

STANDARDS AUSTRALIA

Amendment No. 2
to
AS 2118.1:2017
Automatic fire sprinkler systems
Part 1: General systems

REVISED TEXT

The 2017 edition of AS 2118.1 is amended as follows; the amendment(s) should be inserted in the appropriate place(s).

SUMMARY: This Amendment applies to the Preface and Clauses 1.3.26, 1.3.32, 1.3.37, 1.3.38, 1.3.40, 1.3.41, 2.2, 2.3.1.5, 3.1.1, 3.2.1, 3.2.2, 3.2.4, 3.2.6, 3.2.7, 3.3.2.2, 3.4, 4.3.1, 5.5.2, 5.7.7, 5.7.11.2, 5.8.1, 5.8.2, 5.8.3, 5.9.10, 5.9.17, 5.9.21 (new), 6.2, 7.6, 7.8.4.2, 7.8.4.3, 7.8.4.8 (new), 8.1.1, 8.1.3 (new), 8.1.4 (new), 8.2.2, 8.10.1, 8.10.2, 8.13.3, 9.4.1, 9.4.5, 9.5.2, 10.4.1, 10.6.2.3, 10.7 (new), 11.1, 11.2.10, 11.3.6, 11.4.3 (new), 11.5.1.2, 11.5.1.4, 11.5.1.5.2, 11.5.1.5.3, 11.5.1.7, 11.5.1.9, 11.5.1.11, 11.5.1.12, 11.5.1.13, 11.5.1.19.4, 11.5.1.20.3, 11.5.1.21, 11.5.1.22, 11.5.2.4, 11.5.2.7.2, 11.5.2.9, 11.5.2.9.4, 11.5.2.10 (new), 11.6.1, 11.6.7.3.2, 11.6.7.3.3, 11.6.7.3.4, 11.6.8, 11.7 (new), 12.1.4, 12.1.5.6, 12.1.5.8, 12.2.10, 12.4.5.1, 12.4.7, 12.4.9, 12.4.11.2, 12.4.11.4, 12.6.6.1, 12.6.6.6, 12.6.6.8.2, 12.6.9, 13.5.5.5.1, 13.5.7.2, 13.5.7.3, 13.5.7.4, 13.5.7.5 and Appendix A, Paragraph A4.1.

Tables 3.2.4(A), 3.2.4(B), 6.3, 7.8.4.2, 7.8.4.3, 7.8.4.8 (new), 10.2.3, 11.3.4.3, 11.5.1.4, 11.5.1.5.2, 11.5.2.10(A) (new), 11.5.2.10(B) (new), 11.6.3(A) through 11.6.3(J), 11.6.9, 11.7.3.2(A) through 11.7.3.2(C) (new), 11.7.3.3.3.1 (new), 11.7.3.3.4 (new), 11.7.3.3.5 (new), 11.7.3.3.6(A) (new), 11.7.3.3.6(B) (new), 11.7.4 (new), 12.1.5.2, 12.1.5.3(A) through 12.1.5.3(D), 12.2.14.1, 12.2.15.1, 12.2.16.1, 12.4.10.3(A), 12.4.10.3(B), 12.5.3, 12.6.6.4(A) through 12.6.6.4(F), 13.5.5.1, 13.5.5.2(A), 13.5.5.2(B), 13.5.5.3(A), 13.5.5.3(B), 13.5.5.4(A) through 13.5.5.4(D), 13.5.5.5.1(A), 13.5.5.6, 13.5.5.7(A) through 13.5.5.7(E).

Figures 3.2.4(A), 3.2.4(B), 5.1, 5.2, 5.9.10, 8.13.2, 11.5.1.5.3(C), 11.5.1.12, 11.5.1.13(A), 11.5.1.13(B), 11.5.2.10(A) through 11.5.2.10(F) (new), 11.7.3.3.3.2(A) (new), 11.7.3.3.3.2(B) (new), 11.7.3.3.3.3(A) through 11.7.3.3.3.3(D) (new), 11.7.3.3.3.4(A) through 11.7.3.3.3.4(D) (new), 12.4.10.2, 13.5.6(A) through 13.5.6(L), 13.5.6(J), 13.5.6(K).

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Preface

After the list of series standards *add* the following:

Standards Australia thanks Factory Mutual Insurance Company for permission to reproduce Figures 11.5.2.10(A) to 11.5.2.10(F), 11.7.3.3.3.2(A) and 11.7.3.3.3.2(B), 11.7.3.3.3.3(A) to 11.7.3.3.3.3(D) and 11.7.3.3.3.4(A) to 11.7.3.3.3.4(D), which are copyright of Factory Mutual Insurance Company. All rights reserved.

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Clause 1.3.26

Delete note and *replace* with the following:

NOTES:

- 1 Concealed sprinklers provide the same unobtrusive appearance as flush sprinklers.
- 2 Concealed sprinklers have no defined RTI.

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Clause 1.3.32

- 1 Third line, *delete* 'retractors deflectors that drop' and *replace* with 'a retracted deflector that drops'.
- 2 *Add* 'Flush sprinklers may have RTI' as the second sentence.

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Clause 1.3.37

Delete text, including notes, and *replace* with the following:

A sprinkler designed for installation along the walls of a room close to the ceiling that provides a one-sided (half-paraboloid) discharge pattern directed outwards with a small proportion discharging on the wall behind the sprinkler.

NOTES:

- 1 Vertical sidewall sprinklers are designed for use in either the pendent or upright position.
- 2 Horizontal sidewall sprinklers are designed for use in the horizontal position, usually extending through and fitted off a vertical wall surface.

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Clause 1.3.38

Add the following as the second paragraph:

There are two variants of the spray sprinkler:

- (a) Spray pendent; suitable for use in the pendent position.
- (b) Spray upright; suitable for use in the upright position.

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Clause 1.3.40

1 *Delete* list Item (d) and *replace* with the following:

- (d) *Pre-action system* A combination of a sprinkler system that is permanently charged with air or inert gas above the alarm valve and an independent fire detection system installed throughout the same area.

NOTE: Operation of detectors allows the pre-action alarm valve to open and water to flow into the sprinkler piping, although this water flow can be controlled in various ways depending on how the pre-action sprinkler system is configured.

2 In list Item (f), second line, *delete* 'heat detectors or sprinklers' and *replace* with 'a fire detection system or pilot sprinklers'.

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Clause 1.3.41

Delete clause including note and *replace* with the following:

1.3.41 Sprinkler thermal sensitivity

Sensitivity as a measure of response as follows:

- (a) *Standard response* A sprinkler assembly with a response time index (RTI) greater than $80 \text{ (m.s)}^{0.5}$ up to $350 \text{ (m.s)}^{0.5}$ and a conductivity factor (C) not exceeding $2.0 \text{ (m/s)}^{0.5}$.
- (b) *Quick response* A sprinkler assembly with a response time index (RTI) of $50 \text{ (m.s)}^{0.5}$ or less and a conductivity factor (C) of $1.0 \text{ (m/s)}^{0.5}$ or less with specific design and installation requirements as established by its listing and specified by its data sheet.

NOTE: There are sprinkler assemblies that are termed 'special response' with RTI greater than 50 and less than 80; however, there are no applications within this Standard that call for them to be used and hence these sprinkler assemblies should be treated the same as standard response.

Cl.3.41 *Thermal sensitivity is a measure of how quickly the thermal (heat responsive) element of a sprinkler assembly reaches the temperature at which it actuates (operating temperature). Many other factors such as ceiling height, spacing, ambient temperature and distance below ceiling, affect the time of response of sprinklers.*

The RTI (response time index) is a measure of the sprinkler thermal sensitivity established under laboratory conditions through testing.

The conductivity factor (C), is a measure of the heat conductance between the thermal (heat responsive) element of a sprinkler and the sprinkler assembly.

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Clause 2.2

After the first paragraph, *add* the following:

C2.2 *Occupancy classifications define the minimum required level of protection. This Standard recognizes that it is acceptable to provide higher levels of protection than those specified. For example, an Ordinary Hazard or High Hazard system installed in a ceiling space exceeds the Light Hazard requirements and is considered acceptable.*

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Clause 2.3.1.5

Delete clause text and *replace* with the following:

2.3.1.5.1 General

Where a pre-action sprinkler system is installed, the following shall apply:

- (a) The floor area controlled by one sprinkler control assembly shall not exceed that prescribed in Clause 2.3.1.2 for wet systems.
- (b) The pre-action valve (see Clause 8.12.2) shall be provided with means of manual operation that is independent of the detection system and the sprinklers.
- (c) Where protecting areas exceeding 200 m², the system shall be permanently charged above the alarm valve with air or inert gas under pressure.
- (d) Where protecting areas up to 200 m² the system may remain dry with air at atmospheric pressure above the alarm valve.
- (e) A fire detection system shall be installed throughout the protected area according to the requirements of Clause 2.3.1.5.3.
- (f) Operation of the pre-action fire detection system shall initiate an audible alarm at the FDCIE.
- (g) Loss of pressure in the pre-action system shall initiate an audible alarm at the FDCIE.
- (h) The water transit time from valve trip to discharge of water at the most remote sprinkler shall not exceed 60 seconds.
- (i) The piping shall be hot dipped galvanized steel pipe, copper or stainless steel and installed in accordance with the requirements of Clause 7.5.2.
- (j) Where installed in areas subject to freezing, upright sprinklers shall be installed above the line of pipe or listed dry sprinklers shall be installed.

