are not adequate to cater for the number of occupants;
 - (iv) fire and/or smoke spreading to *exits* and *evacuation routes* through unprotected openings, damage to fire resisting building elements or lack of smoke control features;
 - (vi) fire hazards or excessive fire loads that could impede evacuation (which may include combustible floor coverings, ceilings, wall linings and wall claddings);
 - (vii) insufficient *exits* to cater for the number of occupants;
 - (viii) excessive travel distances to *exits*;
 - (ix) door hardware and/or direction of door swings in *exits* that are likely to impede safe evacuation;
 - (x) inadequate lighting is available for occupants to locate and use exits during an emergency;
 - (xi) no first attack fire-fighting facilities available for occupant use; or
 - (xii) building occupants will not receive adequate warning of a fire or other emergency to enable them to evacuate to a safe place;
- (b) occupants using *exits* and paths of travel to *exits* are not protected from the effects of smoke and fire (eg by fire resisting construction, by use of non-combustible materials, by use of materials that have low fire hazard properties, by use of a smoke control system or fire suppression system), and/or
- (c) the fire brigade cannot access or use existing fire services and equipment needed for fire-fighting operations and to assist safe evacuation.

301.3 Section 157 of the *Act* states that any action taken to address inadequate fire safety in an existing building should seek to achieve, in the following order of priority-

- (a) firstly, a reasonable standard of fire safety for the occupiers of the relevant building;

- (b) secondly, the minimal spread of fire and smoke; and
- (c) thirdly, an acceptable fire-fighting environment,

in accordance with the fire safety objectives and performance criteria of the *Building Code*. The performance standards in this Standard align with those objectives and criteria.

301.4 **Appendix B4** of this document provides additional guidance for building owners on upgrading actions that may need to be taken to satisfy the order of fire safety priorities listed in **301.3** above.

301.5 An existing building that meets the relevant fire safety performance standards in this Standard can be accepted by a *relevant authority* and an *appropriate authority* as having an acceptable level of fire safety under sections 134 and 157 of the *Act* or when it is undergoing a change in building classification (ie when considering if it possesses fire safety attributes appropriate to its proposed or intended use).

301.6 The deemed-to-satisfy options provided in this Standard are not intended to undermine the powers of an *appropriate authority* to negotiate other alternative, cost effective fire safety solutions with a building owner, or for other alternative solutions to be accepted by a *relevant authority* if they meet the performance standards of this Standard or the performance requirements of the *Building Code* that apply to new buildings.

Fire resistance and protection

302 Performance standards for fire resistance and protection

PS 3.1 To provide a reasonable standard of fire safety for the building occupants, an existing building must be capable of maintaining structural stability during a fire to the extent necessary to allow sufficient time for occupants to evacuate to a safe place before being overcome by the effects of fire or smoke, as appropriate to-

- (a) the function or use of the building;
- (b) the age and difficulty of upgrading building elements;
- (c) the fire hazard;
- (d) the height of the building;
- (e) the size of any fire compartment;
- (f) any active fire safety systems installed in the building; and
- (g) the fire fighting environment.

PS 3.2 To provide a reasonable standard of fire safety for the building occupants, building elements of an existing building, including materials and assemblies, must be capable of resisting the spread of fire and smoke to and within *evacuation routes* and *exits* to the extent necessary to allow sufficient time for occupants to evacuate to a safe place before being overcome by the effects of fire or smoke, as appropriate to-

- (a) the function or use of the building;
- (b) the number, mobility and other characteristics of the occupants;
- (c) the fire hazard;
- (d) the height of the building;
- (e) its proximity to other buildings or fire hazards;
- (f) the size of any fire compartment;
- (g) any active fire safety systems installed in the building;
- (h) the age and difficulty of upgrading building elements; and

- (i) the firefighting environment.

PS 3.3 To provide an acceptable fire-fighting environment, where a fire brigade is available to fight a fire, an existing building must be capable of maintaining structural stability and of resisting spread of fire and smoke to the extent necessary for the fire brigade to safely access and use facilities provided for its fire-fighting operations.

303 Application of fire resistance and protection performance standards:

303.1 An existing building undergoing *alterations* or a change of building classification must satisfy performance standards **PS 3.1** to **PS 3.3** as applicable to the particular building occupancy and use.

303.2 Where *alterations* made to an existing building have compromised the fire resistance of existing building elements that are necessary to-

- (a) maintain structural stability of the building during a fire; or
- (b) control and reduce the risk of smoke and/or fire spreading-
 - (i) to *exits* and *evacuation routes*;
 - (ii) between fire compartments, floors, or sole-occupancy units; or
 - (iii) between buildings; or
 - (iv) between a stage and an auditorium; or
 - (v) between floors via an atrium well,

remedial action must be undertaken to ensure that the relevant performance standards are satisfied.

303.3 In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that **PS 3.1** to **PS 3.3** are not being met, the fire resistance of internal building elements complying with the *Building Rules* that applied at the time the relevant *building approval* was issued, the fire resistance of internal building elements are deemed to satisfy performance standards **PS 3.1** to **PS 3.3**.

303.4 The fire resistance of internal building elements will not satisfy performance standards **PS 3.1**, **PS 3.2** or **PS 3.3** if-

- (a) openings, service penetrations, joints and junctions in existing fire/smoke resistant elements are not fully protected or fire stopped to prevent fire or smoke spreading to *exits* and *evacuation routes* before the occupants will have time to evacuate to a safe place; or
- (b) *primary building elements* have insufficient fire resistance to prevent fire causing damage that could result in them collapsing before occupants have time to evacuate to a safe place; or
- (c) there is insufficient fire-resisting construction provided to the extent necessary to protect and prevent smoke and fire spreading-
 - (i) to *exits* and *evacuation routes* before occupants have time to evacuate to a safe place;
 - (ii) to *evacuation routes*; or

- (iii) from one fire compartment to another fire compartment.
- (d) linings and finishes in *exits* and *evacuation routes* are of combustible materials that if ignited will generate heat, smoke and toxic gases that could inhibit safe evacuation; and/or
- (e) external claddings and/or attachments are of combustible materials that have no other safety measures to prevent fire and smoke spreading via the cladding material from one fire compartment to another fire compartment, from one storey to another storey, or from spreading to *exits* or *evacuation routes*.

304 Acceptable practice to meet the performance standards for fire resistance and protection

304.1 Where existing building elements do not meet performance standards **PS 3.1** or **PS 3.2**, one or more of the following options can be used to improve performance-

- 304.1.1 where relevant, fire or smoke resistant building elements can be modified to restore their integrity and/or fire or smoke resistance;
- 304.1.2 fire retardant coatings that have been tested and certified as having appropriate fire resistant properties, and have been appropriately installed, can be used to improve fire resistance of building elements or finishes;
- 304.1.3 a combination of passive (fire or smoke resistant elements) and active fire safety systems (early detection/alarm systems, sprinklers, hose reels, and/or fire extinguishers) can be used to limit the spread of fire and/or smoke;
- 304.1.4 an automatic sprinkler system can be installed throughout the building or a relevant fire compartment to suppress fire and limit smoke spread;
- 304.1.5 combustible materials or systems can be replaced with non-combustible materials or systems;
- 304.1.6 linings, materials and assemblies can be replaced with linings, materials and assemblies having fire hazard properties in accordance with those required by the *Building Code*; and/or
- 304.1.7 any other safety measure or building solution can be used that satisfies performance standard **PS 3.1** or **PS 3.2** or the relevant performance requirements of the *Building Code*.

304.2 Where existing building elements do not have an adequate level of fire and/or smoke resistance to meet performance standard **PS 3.2**, one or more of the following options can be used to provide additional or alternative protection for evacuating occupants-

- 304.2.1 the building or part of the building can be sub-divided where necessary with additional one hour fire-resisting construction or with smoke resisting walls (refer **Appendix B2**) as appropriate to control fire or smoke spreading to *evacuation routes* before the occupants have time to evacuate; or
- 304.2.2 reductions in fire resistance levels for floors and stairs not less than those set out in the following tables can be permitted where an automatic fire sprinkler system or a smoke detection and alarm system is installed throughout the building or relevant part of a building-
 - (a) **Table 304-1** for existing Class 2 buildings;

- (b) **Table 304-2** for existing Class 3 buildings;
 - (c) **Table 304-3** for existing Class 5, 6 and 7a buildings;
 - (d) **Table 304-4** for existing Class 7b and 8 buildings; or
 - (e) **Table 304-5** for existing Class 9b buildings (except any part containing a night club, discotheque or early childhood centre).
- 304.2.3 where the level of safety cannot be improved by options **304.2.1** or **304.2.2**, existing building elements can be upgraded or replaced to the extent necessary with construction having the relevant fire or smoke resistance *required by the Building Code* for new construction, including protection of openings that could contribute to fire and/or smoke spreading to *exits*.
- 304.3** The fire resistance levels (FRLs) specified in **Tables 304-1 to 304-5** assumes that the building has the same classification throughout the whole building. In a building with multiple classifications, the tables can still be used but the level of fire-resistance that must be applied in a particular area is the most fire resisting level that would apply to one or more of the individual classifications within the building as if it was of the same classification throughout the building.
- 304.4** Where a floor covering, wall lining or ceiling lining in an existing fire-isolated *exit* or a public corridor is of a flammable and/or combustible material that is likely to contribute to the spread of fire within an *exit* or *path of egress*, one or more of the following options can be taken to reduce the hazard and meet the relevant performance standards-
- 304.4.1 replace flammable materials with non-flammable materials;
 - 304.4.2 replace with non-combustible materials;
 - 304.4.3 cover with non-combustible materials (eg fire retardant paint that has been tested and certified as having appropriate fire resistant properties);
 - 304.4.4 replace with materials that have fire hazard properties complying with those required by the *Building Code* for new construction;
 - 304.4.5 install an automatic fire sprinkler system throughout a fire compartment or the building to the extent necessary to protect the occupants from the effects of fire and smoke while evacuating the building; or
 - 304.4.6 any other safety measure or building solution can be used that satisfies either performance standard **PS 3.2** or the relevant performance requirements or deemed-to-satisfy provisions of the *Building Code*.
- 304.5** To meet performance standard **PS 3.2**, a building undergoing the assignment of a new building classification must have the following additional fire resistance attributes-
- 304.5.1 A Class 2 or Class 3 building, or a Class 4 part of a building, must have fire safety measures that will inhibit the spread of fire to sole-occupancy units and public corridors. Acceptable measures for existing rooms and spaces include having-
 - (a) not less than one hour fire resisting construction bounding sole-occupancy units and public corridors, with self-closing doors opening from sole-occupancy units onto public corridors;
 - (b) an automatic sprinkler system installed throughout the building;

- (c) external wall claddings must be of non-combustible material unless other safety measures are provided to prevent spread of fire and smoke from one storey to another storey;
- (c) other safety measures complying with the deemed to satisfy or performance requirements of the *Building Code*; or
- (d) any other safety measure or building solution can be used that satisfies either performance standard **PS 3.2** or the relevant performance requirements of the *Building Code*.

304.5.2 A Class 9a building used for aged care must have fire-resisting walls and floors and/or other measures to the degree necessary to inhibit the spread of fire and smoke in patient care, ward areas and treatment areas between-

- (a) a fire compartment not exceeding 2000m² in area and another fire compartment;
- (b) a fire compartment not exceeding 2000m² in area and non-patient care areas of the building;
- (c) a smoke compartment not exceeding 500m² in area to another smoke compartment; and
- (d) one storey and another storey.

Acceptable measures include-

- (d) wall and floors having not less than one hour fire resistant construction;
- (e) an automatic sprinkler system installed throughout the building;
- (f) having non-combustible external wall claddings; or
- (f) other safety measures or building solutions that satisfy either performance standard **PS 3.2** or the relevant performance requirements or deemed-to-satisfy provisions of the *Building Code*.

304.5.3 Where an adjoining building or property poses a fire hazard, an existing building undergoing a change in building classification must have fire resisting external walls and protected openings to the extent necessary to prevent a fire spreading to *exits* and *evacuation routes* from the fire hazard before the occupants have time to evacuate to a safe place.

Acceptable measures include-

- (a) for buildings up to 4 storeys in effective height, having not less than one hour fire resistant construction for external walls that are within 3 metres of the fire hazard;
- (b) external walls within 3 metres of the fire hazard having the same fire resistance level required by **Tables 304-1** to **304-5** for floors as applicable to the building classification;
- (c) installing an automatic sprinkler system throughout the building and any external walls within 3 metres of the fire hazard having the same fire resistance level required by **Tables 304-1** to **304-5** for floors as applicable to the building classification;

- (d) protecting openings as necessary to resist fire spread from the fire hazard;
- (e) removing any combustible wall claddings, and replacing with non-combustible materials or systems; and/or
- (f) using any other safety measures or building solutions that satisfy either performance standard **PS 3.2** or the relevant performance requirements or deemed-to-satisfy provisions of the *Building Code*.

304.5.4 Where a single storey Class 1 building is being reclassified to a single storey Class 5 or 6 building, an external wall with unprotected openings located not less than 900mm from a boundary is deemed to have acceptable fire resistance to meet performance standard **PS 3.2**.

Table 304-1: Class 2 buildings - Acceptable FRLs for existing floors and stairs.

| Rise in storeys | Building element | CATEGORY I Buildings 600m ² or less gross floor area per floor | | | | CATEGORY II Greater than 600m ² gross floor area per floor | | | |
|-----------------|--------------------------------|--|--|---|---------------------------------|--|--|---|--------------------------------|
| | | FRLs required by Building Code for new building work | Smoke detection and alarm system installed | FRLs if AS 2118.4 sprinklers installed – limited to 4 storeys | AS 2118 .1 sprinklers installed | FRLs required by Building Code for new building work | Smoke detection and alarm system installed | AS 2118.4 sprinklers installed – limited to 4 storeys | AS 2118.1 sprinklers installed |
| 2 | Floors and supporting elements | 30/30/30 or 60 incipient or Fire protective covering | Non-combustible floor or ceiling under floor | -/-/ | -/-/ | 30/30/30 or 60 incipient or Fire protective covering | Non-combustible floor or ceiling under floor | -/-/ | -/-/ |
| | Stairs | 30/30/30 | Open | Open | Open | 30/30/30 | Open | Open | Open |
| 3 | Floors and supporting elements | 90/90/90 | Fire protective covering | Fire protective covering | -/-/ | 90/90/90 | No concession | Fire protective covering | Fire protective covering |
| | Stairs | 90/90/90 if load bearing | Open | Open | Open | 90/90/90 if load bearing | Open | Open | Open |
| 4 | Floors and supporting elements | 90/90/90 | 60 incipient | 60 incipient | Fire protective covering | 90/90/90 | 90/90/90 | 60 incipient | Fire protective covering |
| | Stairs | 90/90/90 if load bearing | 60/60/60 | Open | Open | 90/90/90 if load bearing | 60/60/60 | Open | Open |
| 5 | Floors and supporting elements | 90/90/90 | 90/90/90 | Not suitable – no concession | 60 incipient | 90/90/90 | 90/90/90 | Not suitable – no concession | 60 incipient |
| | Stairs | 90/90/90 if load bearing | 90/90/90 | | 60/60/60 | 90/90/90 if load bearing | 90/90/90 | | FRL 90/90/90 |

NOTE: See definitions and comments to Tables following Table 304-5.

