



Ministry of Housing, Communities & Local Government

Consultation

Sprinklers and other fire safety measures in new high-rise blocks of flats

Response from the Chartered Institution of Building Services Engineers

28th November 2019

Name:	Dr Hywel Davies
Position:	Technical Director
Submitted on behalf of the:	Chartered Institution of Building Services Engineers
Address:	222 Balham High Road, London, SW12 9BS
Email address:	hdavies@cibse.org
Telephone no:	0208 772 3629

ABOUT CIBSE

This response is submitted on behalf of the Chartered Institution of Building Services Engineers (CIBSE). CIBSE is the professional engineering institution that exists to 'support the Science, Art and Practice of building services engineering, by providing our members and the public with first class information'.

CIBSE members are engineers who design, install, operate, maintain and refurbish life safety and energy using systems installed in buildings. Our members specialise in a range of disciplines related to building performance, including specialists in fire safety systems and fire engineering. Others belong to the Society of Façade Engineering, a Division of CIBSE, who specialise in the design and installation of cladding systems and facades.

CIBSE is unusual amongst built environment professional bodies because it embraces design professionals and also installers and manufacturers and those who operate and maintain engineering systems in buildings, including fire related safety systems, and so our membership has an interest throughout the life cycle of buildings.

CIBSE has over 20,000 members, with around 75% operating in the UK and many of the remainder in the Gulf, Hong Kong and Australasia. CIBSE is the sixth largest professional engineering Institution, and along with the Institution of Structural Engineers is the largest dedicated specifically to engineering in the built environment.

CIBSE publishes Guidance and Codes providing best practice advice and internationally recognised as authoritative. The CIBSE Knowledge Portal makes our Guidance available online to all CIBSE members, and is the leading systematic engineering resource for the building services sector. It is used regularly by our members to access the latest guidance material for the profession. Currently we have users in over 170 countries, demonstrating the world leading position of UK engineering expertise in this field. CIBSE Guide E, Fire safety, was republished earlier this year, and provides guidance on all aspects of fire safety, including fire suppression systems. The Department was provided with a copy of the Guide at publication for internal use.

CONSULTATION RESPONSE

This response has been prepared by the CIBSE Technology Committee, a standing committee of the Board of the Charity, which comprises senior and practicing engineers from consultancy, contracting and facilities management backgrounds. It has also been informed by contributions from a range of members in response to a call for contributions from professional members.

General comments on the Consultation Document

These comments go beyond the specific questions posed in the consultation document, but there is a need for clarity over what is being proposed.

Is government proposing changes to regulatory requirements, or to regulation?

Paragraph 4 talks about "reducing the height threshold at which sprinkler systems would be required from the current requirement of 30 metres to a lower height threshold."

Paragraph 6 then sets out the statutory requirement to consult on substantive changes to the Building Regulations, and the practice of consulting on changes to Approved Documents, which are guidance.

Paragraph 7 then talks about changes to AD B relating to sprinkler provision. But it then ends by referring to “requirements”. Paragraph 8 then talks again about guidance.

This leaves the inevitable question – is AD B guidance, or is it a set of requirements? Is government consulting on changes to guidance about sprinkler provision, or on changes to regulations? In the absence of clarity within the consultation document, this response has been prepared to address the questions that are posed, but also to consider whether the changes being set out should be changes to the approved guidance or changes in the regulatory requirements.

It is recognised that the consultation was issued prior to the recent fire in student accommodation in Bolton, which may cause further consideration of height thresholds. This response has been finalised since the Bolton fire and does take it into account.

Sprinkler Provision

Paragraph 9 refers to “the current requirement...in AD B”. This is potentially confusing, as the AD is guidance (as is stated in the standard rubric in all ADs).

Paragraph 10 deals with extending the range of buildings in which reasonable provision of automatic fire suppression systems could include guidance about installation of sprinklers, in response to functional requirement B3 (3).

Paragraph 12 then returns to proposing a change to “fire safety guidance to require sprinkler systems in a wider range of new high rise blocks of flats. **This response supports such an extension.**

However, it also suggests that for the avoidance of doubt about where automatic suppression is “required”, this extension should not be solely set out in amendments to guidance in AD B. An appropriate amendment to the Building Regulations – whether to a specific regulation or to Schedule 1 – should also be made to convey the changes as explicit regulatory **requirements**.

