

**Honeywell**

MORLEY IAS  
FIRE DETECTION

Morley-IAS

# Fire Detection Systems

Pocket Design & Installation Guide



# Pocket Design & Installation Guide

This Pocket Design & Installation booklet provides a simple guide for the provision of a fire detection and alarm system in accordance with the recommendations detailed within the British Standard Code of Practice BS5839-1:2013.

The handbook is designed to act as an aide-memoire and there is no substitute for reading the full standard, copies of which can be obtained from:

British Standards Institute  
389 Chiswick High Road  
Chiswick  
London W4 4AL

Tel: 020 8996 9001

Web: [www.bsi-global.com](http://www.bsi-global.com)

Email: [orders@bsi-global.com](mailto:orders@bsi-global.com)

## Introduction

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- Regulatory Reform Fire Safety Order 2005
- The Equality Act 2010 (formerly Disability Discrimination Act 1995)
- Building Regulations Approved Document Part B and Approved Document Part M

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# Introduction

This guide provides a basic overview to anyone involved in the design or installation of a fire detection system. It will identify the current legislative requirements as well as clarify the responsibilities placed on the three key roles involved with the provision of a new system, namely the Designer, Installer and Commissioning Engineer, as well as remind the End User or Owner/Occupier what part they play in ensuring that the best possible system is supplied to protect life and property from fire.

It is important that everyone involved is conversant with the current British Standard Codes of Practice BS5839-1:2013 for non-domestic premises and BS5839-6:2013 for domestic premises. The Installer should also be conversant with the British Standard relating to general wiring BS 7671.

This guide is intended to offer practical advice and is not a substitute for any of the standards or legislation referred to.

## Legal elements

- Regulatory Reform Fire Safety Order 2005
- The Equality Act 2010 (formerly Disability Discrimination Act 1995)
- Building Regulation Approved Document Part B
- Building Regulation Approved Document Part M

All these documents in some way affect what is included in the system. However the Owner/Occupier is ultimately responsible for the level of protection provided.

It is recommended that the Owner/Occupier carries out a Fire Risk Assessment to identify the level of protection required i.e. one of the categories detailed within BS5839-1:2013 (L1,L2,L3,L4,L5,M,P1 or P2). The full responsibilities of the Owner/Occupier are detailed within the new Regulatory Reform Fire Safety Order (RRO) that replaced the majority of existing laws with the UK from October 2006.

Any design should be prepared by a competent individual/organisation, who has consulted all interested parties and created a set of drawings, a specification, a cause & effect or fire plan, a list of Variations and completed a G1 Design certificate, detailed within BS5839-1:2013.

If designs are undertaken without this research being carried out, the fire detection system is unlikely to comply with the legal requirements. This could result in prosecution of the parties involved within the supply chain as well as the Owner/ Occupier.

**WARNING: Anyone who takes on the responsibility for design will do so at their own risk and design liability insurance is advisable.**

## The Designer's responsibilities:

- Agree the level of protection or category with Owner/Occupier
- Justify any Variations and document reasons
- Detail the detection & alarm zones
- Prepare specification and drawings including;
  - Siting of manual call points
  - Siting of point type heat and smoke detectors
  - Siting of beam detectors
  - Siting of any other forms of detection
- Specify type of cable for each circuit
- Specify type of system and equipment
- Include detail for on/off site links with other equipment
- Take into account the risk of false alarms
- Allow for correct level of sounders and visual alarms
- Prepare a fire plan or cause and effect chart
- Sign a G1 design certificate

Note BS5839-1:2013 recommends that a fire detection system is designed by a competent person, who takes responsibility for completing the design and signing off a 'Design certificate' G1. This should not be confused with other certificates relating to Installation G2 and Commissioning G3, that are completed by the parties responsible for those parts.

Also if the contract allows, it is suggested that the Designer witness tests the completed system to ensure the original design is still appropriate – the Design certificate can then be completed after any amendments have been included.

## Talk to the interested parties to decide on the level of protection or category and agree Variations

The importance of pre-design planning cannot be overstated. Many parties are likely to have an interest in what the fire detection is expected to do. Ultimately it is up to the Owner/ Occupier, who is responsible by law, to make the final decision on the level of protection provided for a particular building.

In most circumstances the Owner/Occupier will appoint a competent Designer to carry out this work and take liability for the design as a whole.

The nominated Designer is expected to consult the following organisations:

- The User or Facilities Manager
- The Building Control Officer
- The Health and Safety Executive
- The Insurer
- The Local Fire and Rescue Service
- A specialist fire alarm system supplier

## Issues to be covered by the designer should include:

- The Fire Risk Assessment demands
- The requirements necessary to comply with the Regulatory Reform (Fire Safety) Order (RRO) 2005, The Equality Act 2010 (formerly Disability Discrimination Act 1995) and Building Regulations Approved Documents Part B and Part M
- The prime purpose of the system (Property or life protection or both)
- The level of protection suggested by the interested parties.  
(Category P1 or P2, M or L1 L2 L3 L4 or L5)
- The list of Variations identified by the interested parties

## Determine the System Category or Level of Protection

Category P, systems are designed for Protection of Property and fall into two classifications P1 or P2.

The objective of a Category P1 is to provide the earliest possible warning of a fire to minimise the time between ignition and the arrival of the fire fighters.

