

BUILDING ACT 1984 - SECTION 16(10)(a)

DETERMINATION OF COMPLIANCE WITH REQUIREMENT B1 (MEANS OF WARNING AND ESCAPE) IN PART B (FIRE SAFETY) OF SCHEDULE 1 TO THE BUILDING REGULATIONS 2000 (AS AMENDED), IN RESPECT OF BUILDING WORK COMPRISING REFURBISHMENT, AN EXTENSION AND REMODELLING TO AN OPEN PLAN LAYOUT.

The proposed work and question arising

4. The papers submitted indicate that the building work to which this determination relates comprises the refurbishment and extension of an existing three storey, four bedroom, end of terrace house. The existing layout includes a single enclosed stair serving all floors and an integral garage at ground floor level.

5. The work in question includes remodelling of the internal layout of the house, conversion of the garage to habitable space, the erection of a single storey rear extension and general refurbishment at first and second floor levels. Existing staircases are to be removed and a new stair constructed such that the ground and first floor stairs form a straight, double flight leading down towards the rear of the house that delivers, at ground floor level, adjacent to the new extension.

6. The remodelling of the ground floor involves the conversion of the existing integral garage to an open plan kitchen with utility spaces and allows the existing kitchen to become a dining space. The internal partition walls are to be removed, which leaves the new ground floor as essentially a single open plan space with no enclosure to the stairway.

7. In lieu of a protected enclosure to the stair you have proposed the installation of a fire detection and alarm system to an LD1 specification in each habitable room and circulation spaces at all levels of the house in accordance with BS 5839-6:2004, and a sprinkler system at ground floor level in accordance with BS 9251:2005. Smoke alarms will be provided in each habitable room and a heat alarm in the kitchen area.

8. The above proposals were the subject of a full plans application which was conditionally approved on 11 May 2006 and subsequently rejected by the Council on 8 July 2008 on the grounds that your proposals do not comply with Requirement B1 (Means of warning and escape) in Part B (Fire safety) of the Building Regulations 2000 (as amended). It is in respect of this question that you have applied for a determination.

The Secretary of State's consideration

9. The Secretary of State has given careful consideration to the particular circumstances of this case and the arguments presented by both parties. She considers that the dispute arising in this case evolves around the omission of a protected enclosure at ground floor level to a stair in a house with a floor more than 4.5m above ground level.

10. You consider that your proposals (relating to detection, alarm, sprinkler protection, clear layout and short travel distances and the retention of self-closing doors at upper levels) provide a greater level of protection to the means of escape than would be given by a "conventional" solution as offered by the guidance in Approved Document B (Fire safety).

11. However, the Council has concluded that, after full and lengthy consideration of all the information you have provided, Requirement B1 of the Building Regulations has not been met, as your proposals do not provide a satisfactory primary means of escape from the building in case of fire on the ground floor level. The Council rejected your proposal to install a sprinkler system on the grounds that it does not adequately compensate for a protected stairway.

12. The Council has suggested options for your proposals that would meet the guidance in Approved Document B (Fire safety). These options are to provide a protected stairway, provide an alternative escape from second floor level, or to provide separation at first floor level. You have pointed out that this last option would not be practical due to the open riser stair design. You consider that your proposals, as they stand, comply with Requirement B1.

13. In your letter dated 29 September, you say that you believe that the installation of domestic fire sprinklers is recognised as a good idea by the Fire and Rescue Services, and something to be encouraged because they have significant benefits for life safety. You go on to state your view that the position taken by the Council is inconsistent with encouraging the wider use of sprinkler systems and add that the Council should also take advice from the Fire and Rescue Authority. You have also referred to a previous similar case which you regard as a "precedent".

14. The Secretary of State considers that the Council's duties in respect of your application, relate only to determining compliance with building regulations and the Council has no duty to promote the use of sprinkler systems beyond this. The Council is at liberty to take advice from whichever source it sees necessary and to treat each case on its own merit, but it should be noted that the Fire and Rescue Authority would have no specific jurisdiction in relation to fire safety in a dwelling house.

15. You have provided a copy of a fire safety report and other representations from your consultants which go to some length in setting out the benefits of sprinkler installation and the differing technical standards for means of escape, fire detection and fire suppression that apply in other countries around the world. The Secretary of State takes the view that the broader benefits of sprinkler protection are not in question here, what must be determined in this case is whether the proposed package of measures for the house in question provides adequate means of warning and escape in accordance with Requirement B1.

16. You state that the concept of a 'protected' stairway is not compatible with the minimum LD3 smoke detection system requirements as provided for in the guidance given in Approved Document B. This is because the "fire sterile" escape route cannot be "fire sterile" as it is the only place where the fire can be detected. It is your view that for means of fire warning to be effective in domestic applications, fire detection systems should be fitted in habitable rooms rather than the "fire sterile" circulation spaces. As part of your proposals you have therefore provided detection and alarm in habitable rooms and circulation spaces.

17. You also argue that the reduction in detection time under your proposals from 15 - 20 minutes (with LD3 detection and a protected stair) to 5 - 6 minutes (with LD1 detection) is a significant factor in how safe an escape can be made from the property relative to the growth of a fire.

