

PART 3.7.2 SMOKE ALARMS

Appropriate *Performance Requirements*

Where an alternative smoke alarm system is proposed as an *Alternative Solution* to that described in **Part 3.7.2**, that proposal must comply with—

- (a) *Performance Requirement P2.3.2*; and
- (b) the relevant *Performance Requirements* determined in accordance with **1.0.10**.

Acceptable construction practice

3.7.2.1 Application

Compliance with this acceptable construction practice satisfies *Performance Requirement P2.3.2* for smoke alarms.

3.7.2.2 Requirements for smoke alarms

Smoke alarms must be—

- (a) located in—
 - (i) Class 1a buildings in accordance with **3.7.2.3**; and
 - (ii) Class 1b buildings in accordance with **3.7.2.4** and **3.7.2.5**; and
- (b) comply with AS 3786; and
- (c) connected to the consumer mains power where consumer power is supplied to the building; and
- (d) interconnected where there is more than one alarm.

3.7.2.3 Location — Class 1a buildings

Smoke alarms must be installed in a Class 1a building on or near the ceiling in—

- (a) any storey containing bedrooms—
 - (i) between each part of the dwelling containing bedrooms and the remainder of the dwelling; and
 - (ii) where bedrooms are served by a hallway, in that hallway; and
 - (b) any other storey not containing bedrooms.
- (see Figure 3.7.2.1, Diagram a and Figure 3.7.2.2)

3.7.2.4 Location — Class 1b buildings

In a Class 1b building, smoke alarms must be installed on or near the ceiling—

FIRE SAFETY

- (a) in every bedroom; and
- (b) in every corridor or hallway associated with a bedroom, or if there is no corridor or hallway, in an area between the bedrooms and the remainder of the building; and
- (c) on each other storey.

(see Figure 3.7.2.1, Diagram b and Figure 3.7.2.2)

3.7.2.5 Lighting to assist evacuation — Class 1b buildings

In a Class 1b building, a system of lighting must be installed to assist evacuation of occupants in the event of a fire, and—

- (a) be activated by the smoke alarm *required* by 3.7.2.4(b); and
- (b) consist of—
 - (i) a light incorporated within the smoke alarm; or
 - (ii) the lighting located in the corridor, hallway or area served by the smoke alarm.

Explanatory information:

The lighting *required* by 3.7.2.5 may consist of the artificial lighting which may already be installed in a corridor, hallway or area, provided that lighting is activated by the smoke alarm.

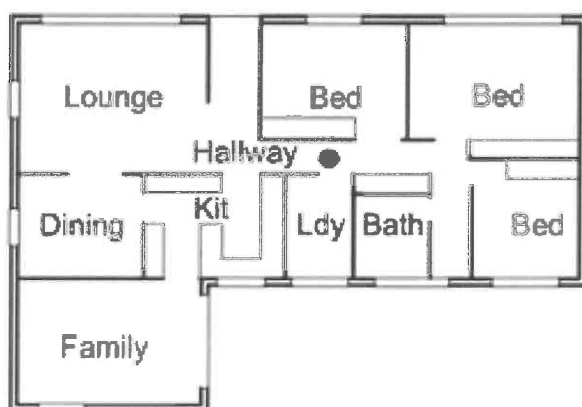
Figure 3.7.2.1

LOCATION OF SMOKE ALARM

Legend: ● Smoke alarm

☐ Smoke alarm with evacuation lighting (as required by 3.7.2.5(b)(i))

Diagram a. Class 1a buildings



FIRE SAFETY

Figure 3.7.2.1

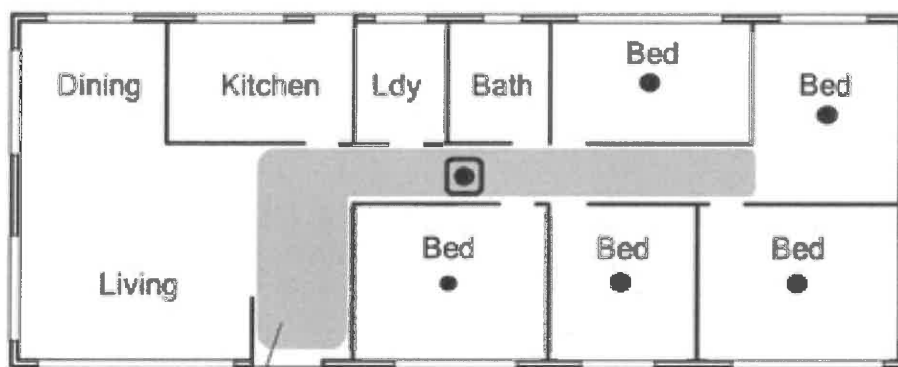
LOCATION OF SMOKE ALARM

Legend: ● Smoke alarm

◻ Smoke alarm with evacuation lighting (as required by 3.7.2.5(b)(i))

Diagram b.