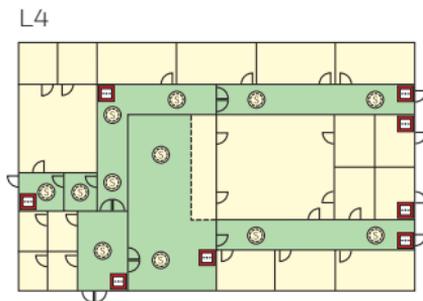
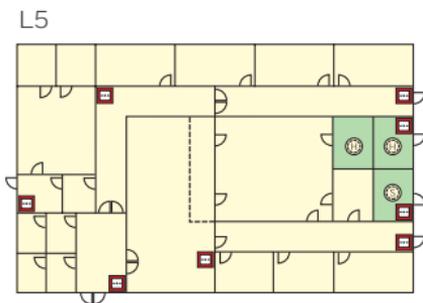
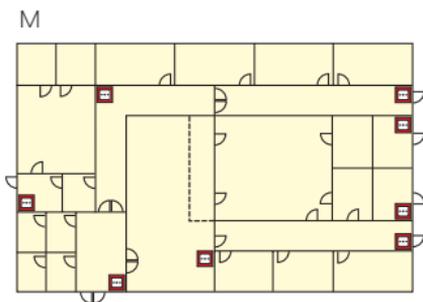
P1 is designed to protect the whole building whilst P2 is installed in defined parts of the building only, which may have an extraordinary high risk or hazard.

Life protection on the other hand will often depend on the number of people accessing a particular building and depending on the variations, the systems can range from simple Type M to L1 categories, these being detailed in the diagrams on this page.

These diagrams show a typical building with a number of escape routes, side rooms and open plan areas used for escape.

A Category M system requires manual call points on all exits as well as corridors where persons are not expected to walk more than 30/45m (see Design Stage 3) to operate one.

Category L5, designed for buildings that have a particular risk identified which warrants some special attention. For example if there is an area of high risk which is considered worthy of having some automatic detection but a manual system is also needed, then this will be termed as L5/M.

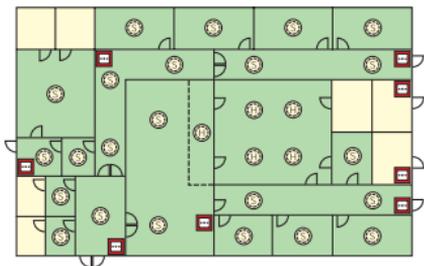


Category L4 provides detection within the escape routes only, whereas L3 not only covers these areas but all rooms leading onto the escape route. The reasoning behind this is to alert people of the danger prior to the corridor becoming “Smoke logged” so people can escape safely.

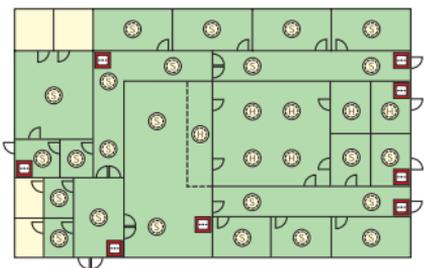
L2 is a further enhancement of protection with all the areas covered by an L3 category as well as all high risk areas such as boiler rooms etc.

L1 provides protection throughout the building, and also where Property Protection is the prime reason for the system (this allows for a choice between the P1 or P2 categories).

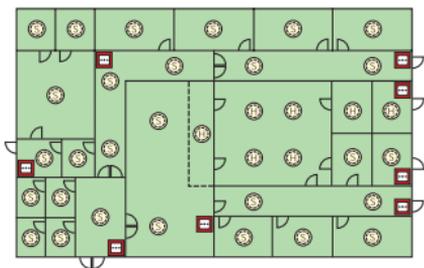
L3



L2



L1



## Detection and Alarm Zones

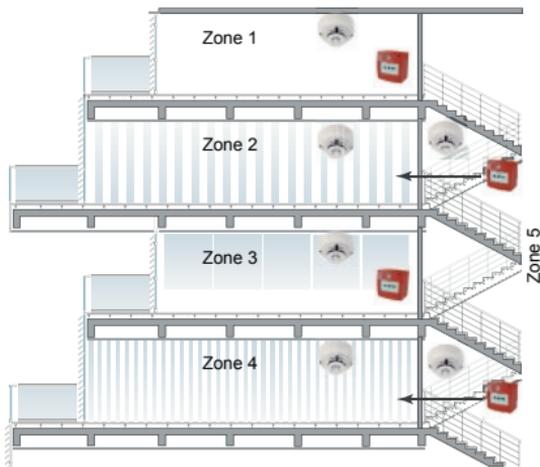
Generally a building is broken down into smaller compartments to enable the fire fighters to locate the fire as quickly as possible.

Even if the system is addressable it is still considered beneficial to have a separate 'at a glance' indication of the location of the fire.

These compartments of a building are called detection zones, which need to comply with the following criteria.

## Detection Zones

- A detection zone should cover no more than 1 storey, unless total floor area is less than 300m<sup>2</sup>. Voids in the same fire compartment should be included in the same floor zone. The maximum floor area of a zone should not be greater than 2,000m<sup>2</sup>, except for some large open plan areas incorporating manual call points only, which can be extended to 10,000m<sup>2</sup>
- The maximum search distance for the fire fighters to see the seat of the fire within a zone should not exceed 60m assuming the route taken is the worst possible option
- Vertical structures such as stairwells, liftwells etc should be considered as separate zones
- A manual call point within a staircase should be connected to the zone associated with that floor and ideally be mounted on the accommodation side of the corridor exit. Automatic sensors on the stairwell remain as part of the stairwell detection zone

