

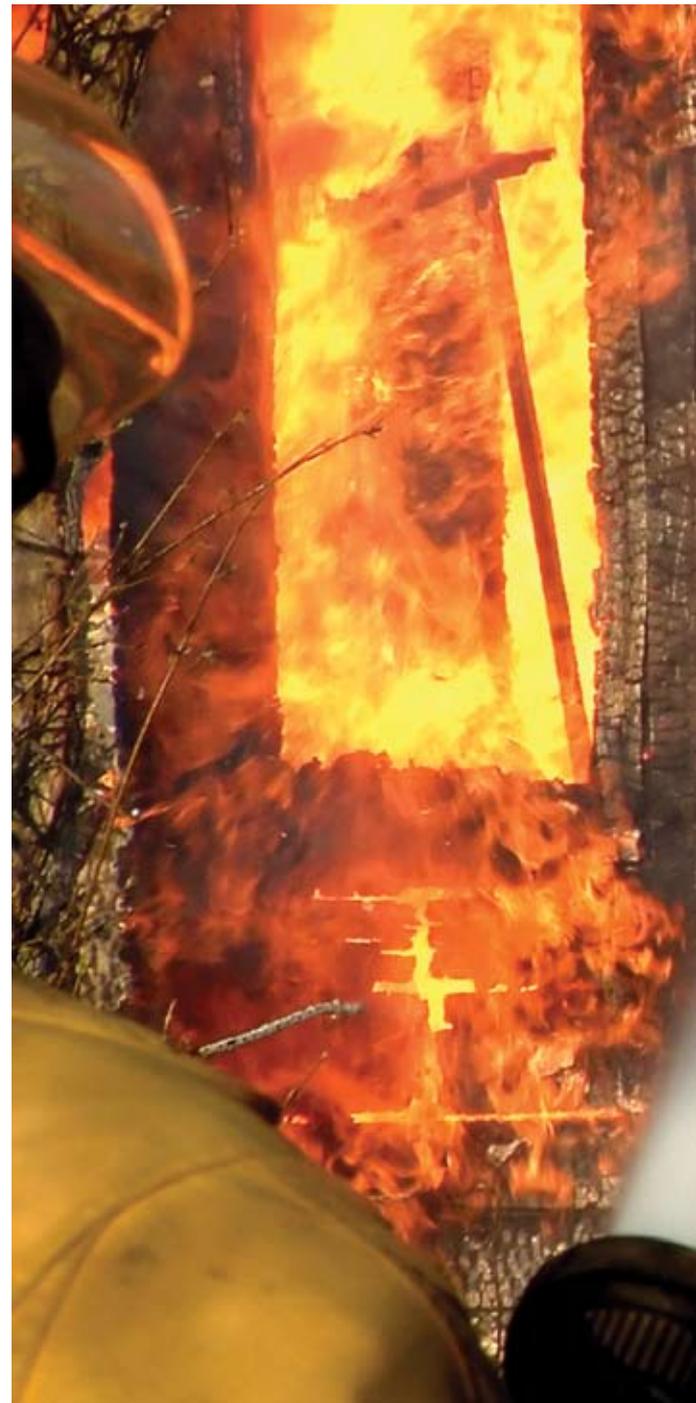


In the event of an emergency or fire hazard, quick evacuation is key. However, for those with disabilities, the fire hazard itself is not the only barrier blocking their exit. **Jane Simpson** and **Jonny Joinson** discuss the fundamental issues that need to be considered when reviewing an evacuation plan.

The fire next time

The safe evacuation of building occupants is the fundamental objective that all other aspects of fire safety are put in place to achieve. The aim is simple; to enable occupants to move away from a fire and escape to a place of safety that ultimately leads to the exterior of the building. This can either be through their own efforts, or with the assistance of other occupants within the building, but should never rely on rescue by the Fire Service.

Guidance for the design of escape routes within buildings has developed in a piecemeal fashion in response to particular disasters. However, for several



decades the typical place of safety within multi-storey buildings has been the escape stair, protected with fire resisting walls and doors. This continues to form the basis of safe escape route design within the current guidance document, Approved Document B1 (ADB), to Part B of the Building Regulations² produced by the Department for Communities.

The challenge for disabled persons

For the majority of people, the use of escape stairs offers little additional challenge compared to level access routes. In contrast, an escape stair for



disabled persons can represent a barrier that cannot be overcome alone. In the event of a fire, disabled persons should be provided with an equal standard of escape route as other persons within the building. However, this is often not the case, due to the need to ensure a robust and reliable route, safe from the effects of fire.

The minimum standard outlined within ADB and therefore considered acceptable in many instances under the Building Regulations, is for a safe area of refuge that is either within, or connected to, a protected escape stair. This provision will ensure the

forementioned robustness, although it is reliant on the management within the building during its operational life and is often incorporated within a building design without sufficient engagement with the end user. The reliability therefore remains questionable until an adequate management plan is in place on occupation.

