Promoting Safe Egress and Evacuation for People with Disabilities

National Disability Authority
Údarás Náisiúnta Míchumais

Acknowledgements

This document was prepared for the NDA by:
- Michael McGlennon, White Young Green;
- Stephen Montgomery, White Young Green; and
- Barry Turner, White Young Green.

Our special thanks to:
- Peter Carroll, PM Group;
- Paddy O'Brien, Cheshire Ireland;
- Kenneth Moore, Office of Public Works;
- Francis Power, Health and Safety Authority; and
- all those who participated in the consultation process.

ISBN: 978-1-870499-18-7

Contents

1 Foreword **Page 5**

2 Introduction **Page 10**
2.1 Background 10
2.2 The aims of This Document 11
2.3 Target Audience 14
2.4 How to Use This Document 14

3 Initial Review **Page 17**
3.1 Carrying Out the Initial Review 18
3.2 Summary 20

4 Egress Policy **Page 21**
4.1 Legislation 23
4.2 Responsibility for Means of Escape 26
4.3 Evacuation Strategies 27
4.4 Typical Details Contained Within an Egress Policy 28
4.5 Summary 28

5 Planning for Egress **Page 29**
5.1 Understanding the Problem 31
5.2 Egress Issues for People with Disabilities 34
5.3 Assessing the Risk 39
5.4 Consultation 42
5.5 General Means of Escape Design Principles 43
5.6 General Warning and Alarm 45
5.7 Wayfinding 49
5.8 Horizontal Movement 54

5.9 Refuges 55
5.10 Vertical Movement 60
5.11 Advice on Specific Building Types 66
5.12 Emergency Planning 74
5.13 Summary 78

6 Implementing Your Egress Plan Page 83
6.1 Making Changes to the Building 85
6.2 Communicating the Plan 86
6.3 Evacuation Aids 87
6.4 Staff Training 91
6.5 Evacuation Drills 93
6.6 Summary 94

7 Measuring Performance of Your Egress Plan Page 97
7.1 Demonstrating Performance 98
7.2 Summary 100

8 Reviewing Performance of Your Egress Plan Page 101
8.1 Regular Reviews 101
8.2 Audit 104
8.3 Summary 104

9 Conclusion Page 107

Appendices Page 108
1. **Glossary of Terms;**
2. **PEEP Questionnaire and Template;**
3. **Risk Assessment Checklist;**
4. **Further Information.**

1 Foreword

The access of buildings for people with disabilities has attracted considerable attention in recent years and a great deal of work has been undertaken to improve the accessibility of public buildings for people with disabilities.

The Disability Act 2005 and the responsibilities that it places on public bodies to ensure the accessibility of their buildings has led to accessibility audits being carried out which will see considerable changes made to public buildings in advance of the 2015 deadline. Equality legislation enacted over the last decade also requires public bodies to provide for the needs of their employees and customers with disabilities.

In many cases, public bodies are striving to go beyond their minimum legal obligations to create environments that are universally accessible to as wide a group as possible.

This period of improvement in the accessibility of buildings presents a considerable opportunity to implement measures to ensure prompt and safe egress for people with disabilities in the event of an evacuation or emergency situation.

Ensuring safe egress in an emergency is a complex issue, requiring consideration of a broad range of factors, including the design and usage of a building, the training of staff and the provision of appropriate equipment and facilities. Those responsible for buildings must ensure safe egress for all and this requires consideration of the needs of everyone using the building, particularly the specific requirements of people with disabilities.

The National Disability Authority has produced this guide to promote safe egress and evacuation for people with disabilities. It will be of interest to all public sector staff with responsibility for evacuation, including building and facilities managers, health and safety personnel and human resources professionals. The information contained within the guide will also be of interest to people with disabilities, their families and representative organisations, to building designers and to those who manage buildings operated in the private sector.

We would like to encourage all those with responsibility for building management and for ensuring safe egress in the event of an emergency to take the time to consider this guide and to develop and implement plans to ensure that everyone can safely and quickly exit a building when required.

Dr Angela Kerins
Chairperson

2 Introduction

2.1 Background

The National Disability Authority (NDA) is the national independent statutory body established to advise the Minister for Justice, Equality and Law Reform on policy and practice relating to people with disabilities. It was set up in 1999 by an Act of the Oireachtas called the National Disability Authority Act 1999. The NDA has been in operation since June 2000 and has undertaken a wide range of activities in an effort to achieve better outcomes for people with disabilities.