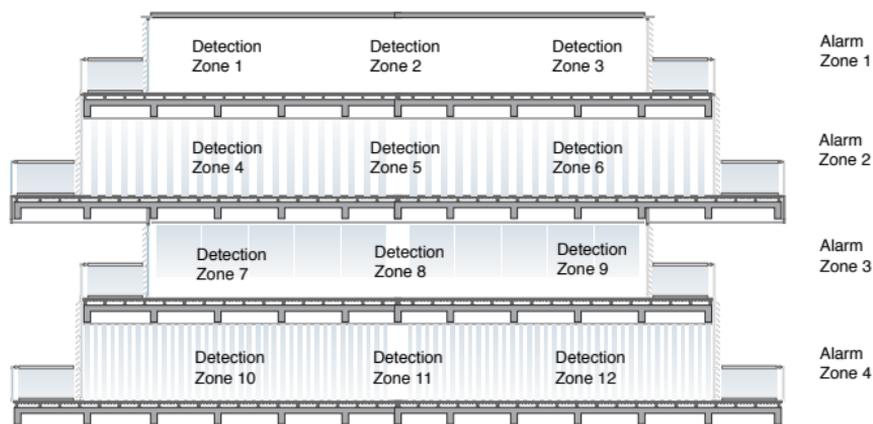


## Alarm Zones

An alarm zone is clearly defined within the standard but generally is an area of the building coinciding with the fire compartment boundaries. There must be a clear break between these alarm zones to ensure alert and evacuation messages are not overheard from adjacent areas.

The only other criteria is that an alarm zone may consist of a number of detection zones but not vice versa.

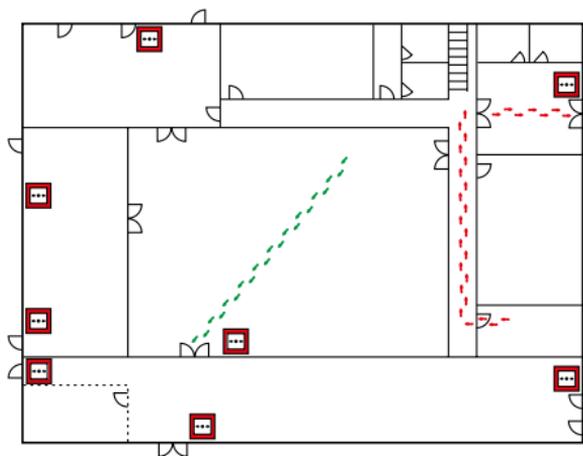
Alarm zones are only required when phased or staged evacuation is required. It is therefore important that care should be taken to ensure only one message is heard at any one time particularly where two alarm zones are attached.



### Siting of Manual Call Points

All manual call points, whatever the system, should comply to BS EN54-11 single action Type A version only and should be located as follows:

- On all storey exits and all exits to open air irrespective of whether they are designated fire exits
- Nobody should travel more than 45 metres to reach a manual call point. If the exit routes are not defined at the time of design the straight line distance from any MCP should be maximum 30m
- Travel distances should be reduced to 25 and 16 metres respectively, if there are persons with limited mobility or there is a likelihood of rapid fire development
- In all areas with potential high fire risk such as kitchens etc
- Where phased evacuation is planned, call points will need to be sited on all exits from a particular zone
- At a height of 1.4m above finished floor level (A lower mounting height is acceptable in circumstances where there is a high likelihood that the first person to raise an alarm of fire will be a wheelchair user)
- Call points may be fitted with protective hinged covers where they are likely to be subject to malicious operation. This provision should be recorded as a variation
- MCP's should be sited in a conspicuous well lit location against a contrasting background to assist in easy recognition



Manual Call Point



Route of travel defined  
- max 45m



Route of travel  
undefined - max 30m

### Selection and siting of Sensors

For further advice please refer to clauses 21 & 22 of BS5839-1:2013.

The objective is to select the correct sensor for the appropriate application, to provide the earliest warning of fire without the risk of a false alarm.

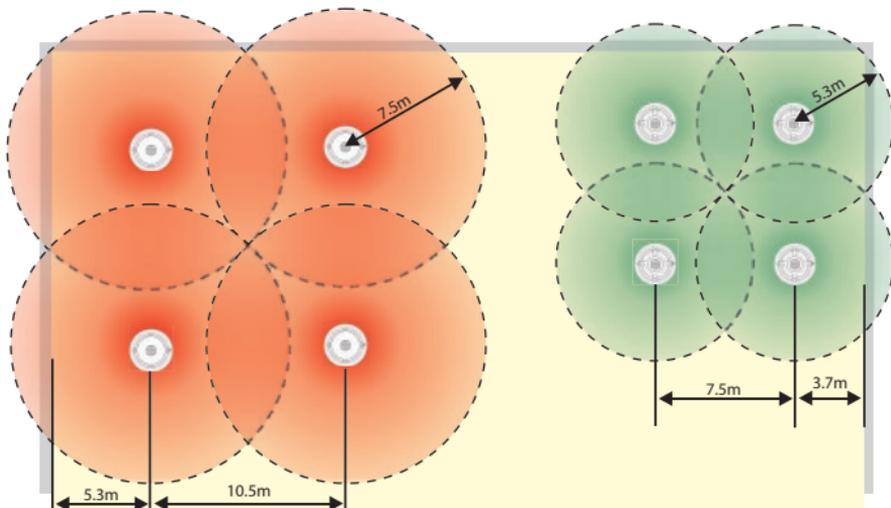
It is therefore worth trying to visualise the type of fire that is likely to occur in a particular room or area and also to familiarise oneself with the application and the risks that could give rise to a false alarm.

On a flat ceiling with no obstructions, the radius of protection of fire detectors is 7.5m for a smoke detector and 5.3m for a heat detector, and detectors should be mounted a minimum of 0.5m from a wall.

Some analogue multi-criteria detectors have a heat sensor only function, switched by the control panel, typically used to reduce the possibility of false alarms during daytime when a building is occupied, reverting to multisensor operation at night time. If this type of operation is employed, the radius of protection for a heat sensor should be used.