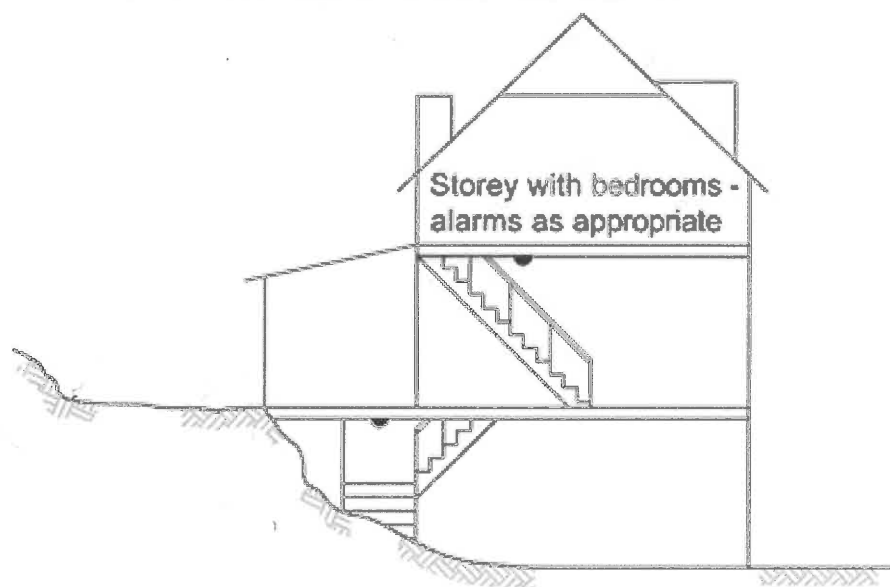
Class 1b buildings



Lights in this area to be activated by smoke alarm if using 3.7.2.5(b)(ii)

Figure 3.7.2.2

LOCATION OF SMOKE ALARMS ON DIFFERENT STOREYS



(a) Smoke alarms installed on each storey not containing bedrooms — located in the area of the stairway

Explanatory information:

1. HOW DOES A SMOKE ALARM WORK ?

There are two types of smoke alarms.

1.1 Photoelectric:

This type of smoke alarm uses a light source and photocell. As the smoke enters the detection chamber it interferes with the light beam which in turn causes the alarm to sound.

1.2 Ionisation:

A small amount of radioactive material is used to create an electrical current which travels through ionised air. When smoke enters the detection chamber it impedes the flow of current and causes the alarm to sound.

2. LOCATION OF SMOKE ALARMS

When deciding on the position of smoke alarms it is important to remember that they are intended to detect smoke before it reaches the sleeping occupants of a building.

The ensuing alarm is designed to wake the occupants and give them time to evacuate the building.

2.1 Added flexibility when considering detector location

As mentioned earlier, the introduction of the *Performance Requirement* gives the *appropriate authority* flexibility when considering the location of smoke alarms.

For instance, in Class 1a buildings if the *Deemed-to-Satisfy Provision* states that the smoke alarm should be located in the hallway, and there is a bathroom adjacent this location (that will potentially cause nuisance alarms) the *appropriate authority* could accept the alarm being installed in the bedroom as a suitable option using the performance clause.

This approach should also be adopted when considering sleep-outs or similar type residential buildings that are not connected to the remainder of the building by a hallway or other enclosed structure. In these situations the alarm could be located in the room itself.

2.2 Protection of sleeping areas in Class 1a buildings

The *deemed-to-satisfy provisions* require that a smoke alarm be located “between each area containing bedrooms and the remainder of the dwelling”.

In some dwellings the bedrooms are located in a common area and connected by a hallway. In this instance the alarm should be located as shown in Figure 3.7.2.1, Diagram a.

2.3 Location of the smoke alarm on other storeys

A smoke alarm is also required on each other storey that is not already provided with a smoke alarm. It should be noted that smoke alarms are required to be installed in other storeys even if those storeys consist of only carparking, bathrooms, laundries and the like. “Storey” in this context differs from the definition contained in BCA Volume One which excludes such spaces from being considered as storeys.