On occupation there is a legal requirement on the end user, under the Regulatory Reform [Fire safety] Order 20053 (RRO), to ensure that any disabled persons can be safely evacuated to a place of ultimate safety, typically the exterior of the building. Consequently,

it is not legally acceptable to leave disabled persons within a safe area of refuge without a management plan being in place to ensure their continued evacuation. Unless the evacuation management plan has been appropriately considered during design or construction, it is likely that the methods available to the end user will be limited and heavily reliant on physically demanding staff intervention.

This disconnect, between the minimum acceptable 'structural' provisions under the Building Regulations and the need for a management plan under the RRO, becomes much greater within schools where the number of disabled students, in particular wheelchair users, can be significant. A concentration of wheelchair users above ground floor, in the event of fire, can easily overwhelm a design incorporating the minimum refuge provision, as well as provide a huge physical burden on staff.

The latest offering for the fire safety design of buildings from the British Standards Institute, BS 99994, incorporates fire safety engineering principles. Therefore, whilst this standard does echo the minimum standards for disabled evacuation from ADB, with an onus placed on the building management, it does provide some basic guidance on approaches that can alleviate the burden on staff.

An holistic approach to disabled evacuation using fire safety engineering at design stage, can lead to the development of a strategy that will enable the end user to have a flexible response to different evacuation situations. Such an approach can include the use of standard lifts in combination with strategic fire compartmentation and sprinklers, both of which may have been necessary for other aspects of the fire safety design, or evacuation lifts. The suitability of an approach is very much dependent upon the building, the occupants and the physical ability of staff.

Evacuation management plan

Regardless of the type of approach adopted, an evacuation management plan remains a requirement to ensure that the responsibility of the end user under the RRO, for the safety of occupants within the building, has been adequately discharged. This plan must also be supported with the necessary minimum training for the appropriate number of individuals, coupled with regular practice drills to give the best chance of safe evacuation.

The safe evacuation of disabled people has been dealt with over a large number of years in a very haphazard way. There is anti discrimination legislation, such as the Disability Discrimination Act 2005 (1995) recently replaced by the Equality Act 2010, which requires that disabled people are treated in an equal manner. Historically, many people have been under the misapprehension that the fire service should evacuate disabled people. This is not the



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case and has never been so. The responsibility has always been with the operators of the building. The Regulatory Reform Order [Fire Safety] 2005 has reaffirmed that the responsibility for fire safety is with the building operators, yet many schools still seem unclear as to what this means for them.

Meeting a spectrum of needs

The legislation requires that the building operators risk assess and plan for the evacuation of all their occupants, including those with disabilities. So who are disabled people? There are acknowledged to be over 11 million people covered under the discrimination legislation, although many would argue that the number is potentially much higher than this. For example, the RNID suggest that there may be as many as nine million people with hearing impairments.

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within the full spectrum of disabilities; all people are individual with a complex mixture of needs and wants. Disability is generally understood to be divided into the following major categories; mobility and dexterity, sensory and learning or cognitive disabilities. Each of these can then be broken down further and many people may have more than one disability; this is particularly pertinent within schools. Due to medical advances many more children are surviving childbirth, often with multiple disabilities.

Level playing field

The Equality Act 2010 (EA) along with the Special Educational Needs and Disability Act 2001 (SENDA) requires that a level playing field is provided for all children with disabilities or a special educational need (SEN). Building Bulletin 102 identifies these children differently, the classifications cover, those with sensory and/or physical, cognition and learning, behavioural, emotional and social development and communication and interaction.

A level playing field will require consideration of emergency egress for disabled individuals, whether pupils, staff, visitors or third party users. To understand the requirements it would be wise to consider the RRO's supplementary guidance, Means of Escape for Disabled People. This document identifies the following disabilities; mobility impaired

people, wheelchair users, hearing impaired and deaf people, visually impaired and blind people and people with cognitive disabilities. It can be found at, <http://www.communities.gov.uk/publications/fire/firesafetyassessmentmeans>, and gives guidance on evacuation strategies for the full range of disabled people.

The guidance makes it clear that all people prefer to be in control of their own escape. The fire strategy will require mechanisms to suit the individual; this is why a PEEP (Personal Emergency Evacuation Plan) for all known individuals and for unknown visitors is required.

Features of the school building

We have explained the school's management responsibilities, but how could a school building impact on a disabled person's evacuation?

There is a necessity, often for insurance reasons, to provide sprinklers. This allows larger fire compartments, which has its advantages. However, the disadvantage is a reduced potential for horizontal evacuation. Manual vertical evacuation can be challenging for many people with disabilities and should only be used as a last resort. Fire compartments should be planned so that lifts can be used for evacuation. Fire doors are heavier than 30N, therefore, any corridor doors on a compartment



line should be held back during normal opening hours. Also, ensure that security doors are not on a compartment line as they will be difficult to open due to the weight and may require automation.