The diagram below gives a simple spacing plan based on these figures, however it should be noted that this might not be the most efficient layout for a given site; for example in larger areas, it is also possible to use a staggered layout, see diagram on opposite page, which may reduce the number of detectors required. In practice, the layout of the room must be considered to obtain the most efficient detector layout.

When using a multi sensor consideration should be given to the configuration set up of the sensing element and the mounting height and spacing of each detector.



Standard Smoke Detector Spacing

Standard Heat Detector Spacing

## Smoke sensors complying to BS EN54-7

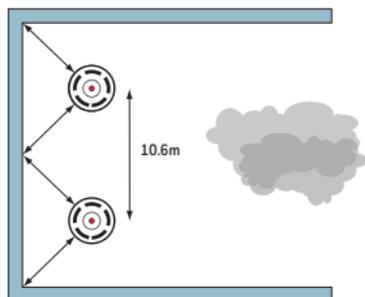
Traditionally, 'point' type smoke sensors have fallen into two main categories, optical or ionisation.

Due to new European Directives for the storage and transport of radioactive sources, ionisation sensors are becoming less favourable and multi-sensors combining optical with heat sensing are becoming more popular.

The System Sensor range of sensors has been designed to detect different types of fires with lower sensitivity to signals that previously have led to false alarms such as white dust or steam particles.

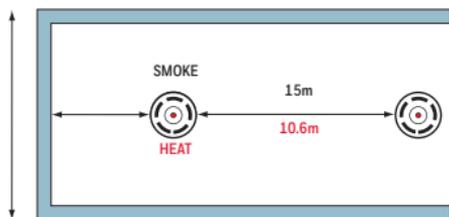
The Syyetm Sensor range of Optical and Optical Heat sensors are certified to both EN54 parts 5 and 7.

## SMOKE detector spacing (Under flat horizontal ceiling)

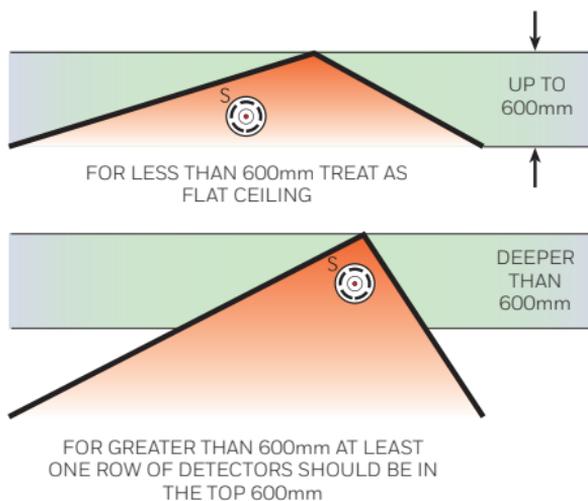


## HEAT detector spacing in corridors (category P only)

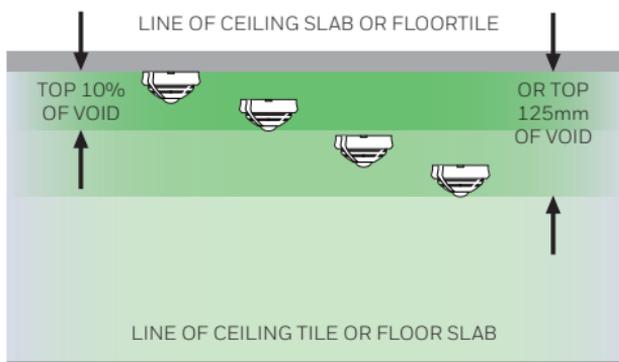
## SMOKE detector spacing in corridors (category L & P)