The work of the NDA includes:

- advising the Minister for Justice, Equality and Law Reform to develop policy on issues concerning people with disabilities;
- researching, collecting and analysing information on issues related to disability and services for people with disabilities;
- advising on standards and quality of services for people with disabilities;
- preparing codes of practice that will help achieve high standards and good quality in services for people with disabilities;
- monitoring the establishment and use of standards and codes of practice;
- acknowledging when services have achieved high standards and good quality;
- working with those who provide services to people with disabilities and helping and supporting them in establishing quality standards; and
- establishing the Centre for Excellence in Universal Design, which contributes to development and promotion of standards, awareness, education and professional development in the field of Universal Design.

As part of its work, the NDA has commissioned White Young Green to prepare a guidance document that provides advice in relation to safe egress and evacuation for people with disabilities. The guidelines are based in the context of Irish legislation and Building Regulations, and draw on relevant local and international good practice.

2.2 The Aims of This Document

Over many years, guidance has focused on improving both accessibility and the use of buildings and facilities for all potential users. Equal importance must also be given to ensuring safe egress. Recent developments in health and safety legislation require this to be addressed. This guide can assist building operators to meet their obligation to create a safe environment for all.

The main aims of this document are:

- **Aim 1** – to provide the reader with an appreciation of the problem and an understanding of egress issues that particularly affect people with disabilities;
- **Aim 2** – to impart the ability to identify egress features that are normally designed into buildings and the capability of using this information in preparing risk assessments and emergency evacuation plans;
- **Aim 3** – to give guidance on providing safe egress for people with disabilities; and

- **Aim 4** – to identify good practice in relation to safe egress for people with disabilities.

Building managers, for example, may face the following questions when designing egress policies and procedures:

- How does a person with a hearing impairment know when a fire alarm is activated?
- How does a wheelchair user vacate an upper storey of a property if the passenger lifts cannot be used during evacuation?
- How would a person with learning difficulties understand complex escape signage?
- Is safe egress for people with disabilities the responsibility of the Fire Service or building management?
- What support does a person with a cognitive or mental health impairment require?

This document provides guidance on safe egress of publicly owned and operated buildings for people with disabilities. The document covers:

- guidance in relation to management policy, planning and practices;
- background into the behaviour of people during evacuation;
- general building design issues;
- information on assistive technology and equipment;
- issues specific to certain building types and uses; and
- where to get additional information.

Good practice has been identified from relevant publications. The following list identifies the main documents reviewed:

- NDA (2002), **Building for Everyone**, The National Disability Authority, Dublin;
- The Building Regulations (Ireland) 1997-2006, **Technical Booklet M 2004 – Access for People with Disabilities**;
- The Building Regulations (Ireland) 1997-2006, **Technical Booklet B 2006 – Fire Safety**;
- BS8300: 2001, **Design of Buildings and Their Approaches to Meet the Needs of Disabled People – Code of Practice**, The British Standards Institution;
- BS5588, **Fire Precautions in Design and Construction of Buildings**, The British Standards Institution, 1988;
- Health and Safety Authority guidance document for the healthcare sector – **How to Develop and Implement a Safety and Health Management System**.

Owing to the new accessibility responsibilities placed on public sector bodies in Part 3 of the Disability Act (2005), this document provides a background introduction to the principles of safe egress and specific guidance on requirements for public sector buildings only. Although this document does not provide specific guidance to the private sector, the general principles are applicable. Appendix 4 identifies further reading.

It is recognised that the skills required to make a meaningful assessment of the built environment, together with the incorporated fire safety systems and the specific needs of people with disabilities, are highly specialised. External guidance could be obtained from suitably qualified and experienced persons such as:

- access auditors;

- fire risk assessors; and
- fire engineers.

In any event, an egress audit carried out by an independent expert should form an intrinsic part of any access audit or fire risk assessment.

2.3 Target Audience

The guide offers good practice advice on how to provide safe egress from buildings for people with disabilities. It is envisaged that the guidelines will be of interest to designated managers, facilities managers, accommodation officers, health and safety personnel, access officers, disability liaison officers, human resource professionals and others who have a responsibility to ensure the accessibility and safety of the built environment.

It will also be of interest to design consultants and disability organisations involved with accessibility matters as well as people with disabilities and their families and carers.

