Department for Education

Technical Review of Building Bulletin (BB) 100: Design for Fire Safety in Schools

Call for Evidence Report

May 2021

Contents

Introduction

The Department for Education's (DfE's) Building Bulletin (BB) 100, "Design for Fire Safety in Schools", was published in 2007. To ensure this guidance remains fit for purpose and aligns with the Ministry of Housing, Communities and Local Government's (MHCLG's) wider review of fire safety, we launched a Call for Evidence on the Technical Review of BB 100 in March 2019.

There were 64 responses overall from a wide range of sources, including: 15 trade associations/manufacturers/commercial insurers; 10 fire and rescue service organisations; 8 local authorities and the Local Government Association; 9 fire engineers; 7 professional bodies/design professionals; and 3 building control bodies/fire safety officers. The remainder included schools, a school workforce union and an adviser to the All-Party Parliamentary Fire Safety and Rescue Group (APPG).

Dialogue with many of the above stakeholders on the material received and the wider evidence that is available has been ongoing. We expect that to feed into an updated version of the guidance which will be the subject of a full consultation.

Question analysis

It should be noted that not all respondents answered all questions. The number of responses for each question is shown and all percentages quoted relate to the specific question.

Question 1

We would welcome views and evidence around the design opportunities, or limitations, that sprinklers can provide specifically in school building design for compliance with Building Regulations.

Government response

The main design opportunities cited by respondents were: larger compartment sizes; relaxations on travel distances and numbers of means of escape; fewer fire-fighting shafts; and decreased building separation and boundary distances.

Other suggestions were that there would be less need for passive measures, that there could be greater use of glazing, and that it would be safer to use cheap, environmentally friendly materials such as wood.

Other views were that sprinklers did not imply limitations to school design, and that Automatic Water Suppression Systems (AWSS) allow much more in the way of design freedoms and can enable more innovative designs, including open plan and atria features. AWSS can also lead to cost reductions in other areas

A number of respondents also pointed out that if BS 9999 is used, these design opportunities can be achieved without installing sprinklers.

Another view was that where sprinklers are required in schools purely for protection of the school as a community asset, then life safety features might arguably be unnecessary. A risk-assessed approach should be taken and, where necessary, consultation may be required with insurers.

About one third of respondents called for the installation of sprinklers in new schools. Of these, a few argued against the use of sprinklers as a compensatory feature for other key fire safety measures.

There was also support for continuing to use fire risk assessments to determine whether or not sprinklers should be installed, though some respondents said that the risk assessment tools accompanying BB 100 are either out of date or inadequate.

The majority view in this context was that whilst sprinklers can provide additional benefits in buildings, physical fire protection measures and the management regime need to stand alone without sprinklers.

(Number of responses: 56).

Question 2

We would welcome evidence on the technical issues associated with compartmentation, specifically related to schools, including whether the maximum compartment size should be reviewed and amended.

Government response

There was a variety of views on this question. Some respondents thought that the current recommendation of 800m² should be retained. Others called for it to be increased, pointing out that AD B allows for 2,000m². Another view was a review of the existing recommended size, on the basis that it is no longer clear that the risks associated with 800m², at the time the maximum size was set, still exist.

Around 15% of respondents thought that the recommended size should be increased. It was pointed out that AD B allows 2,000m², while BS 9999 does not have a limit where the top floor is less than 30m above ground level. Where it is over that height, the limit is 4,000m².

A smaller number of respondents called for the maximum size to be reviewed as further studies are needed.

Some respondents also raised concerns about the ongoing integrity of compartmentation due to defects in initial construction or the result of later alterations.

(Number of responses: 46).

Question 3

We welcome views and any evidence on the number and type of staircases, limits on occupation and safe escape approaches in multi-storeyed schools.

Government response

Around 20% of respondents thought that the guidance on single staircases in schools should be revised and that, in future, all schools should have a minimum of two staircases.

10% of respondents consider evacuation lifts, especially designed for occupants facing mobility challenges, to be essential in multi-storey schools. Several think that the size of refuges should be reviewed.

Several people considered BB 100 to be too onerous and recommended following BS 9999. Another queried the recommendation not to use external stairs for escape.

Otherwise respondents were generally content with the current situation, saying that Building Regulation compliance is adequate and that schools are generally low risk.

(Number of responses: 50).

Question 4

We would welcome views on the impact of community and out of hours use by school and non-school bodies on fire safety design.

Government response

The main 2 issues highlighted were: the need for emergency and escape lighting (cited by 25% of respondents); and users' unfamiliarity with the building and the need to recognise a different risk from frequent occupants.

Other issues raised were that there may be an impact on minimum travel distances, exit numbers, widths and capacities. Good signage is needed and the specification for fire detection and alarm systems may need enhancing.

(Number of responses: 52).

Question 5

We would welcome views on whether BB 100 should recommend that all new schools over 18m, within the scope of the guidance, should not use combustible materials in the external walls, in line with the terms of MHCLG's ban.

Government response

Around 30% of respondents thought that the ban should apply to schools.