NOTE: Remove dry pendants after a trip, drain and reinstall to prevent ice plugs.

- (k) Grooved couplings shall be listed for use on dry pipe installations.

2.3.1.5.2 Pre-action sprinkler system configurations

A pre-action sprinkler system shall be arranged so that piping downstream of the pre-action valve is charged with water by one of the following alternatives:

- (a) *Non-interlock*—Where either a fire detection system, complying with Clause 2.3.1.5.3, activates or a sprinkler activates.
- (b) *Single-interlock*—Only where a fire detection system, complying with Clause 2.3.1.5.3, activates.

- (c) *Double-interlock*—Only where both a fire detection system, complying with Clause 2.3.1.5.3, activates and a sprinkler activates.

Pre-action systems protecting areas less than 200 m² that are not permanently charged with air or inert gas under pressure shall only be configured as single-interlock.

C2.3.1.5.2 *The different configurations of pre-action systems suit different applications:*

- (a) *A non-interlock system is essentially a dry-pipe sprinkler system that may be pre-charged should the fire detection system activate before a sprinkler activates, but it will not prevent pipework being charged should a sprinkler activate.*
- (b) *A single-interlock system becomes a wet system following operation of the fire detection system. The objective being to prevent a discharge of water from piping or sprinklers that may have suffered mechanical damage.*
- (c) *A double-interlock system offers the greatest safeguard against inadvertent water discharge by requiring that both the sprinkler system and the fire detection system be activated before water is admitted to the installation piping.*

2.3.1.5.3 *Pre-action detection system*

Except where electrical supply is to be avoided, a fire detection system shall be installed throughout the area protected by a pre-action system, in accordance with the following:

The fire detection system shall—

- (a) conform to all applicable aspects of AS 1670.1;
- (b) automatically initiate an alarm on the FDCIE;
- (c) have, where thermal detectors are installed, a lower activating temperature than the pre-action sprinklers; and
- (d) operate a solenoid valve, or trip mechanism, to release the pre-action alarm valve. The solenoid valve wiring system elements shall be rated as WS5XW as defined in AS/NZS 3013 and supervised for faults that prevent the transmission of signals on any path to the FDCIE in accordance with Clause 3.5 when the solenoid is not continuously energized as fail-safe, that is, set to release when de-energized.

2.3.1.5.4 *Pilot sprinklers*

Where an electrical supply is to be avoided, pilot sprinklers shall be installed throughout the area protected by a pre-action system, in accordance with the following:

- (a) Be fitted to piping charged with air or inert gas.
- (b) Located according to the requirements for the hazard.
- (c) Automatically initiate an alarm on the FDCIE.
- (d) Have sprinklers with lower activating temperature than the pre-action sprinklers.
- (e) Operate a trip mechanism to release the pre-action alarm valve.

Clause 3.1.1

Delete clause text and *replace* with the following:

Sprinkler protection shall extend—

- (a) to bounding walls or other barriers designed to resist the spread of fire into the sprinkler-protected area and constructed in accordance with the National Construction Code (NCC); and

- (b) throughout any non-fire-separated roofed passageway, roofed area, roofed ramp or tunnel connecting to non-sprinkler-protected areas.

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Clause 3.2.1

- 1 Paragraph 1, *delete* ‘by a sprinkler system, Clauses 3.2.2 to 3.2.7 shall apply’ and *replace* with “(glazed openings and/or infills) by ‘wall wetting sprinklers’ in a sprinkler protected building, Clauses 3.2.1 to 3.2.7 shall apply”.
- 2 Paragraph 2, Item (c), *delete* ‘30 min’ and *replace* with ‘60 min’.
- 3 Paragraph 3, *delete* note and *replace* with the following:

NOTES:

- 1 Exposure hazards include the following:
 - (a) Non-sprinkler-protected combustible buildings.
 - (b) Combustible yard storage.
- 2 Where wall wetting sprinklers are required by the NCC for a non sprinkler protected building, AS 2118.2 should be used.

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Clause 3.2.2

Delete clause text and *replace* with the following:

All sealed sprinklers used for exposure protection shall—

- (a) be rated as quick response, as defined in AS 4118.1.1;
- (b) have a temperature rating of 93°C;
- (c) be 15 mm or $K_m8.0$ nominal size sprinklers; and
- (d) be of a type where the thermal element is visible (directly exposed) to the radiant heat source and not shielded by the body or arms of the sprinkler.
- (e) Sprinklers shall be one of the following sprinkler types and orientations:
 - (i) Vertical sidewall (WP) mounted in either the pendent or upright position with the deflector pointing towards the glazed opening or wall (spray directed at the glazed opening or wall).
 - (ii) Sprinklers specifically designed for the purpose (e.g. glazed opening protection).

NOTE: Sprinklers specifically designed for the purpose are designed and installed in accordance with their listings and data sheets.

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Clause 3.2.4

Delete clause text and *replace* with the following:

All sprinklers used for exposure protection shall be—

- (a) located in accordance with Tables 3.2.4(A) and 3.2.4(B); and
- (b) positioned not more than 1.25 m horizontally from—
 - (i) the vertical extremities of the protected surface;
 - (ii) the vertical extremities of each glazed opening, with the sprinkler located within the opening; and
 - (iii) the centre of any building feature such as downpipes and glazing bars or mullions that project more than 40 mm from the protected surface;

- (c) where vertical glazing bars or mullions project more than 40 mm from the protected surface and are spaced not more than 1660 mm centre to centre, every alternate sprinkler shall be positioned on the centre-line of a mullion or glazing bar, provided the sprinklers are positioned within 1.25 m of each side of any vertical glazing bar or mullion that exceeds 40 mm in width;
- (d) where windowsills or horizontal mullions result in recesses or projections exceeding 25 mm in depth, separate sprinklers shall be provided for each glazed opening on each level; and
- (e) where exposure sprinklers are installed as drenchers for internal glass walls and obstruct swing opening doors, only the obstructing sprinklers may be installed at the ceiling with standard escutcheons or semi-recessed escutcheons, provided the sensing element is directly exposed to the radiant heat source.

Table 3.2.4(A)

Delete table and *replace* with the following:

Spacing	Measured	Measurement		Point of measurement
		Max.	Min.	
Horizontal	Horizontal	2.5 m for glazed openings 3.0 m for walls	1.8 m (see Note)	Centre of sprinkler
Vertical	Vertically	4.6 m for glazed openings 6.0 m for walls	N/A	Deflector to deflector

Table 3.2.4(B)

Delete table and *replace* with the following:

Orientation	Measured	Measurement, mm		Point of measurement
		Max.	Min.	
WP vertical (spray towards glazed openings or wall)	Vertically below top of eave, overhang or spacing datum for protected surface	200	150	Sprinkler deflector
WP vertical (spray towards wall)	Horizontal from the wall, glazed opening or infill	300	150	Centre of sprinkler
Sprinklers specifically designed for glazed opening protection	Per their listing and data sheet	—	—	

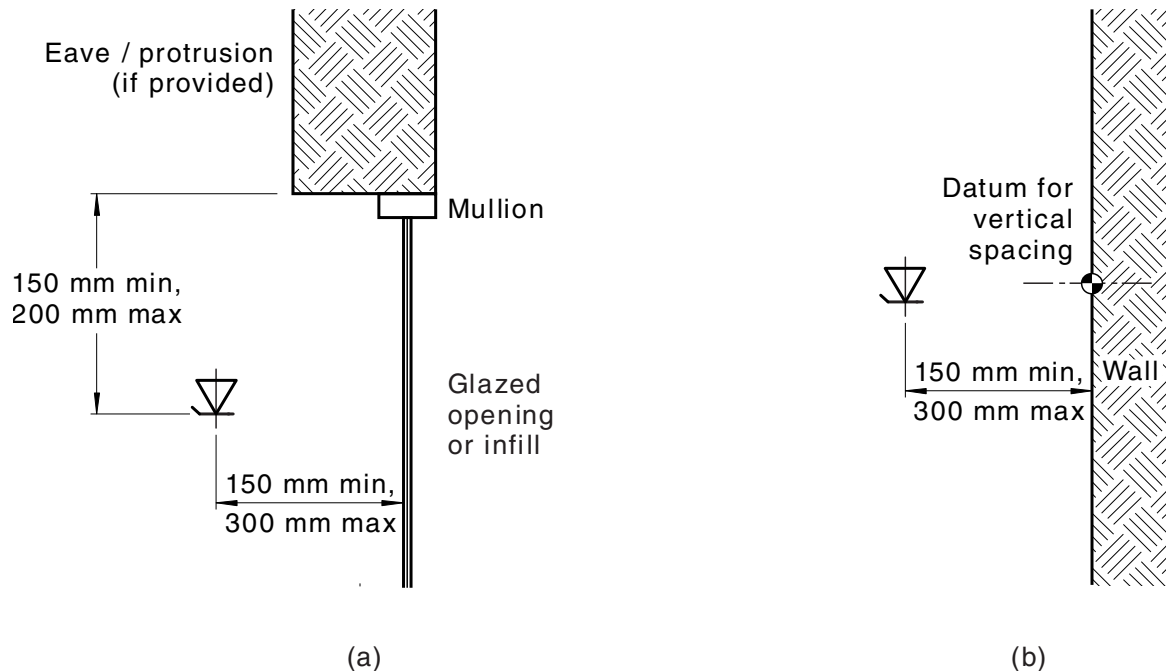
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Figure 3.2.4(A)