It is anticipated that the guide will be used in two ways:

- A designated manager may use the document to ensure suitable procedures or facilities are in place to warrant safe egress; or
- A designer may refer to the guidelines to ensure good practice within their design.

2.4 How to Use This Document

This document is structured to follow the principles of a typical safety and health management system. This management system identifies the key elements needed to assist the target audience in providing egress for all. The six key elements of the management system form the main chapter headings of this document. Figure 1 outlines the relationship between them.

Initial Review

This section outlines the information that needs to be collected to enable an emergency egress plan to be developed, and to set the scope and outcomes of the planning process.

Egress Policy

An understanding of egress policy and relevant statutory requirements, guidelines and standards are detailed within this section. It also identifies who is responsible for ensuring safe means of escape.

Planning for Egress

This is one of the main sections of the document and sets out the principal information required to assist with planning for safe egress. Information relating to the problem, egress issues affecting people with disabilities, risk assessment, consultation, planning and design issues are all discussed.

Implementing Your Egress Plan

Issues relating to managing and implementing the egress plan are described within this section. A planned and systematic approach to implementing egress procedures will ensure safe egress for all. The section includes information relating to managing egress, personal emergency egress plans, evacuation aids and training.

Measuring Performance of Your Egress Plan

Information relating to measurement, monitoring and evaluating a safe egress system are included within this section.

Reviewing Performance of Your Egress Plan

Details on the procedures required to review the egress system are contained here.

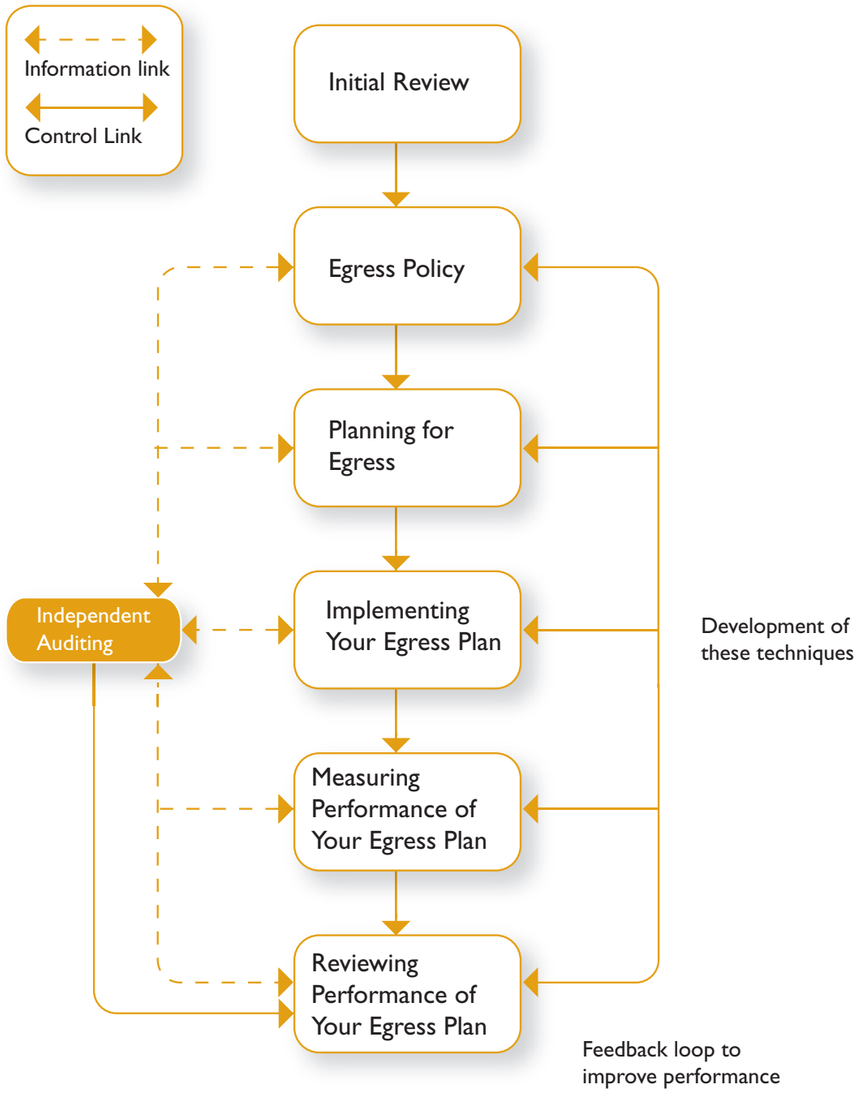
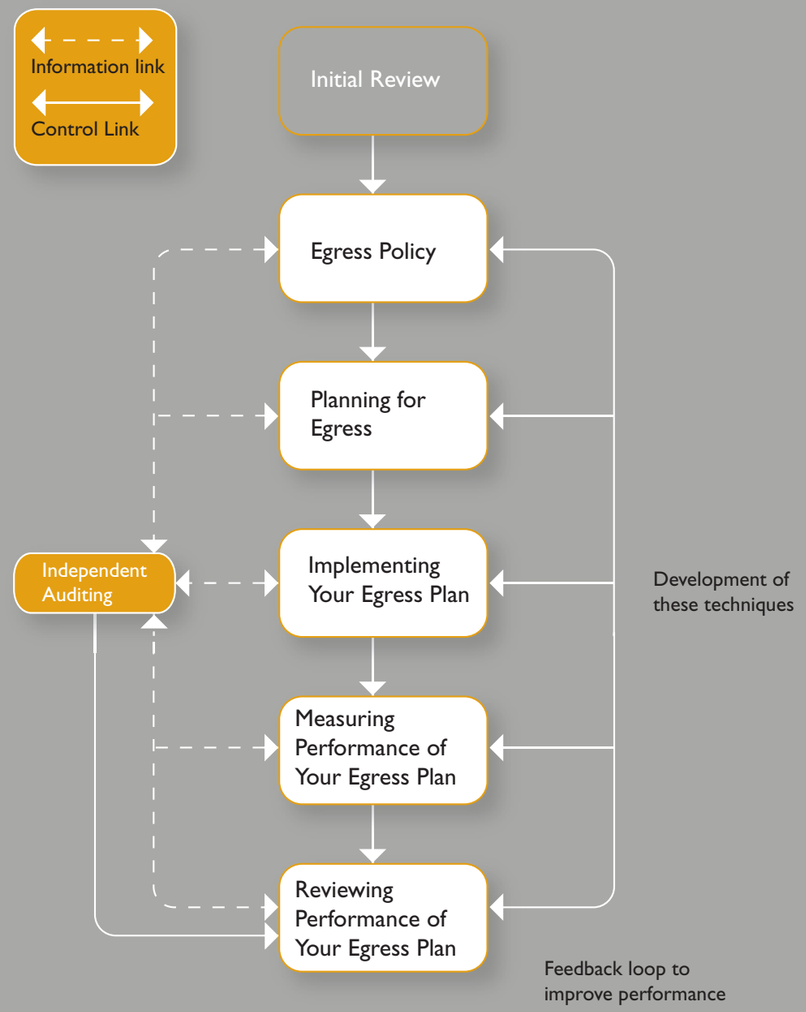