A similar proportion agreed, but considered that the ban should apply to the external walls of all new school buildings, of any height. Within that, there was a view that combustible materials should not be used in the external walls of any building in which vulnerable people sleep, including residential schools.

A smaller number of respondents thought that the trigger height should be different - 11m (or 3 storeys) was suggested.

A small number of respondents disagreed with including schools in the ban, on the basis that they typically have adequate means of escape and evacuation times.

(Number of responses: 53).

Question 6

We would welcome views on whether we should provide greater guidance, through BB 100, on meeting fire safety management long-term, to support school building users to meet the requirements of the Fire Safety Order.

Government response

66% of respondents agreed that more extensive guidance on fire safety management should be included in BB 100.

The general view was that BB 100 should cover Fire Safety Order requirements and should encourage the effective implementation of Regulation 38 of the Building Regulations (the provision of fire safety information at the completion of a project), and ensure that a full and appropriate fire strategy is supplied to the end user in a form that is understood, covering not only what is needed at handover, when a building is first occupied, but also for the lifetime of the building.

Some respondents said that BB 100 should include guidance on carrying out fire risk assessments.

A number of respondents called for more practical guidance for end users, including on:

- storage of materials and resources outside of designated areas
- displays in corridors, communal areas amd on fire escapes
- introduction of lockers in corridor areas reducing escape route widths
- exceeding maximum capacities – e.g. during school plays
- obstructions to fire exits.

Ongoing fire safety management was a recurrent theme, although around 15% of respondents thought that guidance on fire safety management should not be included in BB 100. Their reasoning was that BB 100 is a technical document, and therefore not appropriate for building users.

(Number of responses: 53).

Question 7

We would welcome views on whether there are any school-specific issues in relation to Modern Methods of Construction (MMC). We appreciate that there are elements of both life safety and property protection in relation to MMC and would welcome views on both.

Government response

The main school-specific issue raised concerned certain types of MMC buildings being particularly vulnerable to arson.

Otherwise the issues raised seem to be the more general ones that also apply to school buildings however they are constructed. These fall into five broad categories:

- systems of construction
- junctions, voids and compartmentation
- use of combustible materials
- building control and testing

- future proofing.

Around 10% of respondents considered there were not any school-specific issues with MMC.

(Number of responses: 44).

Question 8

What specific property protection measures should BB 100 cover in addition to the topics covered below in questions 9 to 12?

Government response

Around 60% of respondents were in favour of including additional information on property protection over what is covered by the current guidance. Of these, the majority were in favour of including additional advice on better security design and arson reduction.

Particular security measures cited were:

- the need for effective boundary treatment
- the protection of school buildings while unoccupied
- perimeter security and motion detection, including security lighting and CCTV
- that temporary buildings and sheds constructed with combustible materials should not be located close to the main buildings.

A number of respondents suggested that BB 100 should include improved and additional guidance on fire detection and alarm systems.

Some respondents said that fire safety guidance on the conversion of, for example, office buildings to school use is needed.

Several respondents called for improved guidance on displays in schools with regards to fire safety.

(Number of responses: 46).

Question 9

We would welcome views on which fire suppression systems (including sprinklers, misting systems etc) are most effective in a school environment and any supporting evidence.

Government response

Around 40% of respondents favoured sprinklers over water mist systems, saying that they have a much longer track record and are tried and tested. However, greater clarity is needed on when to use a property protection sprinkler system (the normal recommendation of insurers) or an enhanced system for “life safety”.

Other views suggested that water mist suppression systems do have some advantages – for example, that they are easier to install in an existing building. They also have less reliance on tanked water supply, require smaller pipework and cause less water damage when activated.

Respondents also raised caveats or criticisms of mist systems – for example that they may be designed chiefly to aid means of escape and assist early evacuation rather than extinguishing fires; and are unsuitable within a school environment.

While a small number of respondents suggested the use of gas protection for IT rooms, the general advice from fire engineers was that gas and powder-based suppression systems are not suitable for use in schools.

(Number of responses: 47).

Question 10

We would welcome evidence relating to the effectiveness of compartment floors in schools.

Government response

BB 100 recommends that all floors in school buildings should be compartment floors. The majority of respondents favoured keeping the current recommendation.

The importance of passive fire separation in schools to restrict fire and smoke spread was noted, in that it assists firefighters in minimising further damage to the building, and is likely to offer a degree of protection for working firefighters against possible collapse.

Some respondents considered the recommendation unnecessary. For example, the use of compartment floors can result in less open space, due to a lack of connectivity between several, or multiple floors; and that they can also be more difficult to construct if corridor floors have voids for ventilation and daylighting.

(Number of responses: 29).

Question 11

What measures, if any, should BB 100 provide guidance for around property protection for special schools? Do these measures differ for types of special school or particular pupil needs?

Government response

25% of respondents agreed that having adequate property protection measures in place is particularly important in special schools.

Other issues raised were that guidance should emphasise that user input is particularly important in developing a fire strategy for a special school.