RESPONSES TO SPECIFIC QUESTIONS

Sprinkler provision in new high-rise blocks of flats

Question 1 – *Do you agree or disagree that the height threshold for sprinkler provision in new blocks of flats should be reduced?* **CIBSE agrees that the threshold should be reduced.**

1b - *If you agree that the height threshold should be reduced, what should the new threshold be and what is the evidence for this particular threshold?*

CIBSE has concerns about the selection of any trigger height. It is clear that the evidence base for the selection of either 18m or 11m is limited and may be related to the heights of historic fire fighting appliances and equipment.

There is a significant concern around the technical evidence for justification of any trigger height at this time. There is also a concern about the behavioural aspects of the selection of such a height. It is not clear on what evidence the Secretary of State in post at the time will be able to base the selection, or to reassure those who live in a building just below the chosen threshold that they are also in a safe building. This may become particularly difficult to explain to the media in the event of an incident in a building that falls just below the chosen threshold.

It has to be noted that the proposed threshold of 18m is some 100 or 200 mm higher than the Cube building in Bolton. Will the Secretary of State want to be in a position where they have to justify not fitting fire suppression in such a building in the light of what has happened? From a public perspective Grenfell and the Cube were not supposed to be able to happen. But they have happened, and public perception has changed as a result. The fact that sprinklers would almost certainly not have significantly changed the outcome in either case does not have the same impact on public perception as the video images of these two events on live rolling news programmes.

It is also noted that the Review Panel on Building Standards (Fire Safety) in Scotland has recommended that in Scotland a wider range of buildings should be fitted with automatic fire suppression, to include flats, HMO's occupied by more than 10 people and care homes (and the requirement to define care homes very carefully is acknowledged). There is no height restriction proposed, although single family dwellings are excluded, unlike the requirement in Wales.

It therefore seems reasonable to ask whether, in England as well, sprinklers should be installed in all multi occupancy residential buildings as a matter of course regardless of height, both for new build and conversions involving change of use, unless a compelling fire safety case can be made not to. This would be more in line with US practice and the NFPA codes.

Where sprinklers are provided the guidance in ADB should allow for extended travel distances within the flat and common areas. Sprinklers should also be provided to common areas as often these spaces are misused for storage of combustibles. The head of the stairs and bottom of the stairs should also be sprinklered as there is a possibility that the area will be misused for storage by tenants. There are many cases where experienced fire engineers have found combustibles stored in common areas, even in "affluent and well maintained" premises.

As noted above, the evidence base is limited. However, the approach is in line with the NFPA approach, which is adopted across the North American market and in other jurisdictions that commonly use NFPA codes such as the Middle East, Asia and South East Asia. Aligning UK practice with international approaches would benefit UK practitioners seeking to work in other jurisdictions.

But the reality is that the evidence for any of the options: do nothing and retain a 30m threshold, reduce to 18m, 11m or the "Scottish approach" described above, is currently limited.

Question 2 – *Do you agree or disagree that these systems should be designed in accordance with the relevant guidance in BS 9251?* Fire practitioners have expressed concerns with this standard, that it is not stringent enough.

2b - If you disagree, what specifications and performance should be required?

It is not so much about agreement or otherwise, but it should be recognised that BS 9251 may be one way of demonstrating compliance with a requirement for automatic fire suppression systems. If the AD is guidance, then there is an argument for recognising that there may be more than one way to comply with the requirement. There are three options suggested. The first is to use BS EN12845 instead of BS9251. The second is to recognise NFPA Standard 13 R, which is a less onerous standard than Standard 13 for non-residential buildings.

NFPA 5000 Section 25 "Apartment Buildings" states that.

25.3.5.2 All buildings shall be protected throughout by an approved, supervised automatic sprinkler system installed in accordance with 25.3.5.3.

A third option is to revise BS 9251 to address areas of concern, including:

- In many cases there is a need for enhanced availability (e.g. resiliency in water suppliers and/or pumps) which isn't addressed in BS 9251;
- With modern electrical equipment and some furnishings, the water density may not always be sufficient as prescribed in BS 9251;
- The duration for supply is inadequate and there is a natural tendency for contractors to use the minimum that in many circumstances does not take into account the nature of the building, location, escape routes, and fire brigade attendance time.