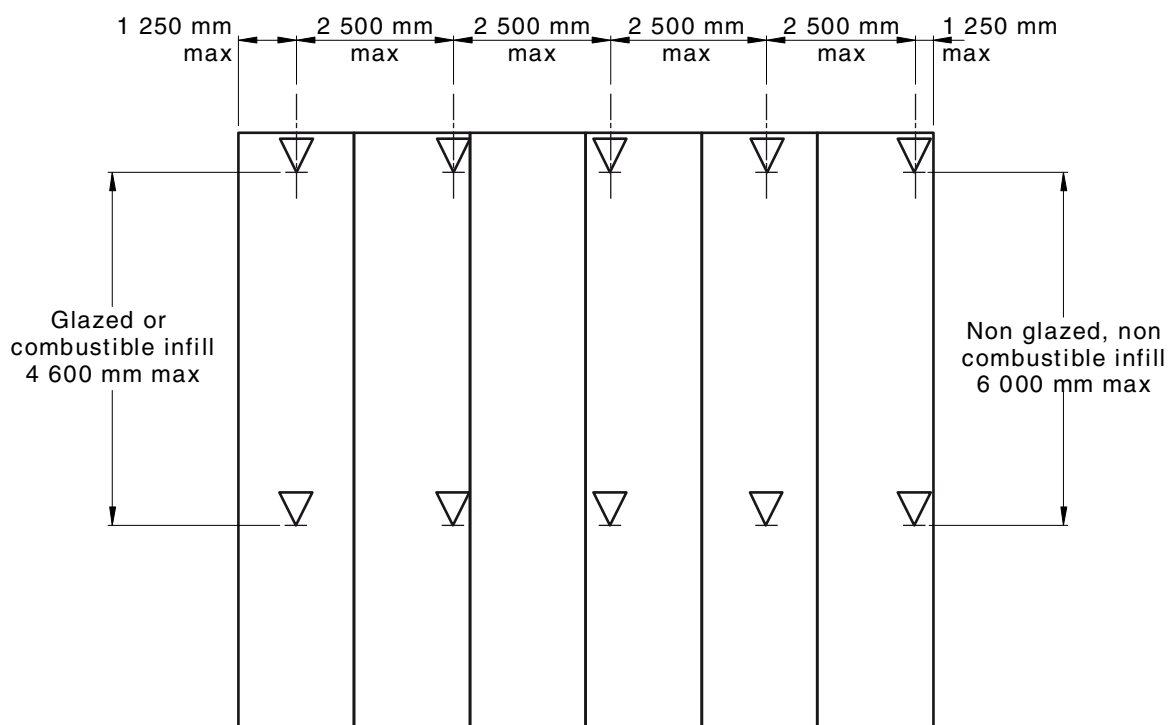
Delete figure and replace with the following:



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Figure 3.2.4(B)

Delete figure and replace with the following:



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Clause 3.2.6

Delete the second paragraph and *replace* with the following:

Where the area to be protected by an individual sprinkler is less than 2.5 m wide, the minimum flow rate shall be reduced proportionally but shall be no less than 50 L/min at zero width.

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Clause 3.2.7

After the first paragraph, *add* the following:

The water demand for exposure sprinklers (wall wetting sprinklers) shall be calculated independent of the internal sprinkler and/or hydrant demand and be for a minimum duration of 60 min.

NOTE: The 60-minute duration is determined by the minimum FRL requirement for openings in bounding walls in the NCC.

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Clause 3.3.2.2

- 1 *Replace* 'control assemblies' with 'installations'.
- 2 *Delete* 'and each is fitted with a manually resettable 'system operated' indicating device,'.

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Clause 3.4

- 1 At the end of the first line, *add* the following:

Where installations are grouped, an externally mounted alarm indicator shall serve all installations in any one location (see also Clauses 8.1.1 and 8.13.3).

- 2 *Delete* notes and *replace* with the following:

NOTE: Acceptable types of alarm indicator are as follows:

- (a) An audible warning device.
- (b) A water motor alarm in accordance with AS 4118.1.3.

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Clause 4.3.1

Delete clause text and *replace* with the following:

A reticulated town main system may be used to supply a sprinkler system provided:

- (a) The town main system is fed from a source of at least 1 ML capacity.
- (b) Any stop valves on the branch connection from the town main and under the control of the occupier of the building containing the installation are multi-turn type secured in the open position.
- (c) Except where Item (e) applies, the town main is to be capable of supplying the hydrant system flow demand and the sprinkler system flow demand simultaneously. The hydrant system demand shall be determined in accordance with AS 2419.1.
- (d) Except where Item (e) applies, the town main shall be capable of supplying the pressure demand of the sprinkler system at the combined hydrant flow and sprinkler flow demands.
- (e) A Class 7a car parking compartment of a building is provided with sprinkler protection throughout, while the rest of the building is not sprinkler protected, then

the town main shall be capable of supplying the pressure and flow demand for the system with the highest demand requirements.

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Figure 5.1

Delete 'S (spacing of sprinklers) = 4.6 m maximum for light hazard' and *replace* with 'S (spacing of sprinklers) = 4.8 m maximum for light hazard'.

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Figure 5.2

Delete 'S (spacing of sprinklers) = 4.6 m maximum for ordinary hazard' and *replace* with 'S (spacing of sprinklers) = 4.8 m maximum for ordinary hazard'.

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Clause 5.5.2

Delete clause text and *replace* with the following:

Where walls and partitions are installed the following shall apply:

- (a) Except as provided for in Clause 5.2, the distance of sprinklers from walls or partitions shall be as specified for the hazard class (see Sections 9, 10 and 11).
- (b) For open-joisted ceilings or where the roof has exposed common rafters, the distances from walls and partitions referred to in Clauses 9.4.4, 10.4.6 or 11.4.1 shall not exceed 1.5 m.
- (c) Where the top of a partition (or blade feature, architectural or signage, etc.) is between 100 mm and 500 mm from the sprinkler deflector, sprinklers shall be located—
 - (i) directly above the partition; or
 - (ii) either side and within half the design spacing of the partition.

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Clause 5.7.7

Delete Item (d) and *replace* with the following:

- (d) in all other cases, 500 mm, except in rooms not higher than 3 m where—
 - (i) bookcases, cupboards and moveable furniture may be positioned against a wall, provided sprinklers are not located directly above the furniture and are spaced to spray to the wall; and
 - (ii) bookcases, cupboards and other moveable furniture may be positioned within a room, provided sprinklers are not located directly above the furniture and sprinklers are positioned on either side of the furniture within half the design spacing.

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Clause 5.7.11.2

In list Item (f), *delete* 'Fast response' and *replace* with 'Quick response'.

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Clause 5.8.1

- 1 *Delete* first sentence and *replace* with the following:
Concealed spaces between ceilings and roofs or floors, above and below false floors, shall be fitted with sprinklers except where the following apply:
- 2 *Delete* second paragraph and list and *replace* with the following:

- (c) Concealed spaces exceeding 200 mm but not greater than 800 mm in depth and not qualifying under Clause 5.8.1(b) shall be fitted with—
 - (i) fire and draft stops provided at intervals not exceeding 15 m in each direction; or
 - (ii) as a minimum, 42 m² skeleton spacing of quick response Light Hazard spray sprinklers spaced at maximum of 6.0 m × 7.0 m.
- (d) Any space exceeding 200 mm in depth not requiring protection per Clause 5.8.1(b) and which contains electrical motors (including ceiling exhaust fans), electric heating coils or other heat-producing equipment, or ducting from heat producing equipment, e.g. clothes dryers. These spaces shall have a sprinkler installed within 1.5 m of such equipment.
- (e) Where heat producing equipment discharges into the ceiling space. In this case, a sprinkler shall be installed adjacent to the discharge within the concealed space.