Nearly a half of respondents raised life safety issues they thought needed addressing in guidance. In order of citation these were:

- extended evacuation times
- evacuation lifts should be installed in multi-storey special schools
- clear guidance is needed on the fire detection and alarm systems in special schools. This includes the need for voice alarms
- review sizes of refuge spaces
- guidance is needed on Personal Emergency Evacuation Plans (PEEPS) for occupants with mobility or other special needs.

In some special schools, a proportion of non-ambulant pupils may require hoisting into wheelchairs before evacuation. There is also the issue of trying to avoid the need to evacuate those with feeding tubes or severe mobility issues to external spaces if a fire breaks out. Safe internal areas could be designed to deal with this.

(Number of responses: 51).

Question 12

We would welcome views on whether guidance, in addition to what is covered in AD B, is required for residential schools and whether any specific measures are required for residential schools.

Government response

Opinion for and against including guidance on school residential/boarding accommodation was equally divided with around 30% stating a preference one way or the other.

The main view in favour was that reference to AD B is relevant, but as most residential school buildings are multi-purposed, guidance on how the various requirements fit together would be beneficial.

Those against the idea of including guidance in BB 100 either recommended referring to AD B or following the guidance in BS 9999 and BS 9991, “Fire Safety in the Design, Management and Use of Residential Buildings”.

(Number of responses: 49).

Question 13

We are interested in views and evidence on the effectiveness of fire engineering approaches in school building design.

Government response

Many respondents thought that fire engineering solutions were not appropriate for school design, unless the designs were complex, and that they were only being used to achieve cost savings. Others were concerned that fire engineering does not consider property protection.

Some respondents did consider that fire engineering could have a place in school design, even though a few of these also expressed caveats.

The main view was that fire engineering design should take a holistic view of all measures provided and the likely risk profile of the occupants. As such it should provide a suitable design for schools (as with any other building).

(Number of responses: 41).

Question 14

We would welcome evidence or views on whether revised guidance should continue to replicate advice provided elsewhere.

Government response

The majority of respondents thought that BB 100 should be comprehensive and be the authoritative fire safety guide for schools.

Some suggested that BB 100 should be clear on the application of both AD B and BS 9999, and in particular to be unambiguous so far as the implications and distinctions around life preservation and property protection are concerned.

Some respondents thought that all duplication should be removed, with BB 100 only including alternative provisions for schools not covered in AD B.

(Number of responses: 49).

Next steps

We have appointed a multi-disciplinary team of design and technical consultants to provide further advice on some of the areas covered in the Call for Evidence. These include:

- fire suppression systems
- fire safety management
- fire safety issues with Modern Methods of Construction
- special schools
- residential accommodation in schools

Once this work is complete and any subsequent revisions incorporated into the draft, there will be a public consultation on a revised BB100.

Annex A: List of organisations that responded to the consultation

1. Fire engineer
2. School kitchen designer/installer
3. Political commentator
4. Wokingham LA
5. Fire engineer
6. Cumbria FRS
7. Accessibility consultant
8. Fire engineer
9. Fire safety manager
10. Approved Inspector
11. Royal Berkshire FRA
12. Construction manager
13. European Fire Sprinkler Network
14. Ivel Valley School
15. Cornwall FRS
16. H&S in Care
17. Essex FRA
18. Calderdale LA
19. Richmond & Wandsworth LA
20. Fire Engineer
21. Individual (Education)
22. Donegal Fire Service
23. Sundeala
24. AIG Insurance
25. Essex FRS
26. Kingston LA
27. H&S Consultant to Kingston LA
28. AHR Architects
29. Hampshire CC
30. Dorset & Wiltshire FRS
31. Fire engineer
32. The Concrete Centre
33. Kirklees LA

34. SPACES
35. Cheshire FRS
36. Insulation Manufacturers' Association
37. LGA
38. Leicestershire CC
39. Fire suppression systems contractor
40. Construction Products Association
41. RICS
42. Fire engineer
43. The British Blind and Shutter Association
44. Cambridge LA
45. Secretariat for the APPG
46. Buidling Research Establishment
47. Consulting Engineers (electrical)
48. Sherborne School
49. RIBA
50. Business Sprinkler Alliance
51. Fire Engineer
52. Lancashire FRS
53. BEAMA Ltd trade association
54. Door and Hardware Federation
55. Fire Sector Federation
56. Modular & Portable Building Association
57. Engineering Panels in Construction trade association
58. Rockwool Ltd.
59. British Automatic Fire Sprinkler Association
60. Fire engineer
61. Glass & Glazing Federation
62. National Fire Chiefs' Council
63. National Education Union

Annex B: Response Rate

The percentage of respondents who answered each question is as follows:

Q1 – 87%

Q2 – 71%

Q3 – 78%

Q4 – 81%

Q5 – 83%

Q6 – 83%

Q7 – 68%

Q8 – 71%

Q9 – 73%

Q10 – 44%

Q11 – 79%

Q12 – 76%

Q13 – 63%

Q14 – 76%

Department for Education

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