Table 304-2: Class 3 buildings - Acceptable FRLs for existing floors and stairs.

| Rise in storeys | Building element requiring FRL | CATEGORY I 600m ² or less gross floor area per floor | | | | CATEGORY II Greater than 600m ² gross floor area per floor | | | |
|-----------------|--------------------------------|--|--|---|--|--|---|---|--------------------------------|
| | | FRLs required by <i>Building Code</i> for new building work | FRLs if smoke detection and alarm system installed | FRLs if AS 2118.4 sprinklers installed – limited to not more than 4 storeys | FRLs if AS 2118.1 sprinklers installed | FRLs required by <i>Building Code</i> for new building work | FRL if smoke detection and alarm system installed | AS 2118.4 sprinklers installed - limited to not more than 4 storeys | AS 2118.1 sprinklers installed |
| 2 | Floors and supporting elements | 30/30/30 or 60 incipient or Fire protective covering | Non-combustible floor or ceiling under floor | -/-/ | -/-/ | 30/30/30 or 60 incipient or Fire protective covering | Non-combustible floor or ceiling under floor | -/-/ | -/-/ |
| | Stairs | 30/30/30 | Open | Open | Open | 30/30/30 | Open | Open | Open |
| 3 | Floors and supporting elements | 90/90/90 | Fire protective covering | -/-/ | -/-/ | 90/90/90 | 90/90/90 | Fire protective covering | Fire protective covering |
| | Stairs | 90/90/90 if load bearing | Smoke resistant | Open | Open | 90/90/90 if load bearing | Smoke resistant | Open | Open |
| 4 | Floors and supporting elements | 90/90/90 | 60 incipient | 60 incipient | Fire protective covering | 90/90/90 | 90/90/90 | 60 incipient | Fire protective covering |
| | Stairs | 90/90/90 if load bearing | Smoke resistant | Smoke resistant | Smoke resistant | 90/90/90 if load bearing | Fire isolated 60/60/60 | Smoke resistant | Smoke resistant |
| 5 | Floors and supporting elements | 90/90/90 | 90/90/90 | | 60 incipient | 90/90/90 | 90/90/90 | | 60 incipient |
| | Stairs | 90/90/90 if load bearing | Fire isolated 90/90/90 | 90/90/90 LB | Fire isolated 60/60/60 | 90/90/90 if load bearing | Fire isolated 90/90/90 | 90/90/90 LB | Fire isolated 90/90/90 |

NOTE: See definitions and comments to Tables following Table 304-5.

Table 304-3: Class 5, 6 and 7a buildings - Acceptable FRLs for existing floors and stairs.

| | | CATEGORY I 600m ² or less gross floor area per floor | | | CATEGORY III Greater than 600m ² gross floor area per floor | | |
|-----------------|--------------------------------|---|--|--|---|--|--|
| Rise in storeys | Building element requiring FRL | FRLs as required by the <i>Building Code</i> | FRLs if smoke detection and alarm system installed | FRLs if AS 2118.1 sprinklers installed | FRLs as required by the <i>Building Code</i> | FRLs if smoke detection and alarm system installed | FRLs if AS 2118.1 sprinklers installed |
| 2 | Floors and supporting elements | -/-/- | -/-/- | -/-/- | -/-/- | -/-/- | -/-/- |
| | Stairs | 60/60/60 | Open or -/-/- | Open or -/-/- | 60/60/60 | Open or -/-/- | Open or -/-/- |
| 3 | Floors and supporting elements | 30/30/30 or 60/-/- if supported by stair shaft | -/-/- | -/-/- | 30/30/30 or 60/-/- if supported by stair shaft | -/-/- | -/-/- |
| | Stairs | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Smoke-resistant | Open or -/-/- | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Smoke-resistant | Open or -/-/- |
| 4 | Floors and supporting elements | Class 5 & 7a 120/120/120 Class 6 - 180/180/180 | 60 incipient | -/-/- | Class 5 & 7a 120/120/120 Class 6 180/180/180 | 60 incipient | Fire - protective covering |
| | Stairs | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Fire-isolated 60/60/60 | Smoke resistant | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Fire-isolated 60/60/60 | Smoke resistant |
| 5 | Floors and supporting elements | Class 5 & 7a 120/120/120 Class 6 180/180/180 | 90/90/90 | Protective covering | Class 5 & 7a 120/120/120 Class 6 180/180/180 | 90/90/90 | 60 incipient |
| | Stairs | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Fire-isolated 90/90/90 | Smoke resistant | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Fire-isolated 90/90/90 | Fire-isolated 60/60/60 |
| 6 | Floors and supporting elements | Class 5 & 7a 120/120/120 Class 6 180/180/180 | 90/90/90 | 60 incipient | Class 5 & 7a 120/120/120 Class 6 180/180/180 | 90/90/90 | 90/90/90 |
| | Stairs | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Fire-isolated 90/90/90 | Fire-isolated 60/60/60 | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Fire-isolated 90/90/90 | Fire-isolated 60/60/60 |
| 7 | Floors and supporting elements | Class 5 & 7a 120/120/120 Class 6 180/180/180 | 90/90/90 | 60 incipient | Class 5 & 7a 120/120/120 Class 6 180/180/180 | 90/90/90 | 90/90/90 |
| | Stairs | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Fire-isolated 90/90/90 | Fire-isolated 90/90/90 or 2 fire-isolated stairs 60/60/60 | Fire-isolated Class 5 & 7a 120/120/120 Class 6 180/120/120 | Fire-isolated 90/90/90 | Fire-isolated 90/90/90 |

NOTE: See definitions and comments to Tables following Table 304-5.

Table 304-4: Class 7b and 8 buildings - Acceptable FRLs for existing floors and stairs.

| | | CATEGORY I 600m ² or less gross floor area per floor | | | CATEGORY II Greater than 600m ² gross floor area per floor | | |
|-----------------|--------------------------------|--|--|---|--|--|--|
| Rise in storeys | Building element requiring FRL | FRLs required by Building Code for new building work | FRLs if smoke detection and alarm system installed | FRLs if AS 2118.1 sprinklers installed | FRLs required by Building Code for new building work | FRLs if smoke detection and alarm system installed | FRLs if AS 2118.1 sprinklers installed |
| 2 | Floors and supporting elements | -/-/- | -/-/- | -/-/- | -/-/- | -/-/- | -/-/- |
| | Stairs | Open or -/-/- | Open or -/-/- | Open or -/-/- | Open or -/-/- | Open or -/-/- | Open or -/-/- |
| 3 | Floors and supporting elements | 30/30/30 or 60/-/- if supported by stair shaft | -/-/- | -/-/- | 30/30/30 or 60/-/- if supported by stair shaft | -/-/- | -/-/- |
| | Stairs | Fire-isolated 240/120/120 | Smoke-resistant | Open or -/-/- | Fire-isolated 240/120/120 | Smoke-resistant | Open or -/-/- |
| 4 | Floors and supporting elements | 240/240/240 | 60 incipient | -/-/- | 240/240/240 | 60 incipient | Fire - protective covering |
| | Stairs | Fire-isolated 240/120/120 | Fire-isolated 60/60/60 | Smoke resistant | Fire-isolated 240/120/120 | Fire-isolated 60/60/60 | Smoke resistant |
| 5 | Floors and supporting elements | 240/240/240 | 90/90/90 | Protective covering | 240/240/240 | 90/90/90 | 60 incipient |
| | Stairs | Fire-isolated 240/120/120 | Fire-isolated 90/90/90 | Smoke resistant | Fire-isolated 240/120/120 | Fire-isolated 90/90/90 | Fire-isolated 60/60/60 |
| 6 | Floors and supporting elements | 240/240/240 | 90/90/90 | 60 incipient | 240/240/240 | 90/90/90 | 90/90/90 |
| | Stairs | Fire-isolated 240/120/120 | Fire-isolated 90/90/90 | Fire-isolated 60/60/60 | Fire-isolated 240/120/120 | Fire-isolated 90/90/90 | Fire-isolated 60/60/60 |
| 7 | Floors and supporting elements | 240/240/240 | 90/90/90 | 60 incipient | 240/240/240 | 90/90/90 | 90/90/90 |
| | Stairs | Fire-isolated 240/120/120 | Fire-isolated 90/90/90 | Fire-isolated 90/90/90 or 2 fire-isolated stairs 60/60/60 | Fire-isolated 240/120/120 | Fire-isolated 90/90/90 | Fire-isolated 90/90/90 |

NOTE: See definitions and comments to Tables following Table 303-5.

Table 304-5: Class 9b buildings - acceptable FRLs for floors and stairs, except for any part containing a nightclub, discotheque or early childhood centre.

| Rise in storeys | Building element requiring FRL | CATEGORY I 600m ² or less gross floor area per floor | | | CATEGORY II Greater than 600m ² gross floor area per floor | | |
|-----------------|--------------------------------|--|--|---|--|--|--------------------------------|
| | | FRLs required by <i>Building Code</i> for new building work | Smoke detection and alarm system installed | AS 2118.1 sprinklers installed | FRLs required by <i>Building Code</i> for new building work | Smoke detection and alarm system installed | AS 2118.1 sprinklers installed |
| 2 | (a) Floors | 60/-/- | -/-/- | -/-/- | 60/-/- | -/-/- | -/-/- |
| | (b) Stairs | 30/30/30 | Open | Open | 30/30/30 | Open | Open |
| 3 | (a) Floors | 120/120/120 | -/-/- | -/-/- | 120/120/120 | -/-/- | -/-/- |
| | (b) Stairs | 120/120/120 | Smoke-resistant | Open | 120/120/120 | Fire isolated FRL 60/60/60 | Open |
| 4 | (a) Floors | 120/120/120 | 60 incipient | -/-/- | 120/120/120 | 60 incipient | Fire - protective covering |
| | (b) Stairs | 120/120/120 | Fire isolated FRL 60/60/60 | Smoke resistant | 120/120/120 | Fire isolated FRL 60/60/60 | Smoke resistant |
| 5 | (a) Floors | 120/120/120 | No concession 120/120/120 | -/-/- in buildings up to 300m ² floor area and 60 incipient for 300m ² and above | 120/120/120 | No concession 120/120/120 | |
| | (b) Stairs | Fire-isolated 120/120/120 | Fire-isolated 120/120/120 | Smoke resistant | Fire-isolated 120/120/120 | Fire-isolated 120/120/120 | Fire-isolated 60/60/60 |
| 6 | (a) Floors | 120/120/120 | No concession 120/120/120 | Fire - protective covering in buildings up to 300m ² floor area and 60 incipient for 300m ² and above | 120/120/120 | No concession 120/120/120 | No concession 120/120/120 |
| | (b) Stairs | Fire-isolated 120/120/120 | Fire-isolated 120/120/120 | Fire-isolated 60/60/60 | Fire-isolated 120/120/120 | Fire isolated 120/120/120 | Fire-isolated 60/60/60 |
| 7 | (a) Floors | 120/120/120 | No concession 120/120/120 | 60 incipient | 120/120/120 | No concession 120/120/120 | No concession 120/120/120 |
| | (b) Stairs | Fire-isolated 120/120/120 | Fire-isolated 120/120/120 | Fire-isolated 60/60/60 | Fire-isolated 120/120/120 | Fire-isolated 120/120/120 | Fire-isolated 120/120/120 |

Abbreviations and comments to Tables 304-1, 304-2, 304-3, 304-4 and 304-5:

Fire-protective covering – a covering of 13mm fire-protective plasterboard or equivalent fire resistant material

60 incipient – a ceiling with a resistance to the incipient spread of fire to the space above itself of 60 minutes.

Fire-isolated – a stairway with a fire-resisting shaft and includes the floor and roof or top of enclosing structure.

Smoke-resistant – a stair with smoke-resisting construction as described in **Appendix B1** of this Standard.

Smoke detection and alarm system – an automatic smoke detection and alarm system complying with the requirements of the *Building Code* for the particular building classification and use.

All building elements that support another element required to have a fire resistance level (eg a floor), must have the same fire resistance level.

Means of egress

305 Performance standards for means of egress:

PS 3.4 To provide a reasonable standard of fire safety in an existing building, the number, location and dimensions of *exits* and *evacuation routes*, and the latch operation of *exit* doors, must be adequate to enable occupants to evacuate to a safe place before being overcome by the effects of fire, as appropriate to-

- (a) the travel distance;
- (b) the number, mobility and characteristics of the occupants;
- (c) the function or use of the building;
- (d) the height of the building; and
- (e) the practicality of upgrading an existing building.

Note: Refer to **PS 3.10** for determining the time needed for safe evacuation.

306 Application of performance standards for means of egress:

306.1 An existing building that is undergoing *alterations* or a change of building classification must meet performance standard **PS 3.4**.

306.2 *Alterations* made or proposed to be made to an existing building must not prevent existing *exits* and *evacuation routes* from meeting performance standard **PS 3.4**.

306.3 *Exits* and *evacuation routes* will not meet performance standard **PS 3.4** if-

- (a) *alterations* will alter *evacuation routes* and paths of travel to *exits* and increase the time occupants will take to travel to an *exit* (beyond the time needed for safe evacuation);
- (c) the number of occupants needing to evacuate the building or part of a building have substantially increased and existing *exits* will be inadequate to cater for safe evacuation;
- (d) the characteristics of the building occupants have changed and the occupants need more time and/or assistance to reach an *exit* (beyond the time needed for safe evacuation);
- (e) an obstruction or fire hazard exists that could impede safe egress;
- (f) an *exit* door is not readily openable without a key from the side that faces the person seeking egress, or the *exit* door swing is restricting or impeding safe egress;
- (g) combustible materials are stored under stairways or used to enclose the space under stairways that form part of an *exit*; or
- (h) materials are stored in or used to enclose the space under fire isolated stairways.

306.4 In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that *exits* and *evacuation routes* do not meet performance standard **PS 3.4**, where no *alterations* have been made to an existing building (including no change of use or classification), the number, dimensions and locations of *exits* and *evacuation routes* complying with the *Building Rules* that applied at the time the relevant *building approval* was issued are deemed to satisfy performance standard **PS 3.4**.

307 Acceptable practice to meet performance standards for means of egress:

- 307.1** In an existing building undergoing *alterations* or the assignment of a new building classification, performance standard **PS 3.4** will be met if-
- 307.1.1 there are sufficient *exits* for the number of building occupants available within the travel distances shown in **Tables B301 to B303** in **Appendix B3** of this Standard, unless justified through fire engineering analysis;
 - 307.1.2 *exits* and paths of travel to *exits* have dimensions appropriate to the building classification and the number of building occupants and not less than those shown in **Table B304**, unless justified through fire engineering analysis;
 - 307.1.3 doors forming part of an *exit* are readily openable without a key from the side that faces a person seeking egress;
 - 307.1.4 in a building or part of a building with a floor area more than 200m², doors forming part of an *exit* swing in the direction of egress unless a *relevant authority* or an *appropriate authority* has determined that it is not necessary to change the door swing; and
 - 307.1.5 there are no obstructions or fire hazards within *exits* or *evacuation routes* that could impede safe evacuation.
- 307.2** Where performance standard **PS 3.4** is not being met, one or more of the following measures can be undertaken to improve occupant safety and satisfy the performance standards-
- 307.2.1 *exits* and/or paths of travel to *exits* can be altered to the extent necessary to ensure that they are adequate to accommodate the number of building occupants during an emergency (eg widen paths of travel and *exits* or provide additional *exits*);
 - 307.2.2 the number of persons occupying the building, relevant fire compartment or space served by the *exits* and *evacuation routes* can be restricted to ensure that the available *exits* are adequate for the number and type of occupants (any restrictions should be recorded on a new certificate of occupancy);
 - 307.2.3 additional fire resisting construction can be provided to reduce compartment size and travel distances to *exits*;
 - 307.2.4 additional smoke resistant construction can be provided as necessary (eg corridors or *exits*) to improve conditions in *exits* and *evacuation routes* by controlling smoke spread;
 - 307.2.5 a suitable automatic fire detection or automatic sprinkler system can be installed throughout the building or relevant fire compartment as appropriate to protect evacuating occupants;
 - 307.2.6 the number, location or dimensions of *exits* and/or paths of travel to *exits* can be changed to meet the minimum needed for safe evacuation;
 - 307.2.7 where necessary, the door swing of external *exit* doors can be changed to swing in the direction of egress; and/or the operation of the locks can be changed to be readily openable without a key from the side facing the direction of egress; and/or

307.2.8 any other safety measures that achieve the relevant performance standards in this Standard or the relevant performance requirements or deemed-to-satisfy provisions of the *Building Code* can be used.

