

Fire Sprinkler Standard

Note: (i) This replaces the Standard dated 18 December 2012.
(ii) This version of the Standard is dated December 2013.

1. Application

- 1.1 This Standard sets out requirements for the design, installation and certification of fire sprinkler systems that are required to be installed in:
- (a) existing residential care facilities for seniors under Division 7B of the *Environmental Planning and Assessment Regulation 2000 (Planning Regulation)* or State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004; and
 - (b) new and new parts of, residential care facilities for seniors under clause 55 of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.
- 1.2 The Planning Regulation also provides that a certifying authority must not issue a complying development certificate or construction certificate for building work involving the installation of a fire sprinkler system in a residential care facility for seniors unless it complies with this Standard.
- 1.3 This Standard does not apply when the Building Code of Australia would otherwise require a fire sprinkler system to be installed in a building.
- 1.4 Where this Standard states that compliance with Parts, Specifications or Clauses in the Building Code of Australia must be achieved, this means that all elements of those Parts, Specifications or Clauses, as relevant, are requirements of this Standard unless otherwise stated by this Standard.
- 1.5 Unless otherwise indicated, all references to clauses and paragraphs throughout this document relate to provisions of the Fire Sprinkler Standard.

2. Interpretation

Definitions

- 2.1 In this Standard:

Building Code of Australia has the meaning that it has under the *Environmental Planning and Assessment Act 1979*.

building has the meaning that it has under the *Environmental Planning and Assessment Act 1979*.

carpark has the meaning that it has in the *Building Code of Australia*.

Class 9a building has the meaning that it has in the *Building Code of Australia*.

compliance certificate has the meaning that it has under the *Environmental Planning and Assessment Act 1979*.

complying development certificate has the meaning that it has under the *Environmental Planning and Assessment Act 1979*.

construction certificate has the meaning that it has under the *Environmental Planning and Assessment Act 1979*.

Deemed-to-Satisfy Provisions – see section 5.

evacuation route means the continuous path of travel (including exits, public corridors and the like) from a resident area to a road or open space.

facility means a residential care facility for seniors (these terms have the meaning that they have under *State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004*), and includes all buildings that comprise the facility.

fire compartment has the meaning that it has in the *Building Code of Australia*.

fire hazard has the meaning that it has in the *Building Code of Australia*.

fire protective covering has the meaning that it has in the *Building Code of Australia*.

fire resistance level (FRL) has the meaning that it has in the *Building Code of Australia*.

fire safety engineer has the meaning that it has under the *Environmental Planning and Assessment Regulation 2000*.

fire sprinkler system has the meaning that it has in the *Environmental Planning and Assessment Regulation 2000*.

high fire hazard use area means a:

- i. carpark
- ii. kitchen and related food preparation area with an aggregate floor area of more than 30m²
- iii. laundry, where items of equipment are of the type that are potential fire sources (e.g. gas fire dryers).
- iv. storage room greater than 10m².

integrity has the meaning that it has in the *Building Code of Australia*.

new building includes a new part of an existing building.

occupant warning system means a system designed to automatically alert all occupants in the building in the event of an emergency.

occupation certificate has the meaning that it has under the *Environmental Planning and Assessment Act 1979*.

open space has the meaning that it has in the *Building Code of Australia*.

Performance Requirement – see section 4.

resident area means areas of the facility normally used or occupied by the residents including a bedroom, living areas (such as lounge, dining or television room) and evacuation routes, but excluding specialized areas that are occupied infrequently or for a short period of time.

residential sprinkler has the meaning that is has in AS 2118.4.

Specification C2.5 means the part of Volume One of the *Building Code of Australia* titled *Specification C.2.5 Smoke-Proof walls in health-care and aged care buildings*

Specification E1.5 means the part of Volume One of the *Building Code of Australia* titled *Specification E.1.5 Fire Sprinkler Systems*.

storey has the meaning that it has in the *Building Code of Australia*.

Australian Standards

2.2 In this Standard:

AS 1670.1 means the version of the Australian Standard entitled AS 1670.1 - 2004 Fire detection, warning, control and intercom systems - Systems design, installation and commissioning - Part 1: Fire, published by Standards Australia, including Amendment 1.

AS 1905.1 means the version of the Australian Standard entitled AS1905.1 – 2005 Components for the protection of openings in fire-resistant walls – Fire resistant doorsets - Part 1, published by Standards Australia.

AS 2118.1 means the version of the Australian Standard entitled AS 2118.1—1999 Automatic Fire Sprinkler Systems, Part 1: General Systems, published by Standards Australia, including Amendment 1.

AS 2118.4 means the Australian Standard entitled Automatic Fire Sprinkler Systems, Part 4, Residential, published by Standards Australia, however:

- (a) in the case of a fire sprinkler system required to be installed in an existing facility—
 - the version of AS 2118.4 published in 1995; or
 - the version of AS 2118.4 published in 2012;
- (b) in the case of a fire sprinkler system required to be installed in a new facility that is the subject of an application for a complying development certificate or construction certificate made before 1 May 2014—
 - the version of AS 2118.4 published in 1995; or

- the version of AS 2118.4 published in 2012;
- (c) in the case of a fire sprinkler system required to be installed in a new facility that is the subject of an application for a complying development certificate or construction certificate made on or after 1 May 2014— the version of AS 2118.4 published in 2012 only.