## SMOKE detector under pitched roofs



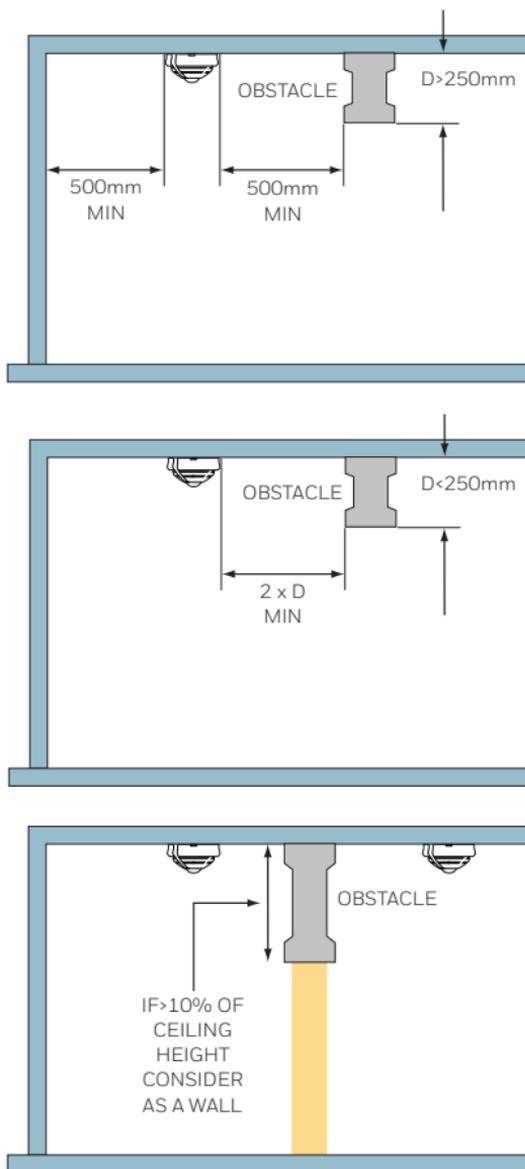
## Mounting detectors in voids



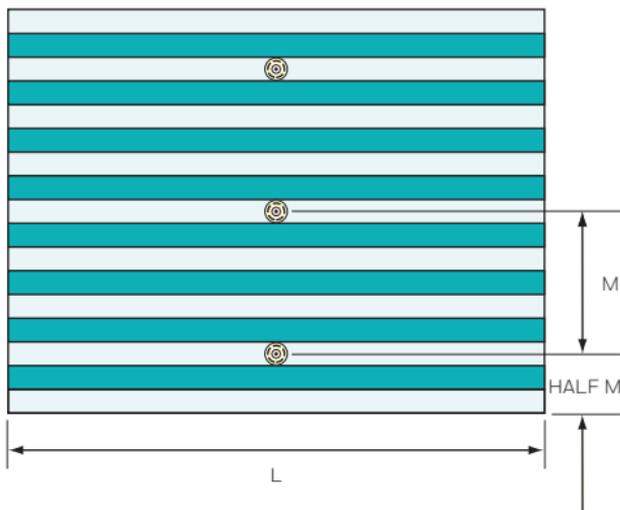
Applies to floor and ceiling void.

Any of the above detector positions are acceptable.

## Limits of siting sensors near obstacles or walls



## Siting sensors on ceilings with multiple joists

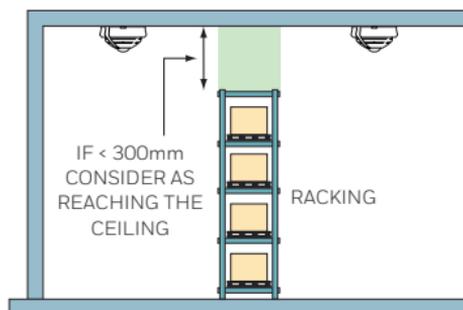


Permitted spacing detailed in table opposite. Ratio between ceiling heights vs beam depth and maximum spacing 'M'.

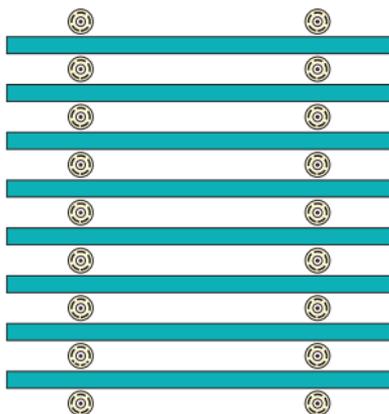
## Ceilings with multiple joists

CEILING HEIGHT (H)	Beam depth (D) <sub>w</sub>	Smoke sensor spacing (M)	Heat sensor spacing (M)
6M OR LESS	Less than 10% H	5m	3.8m
MORE THAN 6M	Less than 10% H and 600mm or less	5m	3.8m
MORE THAN 6M	Less than 10% H and more than 600mm	5m	3.8m
3M OR LESS	More than 10% H	2.3m	1.5m
4M	More than 10% H	2.8m	2.0m
5M	More than 10% H	3.0m	2.3m
6M OR MORE	More than 10% H	3.3m	2.5m

## Obstructions

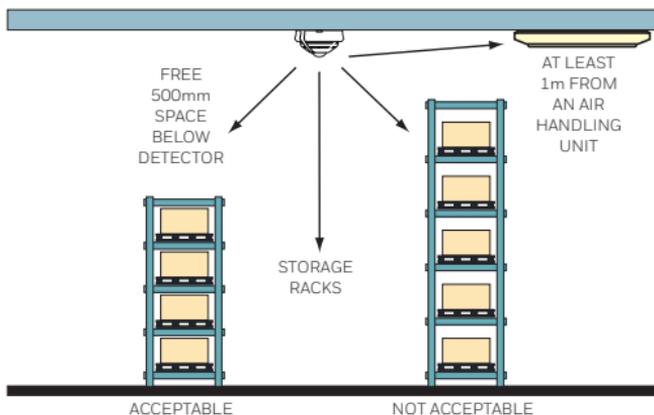


## Ceilings above racking



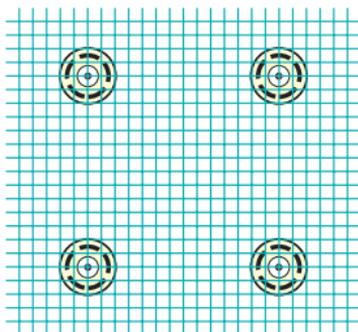
If gap between top of rack and ceiling is less than 300mm then treat as wall and provide detection in each aisle.

## Ceilings with other obstructions or air handling units etc.



One of the most common mistakes is to mount a smoke sensor adjacent to the air conditioning intake or outlet grill. The minimum distance between the two should be at least 1 metre and further if possible. This is due to the fact that smoke may have difficulty penetrating the sensor when the air conditioning is switched on. Also there is a greater risk of the sensor becoming contaminated and giving rise to false alarms.

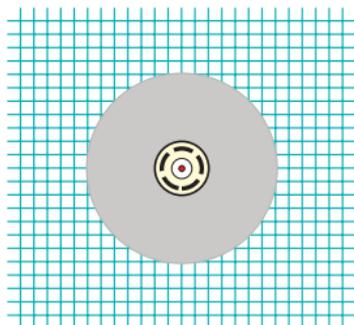
## Ceilings above perforated ceilings



Detectors above ceilings with perforations can protect the area below subject to the following conditions

- The perforations are uniform
- The minimum perforation is  $> 10\text{mm}$
- The thickness is  $<$  than 3 times the minimum dimension of the perforation

