INFORMATION SHEET

BUILDING SERVICES

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Mandatory sprinkler protection for Class 2 & 3 buildings

One of the most substantive changes in the National Construction Code (NCC) 2019 Volume One will introduce **mandatory sprinklers** requirements for Class 2 & 3 buildings that has a rise in storey of 4 storey or more with an effective height of not more than 25m.

This information sheet provides an overview of the changes including the offsets and the new sprinkler standards.

Background

The NCC provisions have for many years required Class 2-9 buildings with an effective height of greater than 25m to be sprinkler protected. NCC 2019 will now require Class 2 (apartments, multi-residential units, etc.) and Class 3 buildings (hotels, motels, etc.) with a rise in storeys of 4 more to be sprinkler protected.

This change is a substantial shift in approach in the NCC as it moves away from the previous approach of passive protection for buildings with effective height less than 25 m and they will now need to be designed having a combination of active (sprinklers) and passive systems.

New provisions

NCC Volume One Clause E1.5 provides the requirement for the installation of a sprinkler system through Table E1.5 and the provisions are as follows:

E1.5 Sprinklers

A sprinkler system must –

(a) Be installed in a building or part of a building when required by Table E1.5; and
(b) Comply with Specifications E1.5 and Specification E1.5a as applicable.

Extract from Table E1.5

Occupancy	**Where sprinklers are required**
All classes— (a) including an open-deck carpark within a multi-classified building; but (b) excluding— (i) an open-deck carpark being a separate building; and (ii) a Class 8 electricity network substation, with a floor area not more than 200 m2, located within a multi-classified building.	Throughout the whole building if any part of the building has an *effective height* of more than 25 m.
Class 2 or 3 building (excluding a building used as a *residential care building*) and any other class of building (excluding a building used as a *residential care building*) containing a Class 2 or 3 part	Throughout the whole building, including any part of another class, if any part of the building **has a rise in storeys of 4 or more and an effective height of not more than 25 m.**

Specification E1.5a

Specification E1.5a sets out the requirements for the design and installation of fire sprinkler systems and concessions for Class 2 & 3 buildings not more than 25m in effective height with a rise in 4 storeys or more.

The changes include the introduction of two new sprinkler standards those being FPAA101D and FPAA101H. These standards provide offsets to the installation of a full AS 2118.1 sprinkler system.

Offsets

As part of introducing the new requirements, depending on which sprinkler system is being provided, there are a number of concessions or offsets that are permitted to be used in the design and construction of the Class 2 or 3 building.

These are located in the following clauses of Specification E1.5a and are as follows:

Class 2 and 3 buildings fitted with AS 2118.1 or 2118.4 sprinkler systems must be constructed in accordance with Specification E1.5a (2(b) and the permitted concessions under clause 3(a) include:

- Reduction in the FRL for fire doors
- Reduction of FRL to service penetrations to non-loadbearing internal walls
- Reduction in FRL to fire isolated stairways enclosed with non-loadbearing construction, increase in travel distance to a single exit and alternative exits.

The concessions for the FPPA101D and FPPA101H sprinkler are similar with the exception that the FPPA101D systems will require internal hydrants to be installed, if there is no external hydrant to serve the building or there is no dry hydrant system installed in the building.

Some of the concessions include:

- reduction in the FRL of non-loadbearing walls and shafts including penetrations to those walls;
- increase in distance of travel from 6m – 12m;
- increase in distance from a single exit from 20m - 30m;
- reduction to protection to windows under certain conditions;

New sprinkler standards

As noted above the changes include the introduction of two new sprinkler standards produced by the Fire Protection Association of Australia (FPAA) now referenced by the NCC, those being FPAA101D and FPAA101H.

These two standards have been developed based on a domestic type sprinkler system and are being promoted as a more cost effective option to the installation a full AS 2118.1 system as well as providing some concession to the passive construction requirements of the building.

It is important to note that FPAA101D and FPAA101H provide concessions to the corresponding requirements in AS 2118 and must be read in conjunction with those standards.

FPPA101D

The FPPA101D Standard is a new design standard for fire sprinkler systems fed from the domestic water system. It is an adaptation of AS 2118.5 to facilitate the use of a cost-effective sprinkler systems in mid-rise buildings.

The system takes its water supply from the building's domestic water riser, downstream of the domestic pump. This eliminates the need for a dedicated sprinkler system water supply tapping, pump set, control valve assembly and riser.

FPPA101H

The FPPA101H Standard is a design standard for sprinkler systems fed from the hydrant system. The system consists of a typical internal hydrant installation commonly required for a Class 2 or Class 3 buildings where coverage cannot be achieved by external hydrants, and includes, a feed for the sprinkler system which is taken at each floor level directly from the hydrant riser.

In comparison to an AS 2118.1 or AS 2118.4 system, this Standard eliminates the need for a dedicated sprinkler system water supply tapping, pumpset (if necessary), sprinkler control valve set and sprinkler riser.

How do the FPPA101D and FPPA101H systems work?

FPPA101D system

Rather than having its own dedicated sprinkler water supply into the building this sprinkler system is integrated with the domestic water supply to the building.

Each floor will have a branch from the domestic riser to feed the sprinkler system and domestic water for that floor. The branch will include an isolation valve to isolate the domestic water from the sprinkler stem on the floor. A further branch to serve the sprinkler system will be taken into the sole-occupancy unit (SOU) and connected to the toilets in each SOU.

This branch will incorporate a back flow prevention device after the take off point and then reticulates throughout the corridors and common area and into each sole occupancy unit.

How do you know if the system is still functioning?

Any interruption or reduction in the water supply to the shower, taps etc will alert the occupants to an interruption to the water supply to the sprinkler system.

If the cistern to the toilet fails to fill or has a reduction in filling up will also alert the occupants that there is an issue with the water supply to the sprinkler system.

What buildings does this system apply to?

This system only applies to the Class 2 or Class 3 parts of a building not more than 25m in effective height. If the building contains other classes or parts of a building they will be required to use an AS 2118.1 sprinkler system if:

- the other classes of buildings contain more than 2 *storeys*; or
- are more than 25% of the total floor area of the building; or
- are located above the fourth *storey* a FPPA101D system cannot be used throughout the building.

FPPA101H system

Rather than having its own dedicated sprinkler water supply into the building this sprinkler system is integrated with the hydrant system water supply to the building. The system takes its water supply feed at each floor level directly from the hydrant riser. Once the feed is taken at each floor level a typical sprinkler piping layout is then provided to each residential floor.

What buildings does this system apply to?

There are some specific limitations on the use of the FPAA sprinkler standards.

These system can be use in Class 2 or Class 3 parts of a building not more than 25m in effective height which can incorporate Class 5 ,6, 7, 8 or 9b building provided a sprinkler system to those other Classes of buildings are in accordance with Specification E1.5a and the relevant provisions of Specification C1.5.

State and Territory variations

It is also important to check with your local authority or administration for any specific State or Territory provisions for these new provisions that may override the NCC provisions.

You should also check with your local authority or administration regarding transitional arrangements and to what version of the NCC applies to your project.

Find out more

HIA has also produced a number of other information sheets on the NCC 2019 changes that can be accessed from our website.

The ABCB and the FPA Australia have also developed a range of resources to assist in understanding and applying the new sprinkler changes and can be accessed through their respective websites.

Getting a copy of the NCC

You can download the new editions of the NCC from the ABCB website www.abcb.gov.au or if you want a hardcopy you can get this from the HIA website here.

For further information on the changes HIA members can contact HIA's Building Services team on 1300 650 620 or email hia_technical@hia.com.au