This could be addressed by the addition of normative and informative annexes to BS 9251 rather than fully adopting EN BS 12845.

There also appears to be a lack of understanding among some building control and/or other authorities having jurisdiction who do not have the necessary fire engineering experience.

Question 3– *Do you agree or disagree that there should be a transitional period of six months?* CIBSE agrees that there should be a transitional period.

3b - If you disagree, how long should the transition period be? If a broader scope for the proposed requirement is implemented, then there may be a case for amending the proposed transition period and potentially introducing a phased approach to enable industry to respond to the changes effectively.

Potential impact of changes

Paragraph 23 notes that “Lowering the sprinkler threshold will deliver life, health and property benefits and provide visible reassurance that the new building is safe for occupants, owners and other interested parties such as insurance and mortgage companies.”

Given the experience with government advice on cladding, where the insurance and finance sectors have taken a position that has rendered many developments that are fully compliant with the Building Regulations in force at the time of construction unsaleable, even those built to the current regulations, there must be a real concern that the finance sector will take a view on automatic fire suppression. This will be driven by their assessment of the market and not by government rules on impact assessment.

This could open up a serious gap between market requirements and regulatory requirements, to the serious detriment and possibly cost of building owners and investors. This needs to be avoided.

Wayfinding signage for fire and rescue services

Question 4– *Do you agree or disagree that there should be a more consistent approach to wayfinding signage for fire and rescue services in Approved Document B?* **CIBSE agree that there should be a more consistent approach to wayfinding for the FRS.**

However, this may be the wrong question. People should be able to self-rescue, be given the information that their building is on fire and so able to decide to escape if they choose to do so, and are able to evacuate themselves. In which case occupants need clear wayfinding information, too.

The concept of stay put is one option and is peculiar to the UK, it is not common in other parts of the world. Recent fires suggest this option to be unsafe in some circumstances. For example, combustible façade materials, timber frame construction and existing/older buildings where the compartmentation is suspect or deficient. The guidance in ADB should also include the concept of simultaneous evacuation as a sensible alternative form of reasonable provision. This approach is the norm outside the UK and is gaining increasing popularity in the UK. There should be detailed guidance provided on this option.

There should also be detailed guidance provided for changing the stay put policy to simultaneous evacuation (which is normal outside the UK) to include shared student accommodation.

Question 5 – *Are there any existing standards or guidance which should be introduced to the guidance provided in Approved Document B? Please specify.* BS 9991 may be used as the starting point, but it is based on ADB which this exercise is consulting on amending, as it is recognised that the guidance is not fit for purpose. It does include some flexibility on travel distances for sprinklers but probably not enough. So BS 9991 needs revision to be a robust basis.

5b – Does this guidance need to be supplemented or amended for inclusion in Approved Document B? If yes, please specify how. Amendments should include a requirement that the fire alarm panel should indicate which zone the sprinklers have activated. This will inform fire fighters where the sprinklers are operating and therefore the approximate location of the fire.

Question 6 - *What views exist on the benefits of each signage option set out above?*

6b - What is the preferred option set out above for wayfinding signage? Vinyl lettering, photoluminescent lettering, emergency powered lighting luminaries, other (please specify). Providing emergency lighting is relatively easy. The EGRESS signage should be self-illuminated (battery pack) or emergency lighting should be provided that also lights a vinyl lettering sign. Photoluminescent signage is a good option. Vinyl lettering may not be readily visible in all conditions.

The consultation is silent on the need for a second stair. It is suggested that the Department considers the case for two stairs be provided where the apartment building exceeds 4 stories or 16 units. It is understood that this would need to be the subject of a separate consultation in due course.

Some additional examples of signage have been provided by a senior practitioner below.

Evacuation systems

Question 7: Again, the AD is guidance and not requirements. There should be a regulatory requirement for an emergency evacuation system if there is no automatic alarm system. Such a system could be advantageous in premises prone to false alarms and complacency about them, leading to delayed responses when there is a real emergency evacuation (as has been widely reported in the Bolton case). The same reservations about the evidence relating to heights applies here as earlier.