Further problematic design areas are atriums, often favoured to create the hub of a school and provide a suitable meeting place with dining and other activities; again, this interrupts horizontal evacuation. Care should be taken to consider evacuation routes, fire zones, and refuges at the inception of any design.

Combined with this, is the need for adequate refuge space/s. The regulations require a minimum of one refuge per upper floor at each fire escape stair; however, there is the requirement to provide refuges to suit anticipated user numbers that may exceed this. All too often disabled people have been refused entry because of the lack of refuge spaces. A fire compartment could potentially be a refuge, careful placing of the communication system would be required.

Stairs are often the only means of escape. Therefore, factors that affect the evacuation potential are:

- the design of the risers and goings
- can they support wheelchair evacuation
- the correct handrails
- tonally contrasting nosings
- adequate lighting

Another aspect is that people, particularly those with learning or behavioural difficulties and visual impairments, may automatically head for the stair from which they arrived. This is why it is always preferable to use circulation stairs for evacuation. Where this is not the case, training and practice evacuations will be essential.

Wheelchair users

Wheelchair users are possibly the most challenging when considering evacuation from a non-level entry floor. Ideally, evacuation by lift or horizontal evacuation to level external space is the preferred option. BS9999



suggests risk assessments should be completed to enable the use of standard lifts for evacuation. Power supply routes and a zoned detection system would assist in this. See, <http://www.communities.gov.uk/publications/planningandbuilding/guidanceemergencylifts>

Where this is not possible, there are a number of options, including, people walking down the stairs themselves with or without assistance; many wheelchair users can walk but it is either painful or time limited. Other options include, the use of an 'evac chair', however, these are not suitable for all and require training and servicing on a regular basis. Carry down is another solution, which requires a stair width of 1600mm for those being carried down in their own chair, sometimes you can use an office chair, or, for those who cannot be transferred out of their wheelchair, some form of mechanical assistance. The equipment to achieve this, are bulky and require space to turn corners on stairs, so straight flights or deeper landings may be required. All of these options will require staff training and risk assessment.

Other impairments

People with hearing impairments may need a variety of interventions, including, flashing beacons, the use of a paging system or loop and in residential situations, and vibrating pillows. Flashing beacons are required wherever someone could be in relative isolation; toilets, stores and possibly offices. They are also needed in noisy environments.

Another aspect to consider is emergency lighting. How effective is it? Research at the BRE on emergency lighting and way finding systems for visually impaired people identified that a combined use of tactile surfaces and lower mounted systems were more effective than overhead emergency fluorescent lighting.

Refuge systems should contain two-way communication systems, often sounders are placed directly above refuge spaces which can make communication difficult, ensure that any sounder is placed at a distance from refuges. An alternative would be to replace sounders within refuge spaces with a flashing beacon. The communication systems should be able to go back not just to reception, which is likely to be evacuated but also to a mobile phone or similar.

All final exits should have level access. This is similar to the ADM which does not allow single steps, they are a trip hazard, particularly in an emergency situation.

One of the concerns in some schools is the potential for false alarms and the cost of fire service call outs. Where a school may have pupils with autism or BESD it

may be wise to have a double knock system. This could be supplemented with a pager system to silently alert teachers and staff on the first knock to an impending evacuation.

Reviewing procedures

In summary, when you are reviewing evacuation procedures for an existing building, all the elements above should be interrogated for the anticipated users of the building. A dedicated PEEP should be drawn up for all known individuals who require assistance with evacuation and one for visitors. Disabled pupils should be able to access the whole of the curriculum and take part in social activities. Where some of these functions are undertaken on non-level exit floors, evacuation procedures should ensure safe egress for the numbers of anticipated users.

When considering the design of a new school, understanding the school demographics is essential. It should be anticipated that a new school may have users in motorised wheelchairs, hearing and visually impaired individuals and people with cognitive or learning disabilities.

Top tips are:

1. Plan for all disabled users evacuations (PEEPS)
2. Plan fire zones to provide horizontal evacuation
3. Provide adequate refuge/s for anticipated numbers
4. Ensure lifts can be used for evacuation
5. Review stair design to accommodate, carry down and future mechanical equipment use
6. Use circulation stairs for evacuation
7. Review the existing or new school design and consider evacuation, this may require evacuation in opposing routes
8. Review policies based on users throughout the day and night
9. Train staff in evacuation procedures and equipment use

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1. Approved Document B 'Fire safety' – Volume 2 'Buildings other than dwelling houses', 2006
2. The Building Regulations 2010
3. The Regulatory Reform [Fire Safety] Order 2005
4. BS 9999, 'Code of practice for fire safety in the design, management and use of buildings', 2008