- 307.3** Where an obstruction or fire hazard exists that could impede safe egress, the obstruction or fire hazard must either be removed, protected by fire-resisting construction, or an alternative safe *evacuation route* provided to the extent necessary to enable safe evacuation.
- 307.4** Where *exit* doors could restrict or impede safe egress due to obstructions, the door swing or the operation of locks and latches, they must be rectified or replaced, with doors, door swings, locks or latches as necessary to meet the relevant performance standards or that comply with the provisions of the *Building Code* for new construction.
- 307.5** *Exits* and *evacuation routes* that comply with the deemed-to-satisfy egress provisions of the *Building Code* will satisfy performance standard **PS 3.4**.
- 307.6** Notwithstanding **307.5**, stairs complying with the following conditions are deemed safe to use as *exits* and to satisfy **PS 3.4**-
- (a) In buildings approved between 20 July 1978 and 17 June 1991, the stair has-
 - (i) goings (G) not more than 395mm and not less than 250mm;
 - (ii) risers (R) not more than 190mm and not less than 115mm;
 - (iii) $2R + G$ not be more than 630 and not less than 585;
 - (iv) any variations between adjacent risers, or between adjacent goings, are no greater than 5 mm;
 - (vi) any variations between the largest and smallest riser within a flight, or the largest and smallest going within a flight, do not exceed 10mm; and
 - (vi) the stair has a continuous barrier along the side/s of the stairway to prevent a person falling from the stair.
 - (b) In buildings approved between 12 April 1973 and 19 July 1978, the stair has-
 - (i) goings (G) not more than 395mm and not less than 255mm;
 - (ii) risers (R) not more than 190mm and not less than 115mm;
 - (iii) $2R + G$ not be more than 625 and not less than 585;
 - (iv) any variations between adjacent risers, or between adjacent goings, are no greater than 5 mm;
 - (v) any variations between the largest and smallest riser within a flight, or the largest and smallest going within a flight, do not exceed 10mm; and
 - (vi) the stair has a continuous barrier along the side/s of the stairway to prevent a person falling from the stair.
 - (c) In buildings approved before 12 April 1973, the stair has-
 - (i) an angle not less than 20 degrees from the horizontal;
 - (ii) goings not less than 229mm;

- (iii) risers not more than 177mm;
 - (iv) any variations between adjacent risers, or between adjacent goings, are no greater than 5 mm;
 - (v) any variations between the largest and smallest riser within a flight, or the largest and smallest going within a flight, do not exceed 10mm;
 - (vi) the number of risers in a flight do not exceed 18, or 20 if a sign is provided at the top and bottom of the stair with lettering not less than 20mm high that says 'WARNING - LONG STAIR'; and
 - (vii) the stair has a continuous barrier along the side/s of the stairway to prevent a person falling from the stair.
- (d) In a Class 5, 6, 7 or 8 building not more than 3 storeys in effective height that was approved before 22 December 1977, an existing spiral stair or a stair with winders can be used as an *exit* provided that-
- (i) the tread nosings have a 50mm strip across the full width of the tread that has a minimum luminance contrast of 30% to the background;
 - (ii) the stairway has a handrail along one side of the stairway;
 - (iii) the stairway is lit with a level of illumination not less than 80 lux;
 - (iv) the maximum travel distance from any point on a floor via the stairway to a point of egress to a road or open space does not exceed 80m; and
 - (v) if necessary, the stairway has a warning sign at the top and bottom of the stair with lettering not less than 20mm high that says 'WARNING – STEEP STAIR'.

Fire-fighting water supply system

308 Performance standards for fire-fighting water supply system:

PS 3.5 To provide an acceptable fire-fighting environment, a water supply system provided for fire-fighting purposes in an existing building must continue to be adequate to facilitate the needs of the fire brigade appropriate to-

- (a) firefighting operations;
- (b) the floor area of the building;
- (c) the fire hazard;
- (d) the age of the building; and
- (e) the practicality of upgrading an existing building.

309 Application of performance standards for fire-fighting water supply system:

309.1 Where appropriate, an existing building undergoing *alterations* or a change of building classification must meet performance standard **PS 3.5**.

309.2 *Alterations* made or proposed to be made to a building must not prevent an existing fire-fighting water supply system (eg a fire hydrant system) from meeting performance standard **PS 3.5**.

- 309.3** In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that an existing fire-fighting water supply system such as a fire hydrant system is not suitable for fire brigade use, if no *alterations* have been made to an existing building (including no change of occupancy) or the fire-fighting water supply system complying with the *Building Rules* that applied at the time the relevant *building approval* was issued, that system is deemed to satisfy performance standard **PS 3.5**.
- 309.4** A fire-fighting water supply system (eg a fire hydrant system) will not meet **PS 3.5** if-
- (a) insufficient coverage is provided by the system;
 - (b) components of the system have been damaged or deteriorated;
 - (c) water pressure and flow test results indicate that pressures and/or flows are not adequate for fire brigade use;
 - (d) fittings and connections of the system are incompatible with fire-fighting equipment used by the fire brigade;
 - (e) the fire brigade is no longer able to gain access to connect to the system; or
 - (f) the system is no longer capable of operating to its design capacity due to the removal or redundancy of associated street fire hydrants.
- 310** **Acceptable practice to meet performance standards for a fire-fighting water supply system:**
- 310.1** Where an existing fire-fighting water supply system or fire hydrant system does not meet **PS 3.5**, one or more of the following measures can be undertaken-
- 310.1.1 the system can be modified, repaired, altered or extended as necessary to provide adequate coverage and/or improve its performance;
 - 310.1.2 tanks, pumps and/or booster assemblies can be installed to boost pressures and flows to a level appropriate for fire brigade use;
 - 310.1.3 pipe fittings and connections can be replaced with fittings suitable for fire brigade use;
 - 310.1.4 using multiple lengths of fire hose where appropriate to the fire brigade's fire-fighting operations;
 - 310.1.5 the existing system can be replaced with a new system complying with the fire hydrant provisions of the *Building Code*;
 - 310.1.6 a sprinkler system can be installed throughout the building to facilitate early fire intervention so the occupants can evacuate the building safely before the fire brigade arrives to undertake its fire-fighting operations;
 - 310.1.7 a *non-required* smoke detection and alarm system can be installed throughout the building to provide early warning to the occupants and enable them to evacuate the building safely before the fire brigade begins its fire-fighting operations; and/or
 - 310.1.8 any other fire-fighting water supply system that meets performance standard **PS 3.5** or the relevant performance requirements or deemed-to-satisfy provisions of the *Building Code* can be used.

310.2 Where proposed *alterations* to an existing building will impact on the effective coverage or performance of a *required* fire hydrant system, one or more of the following measures can be undertaken to improve its performance-

- 310.2.1 the existing fire hydrant system can be rectified, upgraded or extended to provide the necessary coverage, fittings, pressures and flows appropriate for fire brigade use; or
- 310.2.2 the existing hydrant system can be replaced or upgraded to provide the additional coverage.

Fire Hose Reels

311 Performance standards for fire hose reels:

PS 3.6 To limit smoke and fire spread within *evacuation routes* and to *exits*, a fire hose reel system serving an existing building must continue to provide adequate coverage and be suitable for use by occupants to safely undertake initial attack on a fire appropriate to-

- (a) the size of the fire compartment;
- (b) the function or use of the building;
- (c) any other fire safety systems installed in the building; and
- (d) the fire hazard.

312 Application of performance standards for fire hose reels:

312.1 Where relevant, an existing building undergoing *alterations* or a change of building classification must meet the performance standard **PS 3.6**.

312.2 *Alterations* made or proposed to be made to a building must not reduce the ability of an existing fire hose reel system to continue to perform as *required* by **PS 3.6**.

312.3 In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that an existing fire hose reel system does not meet performance standard **PS 3.6**, if no *alterations* have been made to an existing building (including no change of occupancy), a fire hose reel system complying with the *Building Rules* that applied at the time the relevant *building approval* was issued and that has been regularly and appropriately maintained, is deemed to satisfy performance standard **PS 3.6**.

312.4 A fire hose reel system will not meet performance standard **PS 3.6** if it is no longer performing as it was *required* to perform at installation. This can occur where the system has-

- (a) the hoses provide insufficient coverage;
- (b) components are faulty or have deteriorated;
- (c) water pressures and flows are inadequate to provide coverage;
- (d) hoses, fittings and connections are no longer available; or
- (e) the fire hose reel system is no longer accessible or is in a location that is not safe for the occupants to use, eg it is located more than 4m from an *exit*.

313 Acceptable practice to meet performance standards for fire hose reels:

313.1 Where proposed *alterations* to an existing building are likely to impact on the performance of a *required* fire hose reel system or the fire hose reel system does not meet performance standard **PS 3.6**, one or more of the following measures can be used to address the inadequacy or to provide an alternative method of fire suppression as appropriate to meet performance standard **PS 3.6**-

- 313.1.1 the existing fire hose reel system can be rectified or extended to provide the *required* coverage and performance; or
- 313.1.2 a new fire hose system complying with the deemed-to-satisfy provisions for fire hose reels in the *Building Code* can be installed as necessary to provide the *required* coverage and performance; or
- 313.1.3 the fire hose reel system can be decommissioned and removed if additional fire extinguishers are installed to the extent necessary to provide occupants with an alternative means of undertaking initial attack on a fire in the building; or
- 313.1.4 any other safety measures that will achieve performance standard **PS 3.6** or the relevant performance requirements or deemed-to-satisfy provisions of the *Building Code* can be used.

313.2 Where an existing building is to be assigned a new building classification-

- 313.2.1 if the building has an existing fire hose reel system but new occupancy would not require a fire hose reel system under the *Building Code*, the following options can be considered-
 - (a) the existing fire hose reel system can be retained and maintained in accordance with previous requirements; or
 - (b) the fire hose reel system can be decommissioned and removed.
- 313.2.2 if the building does not have a fire hose reel system but the new occupancy would require a fire hose reel system under the *Building Code* if it was a new building, additional fire extinguishers can be provided to the extent necessary to provide occupants with an alternative means of undertaking initial attack on a fire in the building.

Sprinkler systems

314 Performance standards for sprinkler systems:

PS 3.7 To provide a reasonable standard of fire safety for the occupants and minimise the spread of fire and smoke within *evacuation routes* and to *exits*, a *required* automatic sprinkler system in an existing building must continue to function and perform as it was originally *required* to perform.

PS 3.8 To provide a reasonable standard of fire safety for the occupants and minimise the spread of fire and smoke within *evacuation routes* and to *exits*, a non-required automatic sprinkler system or other fire suppression system can be used in an existing building to-

- (a) reduce smoke and fire spread to *exits* and *evacuation routes* that could limit the ability of building occupants to evacuate safely in the event of a fire the building; and

- (b) control the development and spread of fire and smoke to and within *exits* and *evacuation routes* for a period of time necessary to allow occupants to evacuate the building safely (before being overcome by the effects of fire or smoke) as appropriate to-
 - (i) the size of the building or fire compartment;
 - (ii) travel distances to *exits* and other building characteristics;
 - (iii) the function or use of the building (including occupant characteristics);
 - (iv) the height of the building;
 - (v) any fire hazard;
 - (vi) any active fire safety systems installed in the building;
 - (vii) the building age and the practicality of upgrading an existing building; and
 - (viii) the firefighting environment.

315 Application of performance standards for sprinkler systems:

- 315.1** An existing building that is undergoing *alterations* or a change of building classification must meet performance standard **PS 3.7** or **PS 3.8**.
- 315.2** *Alterations* to an existing building must not reduce the ability of an existing sprinkler system or other fire suppression system from continuing to perform as required by **PS 3.7**.
- 315.3** In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that the performance of an existing sprinkler system does not meet **PS 3.7** or **PS 3.8**, an existing automatic sprinkler system or other fire suppression system complying with the *Building Rules* that applied at the time the relevant *building approval* was issued and that has been regularly and appropriately maintained is deemed to satisfy performance standards **PS 3.7** and/or **PS 3.8**.
- 315.4** An automatic sprinkler system will not meet performance standard **PS 3.7** or **PS 3.8** if it is no longer performing as it was required to perform at installation or it will not control the spread of fire appropriate to the current fire hazard level. This could occur where-
- (a) the system has insufficient coverage;
 - (b) components are damaged or have deteriorated;
 - (c) the water service pressures and flows are inadequate to achieve the required performance;
 - (d) the occupancy hazard classification for the sprinkler system is less than the actual occupancy hazard classification (for more information on occupancy classifications refer to Appendix A in AS 2118.1);
 - (e) there is no fire-separation between sprinklered areas and non-sprinklered areas; or
 - (f) fire-separating construction between sprinklered areas and non-sprinklered areas has a FRL rating of-
 - (i) less than 120/120/120 (or -/120/120 as relevant) for buildings with an effective height of 25 metres or more and/or with a *required* sprinkler system; or
 - (ii) less than 60/60/60 (or -/60/60 as relevant) for buildings with an effective height of less than 25 metres that is provided with a *non-required* sprinkler system.

316 Acceptable practice to meet performance standards for sprinkler systems:

- 316.1** Where proposed *alterations* to an existing building impact on the effective performance of a *required* automatic sprinkler system or the system does not meet performance standards **PS 3.7** or **PS 3.8**, one or more of the following options can be used to address the inadequacy and meet the performance standards-
- 316.1.1 the existing fire sprinkler system can be upgraded or extended to provide additional coverage;
 - 316.1.2 damaged or deteriorated components or inadequate sprinkler heads can be replaced or rectified as necessary to ensure effective operation of the sprinkler system;
 - 316.1.3 tanks and/or pumps can be installed to boost water pressures and flows as necessary to ensure effective operation of the sprinkler system;
 - 316.1.4 a new automatic fire sprinkler system complying with the provisions for fire sprinklers in the *Building Code* can be installed to provide the necessary coverage and/or address the deficiencies;
 - 316.1.5 additional fire resisting elements can be provided between sprinklered areas and non-sprinklered areas to improve effectiveness; or
 - 316.1.6 any other safety measures that meets performance standard **PS 3.7** or **PS 3.8** or the relevant performance requirements or deemed-to-satisfy provisions of the *Building Code* can be used.
- 316.2** To satisfy **PS 3.8**, where an existing building or part of an existing building listed below is undergoing *alterations*, sprinklers or other fire safety provisions listed in **316.4** can be used throughout the building or relevant fire compartment to reduce safety risks arising from the size or height of the building or the vulnerability of the building occupants and their ability to evacuate the building safely-
- 316.2.1 a fire compartment in a Class 3 building used for residential aged care (where residents are provided with physical assistance in conducting their daily activities and to evacuate the building in an emergency) that does not have adequate fire resisting construction to limit fire and smoke spread from one compartment to another or to *evacuation routes*;
 - 316.2.2 a fire compartment in a Class 3 building used as a supported residential facility (a facility licensed under the *Supported Residential Facilities Act 1992*, where residents are provided with personal care services) where additional time may be needed to achieve safe evacuation;
 - 316.2.3 any fire compartment in a Class 6 building that exceeds a floor area of more than 3500m² or a volume more than 21 000m³ as a result of the *alterations*;
 - 316.2.4 a fire compartment or storey in a Class 9a building used for a residential aged care that does not have adequate fire resisting construction to limit fire and smoke spread from one compartment to another, or to *evacuation routes*;
 - 316.2.5 a building being reclassified as a Class 9c aged care building;
 - 316.2.6 any storey in any class of building with an effective height of more than 25 metres that contains a *work area*, other than *minor alterations*;

- 316.2.7 any fire compartment in a Class 5, 6, 7, 8 or 9 building that exceeds the maximum fire compartment sizes permitted by the *Building Code* for a new building as a result of the *alterations* and which does not meet the provisions for open space and vehicular access required by the *Building Code* for a new building;
- 316.2.8 any fire compartment in a Class 5, 6, 7, 8 or 9 building with a *floor area* that will exceeds 18 000m² as a result of the *alterations*;
- 316.2.9 any fire compartment containing an occupancy of *excessive hazard* that has a *floor area* more than 2000m² or a volume of more than 12 000m²; and
- 316.2.10 a Class 9b used as a nightclub where no smoke exhaust is provided and smoke exhaust would normally be required.

316.3 To meet performance standards **PS 3.7** and/or **PS 3.8**, a building undergoing the assignment of a new building classification must have the following additional attributes-

- 316.3.1 a Class 3, Class 9a or 9c building or part of a building to be used for residential aged care purposes, must have a suitable automatic sprinkler system or other fire safety provisions installed throughout the newly classified areas that are appropriate to facilitate early intervention and safe evacuation of occupants who may need assistance to evacuate.
- 316.3.2 the following Class 5, 6, 7, 8 or 9 building or parts of buildings must have a suitable automatic sprinkler system or other fire safety provisions installed throughout newly classified areas as appropriate to facilitate early intervention and safe evacuation of the occupants-
 - (a) a Class 6 fire compartment with a *floor area* of more than 3,500m² or a volume more than 21,000m³;
 - (b) a fire compartment in a Class 5, 6, 7, 8 or 9 building that exceeds the maximum fire compartment sizes or open space and vehicular access in accordance with the *Building Code* for a new building;
 - (c) any fire compartment in a Class 5, 6, 7, 8 or 9 building with a *floor area* that exceeds 18 000m²;
 - (d) a Class 5, 6, 7, 8 or 9 building or part of a building within a building that has an effective height of more than 25m; and
 - (e) any fire compartment containing an occupancy of *excessive hazard* that has a *floor area* more than 2 000m² or a volume of more than 12 000m³.