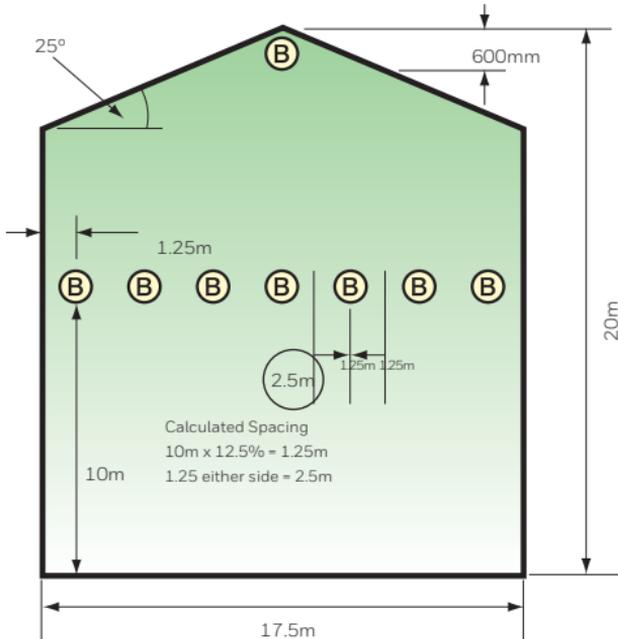
## Ceilings above perforated ceilings



Where air is forced through a perforated ceiling, the detector should be mounted on a solid baffle with a minimum diameter of 1200mm

## Siting of beam detectors

A single beam can cover up to 18.5m using the extra 25% spacing allowed with a roof pitched at 25°



If beam detectors are sited at more than 600mm below the ceiling, the spacing of beam detectors depends on mounting height. Example shows spacing at a height of 10m above likely level of the seat of fire.

- Spacing between beams is generally the same as for point smoke detectors. (7.5m)
- For pitched ceilings spacing may be increased by 1% for each degree of angle
- Beams should be mounted no more than 600mm from the highest point
- Avoid beams close to walls (500mm) or where temporary obstructions may occur
- Mount transmitter and receivers on a solid surface not affected by wind or natural temperature changes
- Additional units may be included in atria to detect at lower levels, to counter stratification and the spacing depends on the height above the floor.

System Sensor Beam sensors can be set to different sensitivity states. This reduces the risk of unwanted alarms and facilitates their use at increased heights if required.

## Limits of ceilings heights (general)

DETECTOR TYPE	MAX CEILING HEIGHT	PERMITTED EXTRA HEIGHT FOR LESS THAN 10% OF CEILING
Heat detector – Class A	9.0m	10.5m
Heat detector – Other Classes	7.5m	10.5m
Point smoke detectors	10.5m	12.5m
Carbon monoxide detectors	10.5m	12.5m
Optical beam smoke detectors – Normal sensitivity	25.0m	28.0m
Optical beam smoke detectors – Enhanced sensitivity	40.0m (see Note 1)	43.0m (see Note 1)
Aspirating smoke detection – General limit	10.5m	12.5m
Aspirating smoke detection – Class C with at least 5 holes	15.0m	18.0m
Aspirating smoke detection – Class C with at least 15 holes	25.0m	28.0m
Class B with at least 15 holes	40.0m (see Note 2)	43.0m (see Note 2)

NOTE 1 The use of supplemental detection is recommended [see 22.5d)] unless the risk (i.e. probability × consequence) of stratification is minimal.

NOTE 2 The use of multilevel sampling is recommended [see 22.7c)] unless the risk (i.e. probability × consequence) of stratification is minimal

### Choice and siting of alarm sounders and visual alarms

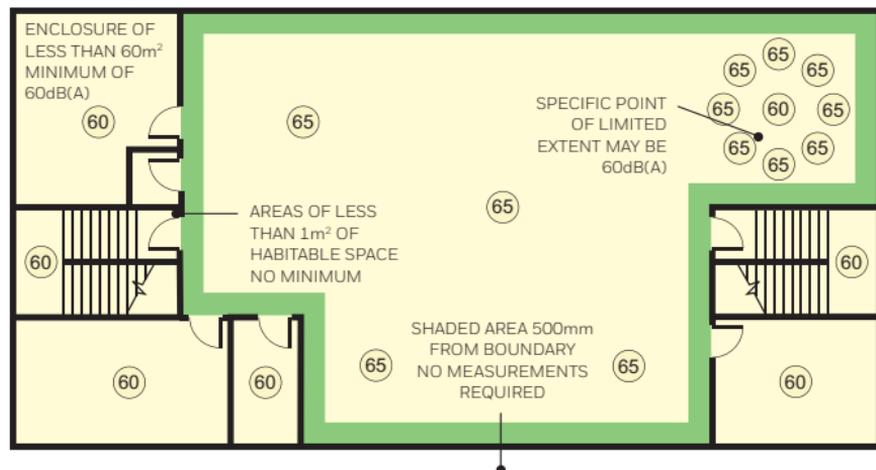
Sounders and strobes are generally provided for systems designed to protect life. However, on the rare occasion when only the property is being protected it is still essential to mount a sounder adjacent to the fire control panel as well as immediately outside the main entrance for the fire fighters.

Before deciding on the number and location of sounders/visual alarms, it is important to establish the 'Fire Plan' or cause and effect.

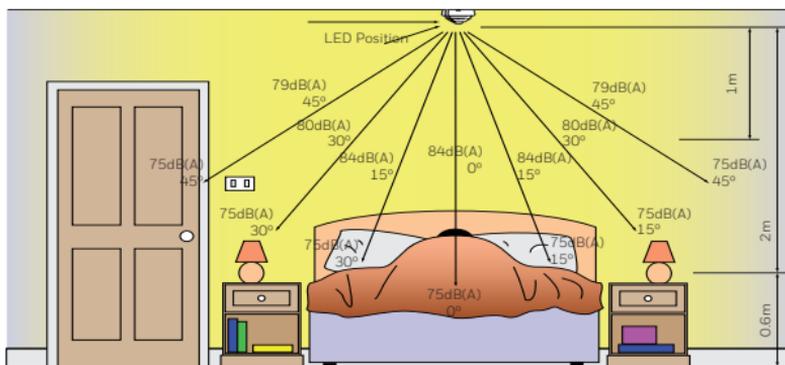
If the building is to be evacuated in stages, the evacuation procedures must be established to identify the alarm zone areas where different alarm messages may be given, for example an alert or an evacuation tone.

