

Residential Fire Safety Systems

This updates the previous Practice Note 2006-07 issued May 2006

Reference to the BCA in this Practice note means Volume One of the National Construction Code Series.

1. SUMMARY

This Practice Note describes the requirements for residential fire safety systems referenced in the Victoria Appendix (clause Vic H103.1) to the Building Code of Australia (BCA) Volume One. This Practice Note covers two separate issues.

Part A refers to Class 3 residential care buildings. It covers installation requirements for local fire indicator panels (or alarm panels) that provide information to staff when a fire alarm is activated. Part B describes requirements for connecting residential sprinkler systems in Class 2 and 3 buildings or a residential care building, to a fire station or other approved monitoring service.

2. DEFINITIONS

ActivFire listed — a product approved and listed in the ActivFire Scheme Register of Fire Protection Equipment maintained by the Commonwealth Scientific and Industrial Research Organisation, Division of Materials Science and Engineering (CSIRO-MSE).

Alarm zone — an area of a building approved by the relevant building surveyor (RBS), protected

by one or more smoke alarms connected to one alarm circuit.

Fixed wired — a system of electrical wiring (either a.c. or d.c.), in which cables are fixed or supported in position in accordance with the appropriate requirements of AS 3000.

Smoke alarm — a device containing a smoke detector and an integral alarm sounding device complying with AS 3786.

Sprinkler alarm switch — a device capable of sending an electrical signal to activate an alarm when a residential sprinkler head is activated (e.g. a flow switch).

Voltage — a difference of potential, measured in Volts

(V), as follows:

- a) Extra-low voltage — voltage not exceeding 50 V a.c. or 120 V ripple-free d.c.
- b) Low voltage — voltage exceeding extra-low voltage, but not exceeding 1000 V a.c. or 1500 V

3. PART A: RESIDENTIAL LOCAL FIRE ALARM SYSTEMS

1. General requirements

- 1.1 The installation must consist of a system of smoke alarms powered either directly from the low voltage supply mains, or from an extra-low voltage power source originating at a local fire indicator panel with a battery

back-up facility. A smoke detector complying with AS 1603.2 may be substituted for a smoke alarm, provided an external warning device is associated with each detector. The sound pressure level provided by a warning device must be equivalent to that required in Clause 3.22 of AS 1670.1, except that the sound pressure level need not be measured inside a sole-occupancy unit, provided that a level of not less than 85 dB(A) is attained at the access door to the unit.

1.2 The alarm system must be wired in accordance with the relevant requirements of AS 3000 for low or extra-low voltage wiring.

1.3 The system must be designed so that:

- An audible alarm is given in the area in which the smoke alarm activates.
- Visible and audible indication of an alarm is provided at the local fire indicator panel.
- An audible alarm is given in any area (including sleeping quarters and staff outbuildings) set aside for staff use.

1.4 The maximum number of smoke alarms on any one alarm zone must be determined by the maximum current output rating of the system source. It should not generally exceed ten (10).

Each zone must be located around a single central access passageway, corridor or similar thorough fare, to enable staff to readily identify the source of the alarm.

1.5 Where the smoke alarm is functionally dependent on an external power source, an audible fault signal must sound at the local fire indicator panel if that power source fails. The local fire indicator panel must be

permanently connected to a reliable 240 V

1.6 separate low voltage final sub-circuit.

Sourced power must be protected by a separate circuit breaker, or fuse, supplied from the live side of the main switch.

1.7 The smoke alarm system is not required to be connected to a fire station (see Clause Vic H103.1 of the BCA Volume One).

2. Local fire indicator panel

2.1 Location The local fire indicator panel must be located in a central area — such as a reception area or manager's office — readily accessible by staff at all times.

2.2 Facilities the local fire indicator panel must be fixed wired in accordance with the relevant requirements of AS3000. It must incorporate the following:

- a) A suitable mains power supply with battery back-up (capable of operating the system for 12 hours) for the local fire indicator panel and extra-low voltage smoke alarms supplied directly from the local fire indicator panel
- b) Suitable terminals for input signal conductors from the smoke alarm and residential sprinkler system. If the signal source is from a low voltage smoke alarm, suitable external isolation must be provided.
- c) Visible indication of the alarm zone in which the actuating device is located.
- d) Automatic audible and visible indication of the following faults:
 - A break in the wiring of any circuit between smoke alarms or sprinkler alarm switch and the local fire indicator panel.

- Low battery condition.
- e) Automatic audible and visible indication of the following faults:
- A break in the wiring of any circuit between smoke alarms or sprinkler alarm switch and the local fire indicator panel.
 - Low battery condition.
- f) Automatic visible indication of mains power failure.
- g) Initiation of any ancillary control facilities, as required by the RBS (e.g. smoke door release, air conditioning shut-down).
- h) Local operation of individual smoke alarms, in the event of alarm zone isolation at the local fire indicator panel.

2.3 If the local fire indicator panel is also used for other purposes (e.g. security), then these functions must be on separate and distinct circuits.

When disabled or isolated, these functions must not interfere with the operation of fire alarm circuitry.

2.4 The local fire indicator panel must be ActivFire listed.

2.5 The local fire indicator panel must have the capacity to incorporate AS 1603.1 approved heat detectors on either the same or separate alarm zones as the smoke alarms.

1. Smoke alarms

3.1 Extra-low voltage smoke alarms must be:

- ActivFire listed.
- Compatible with the local fire indicator panel.