AS 2118.6 means the Australian Standard entitled Automatic Fire Sprinkler Systems, Part 6, Combined Sprinkler and Hydrant Systems, published by Standards Australia, however:

- (a) in the case of a combined fire sprinkler and hydrant system required to be installed in an existing facility—
 - the version of AS 2118.6 published in 1995; or
 - the version of AS 2118.6 published in 2012;
- (b) in the case of a combined fire sprinkler and hydrant system required to be installed in a new facility that is the subject of an application for a complying development certificate or construction certificate made before 1 May 2014—
 - the version of AS 2118.6 published in 1995; or
 - the version of AS 2118.6 published in 2012;
- (c) in the case of a combined fire sprinkler and hydrant system required to be installed in a new facility that is the subject of an application for a complying development certificate or construction certificate made on or after 1 May 2014— the version of AS 2118.6 published in 2012 only.

3. Compliance with Standard

- 3.1 A fire sprinkler system will comply with this Standard if it satisfies the Performance Requirement at section 4.
- 3.2 Compliance with the Performance Requirement can only be satisfied by:
 - (a) complying with the Deemed-to-Satisfy Provisions at section 5; or
 - (b) formulating an alternative solution that either complies with the Performance Requirement or is at least equivalent to the level of safety provided by compliance with the Deemed-to-Satisfy Provisions; or
 - (c) a combination of paragraphs (a) and (b).

Alternative solutions—complying development certificates and construction certificates

- 3.3 If an alternative solution is sought to the Deemed-to-Satisfy Provisions of this Standard, the certifying authority must obtain the following documents, issued by a fire safety engineer, before issuing a complying development certificate or construction certificate for the building work:
 - (a) a compliance certificate that certifies the alternative solution complies with the Performance Requirement of this Standard and any relevant Performance Requirements of the Building Code of Australia; or

- (b) a written report that includes a statement that the alternative solution complies with the Performance Requirement of this Standard and any relevant Performance Requirements of the Building Code of Australia.

Alternative solutions—occupation certificates

3.4 If an alternative solution is sought to the Deemed-to-Satisfy Provisions of this Standard, the certifying authority must obtain one of the following documents, issued by a fire safety engineer, before issuing an occupation certificate:

- (a) a compliance certificate that certifies that the building work relating to the alternative solution that was the subject of the first certificate or report has been completed and complies with the alternative solution; or
- (b) a written report that includes a statement that the building work relating to the alternative solution that was the subject of the first certificate or report has been completed and is consistent with the alternative solution.

4. Performance Requirement

4.1 A fire sprinkler system must be installed throughout the buildings in a facility that contains a resident area to control the growth and spread of a fire appropriate to:

- (a) the size of the fire compartment;
- (b) the function or use of the building;
- (c) the fire hazard;
- (d) the height of the building;
- (e) the number, mobility and other characteristics of the occupants that may affect their ability to evacuate the building in an emergency.

4.2 Notwithstanding 4.1, a fire sprinkler system is not required to be installed in parts of a building that are non-resident areas in the following circumstances:

- (a) Non-resident areas that are:
 - (i) located on the same storey, or storey above a resident area; and
 - (ii) separated from the resident area by elements (such as walls and floors) that have an appropriate resistance to the spread of fire and smoke, with any openings and penetrations adequately fire and smoke protected;
- (b) Non-resident areas that are located in the storey immediately below a resident area, that do not include high fire hazard use areas:
 - (i) where the non-resident areas are separated from resident areas by elements (such as walls and floors) that have an appropriate resistance to the spread of fire and smoke with any openings and penetrations adequately fire and smoke protected; and
 - (ii) where there are staff caring for residents and will be automatically alerted on the detection of fire in the parts that will not be sprinkler

protected with a fire sprinkler system.

- (c) areas excepted by AS 2118.1, AS 2118.4 or AS 2118.6.
 - (d) rooms or enclosures used solely for containing dry (non-oil filled) electrical equipment provided:
 - (i) they are separated from the remainder of the building by elements (such as walls and floors) that have an appropriate resistance to the spread of fire, with any openings and penetrations adequately fire protected; and
 - (ii) there are staff caring for residents and will be automatically alerted on the detection of fire in the areas that will not be protected with a fire sprinkler system
- 4.3 The operation of clause 4.2 does not exempt a high fire hazard use area located in a storey immediately below a resident area from the requirement to have a fire sprinkler system.

5. Deemed-to-Satisfy Provisions

New buildings in a facility

- 5.1 A fire sprinkler system in a new building in a facility must comply with the following:
- (a) Specification E1.5.
 - (b) The general requirements for a fire sprinkler system below.