Audible alarm levels within buildings are generally accepted as 65dB(A) throughout. However, the Standard does accept that in certain locations this can be as low as 60dB(A). This allows some degree of flexibility, although in general the majority of a site must achieve 65dB(A) or greater to be compliant.

The drawing below illustrates the areas where reduced sound levels are permitted:



There are circumstances where the sound level should be higher than 65dB(A). For example in sleeping accommodation, sound levels of 75dB(A) "at the bed-head" should be achieved to rouse people from sleep.



In areas with high background noise levels (more than 60dB(A)), sounders should achieve a sound level at least 5dB(A) higher than the background noise.

When designing the layout of sounders it is important to understand how sound levels may be reduced by the fabric of the building, furniture as well as people in a room.

As a guide, doors will attenuate between 20dB(A) and 30dB(A). Therefore to ensure 75dB(A) is achieved within a bedroom for instance, a sounder should be mounted within the room rather than the corridor outside. Use of sensor sounders ensures an even spread of sound throughout the building eliminating the need (and cost) of separate high output sounders.

## Visual Alarms

The use of visual alarms should be seriously considered in areas of high background noise where ear defenders may be used. In these cases the visual alarm may be considered as supplementary rather than the only means of providing an alarm. There are, however situations where it is undesirable for an audible alarm, for example operating theatres, TV studios and places of entertainment where a discreet staff alarm system is the best option to avoid panic. In these cases Visual Alarms will be the primary alarm devices.

Visual Alarms are also a recommended solution for communicating the alarm to people with impaired hearing; a requirement defined in the Equality Act 2010 (formerly the DDA -1995) and Document M of the building regulations. BS5839-1 2013 states that Visual alarm signals provided for people with impaired hearing should be regarded as fire alarm devices.

In the above cases where the VAD's are primary alarm devices they should be installed with circuits monitored and protected against fire (in the same way as audible alarms) and the visual alarm devices should be certified to EN54 part 23.

### Control equipment and power supplies

The Control panel itself should be certified to EN54-2 and any power supply used should be certified to EN54-4. The Morley-IAS range of fire control panels incorporate their own battery and charger certified to the appropriate standards. Provided the guidelines for loading these systems are complied with, the batteries should be sufficient to sustain the system in the event of a power failure for a period of 24 hours with half an hour alarm load thereafter.

It is however recommended that a battery load calculation is carried out to verify the standby period provided by the capacity of the battery supplied.

Irrespective of the size or type of system the control panel should be sited with the following points in mind;

- In an area of relatively low fire risk
- On the ground floor entrance which the fire fighters will use
- In buildings of multiple occupancy, the panel should be sited within a communal area or if this does not exist, a location which is accessible at all times
- Where ambient light levels ensure visibility at all times
- Fire zonal indication should be clearly displayed by LEDs or an illuminated mimic diagram – it is not acceptable to simply accept the information from an LCD or VDU display

If there are several entrances to the building, consideration should be given to the provision of repeat indicators.

# System Installation

## The Installers' responsibilities

- To install all equipment in accordance with the Standard
- To use the correct types of cable
- To test the cables, continuity and earth, and provide certificates
- To flag up any Variations that affect the Design
- To produce a set of 'as fitted' drawings
- To sign off a G2 Installation certificate

## Types of cable and where to use them

Cable used for fire detection and alarm systems should be rated for fire protection of which there are two basic grades. These are known as Standard grade and Enhanced grade and are designed to meet the standards BS 8434-1 and BS 8434-2 respectively.

The choice of cable needed is dependent on how long the cable is expected to continue to operate whilst a fire is occurring.

The integrity of the system is paramount and all interconnections between devices must be considered, especially those that affect the alarm signal's critical path.

## What cable? – Standard or Enhanced fire resistant cables?

Standard fire resistant cable will satisfy most applications particularly with 'one out, all out' fire plans. Where the building is expected to be evacuated in a short period of time, or where the fabric of the building is protected by means such as sprinklers. Enhanced fire resistant cables are required for applications that need communications to continue during a fire incident for a longer period due to phased evacuation plans or where the critical signal path is at increased risk. Examples of where Enhanced fire resistant cable should be used include:

- In un-sprinklered buildings where the 'Fire Plan' involves the evacuation of occupants in four or more phases
- In un-sprinklered buildings greater than 30 metres in height
- In un-sprinklered buildings or large networked sites where

a fire could affect the cable's 'critical path', particularly where people will remain in occupation during a fire elsewhere on the site

- Where in part, a delayed evacuation may exist and the critical signal path may pass through an area of high risk
- Where a Risk Assessment has identified a particular need for Enhanced cable

## Other aspects in regard to Installation practice

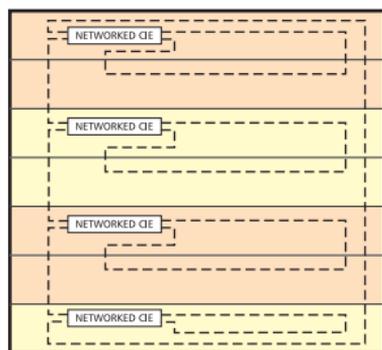
- The electrical characteristics of the cable such as impedance, capacitance etc should be capable of handling the data and power of the system