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Clause 5.8.2

- 1 *Delete* first sentence and *replace* with the following:
Spaces below a ground floor shall be sprinkler-protected, except where the following apply:
 - 2 *Delete* second and third paragraphs.
-

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Clause 5.8.3

- 1 First paragraph, *delete* 'shall be quick response' and *replace* with 'shall be a minimum quick response'.
 - 2 First paragraph, third line, *delete* '(See Section 9)'.
 - 3 After first paragraph, *add* the following:
Sprinklers shall be a minimum 15 mm or $K_m 8.0$ nominal size sprinklers to a maximum coverage of 21 m² per sprinkler and spaced not more than 4.8 m apart and not more than 2.4 m from compartmental boundaries.
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Clause 5.9.10

Delete first paragraph and *replace* with the following:

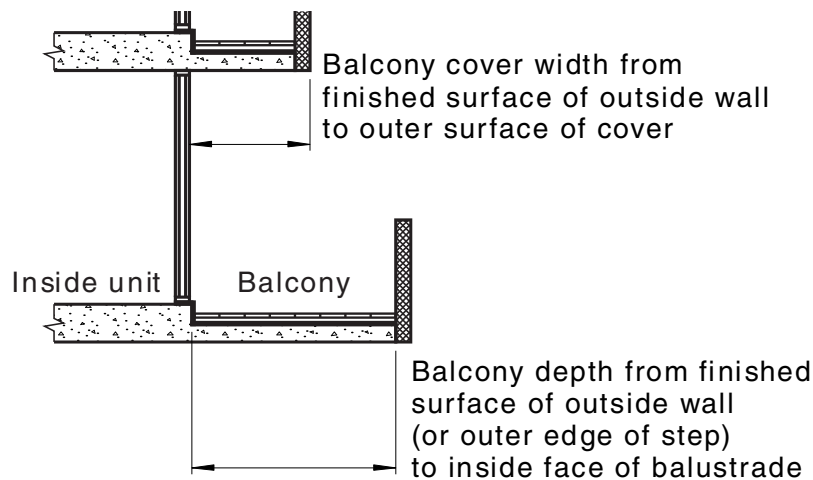
Where all of the following cases apply, a covered balcony shall be sprinkler protected throughout the covered area:

- (a) The balcony (covered and part uncovered) exceeds either the floor area in Item (i) or depth defined in Item (ii):
 - (i) 6 m² floor area measured within the finished surface of the external wall—
 - (A) to the internal surface of the step for the balustrade(s); or
 - (B) where a step is not provided, to the nearest part of the balustrade.
 - (ii) A depth of more than 2 m measured perpendicularly from the finished surface of the external wall—
 - (A) to the internal surface of the step for the balustrade(s); or
 - (B) where a step is not provided, to the nearest part of the balustrade.

- (b) A roof overhang, balcony cover, or the like is located less than 4 m above the finished floor level of the balcony.
- (c) The roof overhang, balcony cover, or the like is greater than—
 - (i) 300 mm in depth if constructed of combustible material as defined by the NCC; or
 - (ii) 800 mm in all other cases.

Figure 5.9.10

Delete figure and *replace* with the following:

**Clause 5.9.17**

- 1 Delete clause title and *replace* with the following:

Cupboards and wardrobes, showers and toilet cubicles

- 2 Delete introductory sentence and *replace* with the following:

Sprinklers are not required within built-in service cupboards, cupboards and wardrobes, or shower and toilet cubicles in protected bathrooms, for Light Hazard and Ordinary Hazard occupancies, provided—

- 3 In list Item (b), after ‘are lined’ add ‘or backed’.

- 4 Delete list Item (d) and *replace* with the following:

(d) sprinklers in the adjoining area are positioned so they shall cover the unprotected area. Obstructions caused by lintels or bulkheads are not considered in this case.

Clause 5.9.21 (new)

After Clause 5.9.20.2, *add* the following:

5.9.21 Impulse (jet) fans

Where impulse (jet) fans are installed in sprinkler protected buildings, the following shall apply:

- (a) The impulse (jet) fan outlet shall be located such that the direction of air flow is centred between sprinklers for a distance not less than 9 m.

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- (b) The impulse (jet) fans shall be arranged to shut down on activation of the sprinkler system or detection system in a fire situation.

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Clause 6.2

- 1 From list Item (k), *delete* the following:
, non-storage sprinklers or special protection sprinklers, identified by K factors, other than extended coverage and large drop sprinklers.
- 2 After list Item (n), *add* the following:
 - (o) Medium- and high-velocity sprayers.

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Table 6.3

Delete table and notes and *replace* with the following:

	K factor $K = Q/\sqrt{P}$ (see Note 1)	Minimum characteristics	
		Flow L/min	Pressure kPa
Light Hazard	≥ 8.0	(See Note 2)	70
Standard coverage sprinkler			
Residential or extended coverage sprinkler	As determined and selected by hydraulic analysis	(See Note 4)	(See Note 3)
Ordinary Hazard	≥ 8.0	≥ 60	(See Note 3)
Standard coverage sprinkler			
Extended coverage sprinkler	As determined and selected by hydraulic analysis	(See Note 4)	(See Note 3)
High Hazard	As determined and selected by hydraulic analysis but not less than $8.0 \pm 5\%$	(See Note 5)	(See Note 5)

NOTES:

- 1 For sprinkler K factor, see Clause 1.3.14.
- 2 Flow as determined by pressure.
- 3 Pressure corresponding to flow and K factor and subject to minimum pressure as per the data sheet.
- 4 See Clause 9.2 for Light Hazard design data and 10.2 for Ordinary Hazard design data.
- 5 See Sections 11, 12 and 13 for design data.

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Clause 7.6

Delete list Item (a) and *replace* with the following:

- (a) The size shall be a minimum 25 mm ID (internal diameter).

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Clause 7.8.4.2 and Table 7.8.4.2

- 1 *Delete* the clause title and *replace* with 'U-bolts and bolts clamping down'.
- 2 *Delete* the clause text and *replace* with the following:
U-bolts and bolts used for clamping down shall be in accordance with the dimensions given in Table 7.8.4.2.

3 Delete the table title and *replace* with the following:

U-BOLTS AND BOLTS CLAMPING DOWN

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Clause 7.8.4.3 and Table 7.8.4.3

Delete clause and Table 7.8.4.3 and *replace* with the following:

7.8.4.3 U-bolts clamping up,

U-bolts clamping up, shall be in accordance with the dimensions given in Table 7.8.4.3.

TABLE 7.8.4.3
U-BOLTS CLAMPING UP

Pipe size	Minimum nominal diameter of material, mm
≤DN 50	8
>DN 50 ≤DN 150	12
>DN 150 ≤DN 250	15
>DN 250 ≤DN 350	20

NOTE: Bolts that clamp down pipe support components may be sized in accordance with Clause 7.8.4.2.

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Clause 7.8.4.8 and Table 7.8.4.8 (new)

After Clause 7.8.4.7, *add* the following:

7.8.4.8 Threaded rod, bolts and studs

7.8.4.8.1 Threaded rod, bolts and studs in suspension

Threaded rod, bolts and studs used in suspension shall be in accordance with the dimensions given in Table 7.8.4.8.

TABLE 7.8.4.8
THREADED ROD BOLTS AND STUDS
USED IN SUSPENSION

Pipe size	Minimum nominal diameter of rod, mm
≤DN 100	10
>DN 100 ≤DN 200	12
>DN 250 ≤DN 300	16

7.8.4.8.2 Threaded rod in other orientations

Where a threaded rod is used to transmit the load of a pipe support assembly in any mode other than in suspension:

- (a) The pipe shall be ≤DN 50.
- (b) The rod shall be no longer than 150 mm in length (see Note 2).

NOTES:

- 1 Fasteners, including bolts and screws, used in conjunction with pipe support components are not considered single rods and therefore need not conform to this Clause.
- 2 Specified rod length is that which is exposed only. It does not include the rod length engaged within its receiving support element.

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Clause 8.1.1

After list Item (l), *add* the following:

- (m) Where installations are grouped, a manually resettable ‘system operated’ indicating device (pop up) (see Clause 3.3.2.2).

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Clauses 8.1.3 and 8.1.4 (new)

After Clause 8.1.2, *add* the following:

8.1.3 Control assembly accessibility and clearance

A clear space of not less than 1 m deep shall be provided immediately in front of the control assembly. The space provided shall span the width of all serviceable and visually indicating control assembly components.

8.1.4 Component accessibility and clearance

Operable, serviceable and visually indicating components, such as but not limited to, ball valves, strainers, gauges or valve position indicators, shall have a clear area around the component to facilitate operation, inspection, testing and maintenance without requiring dismantling of other equipment to gain access to perform the task. The components shall be located in positions that ensure they are visible when viewed from the front of the assembly.

NOTE: It is important that the visibility of indicating components and valves remains unobstructed, so equipment is less likely to be inadvertently left in the wrong condition.

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Clause 8.2.2

Delete clause text and *replace* with the following:

Each sprinkler installation shall be provided with a main stop valve that is—

- (a) located not less than 600 mm above the finished floor level;
- (b) secured in the open position by a padlock or riveted strap; and
- (c) protected from the effect of frost, where applicable.