Figure 1: Key elements of an emergency egress management system

3 Initial Review



Introduction

The completion of an initial review will assist with meeting the following aims of this document:

- **Aim 1** – to provide the reader with an appreciation of the problem and an understanding of egress issues that particularly affect people with disabilities; and
- **Aim 2** – to impart the ability to identify egress features that are normally designed into buildings, and the capability of using this information in preparing risk assessments and emergency evacuation plans.

Before getting involved in the detail of developing and implementing the emergency egress plan, it is important to take an overview of the current situation and establish the desired outcomes.

3.1 Carrying Out the Initial Review

The first step in the initial review is to bring together all the information held by the organisation that relates to emergency egress matters.

The following are some examples of the pieces of information that might be available:

- Safety Statement;
- Fire and General Records Register;
- Minutes of Health and Safety meetings;
- Any existing emergency egress plan;
- The Fire Certificate for the building, including any fire engineering strategy that formed part of the Fire Certificate application for the building. The Fire Certificate will usually comprise of a written report with associated fire safety drawings;
- Existing access audit or risk assessments for egress that may be available, which identify problems and detail the mitigating steps that have been taken in the past;
- Information on life safety systems installed in the building. Such systems will include fire detection and warning, escape lighting, fire suppression, wayfinding and smoke control systems;
- Information on the specification and operation of passenger and other lifts;
- Feedback reports from previous emergency evacuations, both actual and fire drills;
- Statistical information on fire alarm activation frequency, false alarms, locations times, etc;
- Records of fire safety or evacuation training given to staff;
- The number and location of fire and evacuation wardens;
- Personal Evacuation Egress Plans (PEEPs); and
- Feedback from building users.

