

# EVACUATING VULNERABLE AND DEPENDENT PEOPLE FROM BUILDINGS IN AN EMERGENCY

David Crowder and David Charters



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# EXECUTIVE SUMMARY

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This guide has been written for those involved in developing plans and strategies for evacuating premises containing large proportions of people with mobility impairments:

- fire safety managers
- facilities managers
- nursing staff, particularly staff responsible for the day-to-day care of those with mobility impairments
- architects and designers
- fire safety engineers
- approval authorities.

It is intended to provide some understanding of:

- The role of fire safety management, and its interaction with the role of front-line staff.
- The role of fire protection systems in buildings and the role of appropriately trained staff, and the importance of striking a balance between fire protection levels and staffing levels:
  - fire detection and alarm systems and their effect on pre-movement time, reducing the Required Safe Egress Time
  - suppression systems controlling fires, increasing the Available Safe Egress Time
  - passive fire protection systems containing fires, increasing the Available Safe Egress Time.
- The amount of time available for evacuating people, and how this is determined by the level of fire protection provided throughout a building. The greater the level of protection designed into a building, the greater the time will be available for evacuation to be completed, and the smaller the number of staff that will be required to assist in that evacuation.

- The different strategies that are available for protecting building occupants, particularly those with mobility impairments, from fire.
- The potential difference in the levels of a person's ability to carry out horizontal or vertical movement.
- Points to consider in evacuating people with mobility impairments.
- Techniques available for evacuation.
- The importance of training in maximising the effectiveness of staff helping to evacuate people with mobility impairments.
- Ensuring that care can continue to be provided to individuals, where necessary, after an evacuation has been completed.

Appendices have been provided to give more information on the behaviour of fire, as well as on some of the findings of the data analysis carried out during the drafting of this guide.

The research presented in this guide was undertaken before the investigation into the Rosepark care home fire was published, but much of the information it contains should help to prevent future similar fire events.

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# 1 INTRODUCTION

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There is no simple way to know how long it will take a person with mobility impairments, or a highly dependent person, to evacuate or be evacuated from a building before conditions become untenable because of fire. For example, in the attack on the World Trade Center in 2001, over 1000 surviving occupants had a limitation that affected their ability to evacuate, including recent surgery or injury, obesity, heart condition, asthma, advanced age and pregnancy. An investigation into the evacuation indicates that evacuation flow rates were approximately half those normally observed in fire drills<sup>[1]</sup>.

Recent fires, such as those at the Rosepark care home (where 14 people died)<sup>[2]</sup> and at Warrington District General Hospital (three staff were injured while evacuating patients) illustrate how society's most vulnerable people are at risk from fire.

In addition, many of the 400 or so attendees at a series of seven fire safety seminars run by BRE indicated that 'if they had a magic wand, the fire safety problem they would like to solve' would be the need for a better understanding of evacuation of mobility-impaired people. Delegates' responses included the following:

*'Realistic evacuation times/travel distances for residential care premises.'*

*'Evacuation time/staff ratio in respect of residential care premises. We include figures for staffing levels and bed complement in compartments. We will probably have to step back from this in future – I'm not aware of any research re dependency of patient/staff and travel distances.'*

*'Patient evacuation training – how far, how long, health and safety issues, legal issues, physical – should actual patients be involved?'*

*'The effectiveness of signage in a fire.'*

A research programme was therefore commissioned by BRE Trust to consider the means of evacuating people who are elderly or ill, or children, from buildings – residential care, healthcare and domestic premises.

This guide has been written as the outcome of that research. It aims to provide support for designers, owners and managers of buildings so that they can formulate efficient strategies for the effective evacuation of people with mobility impairments.

Qualitative guidance is given to illustrate the points to consider when developing an evacuation strategy that will be as inclusive as practicably possible.

Formulae and data are also provided in order to quantify the relationship that exists between the size and nature of a population that may need evacuating, the resources that are available to effect that evacuation and the level of fire protection afforded by the building requiring evacuation.

This guidance is supplementary to that provided by HTM 05-03: Part K<sup>[3]</sup> as well as the Fire Safety Risk Assessment Guides, and in particular:

- *Fire safety risk assessment: healthcare premises<sup>[4]</sup>*
- *Fire safety risk assessment: residential care premises<sup>[5]</sup>*
- *Fire safety risk assessment supplementary guide: means of escape for disabled people<sup>[6]</sup>.*

It is intended for application to buildings that have been designed and constructed according to the Building Regulations<sup>[7]</sup>. As well as buildings designed to satisfy the recommendations of Approved Document B<sup>[8]</sup> or HTM 05-02<sup>[9]</sup>, it may be equally suitable for fire-engineered buildings.

This guide has been prepared particularly for those responsible for buildings in which large numbers of people with mobility impairments are expected to be present. It gives an overview of the nature of existing fire strategies in healthcare premises, particularly with respect to evacuation.

It is intended to provide information for management as well as front-line staff, since it is successful communication between these two groups that will maximise the effectiveness of evacuation strategies.

The research carried out for the production of this guide involved BRE Global gathering information from evacuation drills and real evacuations. Two evacuation drills were organised with the direct involvement of BRE Global, and information (video and questionnaires) was submitted on a further six exercises and two real incidents over the course of a three-year period. The data from these evacuations and evacuation drills cannot be included in this guide for reasons of data protection.

The research presented in this guide was undertaken before the investigation into the Rosepark care home fire was published, but much of the information it contains should help to prevent future similar fire events.



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## EVACUATING VULNERABLE AND DEPENDENT PEOPLE FROM BUILDINGS IN AN EMERGENCY

How should people who are elderly or ill, or children, be evacuated from buildings, residential care, healthcare and domestic premises? This guide provides support for designers, owners and managers of buildings so that they can formulate efficient strategies for the effective evacuation of people with mobility impairments.

Qualitative guidance is given to illustrate the considerations that need to be made when developing an evacuation strategy that will be as inclusive as practicably possible. Formulae and data are also provided in order to quantify the relationship that exists between the size and nature of a population that may need evacuating, the resources that are available to effect that evacuation and the level of fire protection afforded by the building requiring evacuation.



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