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Clause 8.10.1

Delete clause text and *replace* with the following:

Alarm valves serving a wet sprinkler system shall—

- (a) conform to the requirements of AS 4118.1.2;
 - (b) be fixed on the main supply pipe immediately above the main stop valve and before any connection is taken off to supply any part of the installation;
 - (c) be installed such that any serviceable part is not higher than 1400 mm from the floor; and
 - (d) have the alarm valve face oriented toward the clear space in front of the control assembly.
-

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Clause 8.10.2

Delete clause text and *replace* with the following:

Alarm valves serving a dry sprinkler system shall—

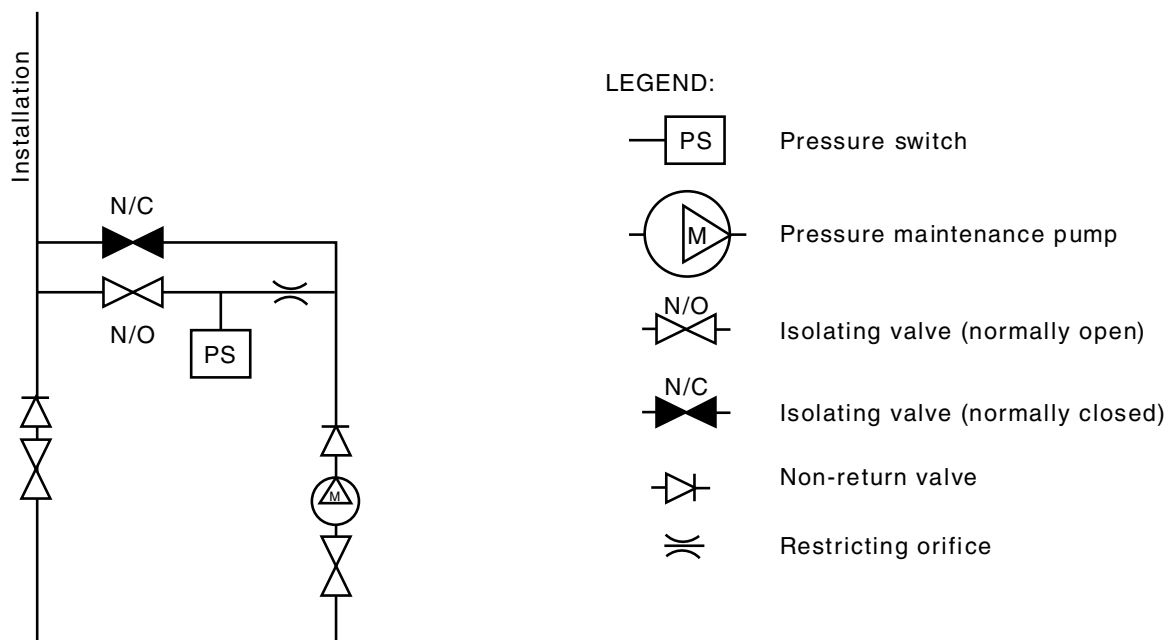
- (a) conform to the requirements of AS 4118.1.7;
- (b) be fixed on the main supply pipe immediately above the main stop valve [and the alarm valve (wet) in installations on the alternate wet and dry system not employing a composite alarm valve as specified in Clause 8.10.3] and before any connection is taken off to supply any part of the installation.
- (c) be installed such that any serviceable part is not higher than 1400 mm from the floor;
- (d) have the alarm valve face oriented toward the clear space in front of the control assembly; and
- (e) have the water motor alarm or electric bell pressure switch connected to the atmospheric chamber or the alarm motor auxiliary valve where the dry system is permanently under air pressure.

NOTE: In order to facilitate the carrying out of flow tests when an installation is under air pressure, an additional drain valve, of a size appropriate to the hazard class, may be fitted. Alternatively, a stop valve may be installed immediately above the alarm valve (dry) [see Clause 8.2.4(a)].

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Figure 8.13.2

Delete the figure and *replace* with the following:



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Clause 8.13.3

Delete clause title and *replace* with 'Local alarms'.

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Clause 8.13.3.1

Delete clause text and *replace* with the following:

A local alarm device shall be provided external to the building to indicate the control assembly(ies) in operation and be either—

- (a) an electric bell powered through a fire detection control and indicating equipment (FDCIE) in accordance with the requirements of AS 1670.1; or
- (b) a water motor in accordance with the requirements of AS 4118.1.3.

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Clause 9.4.1

Delete clause text and *replace* with the following:

Sprinklers used in light hazard occupancies shall—

- (a) conform to the requirements of AS 4118.1.1;
- (b) have a minimum *K* factor of 8.0 where standard sprinklers are used;
- (c) be either pendent, upright, sidewall, flush, recessed or concealed;
- (d) be quick response; and
- (e) be installed in a manner to maintain their quick response rating where extended coverage or residential sprinklers are used.

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Clause 9.4.5

1 Under the main clause title *add* ‘9.4.5.1 General’.

2 From the introductory sentence *delete* ‘shall be installed in accordance with the requirements of AS 2118.4 and’.

3 *Delete* second paragraph and *replace* with the following:

NOTE: Residential sprinklers are not suitable for use in kitchens, cafeterias, restaurants, bars, storerooms, laundries, plant rooms, ceiling spaces or roof spaces.

4 *Renumber* Clause 9.4.5.1 as 9.4.5.2.

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Clause 9.5.2

Delete Paragraphs 1 and 2 and *replace* with the following:

The pipe sizes in light hazard occupancies shall—

- (a) be determined by full hydraulic calculations; and
- (b) be not less than DN 25, except where—
 - (i) a pipe supplies a single sprinkler protecting an external balcony, canopy or carport, or a single exposure sprinkler then a minimum of DN 20 may be used; or
 - (ii) a DN15 mm adaptor(s) is used for an adjustment of no greater than 50 mm and they have been provided for in the hydraulic calculation.

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Table 10.2.3

Column 6, *delete* ‘Longer’ and *replace* with ‘Shorter’.

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Clause 10.4.1

Delete clause text and *replace* with the following:

Sprinklers used in ordinary hazard occupancies shall—

- (a) conform to the requirements of AS 4118.1.1;
- (b) have a minimum *K* factor of 8.0;
- (c) be quick, or standard response;
- (d) be either pendent, upright, sidewall, flush, recessed or concealed type;
- (e) in the case of any fire compartment, all the sprinklers shall have the same response characteristic RTI; and
- (f) in the case of car stacker protection, be in accordance with Clause 10.6.2.3.

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Clause 10.6.2.3

List Item (b), *delete* ‘fast response’ and *replace* with ‘quick response’.

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Clause 10.7 (new)

After Figure 10.6.2.2.4, *add* the following:

10.7 INCIDENTAL RESIDENTIAL STORAGE FOR CLASS 2 OR 3 BUILDINGS

10.7.1 General

The provisions in this Clause define the hazard classifications that shall be used as the basis of the sprinkler system design for incidental storage related to Class 2 and Class 3 (residential) building use.

C10.7.1 Residential buildings may have incidental storage areas for individual apartment occupant use. Incidental storage areas are typically lockable cages in basement or carpark areas. This does not apply to storage for commercial occupancies.

10.7.2 OH2 hazard classification

An OH2 hazard classification shall be applied to an incidental residential storage area where—

- (a) the storage area is not more than 100 m²;
- (b) the storage height is not more than 2.6 m; and
- (c) a separation distance of not less than 2.4 m is provided between each incidental residential storage area.

10.7.3 OH3 hazard classification

Where the provisions of Clause 10.7.2 have not been met, an OH3 hazard classification shall be applied to the incidental residential storage area.

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Clause 11.1

- 1 *Delete* second paragraph.
- 2 *Delete* text of Note 2.
- 3 Note 3, *delete* ‘For ASRS’ and *replace* with ‘For top-loading ASRS’.

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Clause 11.2.10

Delete first paragraph and *add* the following:

A partition, bulkhead or structure extending down at least 600 mm from the underside of the roof or ceiling of non-combustible construction that fits tightly against the underside of the roof or ceiling and is typically installed to separate areas with differing sprinkler protection.

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Table 11.3.4.3

Column 1, row 14, beginning 'Plastics goods ...', *add* to the end of the sentence, 'including plastics waste sorting and recycling'.

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Clauses 11.3.6

1 *Delete* list Item (b), including note, and *replace* with the following:

(b) the height of the High Hazard storage area is not more than that specified in either Table A4.2.2(A) or Table A4.2.2(B) as applicable; and

2 At the end of clause, *add* the following:

NOTE: For incidental residential storage in Class 2 or 3 buildings, refer to Clause 10.7.

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Clause 11.4.3 (new)

After Clause 11.4.2 *add* the following:

11.4.3 Water supply duration

The water supply shall have a minimum duration of 90 min (see also Clause 11.6.6 for on-site water storage capacity calculation).

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Clause 11.5.1.2

Paragraph 3, *delete* 'fast response' and *replace* with 'quick response'.

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Clause 11.5.1.4

Delete clause text and *replace* with the following:

Storage sprinklers shall be installed under ceilings as indicated in Table 11.5.1.4 and —

- (a) where a ceiling has a slope greater than 5°, sprinklers shall be located within 0.9 m of a ceiling's peak, measured horizontally along the slope of the ceiling;
- (b) where a ceiling has a slope that exceeds the maximum indicated in Table 11.5.1.4, one of the following shall apply:
 - (i) A flat, continuous false ceiling (see Clause 11.2.13 for the definition) shall be installed over the affected area and for 6.0 m beyond in all directions. Sprinkler protection shall be provided beneath the false ceiling, based on the occupancy or commodity hazard.
 - (ii) If the affected occupancy is rack storage, the storage racks shall be protected, based on the presence of excessive clearance as outlined in Clause 11.6.4.

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Table 11.5.1.4

Column 1, row 2 *delete* 'fast response' and *replace* with 'quick response'.

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Clause 11.5.1.5.2

Delete clause text and *replace* with the following:

Storage sprinklers installed beneath unobstructed ceiling construction shall be in accordance with the linear and area spacing requirements in Table 11.5.1.5.2, except that for a maximum of two adjacent sprinklers on the same range pipe or a maximum of two adjacent range pipes—

- (a) the maximum linear spacing of storage sprinklers may be increased by 0.3 m; and
- (b) the maximum area of coverage may be increased by 1.4 m².