This information can be collated and held centrally for reference during the planning process.

The second stage of the initial review is to determine the egress needs for staff and visitors. This can be best achieved by surveys, questionnaires or interviews with staff and other users of the building, including visitors, contractors and attendees at training courses and meetings.

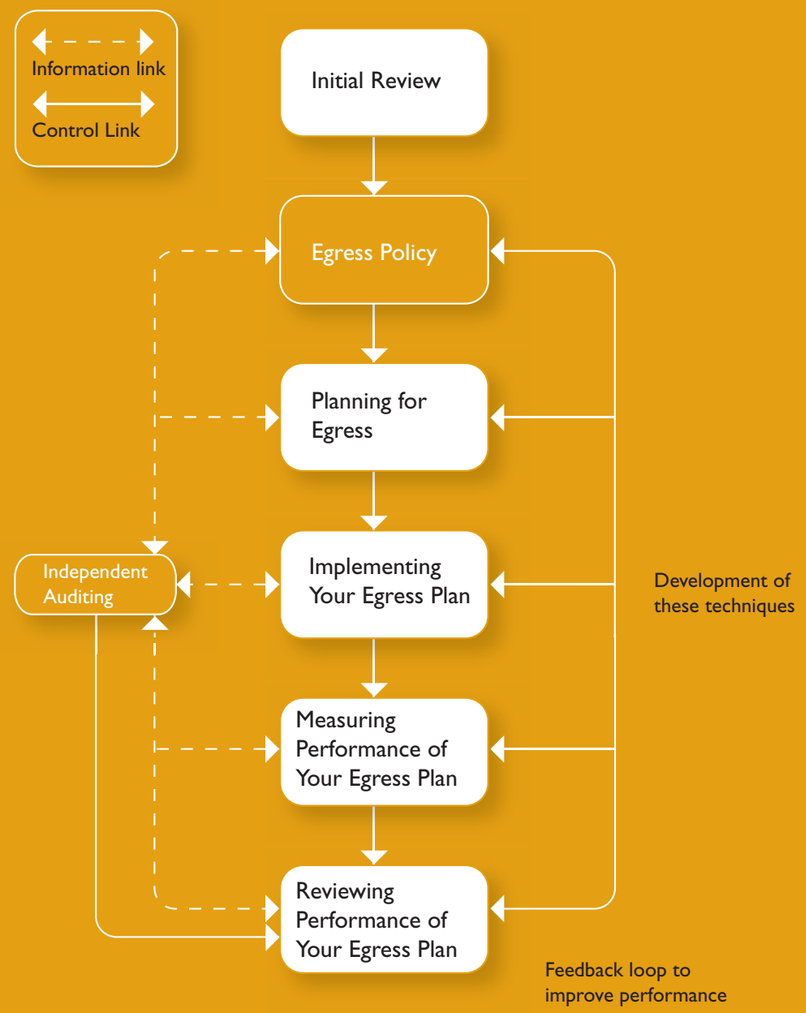
The final stage of the initial review is to consider the information gained in Stages 1 and 2 and use it to:

- identify egress needs;
- highlight current problems with emergency egress; and
- establish the scope and objectives of the emergency egress management system.

3.2 Initial Review – Summary

- Gather all available existing information;
- Find out about the egress needs of staff and other building users;
- Review the information to determine objectives.

4 Egress Policy



Introduction

The Egress Policy section of the document will assist with meeting the following aims:

- **Aim 1** – to provide the reader with an appreciation of the problem and an understanding of egress issues that particularly affect people with disabilities;
- **Aim 2** – to impart the ability to identify egress features that are normally designed into buildings and the capability of using this information in preparing risk assessments and emergency evacuation plans; and
- **Aim 3** – to provide guidance on providing safe egress for people with disabilities.

Organisations have an obligation to ensure that all users of their buildings can escape safely in an emergency. It is necessary for those responsible to have clear policy objectives for safe egress and to demonstrate a commitment to ensuring that the needs of everyone can be met. To meet this objective, it will be necessary for organisations to comply with all statutory requirements, and commit adequate and reasonable financial resources and personnel.