316.4 Alternative fire safety systems to sprinklers that can be used to satisfy **PS 3.8** include but are not limited to the following-

- 316.4.1 provision of fire resisting building elements to reduce fire compartment size;
- 316.4.2 using smoke proof walls to limit smoke spread within a fire compartment;
- 316.4.3 providing smoke exhaust or smoke vents to control smoke spread; and/or
- 316.4.4 providing an early detection and alarm system to facilitate fast evacuation.

Portable fire extinguishers

317 Performance standards for portable fire extinguishers:

- PS 3.9** Portable fire extinguishers must be available in an existing building to allow occupants to undertake initial attack on a fire appropriate to-
- (a) the function or use of the building;
 - (b) any other fire safety systems installed in the building that-
 - (i) warn people of an emergency;
 - (ii) provide for safe evacuation;
 - (iii) restrict the spread of fire;
 - (iv) extinguish a fire;
 - (c) any identified fire hazard; and
 - (d) the building age and practicality of upgrading an existing building.

318 Application of performance standards for portable fire extinguishers:

- 318.1** An existing building that is undergoing *alterations* or a change of building classification must meet performance standard **PS 3.9**.
- 318.2** *Alterations* to an existing building must not diminish the ability of occupants to have access to *required* portable fire extinguishers and to be able to use them to undertake initial fire attack and satisfy performance standard **PS 3.9**.
- 318.3** In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that fire extinguishers in an existing building do not meet performance standard **PS 3.9**, portable fire extinguishers installed in compliance with the *Building Rules* that applied at *building approval* and have been regularly and appropriately maintained are deemed to satisfy performance standard **PS 3.9**.
- 318.4** Portable fire extinguishers will not meet performance standard **PS 3.9** if they are no longer performing as they were required to perform at installation. This could occur where-
- (a) extinguishers are missing, were not provided or are not available where appropriate for occupants to use;
 - (b) the extinguishers have not been regularly inspected, maintained or replaced when necessary;
 - (c) unprotected fire risks exist, such as emergency services switchboards, commercial kitchen cooking equipment or storage of flammable liquids in quantities more than 50 litres; and/or
 - (d) insufficient numbers of fire extinguishers are available or they are not appropriate to the likely class of fire risk to meet performance standard **PS 3.9**.

319 Acceptable practice to meet performance standards for portable fire extinguishers:

- 319.1** Where portable fire extinguishers have been removed or do not meet performance standard **PS 3.9**, portable fire extinguishers appropriate to the class of fire risk must be provided in accordance with the deemed-to-satisfy portable fire extinguisher provisions of the *Building Code*.

- 319.2** Where an existing building is to be assigned a new building classification, portable fire extinguishers appropriate to the class of fire risk must be available or be provided as necessary to meet performance standard **PS 3.9** or the deemed-to-satisfy provisions for fire extinguishers in the *Building Code*.

Smoke hazard management

320 Performance standards for smoke hazard management:

- PS 3.10** In the event of a fire in an existing building, safe conditions must be maintained in *evacuation routes* and *exits* for a period of time needed for occupants to safely evacuate the building or a part of the building before-
- (a) temperatures reach levels likely to endanger human life;
 - (b) visibility is reduced to a point where occupants are unable to locate and safely use *exits*; or
 - (c) toxicity reaches levels likely to endanger human life.

The period of time needed for safe evacuation depends on-

- (a) the number, mobility and other characteristics of the occupants;
- (b) the function, use and age of the building;
- (c) the travel distance and other characteristics of the building;
- (d) the fire hazard, fire load and potential fire intensity;
- (e) the firefighting environment; and
- (f) any active fire safety systems installed in the building that-
 - (i) warn people of an emergency;
 - (ii) provide for safe evacuation;
 - (iii) restrict the spread of fire; and/or
 - (iv) suppress or extinguish a fire.

- PS 3.11** In an existing building with sleeping accommodation, occupants must be provided with automatic early warning on detection of smoke so that they are able to evacuate to a safe place before being overcome by the effects of fire and/or smoke.

321 Application of performance standards for smoke hazard management:

- 321.1** Where relevant, an existing building undergoing *alterations* or a change of building classification must meet performance standards **PS 3.10** and/or **PS 3.11**.
- 321.2** *Alterations* made to an existing building or to a *smoke detection and alarm system* in an existing building must not reduce the effectiveness of the detection and alarm system and its ability to alert the occupants of a fire in the building when smoke is detected.
- 321.3** In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that smoke hazard management in an existing building does not meet performance standard **PS 3.10** or **PS 3.11**, a system of smoke hazard management complying the *Building Rules* that applied at *building approval* that has been regularly and appropriately maintained is considered adequate and deemed to satisfy performance standards **PS 3.10** and/or **PS 3.11**.
- 321.4** In this section, a smoke detection and alarm system includes-
- (a) existing smoke alarms installed in Class 2 buildings in accordance with the *Regulations*;

- (b) a new or existing smoke alarm system complying with the provisions for a smoke alarm systems in the *Building Code* relevant at the time of installation;
- (c) a new or existing smoke detection system complying with the provisions for a smoke detection system in the *Building Code* relevant at the time of installation;
- (d) a combined system consisting of (a) and (b) above; and/or
- (e) any other new or existing alarm system used to effectively alert occupants to a fire in the building and ensure that the performance standards are met.

321.5 A *smoke detection and alarm system* will not meet performance standard **PS 3.10** and/or **PS 3.11** if-

- (a) it has deteriorated and is no longer effective or reliable;
- (b) it is not capable of automatically alerting occupants to a fire in the building on detection of smoke;
- (c) the type detectors are inappropriate for the use of the space (eg where thermal detectors are used in areas where sleeping occupants need to be roused on detection of smoke); or
- (d) the system no longer interfaces with other active fire safety systems as *required*.

321.6 *Alterations* made to an existing building must not reduce the ability of an existing *smoke detection and alarm system*, smoke venting system or other component of a smoke hazard management system (including an automatic air pressurisation system) to continue to perform as required at installation, including where relevant to-

- (a) control and limit smoke spread to *evacuation routes*;
- (b) start up automatically and continue to operate effectively;
- (c) provide automatic warning to alert occupants to a fire in the building; or
- (d) have a viable connection to a fire alarm monitoring system where necessary.

321.7 The performance of an existing smoke venting system or a smoke hazard management system will not meet performance standard **PS 3.10** and/or **PS 3.11** where-

- (a) the system has deteriorated and is no longer capable of controlling smoke spread as *required*;
- (b) changes have been made to the building or system (including occupancy or use) that have affected its performance or effectiveness;
- (c) necessary components of the system have been damaged or disconnected;
- (d) the system no longer interfaces with other fire safety systems it was *required* to interface with; and/or
- (e) the response time to activate the smoke control system is adversely affecting its performance.

322 Acceptable practice to meet performance standards for smoke hazard management:

- 322.1** Where an existing *smoke detection and alarm system* does not meet performance standard **PS 3.10** and/or **PS 3.11**, one or more of the following options can be used to improve smoke hazard management and meet the required performance-
- 322.1.1 The existing smoke detection and alarm system can be rectified or upgraded to restore its performance to that required at installation;
 - 322.1.2 The existing smoke detection and alarm system can be extended to the extent necessary for it to be capable of alerting occupants to a fire when smoke is detected;
 - 322.1.3 To improve occupant warning, existing thermal detectors connected to a fire alarm system can be replaced with smoke detectors that activate fire alarms and alert the occupants earlier on detection of smoke; or
 - 322.1.4 A new automatic smoke detection and alarm system can be installed in a fire or smoke compartment where necessary to provide early occupant warning and meet performance standard **PS 3.10** or **PS 3.11**.
- 322.2** An existing Class 2, 3, 4, 9a and 9c building or part of a building undergoing *alterations* (including a change of use or classification) that has sleeping accommodation must have an alarm system that activates on the detection of smoke to alert sleeping occupants of a fire in the building.
- 322.3** An automatic *smoke detection and alarm system* complying with the provisions of the *Building Code* for smoke detection and alarm systems will meet the requirements of **322.1.4** and **322.2**.
- 322.4** Where an existing smoke hazard management system does not meet performance standard **PS 3.10** and/or **PS 3.11**, the following options can be used to improve occupant safety-
- 322.4.1 the existing smoke hazard management system can be rectified or extended to the extent necessary for it to alert occupants and/or control smoke spread in *evacuation routes* as it was required to at installation;
 - 322.4.2 existing thermal detectors connected to a fire alarm system can be replaced with smoke detectors that will activate the fire alarms on detection of smoke;
 - 322.4.3 a new smoke alarm system, smoke detection system or combined smoke alarm and smoke detection system complying with the deemed-to-satisfy smoke hazard management provisions or the performance requirements of the *Building Code* that apply to the particular building use and classification can be installed; or
 - 322.4.4 for a Class 5, 6, 7, 8 and 9b building not more than 25 metres in effective height-
 - (a) an automatic fire sprinkler system complying with the sprinkler requirements of the *Building Code* for new construction can be installed throughout the whole of a fire compartment containing a *work area* that is not covered by a smoke detection and alarm system; or

- (b) an automatic sprinkler system complying with the deemed-to-satisfy sprinkler requirements of the *Building Code* can be installed throughout the whole building (including *exits*).

- 322.5** Where the control of fire and smoke spread in *evacuation routes* does not meet performance standard **PS 3.10** and/or **PS 3.11**, one or more of the following alternative options can be used to improve occupant safety-
- 322.5.1 additional smoke-proof walls complying with the requirements for smoke-proof walls in **Appendix B2** of this Standard can be installed to limit smoke spread to and within *evacuation routes*;
 - 322.5.2 existing thermal detectors can be replaced with smoke detectors that will activate fire alarms on detection of smoke to give occupants earlier warning;
 - 322.5.3 a new smoke alarm system, smoke detection system or combined smoke alarm and smoke detection system appropriate to the relevant building classification and use can be installed that complies with the smoke hazard management provisions of the *Building Code*;
 - 322.5.4 a sprinkler system appropriate to the building classification, use and height of the building can be installed throughout the relevant fire compartment; or
 - 322.5.5 for Class 6, 7, 8 and 9b buildings, an automatic smoke exhaust system or smoke and heat vents complying with the smoke hazard management provisions of the *Building Code* can be installed.
- 322.6** To meet performance standard **PS 3.10** and/or **PS 3.11**, an existing building more than 25m in effective height that is undergoing *alterations* (other than *minor alterations*) or a change of building classification, must have a smoke hazard management system capable of alerting building occupants of a fire, controlling the development of smoke and limiting smoke spread to *exits* and *evacuation routes* installed throughout any relevant storey or fire compartment containing a *work area* or throughout the whole building.
- 322.7** Where an existing building was not required to have a smoke hazard management system and fire and smoke spread is likely to impede safe evacuation, the introduction of smoke control measures such as early detection and alarm, early fire intervention systems such as sprinklers, or smoke exhaust systems can be used to meet performance standard **PS 3.10** and/or **PS 3.11**.
- 322.8** **Tables B301 to B303 in Appendix B3** set out increased egress distances that are acceptable in existing buildings and are deemed to satisfy performance standards **PS 3.2** where alternative smoke hazard management systems such as sprinklers are installed that were not *required* as part of a previous *building approval*.
- 322.9** **Buildings undergoing a change of building classification** - In addition to the general smoke hazard management standards for existing buildings, a building undergoing the assignment of a new building classification will meet performance standards **PS 3.10** if it has the following attributes-
- 322.9.1 in a Class 3 building or Class 3 part of a building to be used as-
 - (a) a residential part of a school;
 - (b) residential accommodation for children;
 - (c) accommodation for aged persons who need assistance to evacuate (eg a low-care aged care hostel); or

- (d) accommodation for persons with a disability who need assistance to evacuate,

the building has an automatic *smoke detection and alarm system* that is connected to a fire alarm monitoring system if the building or part of the building being reclassified has more than 20 residents and is located more than 2 storeys above ground level.

- 322.9.2 in a Class 9c building or a Class 9a health care building, the building has an automatic *smoke detection and alarm system* that is connected to a fire alarm monitoring system if the building or part of the building being reclassified has more than 20 residents and is located within 20 kilometres of a fire station or fire dispatch centre.
- 322.9.3 in a Class 9b building used as a nightclub, the building has an automatic smoke detection and alarm system that is connected to a fire alarm monitoring system, and a smoke hazard management system complying with the deemed-to-satisfy smoke hazard management provisions for Class 9b nightclubs and discotheques and the like in accordance with the smoke hazard management provisions of the *Building Code*.

Emergency lighting

323 Performance standards for emergency lighting:

- PS 3.12** An existing building must have a level of emergency lighting to the extent necessary to provide levels of illumination that enable occupants to identify *exits* and paths of travel to *exits* to enable them to safely evacuate the building during a fire emergency and power failure, appropriate to-
- (a) the function or use of the building;
 - (b) the floor area of the building;
 - (c) the distance of travel to an exit; and
 - (d) the age and characteristics of the building.

324 Application of performance standards for emergency lighting:

- 324.1 Where relevant, an existing building undergoing *alterations* (other than *minor alterations*) or a change of building classification must meet the performance standard **PS 3.12**.
- 324.2 *Alterations* made to an existing building must not-
 - (a) reduce the coverage of an existing emergency lighting in areas of the building where the *Building Code* would require coverage; or
 - (b) diminish the ability of an existing emergency lighting system to provide adequate illumination for safe evacuation.
- 324.3 In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that emergency lighting in an existing building does not meet performance standard **PS 3.12**, an emergency lighting system complying the *Building Rules* that applied at *building approval* that has been regularly and appropriately maintained is deemed to satisfy performance standard **PS 3.12**.

324.4 In an existing building, emergency lighting will not meet performance standard **PS 3.12** if there is insufficient illumination provided for safe evacuation in *exits* and in paths of travel to *exits*. This can occur where-

- (a) an emergency lighting system has deteriorated or become inactive;
- (b) changes have been made to the building or the lighting system that have reduced its performance, coverage or effectiveness (eg where natural light is relied on, walls have been erected that block illumination to some areas or windows have been removed);
- (c) no emergency lighting has been provided; or
- (d) the operational duration of the lighting system is less than 90 minutes.

325 **Acceptable practice to meet performance standards for emergency lighting:**

325.1 Where existing emergency lighting does not meet performance standard **PS 3.12**, the following can be used to upgrade the system and improve illumination levels to meet the required performance-

- 325.1.1 installing a new emergency lighting system to the extent necessary to provide levels of illumination equivalent to that required for emergency lighting by the *Building Code* for new construction;
- 325.1.2 altering, extending or rectifying an existing emergency lighting system to the extent necessary for it to provide levels of illumination that are equivalent to that required for emergency lighting by the *Building Code* for new construction;
- 325.1.3 using illuminated exit signs to the extent necessary to provide illumination levels equivalent to that required for emergency lighting by the *Building Code* for new construction; or
- 325.1.4 using or installing any alternative system of emergency lighting to the extent necessary to meet performance standard **PS 3.12**.

325.2 An existing building or part of an existing building undergoing *alterations* or a change of building classification must have a system of emergency lighting that meets performance standard **PS 3.12** within-

- (a) any fire compartment that is subject to *alterations* or a change of classification; or
- (b) any *work area*; and
- (c) any *exits* and *evacuation routes* relied on for evacuation from areas (a) and (b) above that would be required by the *Building Code* to have emergency lighting.

Exit signs

326 **Performance standards for exit signs:**

PS 3.13 An existing building must have, to the extent necessary, suitable, clearly visible signs or other appropriate means to identify *exits* and guide occupants to an *exit* during an emergency, appropriate to-

- (a) the function or use of the building;
- (b) the floor area of the building;
- (c) the distance of travel to an exit; and
- (d) the age and characteristics of the building.