END

Please do not hesitate to contact us for more information on this response.

(18) **Photoluminescent.** See 3.3.215.

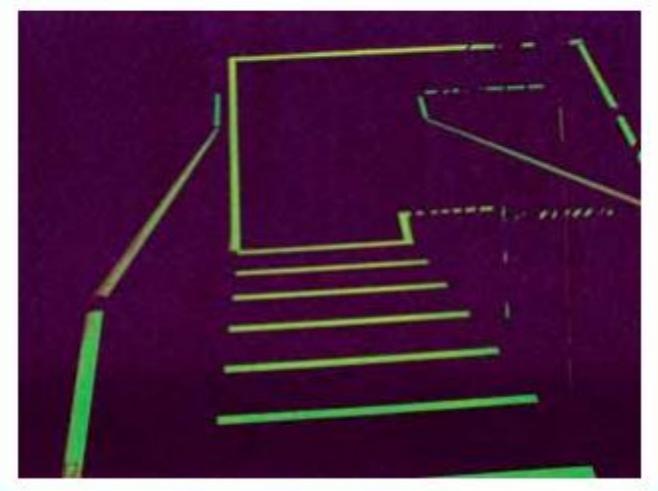
Photoluminescent materials have been used effectively as internally illuminated exit and directional exit signs in accordance with 7.10.7 and as floor proximity egress path marking in accordance with 7.10.1.7.

The provisions of 7.2.2.5.5 on exit stair path markings extend the use of photoluminescent materials as exit stair path markings. See 7.2.2.5.5.10. Exhibit 7.6 depicts the effectiveness of exit stair path marking via photoluminescent materials in a darkened exit stair enclosure.

(19) **Ramp.** See 3.3.229.

Requirements for ramps used in a means of egress are found in 7.2.5.

Exhibit 7.6



Photoluminescent exit stair path marking. (Photo courtesy of Jake Pauls)

14. Proulx, G., et al., *Evaluation of the Effectiveness of Different Photoluminescent Stairwell Installations for the Evacuation of Office Building Occupants*, IRC-RR-232, National Research Council Canada, Ottawa, Ontario, 2007.

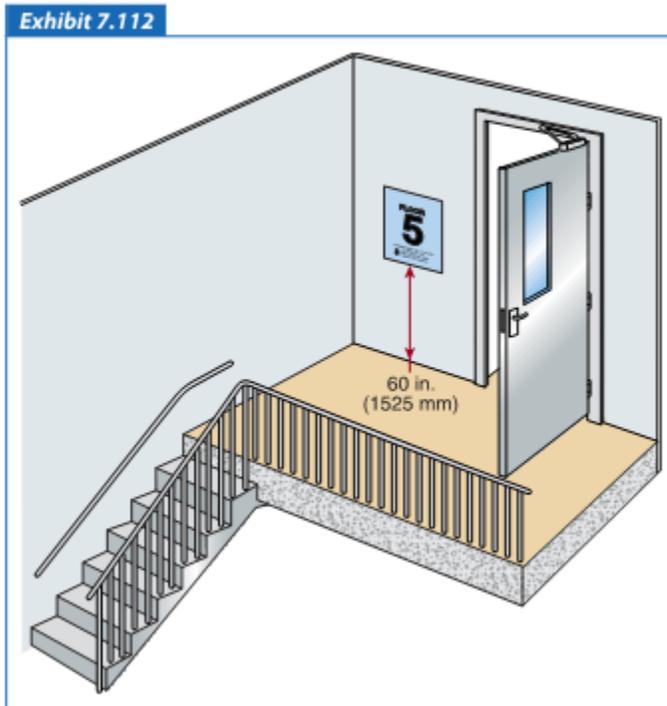
Example of stair signage below

**NORTH STAIR
FLOOR**

5

SUB-BASEMENT TO 24TH FLOOR
NO ROOF ACCESS
↓
DOWN TO FIRST FLOOR
FOR EXIT DISCHARGE

Figure A.7.2.2.5.4 Example of a Stairway Marking Sign.



Stair sign placement.

Exhibit 7.113



Stairway identification sign with tactile floor level designator.