NOTES:

- 1 The increases in the maximum linear spacing and area are in order to avoid obstructing the sprinkler discharge.
- 2 For more information on avoiding obstructions to sprinkler discharge see Clause 11.5.1.19.1.

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Table 11.5.1.5.2

- 1 Column 5, *delete* 'Fast' and *replace* with 'Quick' in all instances.
- 2 In Note 2, *delete* 'fast response' and *replace* with 'quick response'.

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Clause 11.5.1.5.3

Delete clause text and *replace* with the following:

Where an obstructed ceiling construction is installed the following shall apply:

- (a) Storage sprinklers shall be installed under the ceiling in accordance with the minimum and maximum linear and area spacing specified in Table 11.5.1.5.2.
- (b) The position of the centre-line of the sprinkler shall be in accordance with Clause 11.5.1.7.
- (c) The location of the sprinkler deflector shall be in accordance with Clause 11.5.1.19.
- (d) Storage sprinklers shall be installed in every channel bay formed by obstructed ceiling construction, as shown in Figure 11.5.1.5.3(B); except that—
 - (i) when sprinklers are provided in every channel bay formed by obstructed construction, the minimum linear (between pipe ranges) and area spacing requirements in Table 11.5.1.5.2 do not apply to the sprinklers located in adjacent channel bays; or
 - (ii) quick response or standard response storage sprinklers shall be installed in every channel bay formed by obstructed ceiling construction unless—
 - (A) the maximum spacing does not exceed 9.3 m²;
 - (B) combustible and non-combustible solid structural members do not exceed 300 mm from the underside of the ceiling; and
 - (C) the sprinkler sensing element and deflector are located below the bottom of the structural members; or

NOTE: See Figure 11.5.1.5.3(A), for a diagram of this arrangement.

- (iii) Standard response storage sprinklers shall be installed in every channel bay formed by obstructed ceiling construction unless—
- (A) the maximum spacing does not exceed 9.3 m²;
 - (B) non-combustible solid structural members have a horizontal separation between 0.91 m and 2.3 m on centre; and
 - (C) sprinklers are installed with the centre-line of the sprinkler's thermal sensing element a maximum of 550 mm below the underside of the ceiling and are positioned from 25 mm to a maximum of 150 mm below the bottom of the solid structural member.

NOTE: See Figure 11.5.1.5.3(D), for a diagram of this arrangement.

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Figure 11.5.1.5.3(C)

- 1 In the figure *delete* 'fast-response' and *replace* with 'quick response'.
- 2 In the figure title, *delete* 'FAST RESPONSE' and *replace* with 'QUICK RESPONSE'.

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Clause 11.5.1.7

- 1 List Item (b)(ii), *delete* 'Fast response' and *replace* with 'Quick response'.
- 2 List Item (b)(iii), *delete* 'Fast response' and *replace* with 'Quick response'.

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Clause 11.5.1.9

In the last paragraph (following Exception 4), in the first, third and fourth lines and Item (ii), *delete* 'fast response' and *replace* with 'quick response'.

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Clause 11.5.1.11

Delete clause and *replace* with the following:

11.5.1.11 Separation of protected areas (draft curtains)

Where quick response storage sprinklers provide protection to an area that is adjacent to an area protected by standard response non-storage or storage sprinklers, the following shall apply.

- (a) Draft curtain(s) complying with Clause 11.2.10 shall be installed to separate the areas; and
- (b) Sprinklers shall be positioned horizontally either side of the draft curtain in accordance with the requirements of Clause 11.5.1.6.

NOTE: Solid beams, girders, or other structural features that meet the criteria of Clause 11.2.10, may be deemed to be the equivalent of a draft curtain for the purpose of this clause.

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Clause 11.5.1.12

List Item (b) *delete* 'Fast response' and *replace* with 'Quick response'.

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Figure 11.5.1.12

In the figure title, *delete* 'FAST RESPONSE' and *replace* with 'QUICK RESPONSE'.

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Clause 11.5.1.13

List Item (b), *delete* 'Fast response' and *replace* with 'Quick response'.

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Figure 11.5.1.13(A)

In the figure title, *delete* 'FAST RESPONSE' and *replace* with 'QUICK RESPONSE'.

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Figure 11.5.1.13(B)

In the figure title, *delete* 'FAST RESPONSE' and *replace* with 'QUICK RESPONSE'.

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Clause 11.5.1.19.4

List Item (e), *delete* 'fast response' and *replace* with 'quick response'.

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Clause 11.5.1.20.3

List Item (i), *delete* 'fast response' and *replace* with 'quick response'.

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Clause 11.5.1.21

First paragraph, *delete* 'Fast response' and *replace* with 'Quick response'.

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Clause 11.5.1.22

Delete clause text and *replace* with the following:

Where solid walkways are installed in a high hazard occupancy, the following shall apply:

- (a) Quick response sprinklers shall be installed under solid walkways and under solid walkways located between storage racks or similar structures.
- (b) For solid walkways up to 1.2 m wide, a single line of quick response sprinklers shall be installed down the centre of the walkway on maximum 3.0 m linear spacing.
- (c) For solid walkways over 1.2 m wide, a line of quick response sprinklers shall be installed within 300 mm horizontally of each perimeter of the walkway on maximum 3.0 m linear spacing and 9.0 m² area spacing (see Note).
- (d) The walkway sprinklers shall be treated as in-rack sprinklers and designed in accordance with Clause 11.5.2, based on the commodity hazard located either under or adjacent to the solid walkway (see Note).

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Clause 11.5.2.4

- 1 List Item (c), *delete* 'fast response' and *replace* with 'quick response'.
- 2 Note, *delete* 'fast response' and *replace* with 'quick response'.

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Clause 11.5.2.7.2

- 1 *Delete* first sentence and *replace* with the following:
Where in-rack sprinklers are installed in open frame racks the following shall apply:
- 2 *Delete* second paragraph and *replace* with the following:
 - (e) The maximum vertical increments specified above shall be applied to the horizontal in-rack sprinkler layouts shown in Figures 11.5.2.6.2(A), 11.5.2.6.2(B), 11.5.2.6.2(C), 11.5.2.6.3(A), Figures 11.5.2.6.3(C) and 11.5.2.6.3(D), except that—

- (i) for ceiling heights exceeding 9.0 m, Categories 1, 2, 3 and 4 and cartoned Categories 5 and 6 (plastics) maintained in single-row and double-row open frame racks shall be protected by in-rack sprinklers in only the longitudinal flue, provided—
 - (A) the depth (aisle-to-aisle) of the double-row racks does not exceed 2.7 m;
 - (B) the in-rack sprinklers are installed horizontally at every transverse flue space intersection as outlined in Figure 11.5.2.6.3(A) for single-row racks and Figure 11.5.2.6.3(B) for double-row racks; and
 - (C) the in-rack sprinklers are installed on vertical increments not exceeding 3.6 m.
- (ii) for ceiling height exceeding 9.0 m, Categories 1, 2, 3 and 4 and cartoned Categories 5 and 6 (plastics) maintained in single-row and double-row open frame racks shall also be protected by in-rack sprinklers in only the longitudinal flue space provided—
 - (A) the depth (aisle-to-aisle) of the double-row racks does not exceed 2.7 m;
 - (B) the in-rack sprinklers are quick response;
 - (C) the in-rack sprinklers are installed horizontally at every other transverse flue space intersection as outlined in Figure 11.5.2.6.2(A) for single-row racks and Figure 11.5.2.6.2(B) for double-row racks, and staggered vertically;
 - (D) the in-rack sprinklers are installed on vertical increments not exceeding 3.6 m; and
 - (E) all transverse/longitudinal flue space intersections are protected with in-rack sprinklers at vertical increments not exceeding 7.2 m.

3 In Exception (ii)(B) *delete* ‘fast response’ and *replace* with ‘quick response’.

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Clause 11.5.2.9

Paragraph 1, line 3, *delete* ‘fast response’ and *replace* with ‘quick response’.

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Clause 11.5.2.9.4

Paragraph 1, line 1, *delete* ‘fast response’ and *replace* with ‘quick response’.

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Clause 11.5.2.10, Tables 11.5.2.10(A) and 11.5.2.10(B) and Figures 11.5.2.10(A) through 11.5.2.10(F) (new)

After Figure 11.5.2.9.4(C), *add* the following:

11.5.2.10 Alternative in-rack sprinkler design

11.5.2.10.1 General

The in-rack sprinkler designs provided in this Clause are alternatives to the in-rack sprinkler designs derived from Clauses 11.5.2.3, 11.5.2.5, 11.5.2.6, 11.5.2.7 and 11.5.2.8 and associated Figures. The only exception is the positioning of in-rack sprinklers within racking in Clause 11.5.2.5 and Figure 11.5.2.5, also Clauses 11.5.2.8.4, 11.5.2.8.5 and 11.5.2.8.6 which shall apply.

The in-rack sprinkler designs provided in this Clause apply to all categorized commodities in open-frame racks for wet pipe sprinkler systems, with the exception of open top containers.

11.5.2.10.2 *Type, temperature rating, K factor, RTI, coverage and orientation*

Sprinklers within racking shall—

- (a) be storage sprinklers;
- (b) have a nominal temperature rating of 68°C;
- (c) have a minimum K factor of $K_m20.2$ (K14.0 US imp); and
- (d) be quick response, standard coverage and upright.