327 Application of performance standards for exit signs:

- 327.1** Where relevant, an existing building undergoing *alterations* (other than *minor alterations*) or a change of building classification must meet performance standard **PS 3.13**.
- 327.2** *Alterations* made to an existing building must not diminish the ability of existing exit signs to identify *exits* and guide occupants to an *exit* during an emergency and power failure.
- 327.3** In accordance with **103.5**, where no *alterations* have been made to an existing building, exit signs complying with the *Building Rules* that applied at the time of *building approval* that are continuing to perform as originally required, are deemed to meet performance standard **PS 3.13**.
- 327.4** Existing exit signs are not adequate if they are no longer performing as they were required to perform at installation. This could occur where-
- (a) the exit signs have deteriorated or are no longer visible because they have not been regularly tested and maintained;
 - (b) *exits* and/or exit signs are not visible or readily apparent to persons occupying or visiting the building;
 - (c) *required* exit signs have been removed or were never installed; or
 - (d) changes have been made to the building or exit sign system that have reduced the visibility or effectiveness in guiding occupants to the nearest exit during an emergency and power failure.

328 Acceptable practice to meet performance standards for exit signs

- 328.1** Options for upgrading exit signs that are not clearly visible or performing adequately include-
- 328.1.1 Rectifying defects to ensure that exit signs-
- (a) Are illuminated at all times and can operate on emergency power for not less than 90 minutes;
 - (b) are mounted at heights between 2m and 2.7m above floor level, unless otherwise agreed by the relevant authority, so that they are clearly visible to a person approaching an *exit*;
 - (c) incorporate recognised symbols indicating an exit or the direction a person needs to take to find an *exit*, as relevant;
 - (e) have illumination levels that enable the signs to be visible from the maximum viewing distances specified for exit signs as set out in **Table 310-1**.

Table 310-1 - Maximum viewing distances for exit signs

| Maximum viewing distance (m) | Minimum height of wording or pictorial element (mm) |
|------------------------------|---|
| 16 | 100 |
| 24 | 150 |
| 32 | 200 |

328.1.2 Installing additional exit signs complying with the exit sign provisions of the *Building Code* for new construction; or

328.1.3 Replacing existing exit signs with new exit signs complying with the exit sign provisions of the *Building Code* for new construction.

Note: an existing 'EXIT' sign is deemed to meet performance standard PS 3.13 even though it does not include the 'running man' symbol.

328.2 An existing building undergoing a change of building classification must have visible exit signs identifying all available *exits*, which comply with the provisions for exit signs in this section, or with the exit sign provisions in the *Building Code* (except that any existing 'EXIT' signs that are performing satisfactorily will meet **PS 3.13** and do not need to be exit signs using the 'running man' symbol).

Emergency warning, control and sound systems

329 Performance standards for emergency warning, control and sound systems:

PS 3.14 Where necessary an existing building must have adequate means to alert occupants to a fire in the building and to manage the evacuation process, appropriate to-

- (a) the size, height, function or use of the building;
- (b) the floor area of the building;
- (c) the distance of travel to an *exit*; and
- (d) the age and characteristics of the building.

330 Application of performance standards for emergency warning, control and sound systems

330.1 Where relevant, an existing building undergoing *alterations* (other than *minor alterations*) or a change of building classification must meet performance standard **PS 3.14**.

330.2 *Alterations* made to an existing building must not reduce the ability of an existing emergency warning, control and sound system to operate effectively and perform as required by performance standard **PS 3.14**.

330.3 In accordance with **103.5**, a sound system and intercom system for emergency purposes complying with the *Building Rules* that applied at the time a relevant *building approval* was issued that has been regularly and appropriately maintained will meet performance standard **PS 3.14**.

330.4 A sound system and intercom system for emergency purposes does not meet performance standard **PS 3.14** if it is no longer performing at a level it was required to perform at installation. This could occur where-

- (a) the system has deteriorated because it has not been adequately maintained; or
- (b) changes have been made to the building or system (including occupancy or use) that have reduced its performance or effectiveness.

331 Acceptable practice to meet the performance standards for emergency warning, control and sound systems

331.1 Where a *required* sound system and intercom system for emergency purposes is not capable of meeting performance standard PS 3.14, the following measures can be used to improve the system-

331.1.1 it can be modified or rectified to the degree necessary to provide adequate occupant warning; or

331.1.2 it can be extended or replaced with a new emergency warning and sound system that complies with the emergency warning and sound system provisions of the *Building Code*.

331.2 Where an existing building is undergoing a change of building classification and the new classification would be *required* under the *Building Code* to have a sound and intercom system, the building must have or be provided with an adequate sound system and intercom system for emergency purposes before the building can be re-classified.

PART 4 HEALTH, AMENITY AND ACCESSIBILITY

401 General

- 401.1** This Part of the Standard contains provisions for upgrading health and amenity deficiencies in existing buildings, which can arise when they are undergoing *alterations* or a change of building classification.
- 401.2** The provisions for upgrading and improving access for persons with a disability in existing buildings are based on the requirements contained in the federal *Disability (Access to Premises) Standards 2010* (the Premises Standard), which were adopted nationally under the *Disability Discrimination Act 1992* on 1 May 2011. These requirements must be complied with unless a case for unjustifiable hardship can be made.

Accessibility

402 Performance standard for access for persons with a disability

- PS 4.1** As far as is reasonable and practical, *alterations* made to an existing building and/or its associated site works must-
- (a) seek to improve access to and within an existing building and remove barriers for a person with a disability to the maximum extent possible without incurring unjustifiable hardship; and
 - (b) not diminish or compromise existing access to and within the existing building for a person with a disability.

403 Application of performance standards for access

- 403.1** An existing building undergoing *alterations* or a change of building classification must meet performance standard **PS 4.1**.
- 403.2** In accordance with **103.5**, where no *alterations* are proposed or have been made to an existing building and its site works, a building that complies with the *Building Rules* that applied at the time the relevant *building approval* was issued is deemed to satisfy performance standard **PS 4.1** and a council, private certifier or other relevant authority cannot require access to be upgraded.
- 403.3** Where an existing building is undergoing *alterations* that do not include any building work requiring an assessment against the access provisions of the *Building Code*, a council or private certifier cannot require the building or parts of the building, including within a *work area* or an 'affected part', to be upgraded to comply with the access provisions of the *Building Code* or the *Regulations*.
- 403.4** Subject to **403.6**, **403.7** and **403.8**, where a building is undergoing *alteration* work that includes building work that requires assessment against the access provisions of the *Building Code*, the new work must comply with the access provisions of the *Building Code* and a council or private certifier can require that further *alteration* work be undertaken to upgrade an 'affected part' to comply with the *Building Code* access provisions.
- 403.5** An *affected part* includes-
- (a) the principal pedestrian entrance of the building; and

- (b) any part of the building that is necessary to provide a continuous accessible path of travel from the principal pedestrian entrance to the location of the building work (ie to the *work area*).

404 Acceptable practice to meet the performance standards for access

404.1 An *affected part* will meet performance standard **PS 4.1** if the main building entrance and an identified accessway to the new building *work area* complies with the deemed-to-satisfy access requirements of the *Building Code* and *AS 1428.1-2009 Design for access and mobility Part 1: General requirements for access – New building work*.

404.2 An *affected part* will not meet performance standard **PS 4.1** if it has--

- (a) any steps, stairways, turnstiles, revolving doors, escalators, moving walks, or other impediments within an accessway that could restrict access for a person with a disability;
- (b) has less than the prescribed unobstructed widths and heights throughout the accessway and at doorways;
- (c) has insufficient circulation space at doorways;
- (d) does not have passing and turning spaces where necessary;
- (e) door handles are less than the required height above floor level;
- (f) ramps within the identified accessway do not have the correct gradient, landings, kerbs and handrails;
- (g) there is no colour contrast to define door frames and columns;
- (h) tactile signs are not provided where necessary;
- (i) suitable slip resistant floor finishes and tactile surface indicators are not provided where necessary; or
- (j) a lift forming part of the accessway does not have accessible features in accordance with Table E3.6b of the *Building Code*.

404.3 An *affected part* is not *required* to be upgraded to comply with the *Building Code* access provisions if-

- (a) to do so would cause unjustifiable hardship;
- (b) the applicant for the *alterations* is a tenant leasing that part of the building but is not leasing the whole building; or
- (c) the building being altered is a class 2 building constructed before 1 May 2011,

and in relation to (a), compliance is still achieved to the maximum extent not involving unjustifiable hardship.

404.4 Where an accessible lift is being installed in an existing building to meet performance standard **PS 4.1**, the lift must be an accessible lift complying with the access provisions of the *Building Code*.

404.5 Notwithstanding **404.4**, an existing lift within the *affected part* of a building or within a *work area* need not be upgraded to comply with access provisions of the *Building Code* access provisions if-

- (a) to do so would cause unjustifiable hardship; or
- (b) the existing lift travels more than 12 metres and has a floor area of not less than 1100mm x 1400mm,

and in relation to (a), compliance is still achieved to the maximum extent not involving unjustifiable hardship.

404.6 Where existing sanitary facilities are being altered or new sanitary facilities are being provided, at least one unisex accessible sanitary facility complying with *AS 1428.1-2001 Design for access and mobility Part 1: General requirements for access – New building work* must be available or at least one unisex accessible sanitary facility complying with the access provisions of the *Building Code* must be provided but it is not necessary to provide additional sanitary compartments for a person with an ambulant disability where space is limited.

404.7 Notwithstanding **404.5**, existing sanitary facilities within a *work area* need not be upgraded to comply with the access provisions of the *Building Code* if-

- (a) to do so would cause unjustifiable hardship; or
- (b) the existing sanitary facilities comply with *AS 1428.1 – 2001 Design for access and mobility Part 1: General requirements for access – New building work*

and in relation to (a), compliance is still achieved to the maximum extent not involving unjustifiable hardship.

404.8 An action plan for staging upgrading building accessibility over a period of time that is registered with the Commonwealth Human Rights Commission can be taken into account by a council, private certifier or other authority when it is considering a case for exemption from the requirement to upgrade an *affected part* of an existing building on the grounds that to do so would cause unjustifiable hardship; or whether compliance is still achieved to the maximum extent not involving unjustifiable hardship.

404.9 Circumstances that can be taken into account when considering a claim of unjustifiable hardship are listed in Part 4 of the Premises Standard. If a claim is made to modify the access provisions on the grounds of unjustifiable hardship, the applicant and the council or private certifier have an obligation under the Premises Standard to ensure that compliance is still achieved to the maximum extent not involving unjustifiable hardship.

404.10 In determining whether upgrading parts of a building to comply with the access provisions of the *Building Code* would involve unjustifiable hardship, the Premises Standard requires all relevant circumstances of the particular case to be taken into account, which can include the following:

- (a) additional capital, operating or other costs, or loss of revenue, that would be directly incurred by, or reasonably likely to result from, compliance with this requirement;
- (b) any reductions in capital, operating or other costs, or increases in revenue, that would be directly achieved by, or reasonably likely to result from, compliance with this requirement;
- (c) the extent to which the construction of the building has or will be financed by government funding;
- (d) the extent to which the building:

- (i) is used for public purposes; and
- (ii) has a community function;
- (e) the financial position of a person required to comply with the Standards;
- (f) any effect that compliance with the requirement is reasonably likely to have on the financial viability of a person required to comply;
- (g) any exceptional technical factors (such as whether compliance is *technically infeasible* eg due to the effect load bearing elements may have on the structural integrity of the building) or geographic factors (such as gradient or topography) that could affect a person's ability to comply with the requirement;
- (h) financial, staffing, technical, information and other resources reasonably available to a person required to comply with the Standards, including any grants, tax concessions, subsidies or other external assistance provided or available;
- (i) whether the cost of alterations to make existing premises accessible is disproportionate to the value of the building, taking into consideration the improved value that would result from the alterations (this may include claims of technical infeasibility);
- (j) benefits reasonably likely to accrue from compliance with the Standards, including benefits to people with a disability, to building users or to other affected persons, or detriment likely to result from non-compliance;
- (k) detriment reasonably likely to be suffered by the building developer, building certifier or building manager, or people with a disability or other building users, including in relation to means of access, comfort and convenience, if compliance with the Standards is required;
- (l) if detriment under paragraph (k) involves loss of heritage significance – the extent to which the heritage features of the building are essential, or merely incidental, to the heritage significance of the building (refer to Premises Standards for more detail);
- (m) any evidence regarding efforts made in good faith by a person to comply with these Standards, including consulting access consultants or private certifiers;
- (n) if a person has given an action plan to the Australian Human Rights Commission under section 64 of the *Disability Discrimination Act 1992* – the terms of the action plan and any evidence about its implementation;
- (o) the nature and results of any processes of consultation, including at local, regional, State, national, international, industry or other level, involving, or on behalf of, a building developer, building manager or building certifier and people with a disability, about means of achieving compliance with the requirement, including in relation to the factors listed in this subsection;
- (p) any opinion of the Building Committee as to whether the extent of accessibility to be provided is reasonable under the particular circumstances.

404.11 If a substantial issue of unjustifiable hardship is raised having regard to the factors mentioned in **404.10**, the following additional factors are to be considered-

- (a) the extent to which substantially equal access to public premises is or may be provided otherwise than by compliance with these Standards; and
- (b) any measures undertaken or to be undertaken to ensure substantially equal access.

404.12 Where a building is undergoing a change of classification and no *alterations* or building work are proposed, there is no requirement to upgrade accessibility to and within the existing building.

Damp and weatherproofing

405 Performance standard for damp and weatherproofing:

PS 4.2 An existing drainage system provided for the disposal of stormwater from an existing building must continue to convey stormwater away from the building to avoid water entering the building and causing unhealthy conditions.

406 Application of performance standard for damp and weatherproofing:

406.1 An existing building undergoing *alterations* (other than *minor alterations*) must satisfy performance standard **PS 4.2**.

406.2 In accordance with **103.5**, unless a relevant authority has identified that unhealthy conditions exist due to water entering the building, a stormwater system installed in or associated with an existing building and complying with the *Building Rules* that applied at the time the relevant *building approval* was issued is deemed to satisfy performance standard **PS 4.2**.

406.3 A drainage system will not meet performance standard **PS 4.2** if it is no longer performing as it was required to perform at installation and/or overflow from the system is entering the building and caused unhealthy conditions.

406.4 *Alterations* made to a building and/or its associated site works must not-

- (a) reduce the ability of its drainage system to dispose of collected water in a manner that prevents water from entering the building and affecting the stability of the building or creating an unhealthy or unsound condition; or
- (b) reduce the ability of its roof or external walls (including openings around windows and doors) to prevent rain or other water from penetrating to the inner parts of the building.

Exemption: Requirement (b) does not apply to existing Class 7, 8 and 10 buildings that are not required by the *Building Code* to be damp or weatherproof.

407 Acceptable practice to meet performance standard for damp and weatherproofing:

407.1 Where the disposal of stormwater does not satisfy performance standard **PS 4.2**, the following options can be used to improve performance-

- 407.1.1 the existing stormwater drainage collection and disposal system can be extended, modified or replaced as necessary to satisfy **PS 4.2**; or

- 407.1.2 an alternative system of stormwater drainage collection and disposal can be used that satisfies either **PS 4.2** or meets the deemed-to-satisfy provisions for stormwater drainage collection and disposal in the *Building Code*.

Sanitary facilities

408 Performance standard for sanitary facilities:

PS 4.3 To protect the health of occupants, sanitary facilities appropriate to the function or use of an existing building, the number, needs and gender of the occupants and the age of the building must be available for the use of employees and building users.

409 Application of performance standard for sanitary facilities:

409.1 An existing building undergoing *alterations* (other than *minor alterations*) or a change of building classification must satisfy performance standard **PS 4.3**.

409.2 In accordance with **103.5**, unless a *relevant authority* has identified that unhealthy conditions exist due to inadequate sanitary facilities, sanitary facilities serving an existing building and complying with the *Building Rules* that applied at *building approval* are deemed to satisfy performance standard **PS 4.3**.

409.3 Sanitary facilities in an existing building will not meet performance standard **PS 4.3** if-

- (a) they are in an unusable condition; or
- (b) for a building undergoing a change in building classification, the number of facilities provided for employees does not meet the minimum number required for employees by the *Building Code* for occupational health and safety; or
- (c) for a building undergoing a change in building classification, the number of facilities provided for patients, patrons and participants in Class 3 to 9 buildings is less than 75% of the minimum number required by the *Building Code*.

410 Acceptable practice to meet performance standard for sanitary facilities:

410.1 Where *alterations* are being made to existing sanitary facilities that involve moving or installing toilet partitions but existing fixtures are not being moved, the resulting sanitary facilities must be made as accessible as possible under the particular circumstances.

