

School fire evacuation: strategies for inclusion

Guidance on evacuation in the event of fire has developed alongside a number of building standards, which also need to fit around legal requirements for equality and inclusion. Jonny Joinson and Jane Simpson look at how these issues affect the provision of evacuation procedures in schools and suggest inclusive strategies.

by Jonny Joinson and Jane Simpson

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.

For several decades the typical place of safety within multi-storey buildings, such as schools, 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 B (AD B), to Part B of the Building Regulations produced by the Department for Communities.

The escape stair 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 AD B 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 aforementioned 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 2005 (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 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



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and the need for a management plan under the RRO, becomes much greater within schools where there are a number of disabled students and, in particular, wheelchair users. 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 9999, incorporates fire safety engineering principles. Therefore, while this standard echoes the minimum standards for evacuation for disabled people from AD B, 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 evacuation for disabled people 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 much dependent on the building, the occupants and the physical ability of staff.

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 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 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 re-affirmed that the responsibility for fire safety is with the building operators, yet many schools still seem unclear as to what this means for them.

The legislation requires that the building operators risk assess and plan for the evacuation of all their occupants, including those with disabilities. Disabled people should not be considered as a single homogenous group but as individuals 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.

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. RRO 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 for all known individuals and a GEEP for unknown visitors is required.

How school buildings can affect 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

Top Tips

1. Plan for all disabled users evacuations (PEEPS & GEEPS)
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

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 carry down evacuation
- can they support the use of mechanical evacuation equipment
- the correct handrails
- tonally contrasting nosings
- adequate lighting

Another aspect is that people, particularly those with learning or behavioural difficulties and blind or partially sighted people, 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 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. BS 9999 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.

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.

People who are deaf or those with hearing loss may require a variety of interventions, including flashing beacons, the use of a paging system or loop and, in residential situations, 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 AD M, 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, ASHD 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.

Conclusion

When you are reviewing evacuation procedures for an existing building, all the elements above should be integrated for the anticipated users of the building. A dedicated PEEP should be drawn up for all known individuals who require assistance with evacuation and a GEEP 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.

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For guidance on emergency lifts, go to

<http://tinyurl.com/oxrr6s>

RRO's supplementary guidance, 'Means of Escape for Disabled People', gives guidance on evacuation strategies for the full range of disabled people and can be found at

<http://tinyurl.com/6totwo>