Existing buildings in a facility

- 5.2 A fire sprinkler system in an existing building in a facility must comply with the following:
- (a) Specification E1.5 (except clause 8) as it applies to a fire sprinkler system complying with AS 2118.1 and if relevant, AS 2118.6.
 - (b) In a resident area of a building containing no more than 4 storeys, either
 - (i) Specification E1.5 (except clause 8 of Specification E1.5) as it applies to a fire sprinkler system complying with AS 2118.1 and if relevant, AS 2118.6; or
 - (ii) AS 2118.4, however under this Standard, where the water supply for the fire sprinkler system is drawn from a direct connection to an existing on-site fire hydrant system, the required capacity of the water supply serving the combined systems does not need to be aggregated to satisfy the flow requirements of both systems if:
 - it is at least sufficient to serve the flow requirements of the system with the maximum needs; and

- a fire sprinkler system isolation valve is installed downstream of the connection to the fire hydrant system; and
- the resident area occupies only a part of a building, the entire building is protected by a fire sprinkler system.

(c) The general requirements for a fire sprinkler system below.

5.3 For the purposes of clauses 5.1 and 5.2, AS 2118.4 also applies to a Class 9a building containing no more than 4 storeys.

5.4 A fire sprinkler system in an existing building must be connected to and automatically activate the following, if they are already installed in the existing building:

- (a) an occupant warning system; and
- (b) a smoke hazard management system that is activated by smoke detectors.

5.5 If no occupant warning system is installed in the existing building, activation of the fire sprinkler system must, when activated, automatically alert staff caring for residents of the building

General requirements for a fire sprinkler system

Type of sprinklers

5.6 If the design of the fire sprinkler system is based on AS 2118.1 or AS 2118.6, the part of the fire sprinkler system that serves a resident area must be fitted with residential sprinklers.

System monitoring

5.7 A fire sprinkler system must:

- (a) be provided with a monitored stop valve in accordance with AS 2118.1; and
- (b) be permanently connected to a Fire and Rescue NSW authorised fire alarm monitoring service provider by a direct data link.

Fire and smoke separation

Where a non-sprinkler protected area is located on the same storey as, or above, a resident area

5.8 Non-sprinkler protected areas located on the same storey as, or above a resident area, must be separated from the resident area by construction that:

- (a) achieves a fire resistance level (FRL) of not less than -/120/120 (if non-load bearing), or 120/120/120 (if load bearing);
- (b) complies with clause 2 of Specification C2.5 (except subclause (c) of Specification C2.5), and for the purposes of this requirement a Class 3 building is considered to be a Class 9a building;

- (c) has any openings (subject to paragraph (d) below) and penetrations in the separating construction fire and smoke protected in accordance with Part C3 of the *Building Code of Australia*; and
- (d) has any doorways in the separating construction:
 - (i) protected by a self-closing -/120/30 fire door in compliance with AS 1905.1 fitted with smoke seals; and
 - (ii) the door in subparagraph (i) above must not fail by radiation through any glazed part during the period specified for integrity in the required fire resistance level of -/120/30.

Where a non-sprinkler protected area is located below a resident area

- 5.9 A non-sprinkler protected area **located below** a resident area must be separated from the resident area by construction that:
- (a) complies with clause 5.8 (a), (b), (c) and (d); and
 - (b) has any openings and penetrations in the separating construction not covered by clause 5.8 sealed against the spread of fire and smoke from the non-sprinkler protected part to the resident area so as to maintain the performance of the separating construction.
- 5.10 Any non-metal service pipe not fully charged with water which penetrates the separating construction referred to in clause 5.9 must be encased over its entire length throughout the non-sprinkler protected area by a fire protective covering.
- 5.11 Sprinkler protected areas and non-sprinkler protected areas located below resident areas must be separated by construction complying with clause 5.8 (a), (b), (c) and (d).
- 5.12 A part of a building that is:
- (a) located below a resident area; and
 - (b) not required to be protected by a fire sprinkler system
- must be provided with an automatic smoke detection system complying with clause 5.13.
- 5.13 Subject to clause 5.14, an automatic smoke detection system required by clause 5.12 must:
- (a) comply with AS 1670.1; and
 - (b) be connected to and automatically activate the systems referred to in clause 5.4(a) and (b), or alert the persons referred to in clause 5.5, as relevant.
- 5.14 Where the use of an area referred to in clause 5.12 is likely to result in smoke detectors causing spurious signals, any other detector deemed suitable in accordance with AS 1670.1 may be installed in lieu of smoke detectors.

Rooms and enclosures containing electrical equipment

- 5.15 A room or enclosure containing dry (non-oil filled) electrical equipment that will not be protected with a fire sprinkler system must:
- (a) be enclosed by walls, floors and ceilings with a fire resistance level of not less than -/120/120; and
 - (b) have any doorways leading from the enclosure protected by the following:
 - (i) a self-closing -/120/30 fire door in compliance with AS 1905.1;
 - (ii) fitted with smoke seals;
 - (c) have penetrations protected in accordance with clause C3.15 of the Building Code of Australia; and
 - (d) have an automatic smoke detection system in accordance with AS 1670.1 which is connected to and automatically activates the systems referred to in clause 5.4 or alerts the persons referred to in clause 5.5, as relevant.