410.2 Where *alterations* are being made to existing sanitary facilities that involve moving or installing toilet partitions and moving existing fixtures, the resulting sanitary facilities must comply with requirements of the *Building Code* to the maximum extent possible under the particular circumstances and where technically feasible at least one accessible unisex sanitary facility must be available or be provided (unless to do so would incur unjustifiable hardship).

410.3 Notwithstanding **410.2**, where *alterations* are being made to a bank of existing sanitary facilities, it is not necessary to provide a sanitary compartment suitable for a person with an ambulant disability for use by males and females if to do so would be *technically infeasible*.

410.4 Where the number of sanitary facilities in an existing building is inadequate for a new occupancy, sanitary facilities for personal hygiene must be provided to suit-

- (a) its new function or use;

- (b) the number and gender of the occupants; and
- (c) the disability or other particular needs of the new occupancy

to the maximum extent possible taking into account the age of the building and any site or space limitation,

410.5 Where new sanitary facilities are being provided, they must comply with the relevant provisions for sanitary facilities in the *Building Code*.

Room Heights

411 Performance standard for room heights:

PS 4.4 Habitable rooms and spaces in existing buildings must have room heights suitable for their function and use, as appropriate to the age of the building.

412 Application of performance standard for room heights:

412.1 An existing undergoing *alterations* (other than *minor alterations*) or a change of building classification must satisfy performance standard **PS 4.4**.

412.2 In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that performance standard **PS 4.4** is not met, habitable rooms and spaces in an existing building complying with the *Building Rules* applying at the time the *building approval* was issued are deemed to satisfy performance standard **PS 4.4**.

412.3 *Alterations* made to a building must not result in the height of any room or space no longer meeting performance standard **PS 4.4**.

413 Acceptable practice for performance standard for room heights:

413.1 In a building undergoing *alterations*, the room and spaces within a *work area* must have sufficient height for their use or intended function, which can be achieved by use of one of the options set out in **405.5** or by individual analysis of how the room or space is to be used.

413.2 Rooms and spaces will meet performance standard **PS 4.4** if they have-

- (a) ceiling heights complying with the minimum ceiling heights for rooms and spaces set out in **Table 413-1** below; or
- (b) ceiling heights complying with the minimum ceiling height provisions of the *Building Code*; or
- (c) ceiling heights determined through individual analysis of how the room or space is intended to be used.

413.3 In a building undergoing a change in building classification, rooms and spaces must have sufficient height to suit any new function or use in accordance with **413.2**.

Table 413-1 Minimum heights to suit use of rooms and spaces in building undergoing a change of classification

| Classification | Room or space | Minimum ceiling height |
|--|--|---|
| Class 2 or 3 buildings or Class 4 part of a building: | Kitchens, laundries or the like; Corridors, passageways or the like | 2.1 m; or 2.2 m for not less than two-thirds of the room or space (excluding any area less than 1.5 m in height) |
| | Habitable rooms, excluding a kitchen | 2.4 m; or 2.4 m for not less than two-thirds of the room or space (excluding any area less than 1.5 m in height) |
| Class 5, 6, 7 or 8 buildings | Rooms and spaces other than corridors, passageways or the like | 2.4 m |
| | Corridors, passageways or the like; | 2.1 m |
| Class 9a health-care building | Patient care areas Treatment rooms, clinics, waiting rooms, passageways, corridors or the like | 2.4 m |
| | Operating theatres and delivery rooms | 3 m |
| Class 9b buildings | A school classroom or other assembly building or part that accommodates not more than 100 persons, including a corridor serving that part | 2.4 m |
| | A theatre, public hall or other assembly building or part that accommodates more than 100 persons, including a corridor serving that part | 2.7 m |
| Class 9c buildings | Kitchens, laundries or the like; | 2.1 m |
| | Corridors, passageways or the like and habitable rooms, excluding a kitchen | 2.4 m |
| In any Class of building | Bathrooms, shower rooms, sanitary compartments, airlocks, tea preparation room, pantries, store rooms, garages, car parking areas, or the like | 2.1 m |
| | A commercial kitchen | 2.4 m |
| | Above a stairway, ramp, landing or the like | 2 m measured vertically above the nosing of stairway treads or the floor surface of the ramp, landing or the like |

Light and ventilation

414 Performance standards for light and ventilation:

- PS 4.5** Sufficient natural light must be available in existing buildings where appropriate to the function, use and age of the building or a relevant part of the building for health purposes.
- PS 4.6** Sufficient natural or artificial light appropriate to the function, use and age of the building or relevant part of the building must be available throughout rooms and spaces in an existing building for safe movement by occupants.
- PS 4.7** Adequate natural or artificial ventilation appropriate to the function, use and age of the building or relevant part of the building must be available in habitable rooms and spaces in an existing building to maintain satisfactory indoor air quality.

415 Application of performance standards for light and ventilation:

- 415.1** An existing building undergoing *alterations* (other than *minor alterations*) or a change of building classification must satisfy performance standards **PS 4.5** to **PS 4.7**.
- 415.2** In accordance with **103.5**, unless a relevant authority has identified that performance standards **PS 4.5**, **PS 4.6** or **PS 4.7** have not been met, levels of light and ventilation complying with the *Building Rules* applying at the time the *building approval* was issued are deemed as meeting the relevant performance standards.

416 Acceptable practice to meet the performance standard for light and ventilation:

- 416.1** The following rooms and spaces within a *work area* or an area undergoing a change in building classification will satisfy performance standard **PS 4.4** if they have natural light levels complying with one or more of the options set out in **416.2**-
- (a) Class 2, 3 and 4 buildings and occupancies – all habitable rooms;
 - (b) Class 3 buildings and occupancies – all bedrooms;
 - (c) Class 9a and 9c and occupancies buildings – all rooms used for sleeping purposes; and
 - (d) Class 9b buildings and occupancies – all classrooms and children’s playrooms.
- 416.2** In an existing building, one or more of the following options can be used to meet performance standard **PS 4.5**-
- (a) in buildings approved before 17 June 1991-
 - (i) windows that have an aggregate light transmitting area not less than one-fifteenth of the floor area of the room concerned;
 - (ii) borrowed light from an adjoining room that has an external window with an aggregate light transmitting area not less than one-fifteenth of the floor area of both rooms;
 - (iii) windows or roof lights that have an aggregate light transmitting area not less than that provided in accordance with (b); or

- (b) in buildings approved after 17 June 1991–
 - (i) windows that have an aggregate light transmitting area of not less than 10% of the floor area of the room concerned;
 - (ii) roof lights that have an aggregate light transmitting area of not less than 3% of the floor area of the room concerned;
 - (iii) a proportional combination of (i) and (ii); or
 - (iv) borrowed light from an adjoining room that has an external window with an aggregate light transmitting area not less than 10% of the floor area of both rooms,

in accordance with the relevant natural light provisions of the *Building Code*.

416.3 Rooms and spaces within a *work area* or an area undergoing a change in building classification will satisfy performance standard **PS 4.6** if they have levels of natural or artificial light complying with one or more of the options set out in **416.4**.

416.4 In an existing building, one or more of the following options can be used to meet performance standard **PS 4.6**–

- (a) in buildings approved before 17 June 1991–
 - (i) existing windows that have an aggregate light transmitting area not less than one-fifteenth of the floor area of the room concerned;
 - (ii) borrowed light from an adjoining room that has an external window with an aggregate light transmitting area not less than one-fifteenth of the floor area of both rooms;
 - (iii) windows or roof lights that have an aggregate light transmitting area not less than that provided in accordance with (b); or
 - (iv) an artificial lighting system.
- (b) in buildings approved after 17 June 1991–
 - (i) windows that have an aggregate light transmitting area of not less than 10% of the floor area of the room concerned;
 - (ii) roof lights that have an aggregate light transmitting area of not less than 3% of the floor area of the room concerned;
 - (iii) a proportional combination of (i) and (ii);
 - (iv) borrowed light from an adjoining room that has an external window with an aggregate light transmitting area not less than 10% of the floor area of both rooms; or
 - (v) an artificial lighting system complying with the relevant provisions for artificial lighting in the *Building Code*.

416.5 Habitable rooms and spaces within a *work area* or an area undergoing a change in building classification will satisfy performance standard **PS 4.7** if they have levels of natural or mechanical ventilation complying with one or more of the options set out in **416.6**.

- 416.6** In an existing building, performance standard **PS 4.7** can be achieved by using one or more of the following options-
- (a) in buildings approved before 17 June 1991-
 - (i) openings, windows, doors or other devices that have a ventilating area not less than one-thirtieth of the floor area of the room concerned;
 - (ii) borrowed ventilation from an adjoining room that has an external window with an aggregate ventilating area not less than one-thirtieth of the floor area of both rooms; or
 - (iii) a mechanical ventilation or air conditioning systems that provides sufficient air changes to maintain healthy indoor air quality for the occupants.
 - (b) in buildings approved after 17 June 1991–
 - (i) openings, windows, doors or other devices that have a ventilating area not less than 5% of the floor area of the room concerned;
 - (ii) borrowed ventilation from an adjoining room that has external openings, windows, doors or other devices with an aggregate ventilating area not less than one-thirtieth of the floor area of both rooms; or
 - (iii) a mechanical ventilation or air conditioning system meeting the ventilation provisions of the *Building Code*.

Sound Insulation

417 Performance standard for sound insulation:

PS 4.8 To prevent the levels of sound being transmitted through the walls and floors of existing Class 2, Class 3 sole-occupancy units or the walls and floors of bedrooms of Class 9c aged care buildings from causing illness or loss of amenity for the occupants, the walls and floors must be provided with adequate levels of insulation against the transmission of airborne and impact generated sound appropriate to the age and use of the building.

418 Application of performance standard for sound insulation:

- 418.1** An existing Class 2, 3 or 9c building undergoing *alterations* to walls and floors of sole-occupancy units, other than *minor alterations*, the walls and floors must have levels of sound insulation that satisfy performance standard **PS 4.8**.
- 418.2** In accordance with **103.5**, unless a *relevant authority* or an *appropriate authority* has identified that **PS 4.8** is not being met, walls or floors of habitable rooms and spaces in Class 2, 3 sole-occupancy units or bedrooms of Class 9c buildings complying with the *Building Rules* applying at the time the relevant *building approval* was issued are deemed to satisfy performance standard **PS 4.8**.
- 418.3** Where a building is undergoing *alterations* to walls or floors of habitable rooms of Class 2 or 3 sole-occupancy units or the walls or floors of bedrooms in a Class 9c building, including *alterations* to services in or passing through such walls or floors-

- (a) the sound insulation levels of existing floors and walls must not be reduced by *alterations* to a level below that *required* at approval (eg by allowing unprotected service penetrations through them or by not restricting hard floor surfaces from being used where they are likely to increase the level of impact sound transmitted between rooms or spaces); or
- (b) if the floor or walls are being replaced, they must have levels of insulation against the transmission of airborne and impact generated sound in accordance with the sound insulation requirements of the *Building Code*.

419 Acceptable practice for performance standard for sound insulation:

419.1 In a building or part of a building undergoing assignment of a new building classification to a Class 2 or Class 3 occupancy, the floors separating-

- (a) sole-occupancy units;
- (b) a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby, or the like; or
- (c) a sole-occupancy unit from a part of the building with another classification,

will satisfy performance standard **PS 4.8** for floors if they have levels of insulation against the transmission of airborne and impact generated sound not less than the relevant levels for floors set out in **419.3** and **419.4** as applicable.

419.2 In a building or part of a building undergoing a change in classification to a Class 2 or Class 3 occupancy, walls separating-

- (a) sole-occupancy units;
- (b) a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby, or the like; or
- (c) a sole-occupancy unit from a part of the building with another classification,

will satisfy performance standard **PS 4.8** for walls if the wall is separating a bathroom, sanitary compartment, laundry or kitchen in one sole-occupancy unit from a habitable room (other than a kitchen) in an adjoining sole-occupancy unit has levels of insulation against the transmission of airborne sound; and impact generated sound not less than the levels set out in **419.5**, **419.6** or **419.7** as applicable.

419.3 In buildings approved before 1 May 2004, an existing floor separating existing Class 2 or Class 3 sole-occupancy units that has a sound transmission class not less than 45, or a R_w of not less than 45, has an acceptable level of sound insulation.

The following types of floor construction are deemed to have a sound transmission class (STC) of not less than 45 or a R_w of not less than 45-

- (a) 125 mm thick concrete slab (density not less than 2200 kg/m³);
- (b) 100 mm concrete slab (density not less than 2500 kg/m³);
- (c) 100 mm thick precast concrete slab without joints;
- (d) timber floor comprising-
 - (i) timber joists not less than 175 mm x 50 mm;

- (ii) tongued and grooved boards not less than 19 mm thick and secured to 75 mm x 50 mm battens between each joist and laid over joists but not affixed thereto;
 - (iii) 25 mm thick glass-fibre blanket laid over entire floor, including tops of joists before joists are laid; and
 - (iv) 75 mm thick mineral wool cut to fit tightly between joists and laid on 9.5 mm thick plasterboard fixed to underside of joists; or
- (b) a form of construction previously tested and approved as having a STC or a R_w not less than 45.
- 419.4** In buildings approved after 30 April 2004, a floor separating Class 2 or Class 3 sole-occupancy units that complies with the sound insulation provisions of the *Building Code* will meet performance standard **PS 4.8**.
- 419.5** Elements in existing Class 2 or Class 3 buildings approved before 1 May 2004 will satisfy performance standard **PS 4.8** if they have the following sound insulation levels-
- (a) walls separating sole-occupancy units - a sound transmission class not less than 45, or a R_w of not less than 45;
 - (b) walls separating sole-occupancy units from a plant room, lift shaft, stairway public corridor, hallway or the like - a sound transmission class not less than 45, or a R_w of not less than 45; and
 - (c) walls separating a bathroom, sanitary compartment, laundry or kitchen in one sole-occupancy unit from a habitable room (other than a kitchen) in an adjoining unit - a sound transmission class not less than 50, or a R_w of not less than 50.
- 419.6** Elements in existing Class 9c buildings approved before 1 May 2004 will satisfy performance standard **PS 4.8** if they have the following sound insulation levels-
- (a) walls separating sole-occupancy units - a weighted sound reduction index (R_w) of not less than 45; and
 - (b) walls separating sole-occupancy units from a kitchen, bathroom, sanitary compartment, laundry, plant room, or utilities room- a weighted sound reduction index (R_w) of not less than 50 and provide a satisfactory level of insulation against impact sound and not incorporate a duct that reduces the R_w of the wall to less than 50.
- 419.7** In buildings approved after 30 April 2004, walls separating sole-occupancy units in Class 2, Class 3 and Class 9c buildings that comply with the deemed-to-satisfy sound insulation provisions of the *Building Code* will meet performance standard **PS 4.8**.

PART 5 CHANGE OF BUILDING CLASSIFICATION

501 General

- 501.1** This Part of the Standard contains provisions for addressing health and safety issues that could arise in an existing building undergoing a change of building classification.
- 501.2** Even where no *alterations* are proposed, the health and safety of an existing building or part of a building undergoing a change of classification must be appropriate for its new use and occupancy and must not result in an increased risk to occupant health and safety.

502 Change of use with no change of building classification

- 502.1** Under section 134 of the Act, there is no requirement to upgrade an existing building undergoing a *change of use* or occupancy that does not-
- (a) substantially increase the number of occupants from the number for which the building was designed and approved;
 - (b) involve any building *alterations*;
 - (c) change the use of the building from the use for which it was previously classified; or
 - (d) substantially increase the fire hazard or fire load above that for which the building was designed and approved.
- 502.2** Upgrading aspects of an existing building may be required where a *change in use* or occupancy substantially increases the fire load in the building, such as where-
- (a) a Class 9b gymnasium is being changed to a Class 9b nightclub; or
 - (b) a Class 8 factory with low hazard occupancy is being changed to a Class 8 factory with a high hazard occupancy.

503 Change of use with assignment of a new building classification

- 503.1** Where a proposed *change of occupancy* is not consistent with the current building classification, a new classification can be assigned if the building 'possesses the attributes appropriate to its intended use'.
- 503.2** An existing building has health and safety attributes appropriate for its intended use if-
- 503.2.1 it complies with-
 - (a) the relevant performance standards for structural safety set out in **Part 2** of this Standard that are applicable to the new classification; and
 - (b) the relevant performance standards for fire safety set out in **Part 3** of this Standard that are applicable to the new classification; and
 - (c) the relevant performance standards for health, amenity and access set out in **Part 4** of this Standard that are applicable to the new classification; or
 - 503.2.2 it complies with the relevant health, safety and amenity performance requirements in the *Building Code* applicable to the new building classification.