3.2 Low voltage smoke alarms must be:

- ActivFire listed.
- Accepted by the electricity supply authority.
- Configured to send an output alarm signal to the local fire indicator panel.

Note: Unless evidence indicates internal isolation of the signal output conductors, they must at all times be treated as low voltage conductors.

4. SIGNAL ISOLATION INTERFACE UNITS

4.1 Signal isolation interface units must isolate any low voltage connected to the smoke alarms, from the local fire indicator panel.

They must be certified by the CSIRO as compatible with the specific types of smoke alarms used in the system.

They must also be accepted by the electricity supply authority, to ensure the isolation provided is in accordance with the requirements of AS 3100.

4.2 Units must be marked in a clearly visible location, with the following information:

SMOKE ALARM SIGNAL ISOLATION UNIT WARNING — 240V Isolate Power Supply before Removing Cover
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5. WIRING

5.1 Smoke alarms and associated equipment must be fixed wired in accordance with the relevant requirements of AS 3000 for low voltage and extra low voltage wiring systems, as applicable.

5.2 All extra-low voltage wiring must be red sheathed 0.6/1 kV stranded, with conductors having a cross sectional area of not less than 0.75 mm².

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5.3 Clear and concise “as-installed” single line drawings to a suitable scale, showing rooms, external and internal walls, fixed partitions, doorways etc., are to be provided for each installation at the local fire indicator panel.

Drawings must also include the actual location of fire alarms, smoke alarms, sprinkler flow switches (where installed), alarm connection points and local fire indicator panel, to enable easy identification of alarm system elements and their relationship to the building layout. Symbols to be used are:

FLOW SWITCH	FS	
HEAT DETECTOR		⬇
SMOKE DETECTOR	⚡	
END-OF-LINE DEVICE	ELD	
FIRE INDICATOR PANEL	FIP	
SMOKE ALARM	⚡	⋈

6. SYSTEM TESTING

Inspection and testing of the complete system after installation must be as agreed with the RBS and arranged with an independent approved fire system inspector, to verify compliance with relevant requirements of this Practice Note.

A comprehensive inspection and test report must be lodged with the RBS. Appendices B and C of AS 1603.2 give examples of typical report and installation statements.

Guidance on selecting people capable of inspecting and testing this equipment can be obtained from the Chief Officer of the Metropolitan Fire and Emergency Services Board (MFESB), or the Country Fire Authority (CFA).

7. MAINTENANCE

Part 12 of the Building Regulations 2006 requires maintenance of essential safety measures to be carried out by the owner. The following are additional requirements to those under Part 12:

- A manual must be provided, containing all information necessary for the maintenance and operation of the system. The text must be in clear, concise English, and any other language appropriate to the building, and easily understood by staff members not familiar with the equipment.
- A maintenance and testing agreement must be entered into, complying with the intent of AS 1851.8.

8. TRAINING FOR BUILDING OCCUPANTS

A training system, at least to the standard of that described in clause 4 of Practice Note 2008-08, should be introduced for the occupants and staff of the building.

PART B: CONNECTION OF RESIDENTIAL SPRINKLER SYSTEMS TO A FIRE STATION OR OTHER APPROVED MONITORING SERVICE

1. System design
the sprinkler installation must comply with the requirements of the BCA and AS 2118.4.
2. Connection to monitoring service
Connection of a residential sprinkler system to a fire station or other approved monitoring service must be via a sprinkler alarm switch, connected to alarm signalling equipment complying with AS 4428.6. The connection from the alarm signalling equipment must be in accordance with AS 1670.1 clause 3.18.3.

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The alarm signalling equipment must be installed:

- In a secure accessible position.
- In a weatherproof housing, if located externally.
- Not more than 500 mm from the system flow switch, unless approved by the Chief Officer, MFESB/CFA.

Flow switches must be ActivFire listed.

3. Indication at the fire indicator panel
Any signal from the alarm signalling equipment must be mimicked by an audible and visible signal at the fire indicator panel.
4. Certificate of Acceptance
A Certificate of Acceptance and report must be completed by the RBS responsible for issuing the building permit. The Certificate and report must be received by the Chief Officer of the CFA or the MFESB (depending on where the building is located), before the final connection of the alarm is made to a fire station or other approved monitoring service.

The Certificate of Acceptance must be in accordance with the attached form and must include the details of the person who has commissioned the residential sprinkler system.

If you have a technical enquiry please email: technicalenquiry@vba.vic.gov.au or phone 1300 815 127

Victorian Building Authority 733 Bourke Street
Docklands VIC 3008

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CERTIFICATE OF ACCEPTANCE FOR FIRE ALARM CONNECTION¹

TO: The Chief Officer, Metropolitan Fire and Emergency Services Board or
The Chief Officer, Country Fire Authority (Delete whichever is not applicable)

Address of Building:

Postcode:.....

Owner:.....

Building Classification:..... Building Use:.....

CFA or MFESB Report No.2:.....

The residential sprinkler system was commissioned by:

Name:.....

Address:.....

Telephone:.....

I have assessed the residential sprinkler system documentation and I am satisfied that the residential sprinkler system has been installed, inspected and tested in accordance with the applicable parts of the relevant Standard(s) and will perform the function for which it has been installed.

Signed:.....Date:.....

Name:.....

Building Practitioner's Registration Number:.....

Company:.....

Address:.....

Telephone:.....

Notes:

- 1 To be completed by the relevant building surveyor responsible for issuing the building permit.
- 2 Include the report number if the Chief Officer has issued a report for the building permit (under regulation 309 of the Building Regulations 2006).