11.5.2.10.3 *Horizontal location of in-rack sprinklers*

In-rack sprinklers shall be positioned as shown in Figures 11.5.2.10(A), 11.5.2.10(B) and 11.5.2.10(C) for single-row racks, Figure 11.5.2.10(D) and 11.5.2.10(E) for double-row racks, and 11.5.2.10(F) for multiple-row racks, and as follows:

- (a) The minimum horizontal distance between in-rack sprinklers shall be 700 mm.
- (b) The maximum horizontal distance between in-rack sprinklers shall be 1.4 m (between transverse flue) and 2.6 m (between face sprinklers) as shown in the Figures.
- (c) Face sprinklers (located in transverse flues) shall be not more than 450 mm from the face of the storage rack or the outer edge of a pallet load if it protrudes into the aisle.
- (d) All in-rack sprinklers shall be located within the footprint of the rack structure except where a single row rack is within 300 mm of a wall, the arrangement shown in Figure 11.5.2.10(C) is also allowed.
- (e) A minimum clearance between the top of storage and the sprinkler deflector shall be 150 mm.
- (f) The in-rack sprinklers shall be installed with their deflectors at or just below (maximum 10 mm) the bottom of the racks horizontal support member.

11.5.2.10.4 *Vertical location of in-rack sprinklers*

The maximum vertical distance between in-rack sprinkler levels shall be—

- (a) 9.0 m for cartoned Category 6 goods (expanded plastics) and uncartoned Category 5 and 6 goods (unexpanded and expanded plastics); and
- (b) 12.2 m for Category 1 to 4 goods and cartoned Category 5 goods (unexpanded plastics).

11.5.2.10.5 *In-rack sprinkler design*

The in-rack sprinkler design shall be based on the single hydraulically most remote in-rack sprinkler level as required in Table 11.5.2.10(A).

The minimum in-rack sprinkler design flow out of the most remote in-rack sprinkler shall be as required in Table 11.5.2.10(B).

Where the distance between two pallets is greater than 2.6 m, a sprinkler shall be in every transverse flue.

TABLE 11.5.2.10(A)
NUMBER OF SPRINKLERS IN THE IN-RACK SPRINKLER DESIGN

In-rack sprinkler Figure reference	Number of sprinklers in the design	
	Category 1 to 4 and cartoned Category 5 and 6 goods	Uncartoned Category 5 and 6 goods
Single row racks up to 0.9 m deep, Figure 11.5.2.10(A)	4	4
Single row racks up to 1.8 m deep, Figure 11.5.2.10(B)	5	5
Single row racks up to 1.8 m deep against wall, Figure 11.5.2.10(C)	5	5
Double row racks up to 2.7 m deep, Figure 11.5.2.10(D)	6	5 and 5 (see Note)
Double row racks up to 3.6 m deep, Figure 11.5.2.10(E)	6	5 and 5 (see Note)
Multiple row racks, Figure 11.5.2.10(F)	6	5 and 5 (see Note)

NOTE: The number of sprinklers is based on the most remote 5 in-rack sprinklers in the most remote storage rack as well as the most remote 5 in-rack sprinklers in the adjacent storage rack.

TABLE 11.5.2.10(B)
MINIMUM FLOW IN THE IN-RACK DESIGN

Maximum vertical in-rack sprinkler level spacing m	Category of goods	Minimum <i>K</i> factor sprinkler	Min. flow most remote in-rack sprinkler L/min
9.0	Category 1 to 4 and cartoned Category 5	20.2 (K 14)	250
	Cartoned Category 6	20.2 (K 14)	380
	Uncartoned Category 5 and 6	32 (K 22.4)	455
12.2	Category 1 to 4 and cartoned Category 5	32 (K 22.4)	455

11.5.2.10.6 Ceiling sprinkler system design

The ceiling sprinkler system shall be designed in accordance with Clause 11.6 for the category of goods involved and the height from the top level of in-rack sprinklers to the actual ceiling above.

NOTE: The top level of in-rack sprinklers can be considered a virtual floor in this alternative in-rack sprinkler design.

If there is no storage above the top level of in-rack sprinklers, the ceiling sprinklers shall be designed for the minimum ceiling height provided in the applicable table.

The in-rack sprinkler system design shall be considered as totally independent of the ceiling sprinkler system. Combining flows and balancing are not required.

The system duration for water storage capacity calculations, shall be a minimum of 60 minutes.

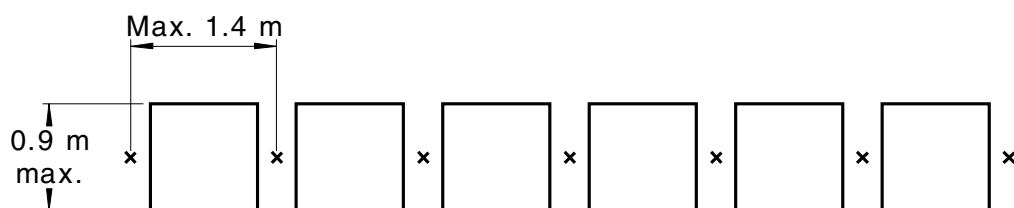


FIGURE 11.5.2.10(A) PLAN VIEW SINGLE ROW RACKS UP TO 0.9 m DEEP

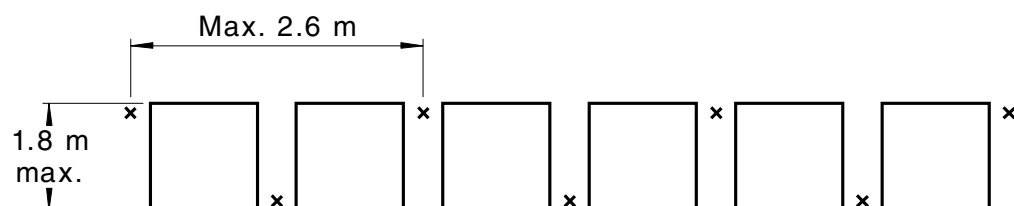


FIGURE 11.5.2.10(B) PLAN VIEW SINGLE ROW RACKS UP TO 1.8 m DEEP

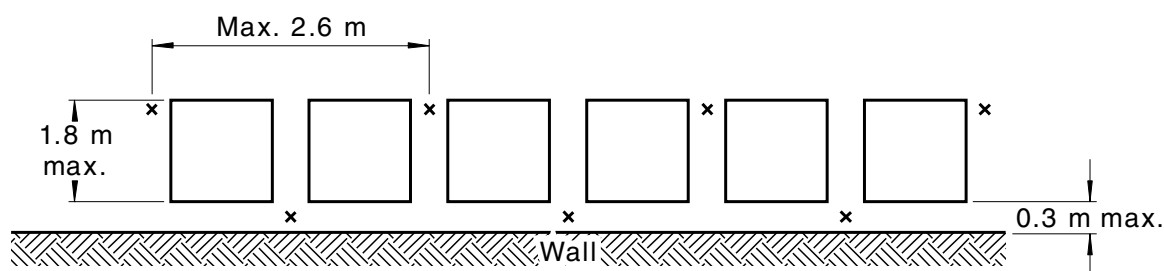
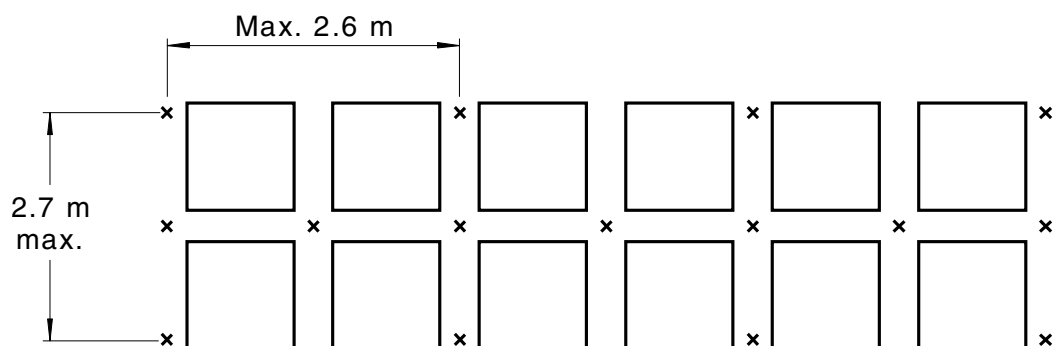
FIGURE 11.5.2.10(C) PLAN VIEW SINGLE ROW RACKS UP TO 1.8 m DEEP
LOCATED AGAINST A WALL