- 503.3** A *relevant authority* can approve the assignment of a new building classification if satisfied that the building does not-
- (a) pose more hazardous, unacceptable health, structural or fire safety risks than its existing use; and/or
 - (b) require a higher level of fire safety under the *Building Code* for the new classification than it was *required* to have for the original classification.
- 503.4** In an existing building, the following scenarios can pose unacceptable safety risks that need to be addressed before the assignment of a new building classification is approved-
- 503.4.1 the proposed use and/or number of occupants will result in substantially increased loads that could alter or affect the structural stability of the building or parts of the building;
 - 503.4.2 the mobility and characteristics of the proposed occupancy could limit their ability to respond within sufficient time to evacuate safely in an emergency;
 - 503.4.3 the number and location of exits are not adequate to enable the proposed number or type of occupants to evacuate safely in an emergency;
 - 503.4.4 there are obstructions, reductions or limitations in the widths of exits and paths of travel to exits that could compromise the ability of the occupants to evacuate safely in an emergency;
 - 503.4.5 passive fire protection measures such as compartmentation and separation have been compromised by unprotected penetrations or openings that are not fire-stopped, reducing their ability to limit fire and/or smoke spread;
 - 503.4.6 the use of combustible or hazardous materials, finishes or building components that may cause rapid spread of fire and/smoke from one fire compartment to another fire compartment; from one storey to another storey; or to *exits* and *evacuation routes*; or
 - 503.4.7 active fire protection measures installed in the building are not operating adequately to provide early fire detection and warning and/or provide an acceptable level of protection for occupants during an evacuation.
- 503.5** Where an application is made for the assignment of a new building classification and no building work is proposed, there is no requirement to upgrade the building, however the application may not be approved if the building has health and safety risks that need to be addressed.

APPENDIX A STRUCTURAL SAFETY

Appendix A1 – Seismic Risk Assessment of Existing Buildings (Amendment 1)

(For buildings other than Importance Level 4 buildings)

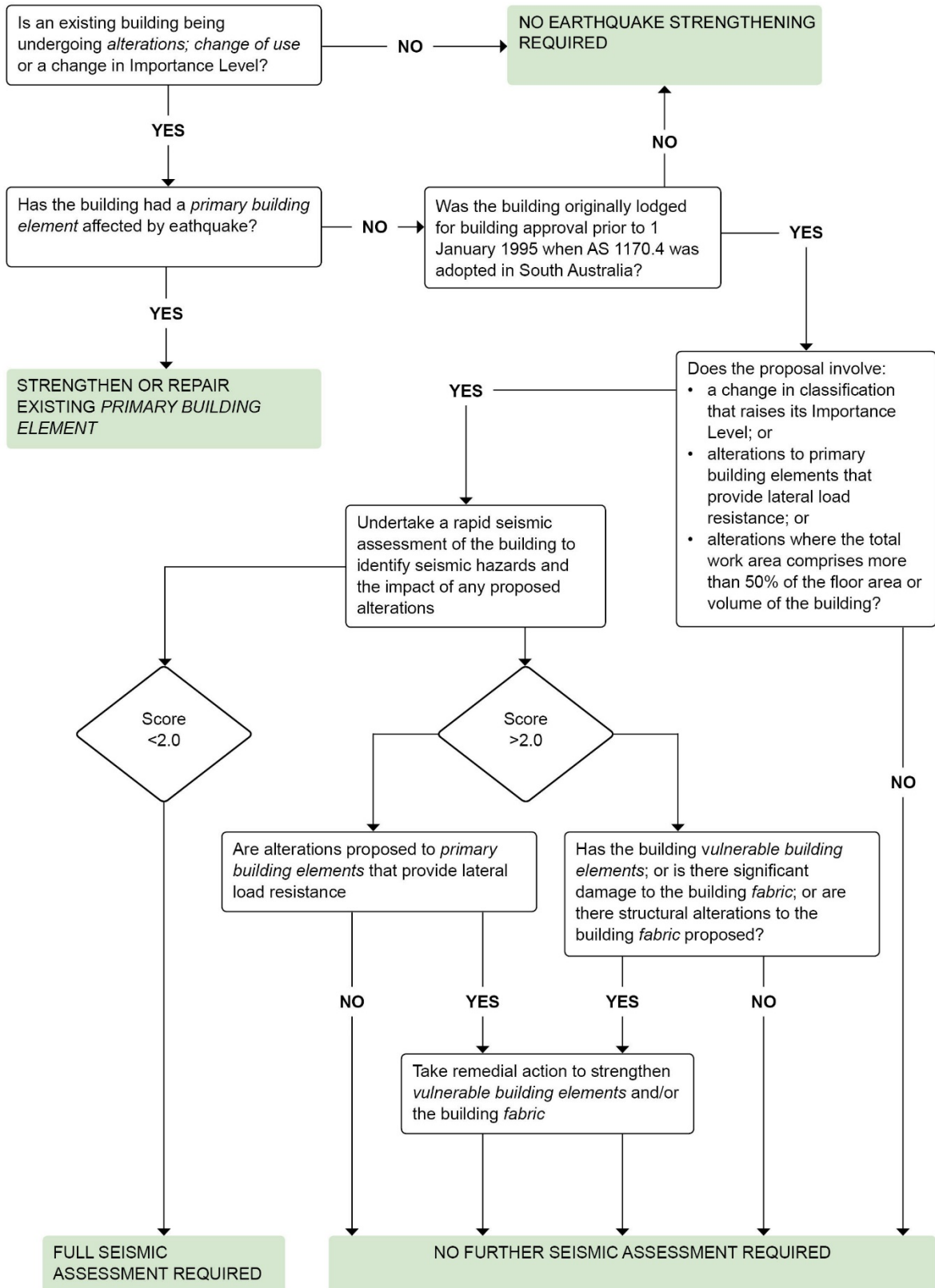


Table A101 - Rapid seismic assessment form

| | | | | | | | |
|---|--|---------------------------------|--------------------------|---|------------------------------------|--------------------------|---------------------|
| Scale: _____ Location Plan | Address: _____ _____ No. Storeys: _____ Year built: _____ Total Floor Area (m ²): _____ Building Name: _____ Use: _____ | | | | | | |
| PHOTOGRAPH | | | | | | | |
| SEISMIC HAZARDS | | | | | | | |
| Identify if the building has any of the following <i>vulnerable building elements</i> or other seismic hazards: | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unreinforced chimneys | Unbraced parapets | Unbraced gable end walls | Heavy cladding | Cantilever or tied street awnings | Structural damage | Other | |
| BASIC SCORE, MODIFIERS, AND FINAL SCORE | | | | | | | |
| Construction type | Braced or moment frame steel, with or without concrete shear walls | Steel frame with masonry infill | Concrete moment frame | Concrete shear wall | Concrete frame with masonry infill | Unreinforced masonry | Timber Construction |
| Basic Score | 2.4 | 2.4 | 2.0 | 2.4 | 2.2 | 2.6 | 3.6 |
| Mid Rise (4 to 7 stories) | +0.4 | +0.4 | +0.2 | +0.4 | +0.2 | -0.4 | n/a |
| High Rise (> 7 stories) | +1.4 | +0.8 | +0.5 | +0.8 | +0.4 | n/a | n/a |
| Vertical Irregularity | -2.0 | -2.0 | -2.0 | -2.0 | -2.0 | -1.5 | -3.0 |
| Plan Irregularity | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Pre 1983 | -0.4 | -0.2 | -1.0 | -0.4 | -1.0 | -0.4 | -0.2 |
| FINAL SCORE | | | | | | | |
| COMMENTS | | | | Detailed Seismic Assessment Required if Final Score ≤ 2.0 YES NO | | | |
| Assessed by: | | | Qualifications: | | | | |
| Signature: | | | Date: | | | | |

Table A102 - Definitions of score modifiers in Form A101

| | |
|-----------------------|--|
| Mid-Rise | 4 to 7 storeys |
| High-Rise | 8 or more storeys |
| Vertical Irregularity | Steps in elevation view; inclined walls; building on hill; soft storey (e.g., house over garage); building with short columns. Discontinuous lateral load path. |
| Plan Irregularity | Buildings with re-entrant corners (L, T, U, E, + or other irregular building plan); buildings with good lateral resistance in one direction but not in the other direction; eccentric stiffness in plan, (e.g. corner building, or wedge-shaped building, with one or two solid walls and all other walls open). |

Rapid seismic assessment process

The process for undertaking a *rapid seismic assessment* is as follows-

1. Identify the building and its location.
2. Identify the size, height, use of the building and year it was built.
3. Visually assess the building and identify if it has any *vulnerable building elements*, such as unreinforced chimneys, unbraced parapets or gable end walls, heavy cladding etc, or other seismic hazards and tick the relevant box or boxes on the **Table A101** form if applicable.
4. Identify the construction type and note the relevant Basic Score from **Table A101** applicable to that type of construction.
5. Identify if the building-
 - (a) is a mid-rise building (4 – 7 storeys);
 - (b) is a high rise building (8 or more storeys);
 - (c) has any vertical irregularities;
 - (d) has any plan irregularities;
 - (e) it was constructed prior to 1983; and

apply all relevant score modifiers listed in **Table A101** to the Basic Score as determined for its construction type to produce its final score.
6. Identify if the building achieved a final score of more than 2.0 and therefore requires no further detailed seismic assessment.
7. Identify if the building has *vulnerable building elements* that need strengthening to provide an acceptable level of safety for building occupants who may be evacuating the building during an earthquake.
8. Identify if the building achieved a final score of less than 2.0 and will therefore require a further detailed seismic assessment.
9. Complete all relevant details in **Table A101** and sign and date the form. The completed form can then be attached to an application for building consent, together with details of any work proposed to be undertaken to address any identified safety risks.

Vertical Irregularity

If a building has a vertical irregularity, the relevant modifier shown in **Table A101** for vertical irregularity must be applied to the basic score. Vertical irregularities can affect all building types. Examples of vertical irregularity include buildings with setbacks, hillside buildings, and buildings with soft storeys (see examples of vertical irregularities in **Figure A1-01**).

If the building is on a steep hill and the up-slope dimension of the building rises at least one storey above the lowest down-slope point of the building, a problem may exist because the horizontal stiffness along the lower side may be different from the uphill side. In addition, in the up-slope direction, the stiff short columns attract the seismic shear forces and may fail. In this case the performance modifier is applicable. See **Figure A1-01** for an example.

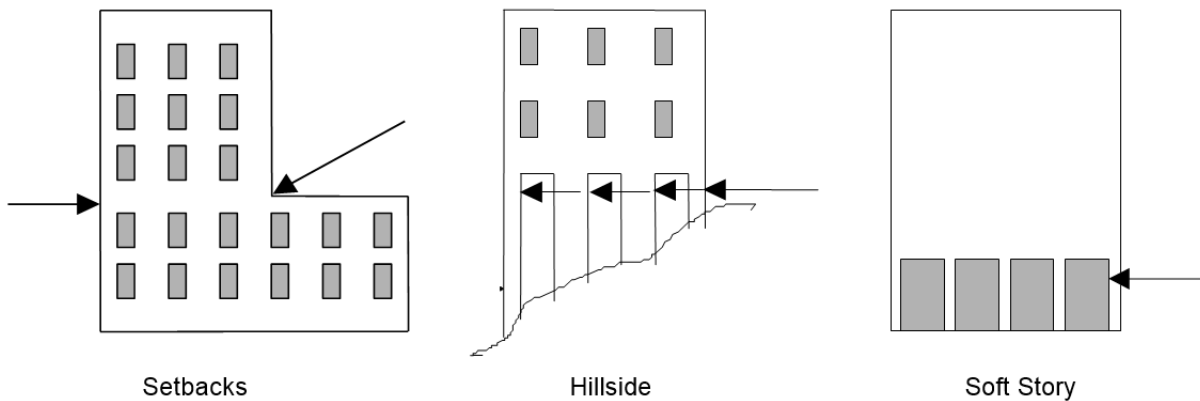


Figure A1-01 Building elevations showing vertical irregularities, with arrows indicating locations of particular concern.

A soft storey exists if the stiffness of one storey is dramatically less than that of most of the others (see **Figure A1-02**). Examples are shear walls or infill walls not continuous to the foundation. In many commercial buildings, the first storey is soft due to large window openings for display purposes. If one storey is particularly tall or has windows on all sides and the storeys above have fewer windows, then that storey is probably a soft storey.

A building may be adequate in one direction but be 'soft' in the perpendicular direction. For example, the front and back walls may be open but the side walls may be solid. Another common example of soft storey is where undercroft parking is provided, which is commonly found in apartment buildings (see **Figure A1-03**).

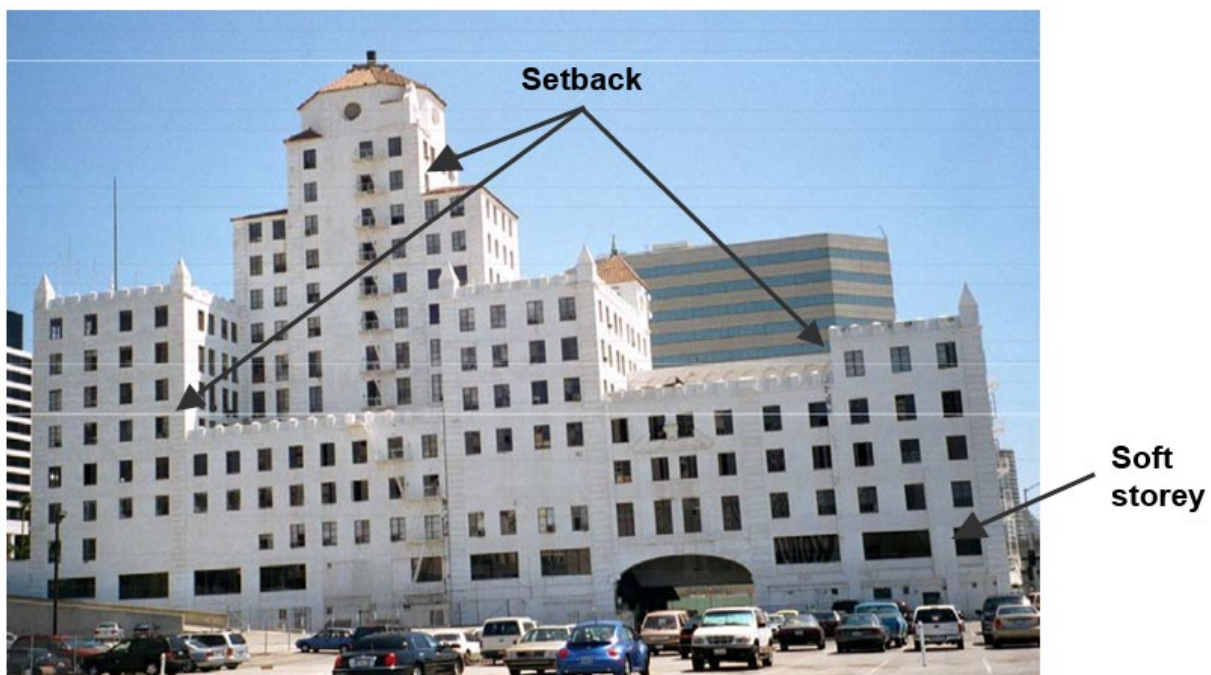


Figure A1-02 Example of setback irregularity.



Figure A1-03 - Example of soft storey conditions, where parking requirements result in large weak openings.

Plan Irregularity

If a building has a plan irregularity, the relevant modifier shown in **Table A101** for plan irregularity must be applied to the basic score.

Plan irregularity can affect all building types. Examples of plan irregularity include buildings with re-entrant corners, where damage is likely to occur; buildings with good lateral-load resistance in one direction but not in the other; and buildings with major stiffness eccentricities in the lateral-force-resisting system, which may cause twisting (torsion) around a vertical axis.

Plan irregularities causing torsion are especially prevalent among corner buildings, in which the two adjacent street sides of the building are largely windowed and open, whereas the other two sides are generally solid. Wedge-shaped buildings, triangular in plan, on corners of streets not meeting at 90 degrees, are similarly susceptible.

Although plan irregularity can occur in all building types, primary concern lies with wood, tilt-up, pre-cast frame, reinforced masonry and unreinforced masonry construction. Damage at connections may significantly reduce the capacity of a vertical-load-carrying element, leading to partial or total collapse.