18. The Secretary of State, however, considers that the provision of smoke alarms within a protected stairway is a well founded approach which is supported by extensive research and experience over many years. She agrees with the Council's view that it is the time delay between detection of a fire and the escape route being obstructed by smoke and becoming impassable that is critical. In the case of a stairway protected from a fire by a closed door, the time between detection of fire in an adjacent room and the escape route becoming impassable would be considerably greater than would occur in the room where the fire has started.

19. You believe that the removal, in the latest edition of Approved Document B, of the provision for self-closing devices in dwellings means that it is extremely unlikely that the doors to the stairway will be closed. The Secretary of State acknowledges that there is no guarantee that doors will always be closed but, in the absence of any attempt to quantify the relative merits of the two approaches in terms of reliability, it is only possible to consider the effectiveness of your proposals against the benchmark of a closed door.

20. The Secretary of State also acknowledges that the additional provision of smoke detectors in the rooms off a stair can significantly improve detection time compared to detectors located only within the stairway. But where there is no enclosure to the stair, as is proposed at ground floor level in this case, the rooms off the stair at that level and the stair itself are effectively one in the same space. As such, the risk of a fire occurring within the stair is increased but the provisions for detecting smoke have not been improved.

21. In respect of the effect of sprinklers, you and your consultants consider that their provision would be likely to maintain tenable conditions (apart from visibility), on the ground floor for evacuating occupants. The Council's opinion, however, is that visibility is critical if an escape route is to be effective in reducing the risk of people becoming trapped by fire.

22. The Council refers to the research published by BRE in 2004 (BRE report 204505), in which visibility was lost after 5-7 minutes in all the fires studied (with or without sprinklers). Sprinkler activation therefore had no beneficial effect on the visibility. In contrast, the Council feels that a protected route will stay passable for an extended period and allow the occupants to make their escape.

23. In response to the Council's comments, your consultants have argued that escape can be expected to be made within 3.5 - 5.5 minutes after detection. The Secretary of State observes that this estimate may be an overly simplistic assessment of the likely behaviour of the occupants of the house, especially in a family home where interactions between family members can be significant. If one could be certain of escape within this period then it is difficult to see what compensation is offered by the sprinklers which, based on this time estimate, would tend to operate after the house has been evacuated.

24. Your consultants also argue that, based on internationally recognised data, occupants could reasonably be expected to travel through smoke when making their escape and that they would tend to turn back when visibility drops below 4m. Given the scale of the building, they contend that occupants of the second floor could travel to a first floor bedroom, a distance of less than 4m through the smoke, and make their escape via escape windows. However, the Secretary of State notes that the study published by BRE in 2004, BRE report 204505, indicates that visibility drops below 2m before, or very shortly after, the sprinklers activate and this does not improve after activation.

25. With regard to possible escape via the windows at first floor level from rooms at both the front and back of the house, the Secretary of State notes that this would offer some additional safety for the occupants of the rooms directly served by those windows. However, the other rooms in the house could only gain access to the windows via the open stairway.

26. It is also noted in your consultants' submissions that sprinkler protection would facilitate a "defend in place" strategy, whereby the occupants of the second floor could wait for rescue in relative safety. The Secretary of State considers that there is some merit in this but that it does not provide adequate means of escape in accordance with Requirement B1.

27. Having had regard to the particular circumstances of this case and the representations made, the Secretary of State takes the view that there are two scenarios that need to be considered. The first is a relatively slow growing fire on the ground floor. If the occupants of the other floors are roused quickly by the smoke alarms, then they could be expected to make their escape before the ground floor becomes impassable.

28. The second scenario is where the speed of fire growth, or the reaction time of the occupants of the other floors, is such that the ground floor is impassable by the time they attempt to make their escape. You/your consultants have suggested that the provision of smoke alarms in the living area and the bedrooms would reduce the potential for this scenario to occur, by detecting the fire earlier, and by providing better audibility than would be achieved by the provision of alarms within an enclosed stairway.

29. As indicated in paragraph 20, the Secretary of State recognises that additional detection in the bedrooms on the upper storeys will offer a safety benefit in terms of earlier detection and audibility in those rooms. But, as stated, the provision for detection at ground floor level in this case is, in effect, no better than would be achieved with a more conventional layout and as such, the second scenario must be considered.

30. As referred to in paragraphs 21 - 24, you/your consultants have argued that tenable conditions, apart from visibility, for egress could be maintained by sprinklers in the room of fire origin. However, the Secretary of State agrees with the Council that visibility on an escape route is an essential consideration if it is to be effective and thus reduce the risk of people becoming trapped by fire.

31. In the light of the above considerations, the Secretary of State takes the view that your plans and supporting arguments do not provide sufficient evidence to demonstrate compliance with Requirement B1.

The determination

32. As indicated above, the Secretary of State considers that your proposals, as submitted, do not make appropriate provision for means of escape in case of fire. She has therefore concluded and hereby determines that the plans of your proposed building work do not comply with Requirement B1 (Means of warning and escape) in Part B (Fire safety) of Schedule 1 to the Building Regulations 2000 (as amended).

33. You should note that the Secretary of State has no further jurisdiction in this case and that any matters that follow should be taken up with the building control body.