FIGURE 11.5.2.10(D) DOUBLE ROW RACKS UP TO 2.7 m DEEP

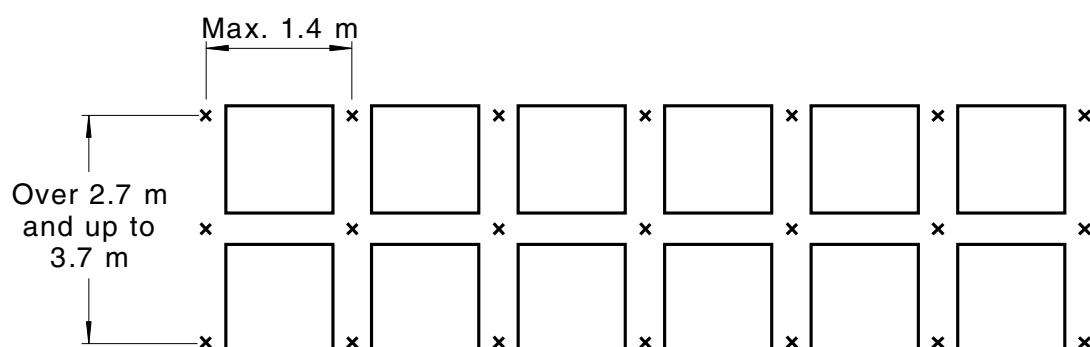


FIGURE 11.5.2.10(E) DOUBLE ROW RACKS UP TO 3.7 m DEEP

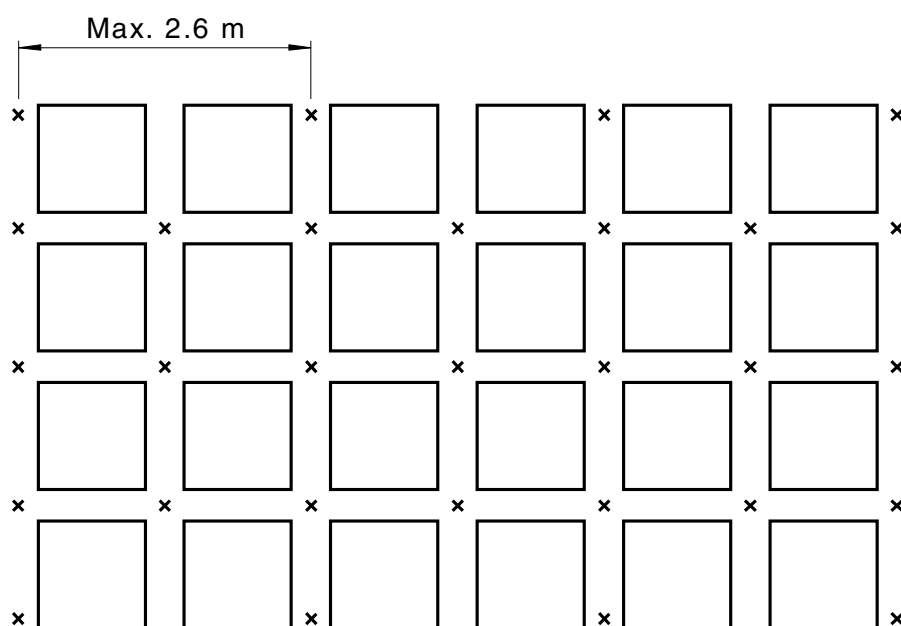


FIGURE 11.5.2.10(F) MULTIPLE ROW RACKS

AMDT
No. 2
JUL
2020

Clause 11.6.1

Commentary C11.6.1, list Item (d), *delete* 'fast response' and *replace* with 'quick response'.

AMDT
No. 2
JUL
2020

Table 11.6.3(A)

- 1 *Delete* 'fast response' and *replace* with 'quick response' in all instances.
- 2 *Delete* Note 3.

AMDT
No. 2
JUL
2020

Table 11.6.3(B)

- 1 *Delete* 'fast response' and *replace* with 'quick response' in all instances.
- 2 *Delete* Note 1.

AMDT
No. 2
JUL
2020

Table 11.6.3(C)

- 1 *Delete* ‘fast response’ and *replace* with ‘quick response’ in all instances.
 - 2 *Delete* Note 3.
-

AMDT
No. 2
JUL
2020

Table 11.6.3(D)

- 1 *Delete* ‘fast response’ and *replace* with ‘quick response’ in all instances.
 - 2 *Delete* Note 1.
-

AMDT
No. 2
JUL
2020

Table 11.6.3(E)

- 1 *Delete* ‘fast response’ and *replace* with ‘quick response’ in all instances.
 - 2 *Delete* Note 3.
-

AMDT
No. 2
JUL
2020

Table 11.6.3(F)

- 1 *Delete* ‘fast response’ and *replace* with ‘quick response’ in all instances.
 - 2 *Delete* Note 3.
-

AMDT
No. 2
JUL
2020

Table 11.6.3(G)

- 1 *Delete* ‘fast response’ and *replace* with ‘quick response’ in all instances.
 - 2 *Delete* Note 2.
-

AMDT
No. 2
JUL
2020

Table 11.6.3(H)

- 1 *Delete* ‘fast response’ and *replace* with ‘quick response’ in all instances.
 - 2 *Delete* Note 3.
-

AMDT
No. 2
JUL
2020

Table 11.6.3(I)

- 1 *Delete* ‘fast response’ and *replace* with ‘quick response’ in all instances.
 - 2 *Delete* Note 2.
-

AMDT
No. 2
JUL
2020

Table 11.6.3(J)

- 1 In table title, *delete* ‘OPEN-RACK’, and *replace* with ‘OPEN-FRAME RACK’.
 - 2 *Delete* table, and *replace* with the following:
-

Number of activating sprinklers @ kPa																					
Ceiling height m	Wet systems										Wet systems				Dry systems						
	Pendent sprinklers—68°C										Upright sprinklers—68°C				Upright sprinklers—141°C						
	Quick response					Standard response					Quick response				Standard response			Standard response			
	<i>K_m</i> 16.0	<i>K_m</i> 20.2	<i>K_m</i> 24.2	<i>K_m</i> 32.0	<i>K_m</i> 36.3	<i>K_m</i> 36.3EC	<i>K_m</i> 16.0	<i>K_m</i> 20.2	<i>K_m</i> 28.3	<i>K_m</i> 36.3	<i>K_m</i> 16.0	<i>K_m</i> 20.2	<i>K_m</i> 24.2	<i>K_m</i> 36.3EC	<i>K_m</i> 16.0	<i>K_m</i> 24.2	<i>K_m</i> 36.3	<i>K_m</i> 16.0	<i>K_m</i> 24.2	<i>K_m</i> 28.3	<i>K_m</i> 36.3
	K11.2	K14.0	K16.8	K22.4	K25.2	K25.2EC	K11.2	K14.0	K19.6	K25.2	K11.2	K14.0	K16.8	K25.2EC	K11.2	K16.8	K25.2	K11.2	K16.8	K19.6	K25.2
1.5	20 @ 50	12 @ 520	12 @ 350	12 @ 350	12 @ 210	10 @ 50	20 @ 50	20 @ 50	20 @ 110	20 @ 50	20 @ 50	20 @ 50	20 @ 50	10 @ 50	20 @ 50	20 @ 50	20 @ 50	25 @ 50	25 @ 50	25 @ 210	25 @ 50
2.4	20 @ 110	12 @ 520	12 @ 350	12 @ 350	12 @ 210	10 @ 80	20 @ 110	20 @ 70	20 @ 110	20 @ 50	20 @ 110	20 @ 70	20 @ 50	10 @ 80	20 @ 110	20 @ 50	20 @ 50	25 @ 110	25 @ 50	25 @ 210	25 @ 50
3.0	20 @ 210	12 @ 520	12 @ 350	12 @ 350	12 @ 210	10 @ 150	20 @ 210	20 @ 140	20 @ 110	20 @ 50	20 @ 210	20 @ 140	20 @ 90	10 @ 150	20 @ 210	20 @ 90	20 @ 50	25 @ 210	25 @ 90	25 @ 210	25 @ 50
3.6	20 @ 350	12 @ 520	12 @ 350	12 @ 350	12 @ 210	10 @ 280	20 @ 350	20 @ 240	20 @ 110	20 @ 70	20 @ 350	20 @ 240	20 @ 170	10 @ 280	20 @ 350	20 @ 170	20 @ 70	25 @ 350	25 @ 170	25 @ 210	25 @ 70
4.5	25 @ 350	12 @ 520	12 @ 350	12 @ 350	12 @ 210	12 @ 280	25 @ 350	25 @ 240	25 @ 110	25 @ 70	25 @ 350	25 @ 240	25 @ 170	12 @ 280	25 @ 350	25 @ 170	25 @ 70	35 @ 350	35 @ 170	35 @ 210	35 @ 70
6.1		12 @ 520	12 @ 350	12 @ 350	12 @ 210																
7.6		12 @ 520	12 @ 350	12 @ 350	12 @ 350 ⁽¹⁾																
9.1		12 @ 690	12 @ 480	12 @ 480	12 @ 480 ⁽¹⁾																
10.7					20 @ 520 ⁽²⁾																
12.2					20 @ 520 ⁽²⁾																

NOTES:

- 1 The operating pressure may be reduced if the sprinkler is listed for protection of uncartoned Category 6 commodities in 7.6 and 9.1 m buildings, at a lower pressure and the sprinkler is installed according to its listing.
- 2 The sprinkler should be listed for protection of uncartoned Category 6 commodity in 10.7 m or 12.2 m buildings, as appropriate, and the sprinkler should be installed according to its listing.
- 3 The ceiling-level protection options highlighted in grey represent those for which the water supply duration is at least 1 h. These highlighted options have the potential to result in less fire, smoke and water damage than other options and thus may, from a sustainability standpoint, be preferable.