## Cable requirements

- Core size not less than 1mm
- Where exposed cables are below 2m, additional mechanical protection should be considered, except for cables complying to BS 7629
- The colour of the outer sheath should preferably be RED although other colours are permitted as long as it is common throughout the building and does not clash with any other electrical services

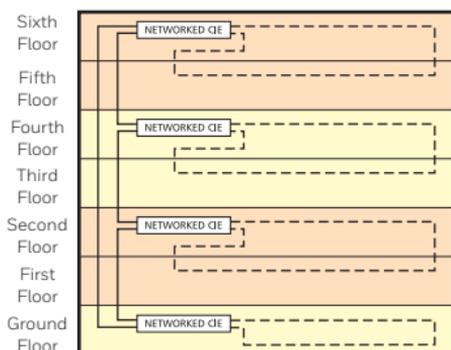
## Network Cabling

The route of network cabling will define whether standard or enhanced cable should be used. see examples:



Standard Fire Resisting Cable

Example of a networked fire alarm in a multi-storey building, showing standard cable grade throughout provided that there is diverse routing of the network cable loop.



Standard Fire Resisting Cable

Enhanced Fire Resisting Cable

Example of a networked fire alarm in a multi-storey building, showing standard cable grade for local wiring and enhanced grade for network cable.

### Fire cables should:

- be segregated from all other services
- not share the same conduit as other services
- use a separate compartment if common trunking is used
- avoid running alongside high current power lines
- avoid running adjacent to lightning conductors
- avoid electro magnetic interference from 'medium voltage AC circuits such as 230V mains supplies'

The Standard precludes the use of multicore cable where a single fault will cause more than one circuit to fail. This is particularly true with loop wired systems where communication from either end is required and the failure of a 4-core cable will mean that all communication is lost

Cable joints should be avoided, other than at the components themselves

Cable support should be designed to withstand the same temperature as the cable, which means the use of plastic cable clips, cable ties or trunking, where this is the main means of supporting the cable, should NOT be used

Cables should not rely on suspended ceilings for their support

Mains power supplies should also be wired back to the main circuit breaker in Standard grade fire resistant cable

## Recommendations for the Mains Power supplies

For reasons of electrical safety, the mains supply to the system should be via a separate circuit breaker taken from the load side of the building's main isolating device. This circuit breaker can incorporate a switch if necessary but in either event should be labelled 'FIRE ALARMS – DO NOT SWITCH OFF' – this supply should be used for the sole purpose of the fire alarm system.

In large multiple occupancy buildings it may be necessary to obtain a mains supply via a mains distribution board. However the same arrangements as above apply. The isolation of this local distribution board and the fire isolating device is a minimal requirement and should be inaccessible to unauthorised persons.

Ideally the supply should not be protected by a residual current device unless necessary to comply with requirements of BS 7671. If this is the case then it should not be capable of isolating the mains supply to the fire alarm system.

## Inspection and testing of wiring

Prior to any equipment being connected, all installed cables should be subject to a 500V dc insulation test. These tests should show an insulation value of at least 2Mohm between conductors and between each conductor and screen or earth.

Earth continuity tests should be carried out on all mains supply circuits as well as an earth loop impedance in accordance with BS 7671. It is important that all earth leads or screen cables are terminated and connected through each device.

The maximum impedance of each loop or radial circuit should be recorded to ensure it meets the manufacturers recommendations. In the case of Morley-IAS DXConnexion and ZXSe this is determined by not exceeding the recommended maximum cable lengths which for loop circuits should not be greater than 2Km.

# System Commissioning

## Commissioning Engineers' responsibilities:

It is important that the system is commissioned by a competent person who has attended recognised training courses on the equipment as well as the British Standard.

At this stage the entire system should be inspected and tested, in particular:

- Every manual call point, sensor, sounder, interface and indicator
- Check that all devices are correctly sited to cover the area they are intended to protect – see previous notes on siting of devices
- All sound pressure levels should be measured and recorded
- Any transmission of signals to remote centres or equipment should be proven
- The fire plan or cause and effect should be checked from every device
- All alarm panels and printers display the correct information and are sited correctly
- A suitable zone plan is mounted adjacent to the control panel
- No changes to the building have affected the siting of equipment or effectiveness of the system for example an additional partition requiring additional sensors
- Mains and standby power supplies are adequate and designed to support the system for a specified period, for example 24, 48 or 72 hours
- As far as reasonable, ascertain that the installation complies with the standard and installation certificates are provided by the installer
- If radio equipment is used, ensure all radio signals are of sufficient strength to ensure reliability

- Ensure there are no obvious shortcomings with the system as a whole and that all the documentation is correct
- Functional testing of all equipment
- Confirm fire plan or cause & effect is correct as per design
- Check that all devices are correctly sited to cover the area they are intended to protect –incorrectly sited devices should be moved or listed as variations
- Carry out staff training

It is also recommended that the system is soak tested for up to a week, dependant on the system size, so that any teething problems are identified without giving rise to any false alarms.

## Documentation

On completion of commissioning and user training all documentation will have to be collected and handed to the client or their representative. This will include:

- G1 Design Certificate
- G2 Installation Certificate
- G3 Signed Commissioning Certificate
- Cable test and Wiring Certificate
- G4 Acceptance Certificate signed by clients representative
- Cable and insulation resistance test records
- "As fitted" drawings of the final installation, including cable run details
- Product manuals and user instructions
- System log book
- A copy of the fire plan documentation against which the commissioning engineer programmed the system
- The designer's specification and a written list of agreed Variations





## **For more information**

please contact your local distributor, your Morley-IAS Business Manager or please feel free to contact the head office using the details provided below.  
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