The favoured location for this alarm will be in the path of travel people will most likely take to evacuate the building. This will ensure an alarm will be raised before smoke makes the common exit path impassable. For example, if the bedrooms are on the first floor, then an alarm should be positioned near the area of the inter-connecting stair at ground level.

If the other storey is not connected to the remainder of the building (for instance a ground floor garage) then the alarm should be centrally located in the lower area. However, it may be reasonable, using a performance approach, not to install smoke alarms where the storey is predominantly open, such as the basement level of a highset house on stumps that is used for carparking or laundry purposes.

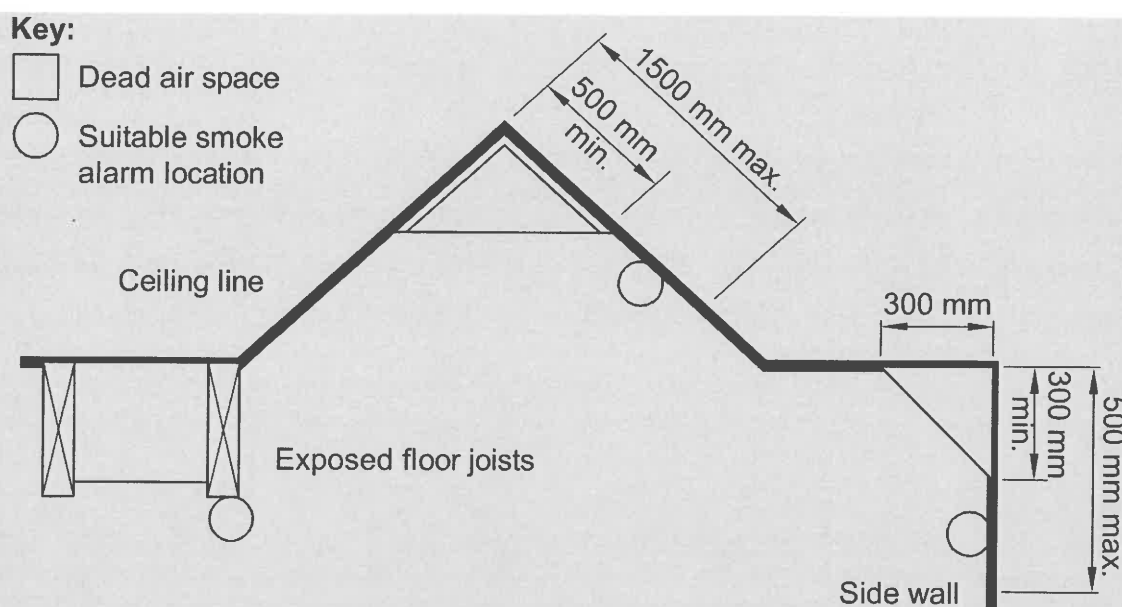


Diagram 1 — DEAD AIRSPACE AND PROPER MOUNTING OF SMOKE ALARMS ON SIDE WALLS

2.4 Installation of smoke alarms

Smoke alarms should be installed on or near the ceiling with special care being taken to avoid dead air spaces.

A dead air space is an area in which trapped hot air will prevent smoke from reaching the alarm. This space generally occurs at the apex of cathedral ceilings, the corner junction of walls and ceilings, between exposed floor joists etc. (see Diagram 1).

If it is impractical to mount the smoke alarm on the ceiling then it may be located on the wall. The recommended position is between 300 mm and 500 mm off the ceiling (see Diagram 1).

The distance from the apex of a cathedral ceiling to the top of the alarm should be between 500 mm and 1500 mm.

3. NUISANCE ALARMS

Smoke alarms are extremely sensitive and may detect smoke and moisture created by common household activities (such as burnt toast or steam from a bathroom).

Accordingly, to reduce the likelihood of nuisance alarms, the smoke alarm should not be located near cooking appliances and bathrooms. However, if it is necessary to locate alarms in these positions, an ionisation type alarm is more suitable near bathrooms, while a photoelectric alarm may be used near cooking appliances.

4. INTERCONNECTION OF SMOKE ALARMS

Alarms need to be interconnected to provide a common alarm so that if one alarm in the dwelling activates then other alarms automatically activate, which will increase the likelihood of sleeping occupants becoming aware of the detection of smoke.