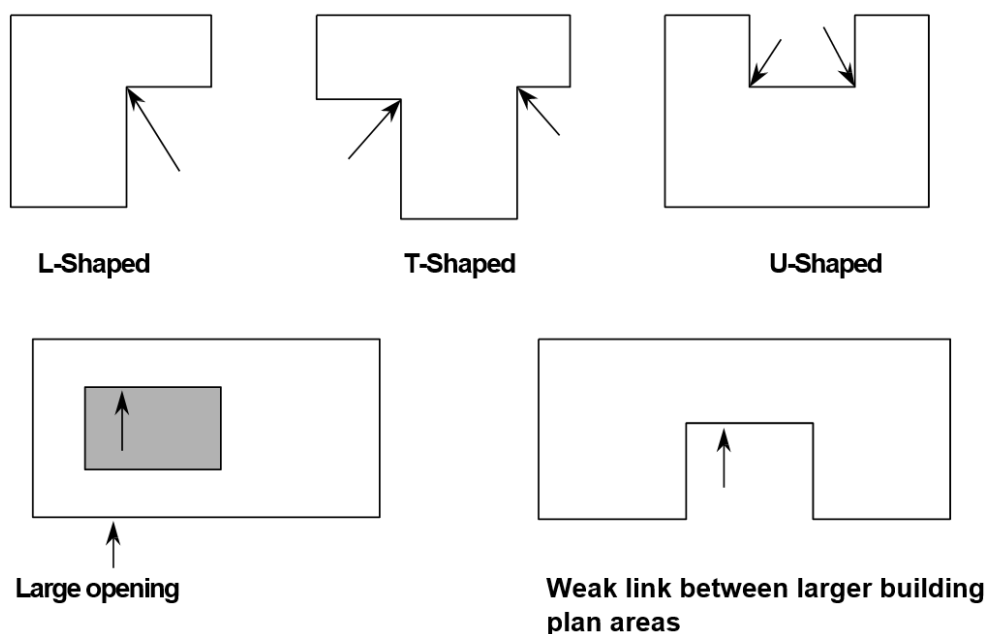


Figure A1-04 - Plan views of various building configurations showing plan irregularities; arrows indicate possible areas of damage.

APPENDIX B FIRE SAFETY

Appendix B1 – Smoke Resistant Stairs

B1.1 Smoke-resisting stairs

For the purpose of applying the concessions outlined in **Tables 304-1** and **304-5** of this Standard a stair is smoke-resisting if it is enclosed by smoke-resisting construction in accordance with the following-

B1.2 Smoke resisting walls

B1.2.1 The walls of the stair shaft are smoke-proof in accordance with the provisions for smoke-proof walls in **B2.2** of **Appendix B2**.

B1.3 Smoke resisting ceiling

B1.3.1 The ceiling of a smoke-resistant stair shaft must have a fire-protective covering of not less than 13 mm fire-protective grade plasterboard or equivalent material that does not permit the free passage of smoke to or from adjoining spaces.

B1.4 Discharge

B1.4.1 At least one stair discharges directly to a road or open space in all cases.

B1.4.2 Stairs can discharge within the building where two or more stairs exist but the path of travel must not exceed 5 metres from the enclosure to an external *exit* in any case.

Appendix B2 – Smoke-Proof Walls

B2.1 General

For the purpose of providing a smoke-proof walls in accordance with this Standard, the wall must comply with the following requirements or meet the provisions for smoke-proof walls in the *Building Code*.

B2.2 Walls

B2.2.1 A smoke-proof wall must be constructed using one of the following-

- (a) materials that are non-combustible (as defined in the *Building Code*);
- (b) if plasterboard is used in the lining on a wall it must be a minimum of 13mm standard grade plasterboard; and
- (c) not incorporate any glazed areas unless the glass is safety glass

B2.2.2 A smoke-proof wall must not incorporate any glazed areas unless the glass is-

- (a) toughened glass with a minimum thickness of 10mm or wired glass with a minimum thickness of 6 mm in steel frames with a maximum pane size of 1.0 m², or 3.0 m² in a sprinklered building; or
- (b) safety glass as defined in *Australian Standard AS 1288 – Glass in buildings – Selection and installation*.

B2.2.3 A smoke-proof wall must extend to the underside of-

- (a) the floor above;
- (b) a non-combustible roof covering; or
- (c) a flush plasterboard ceiling lined with 13mm standard grade plasterboard or a fire-protective covering (as defined in the *Building Code*), with all penetrations sealed against the free passage of smoke to or from adjoining spaces.

B2.2.4 A smoke-proof wall must have all openings around penetrations and the junctions of the smoke-proof wall and the remainder of the building stopped with non-combustible material to prevent the free passage of smoke to or from adjoining spaces.

B2.3 Doors

B2.3.1 Doors in smoke-proof walls comply with the requirements for smoke doors in Standard C3.4 of the *Building Code* and provide a smoke reservoir by not extending within 400mm of-

- (a) a roof covering; or
- (b) the floor above; or
- (c) the ceiling above.

Appendix B3 – Egress Requirements

B3.1 General

The following tables give guidance on the maximum travel distances to *exits* required by the *Building Code* for different building classifications. Where additional non-*required* safety measures such as sprinklers or additional fire or smoke barriers are provided, the travel distances to *exits* can be increased to those set out in **Tables B301, B302 and B303** below.

Table B301 – Maximum travel distances to exits in Class 2, 3 and 4 buildings

| Building Class | Maximum travel distances | Extended travel distances where AS 2118.4 sprinklers are installed throughout – limited to buildings not more than 4 storeys | Extended travel distances where AS 2118.1 sprinklers are installed throughout |
|---|--|---|---|
| Class 2 and 3 buildings (except residential care buildings) | The entrance doorway to a sole-occupancy unit (SOU) must not be more than 6m from an exit or a point from which travel in different directions to 2 <i>exits</i> is available; or 20m from a single exit at ground floor level (GFL) | The entrance doorway to an SOU must not be more than 12m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available; or 25m from a single <i>exit</i> at GFL | The entrance doorway to an SOU must not be more than 12m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available; or 25m from a single <i>exit</i> at GFL |
| | Other than an SOU, no point can be more than 20m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available | Other than an SOU, no point can be more than 25m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available | Other than an SOU, no point can be more than 25m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available |
| | Corridors more than 40m long must be divided with smoke walls every 40m | No concession | No concession |
| | <i>Exits</i> must not be more than 45m apart | <i>Exits</i> must not be more than 60m apart | <i>Exits</i> must not be more than 60m apart |
| Class 4 parts of a building | The entrance doorway to any Class 4 part of a building must not be more than 6m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available | <i>Exits</i> must not be more than 60m apart | <i>Exits</i> must not be more than 60m apart |

Table B302 – Safe travel distances to exits in existing Class 5, 6, 7 and 8 buildings

| Building Class | Maximum travel distances | Extended travel distances where chevron striping, strobe lighting and jumbo exit signs are installed | Extended travel distances where non-required AS 2118.1 sprinklers are installed throughout |
|--|--|--|--|
| Class 5, 6, 7 and 8 buildings (other than large isolated buildings or buildings more than 25m in effective height) | No point more than 20 m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available and max 40m to one of the <i>exits</i> | No point more than 25 m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available and max 45m to one of the <i>exits</i> | No point more than 30 m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available and max 60m to one of the <i>exits</i> |
| | In a Class 5 or 6 building, the maximum travel distance to a single <i>exit</i> at ground floor level can be increased to 30m | In a Class 5 or 6 building, the maximum travel distance to a single <i>exit</i> at ground floor level can be increased to 35m | In a Class 5 or 6 building, the maximum travel distance to a single <i>exit</i> at ground floor level can be increased to 45m |
| | <i>Exits</i> must not be more than 60m apart | <i>Exits</i> must not be more than 60m apart | <i>Exits</i> must not be more than 60m apart |

Table B303 – Maximum travel distances to exits in Class 9 buildings

| Building Class | Maximum travel distances | Extended travel distances where non-required AS 2118.4 sprinklers are installed throughout - limited to buildings not more than 4 storeys | Extended travel distances where non-required AS 2118.1 sprinklers are installed throughout |
|---------------------------|--|--|--|
| Class 9a buildings | No point on a floor must be more than 20m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available and max 40m to one of the <i>exits</i> | In non-patient care areas of buildings not more than 25m in effective height, the maximum travel distances can be increased by up to 30% | In non-patient care areas of buildings not more than 25m in effective height, the maximum travel distances can be increased by up to 50% |
| | In patient care areas, no point on a floor must be more than 12m from a point from which travel to 2 <i>exits</i> is available and max distance to one <i>exit</i> is 30m | In patient care areas of residential aged care buildings only - No point more than 20 m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available and max 40m to one of the <i>exits</i> | In patient care areas, no point more than 20m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available and max 40m to one of the <i>exits</i> |
| | <i>Exits</i> must not be more than 60m apart and in patient care areas not more than 45m apart | <i>Exits</i> must not be more than 60m apart and in patient care areas not more than 45m apart | <i>Exits</i> must not be more than 60m apart and in patient care areas not more than 45m apart |
| Class 9b buildings | No point on a floor must be more than 20m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available and max 40m to one of the <i>exits</i> | No point on a floor must be more than 20 m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> is available and max 40m to one of the <i>exits</i> | In buildings not more than 25m in effective height the maximum travel distances can be increased by up to 50%. |
| | <i>Exits</i> must not be more than 60m apart | No concession as use of AS 2118.4 is not suitable | No concession |
| Class 9c buildings | No point on a floor must be more than 20m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> available and max 40m to one of the <i>exits</i> | No point on a floor must be more than 20m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> available and max 40m to one of the <i>exits</i> | No point on a floor must be more than 20m from an <i>exit</i> or a point from which travel in different directions to 2 <i>exits</i> available and max 40m to one of the <i>exits</i> |
| | <i>Exits</i> must not be more than 60m apart and in patient care areas not more than 45m apart | <i>Exits</i> must not be more than 60m apart and in patient care areas not more than 45m apart | <i>Exits</i> must not be more than 60m apart and in patient care areas not more than 45m apart |

Table B304 - Dimensions of exits and paths of travel to exits

| Column A Building class | Column B Number of occupants | Column C Minimum aggregate width of exits and paths of travel to exits | Column D Minimum aggregate width of doorways in exits and paths of travel to exits |
|---|---|---|---|
| Class 2 to 9 – general areas | 0-100 | 1 metre | 750mm |
| Class 2 to 9 – general areas | 101-200 | 1 metre plus 250mm for every 25 persons in excess of 100 | Width required by column C less 250mm |
| Class 2 to 9 – general areas | More than 200 | 2 metres plus 500 for every 75 persons in excess of 200 | Width required by column C less 250mm |
| Class 9 Open spectator stands | More than 2000 | 17 metres plus a width equal to the number in excess of 2000 divided by 600 | Width required by column C less 250mm |
| Class 9a - patient care, treatment and ward areas | Any number | As per the requirements for general areas except that the minimum width in corridors used for the transportation of patients in beds, the min width is 1800mm | The minimum width required in column C less 250mm for general areas. In patient care areas the minimum width is 1200mm in corridors less than 2200mm wide or 1070mm in corridors more than 2200mm wide, and 1250mm for a horizontal exit |
| Class 9c | Any number | As per the requirements for general areas, except that the minimum width in public corridors is 1500mm, widening to 1800mm at doorways to sole-occupancy units and communal bathrooms | 1070mm if opening from a public corridor to a sole-occupancy unit 870mm in other resident use areas 800mm in non-resident use areas 750mm in all other cases other than bathrooms and sanitary compartments |

Note: Calculating the number of building occupants can be carried out in accordance with clause D1.13 of the *Building Code* (by dividing the floor area of each part of the building by the number of square metres per person listed in Table D1.13 according to the use of that part) or by any other suitable means of assessing its capacity.

Appendix B4 – Building fire safety upgrading priorities

B4.1 General

In accordance with Section 157 of the Act, the priorities for upgrading fire safety in existing buildings (in order of priority) are-

- (a) firstly, a reasonable standard of fire safety for the occupiers of a building
- (b) secondly, the minimal spread of fire and smoke
- (c) thirdly, an acceptable fire-fighting environment,

in accordance with the fire safety objectives and performance criteria of the *Building Code*.

B4.2 A reasonable standard of fire safety for the occupiers of a building.

A reasonable standard of fire safety can be achieved where occupants are alerted to a fire in the building and are able to find and use *exits* and *evacuation routes* to evacuate to a safe place before being overcome by the effects of smoke or fire.

B4.2.1 Safe evacuation can be achieved if-

- (a) occupants, particularly sleeping occupants, are alerted to a fire in the building as soon as possible;
- (b) the number, dimensions, location, operation and visibility of exits and *evacuation routes* are sufficient to enable the number of occupants to evacuate safely;
- (c) occupants using *exits* and *evacuation routes* to evacuate are protected from the effects of smoke and/or fire during the time needed for safe evacuation; and
- (d) the building will maintain structural stability for a period of time needed for building occupants to evacuate to a safe place before being overcome by smoke or fire.

B4.2.2 Occupants can be protected during evacuation through the use of-

- (a) non-combustible and/or fire or smoke resisting building elements where necessary to:
 - (i) delay or prevent fire from damaging structural elements in *exits* and *evacuation routes*;
 - (ii) prevent smoke and/or fire spreading to *exits* and *evacuation routes*;
 - (iii) reduce travel distances and allow occupants more time to reach *exits* and *evacuation routes*; and/or
 - (iv) remove, contain or separate special fire hazards.
- (b) additional exits to decrease travel time to an exit;
- (c) fire extinguishers that occupants can use to undertake initial fire attack;
- (d) fire hose reels where appropriate for occupants to use to undertake initial fire attack;
- (e) fire hazard reduction strategies (eg reducing fire loads that could arise from storage of highly combustible materials or goods etc);

- (f) early fire suppression systems such as sprinklers where appropriate to–
 - (i) delay or prevent fire from damaging structural elements in *exits* and *evacuation routes*;
 - (ii) prevent smoke and/or fire spreading to *exits* and *evacuation routes*;
 - (iii) permit extended travel distances and still allow occupants time to reach *exits* and *evacuation routes*;
 - (iv) suppress a fire arising from an identified fire hazard; and/or
- (g) a smoke extraction system to keep smoke above a safe level within *exits* and *evacuation routes*.

B4.3 Minimal spread of fire and smoke.

Minimal spread of fire and smoke can be achieved if smoke and fire spread to *evacuation routes* is minimised to the extent necessary to enable occupants to reach *exits* and *evacuation routes* before being overcome by the effects of smoke or fire.

B4.3.1 Smoke and fire spread can be minimised through the use of-

- (a) fire or smoke resistant construction where necessary to–
 - (i) delay or prevent fire from damaging structural elements in *evacuation routes*;
 - (ii) prevent smoke and/or fire spreading to and within *evacuation routes*, from one fire compartment to another or from one storey to another storey;
 - (iii) allow occupants more time to use *evacuation routes* to reach *exits*;
- (b) an early fire suppression sprinkler system where necessary to–
 - (i) delay or prevent fire from damaging structural elements in *evacuation routes*;
 - (ii) reduce fire and/or smoke spreading within *evacuation routes*, from one fire compartment to another fire compartment, or from an identified fire hazard; and
 - (iii) allow occupants more time to use *evacuation routes* to reach *exits*.
- (c) a smoke extraction system to keep smoke above a safe level within *evacuation routes*, or from spreading from one fire compartment to another fire compartment; and/or
- (d) early fire brigade intervention where fire-fighting facilities are available and where the building or occupant characteristics are such that they rely on fire brigade intervention for safe evacuation.

B4.4 An acceptable fire-fighting environment.

This can be achieved if the fire brigade can safely access and use facilities needed for its fire-fighting operations.

B4.4.1 Safe access and facilities needed for fire-fighting operations may include-

- (a) where provided, a fire hydrant system or other water supply system for fire-fighting purposes is suitable for use by the fire brigade;
- (b) where provided, fire monitoring connections to the fire brigade are working as required;
- (c) where provided, a fire control centre/room is protected from fire/smoke spread and has working equipment suitable for use by the fire brigade for its fire-fighting operations; and/or
- (d) the building maintaining structural stability and resisting the spread of fire and smoke to the extent necessary for the fire brigade to safely access and use facilities provided for its fire-fighting operations.