The organisation's approach to a whole range of issues needs to be established such as:

- Are all areas of the building to be fully accessible to everyone or is access restricted in some way?
- What is the organisation's policy on first aid fire fighting?
- Are staff with disabilities and other users of the building with disabilities required to advise management of their presence in the building?
- How are visiting groups of people with disabilities accommodated and managed?
- How are conflicts between providing access and ensuring safety resolved?

An understanding of the legislation that impacts upon safe egress is important so that the full extent of the obligations placed upon building operators is known. It is also important to be clear about where the responsibility for ensuring safe egress lies and to establish the overall strategy for emergency egress from the building.

4.1 Legislation

In addition to a moral duty of care to building users, there are a number of pieces of legislation that place a responsibility on public bodies, building owners and employers to ensure the safety, health and welfare of anyone using a particular building.

Safety, Health and Welfare at Work Act (2005)

The Safety, Health and Welfare at Work Act (2005) requires every employer to ensure the design, provision and maintenance of a safe means of access to and egress from the workplace for employees.

Sections 8, 9 and 10 of this Act require that sufficient information, training and supervision is provided to ensure the safety of employees, and also that such instruction, training, etc. must take account of any employees with specific needs, to ensure their protection against dangers that may affect them.

Under Section 11, employers are required to prepare and revise adequate plans and procedures to be followed and measures to be taken in the case of an emergency, and that employers provide the necessary measures for fire fighting

and the evacuation of employees and any other individual present in the workplace.

Section 12 clarifies that consideration must also be given to the safety of persons other than employees within the workplace.

To comply with Section 19 of the Act, employers are required to carry out risk assessments for all Health and Safety issues, including emergency egress, and to record these in the Safety Statement.

The Safety Statement brings this all together in the context of employees in Section 20 of the Act. However, a good-quality Safety Statement also has the capacity to form the basis of the Evacuation Strategy for all users of the building.

Fire Services Act (1981)

Fire safety within existing buildings is covered within the provisions of the Fire Services Act (1981), which empowers local fire authorities to carry out inspections to ensure the adequacy of fire-related matters in relation to existing premises.

Building Control Act (1990)

The Building Control Act (1990) provides the framework for the modern Irish building control system. This legislation regulates standards in building construction and design through the introduction of building regulations. The principal aim of building regulations is to provide for the health, safety and welfare of people in and around buildings.

Part B (2002) of the Building Regulations, entitled 'Fire Safety', requires the developer of every new building, with the exception of domestic buildings, to obtain a Fire Safety Certificate for the premises. Although there are different certificates for different types of development, it is necessary for developers to send a copy of their designs to their local fire authority for approval.

There are 37 fire authorities throughout Ireland and their contact details are available at www.irishfireservices.com (NB. This is not an official fire authority website).

Part M (2000) of the Building Regulations, entitled 'Access for People with Disabilities', covers issues relating to accessibility.

Indoor Events Act (2003)

The Licensing of Indoor Events Act (2003) places a responsibility on any person to whom a licence has been granted to take all reasonable measures to ensure the safety of everyone attending the event.

Equality and disability legislation

There are also a number of Acts that provide a legislative framework for organisations to ensure that premises and services comply with minimum accessibility requirements. These include the Employment Equality Act (1998/2004), the Equal Status Act (2000/2004), the Disability Act (2005) and the Safety, Health and Welfare at Work Act (2005).

The main driving legislation for ensuring accessibility to public buildings is the Disability Act (2005).

Part 3 imposes a duty on public bodies to ensure, over time, that public buildings and services are accessible to people with

disabilities. The standard for access is Part M of the Building Regulations and public buildings must be compliant by 2015. Public buildings must comply with amendments to Part M no later than ten years after the commencement of such amendments.

4.2 Responsibility for Means of Escape

The responsibility for evacuating people with disabilities lies with those who manage the building on a day-to-day basis, not with the fire service. In the vast majority of cases, this is the occupant. It is a common misconception that once a person with a disability has reached a safe refuge area within the stair enclosures of a building, nothing further needs to be done by the management, and the fire service will ensure they are brought down the stairs to ground level when they arrive.

It is essential that evacuation of people with disabilities takes place as soon as possible and it is the responsibility of those in charge of the building to ensure this happens.

The ultimate responsibility will rest with the most senior person in the organisation but specific personnel will have designated responsibility. It is extremely important that there is no doubt about who holds operational responsibility for safe egress in each organisation. It is also extremely important that the responsible people are given full support from the highest level and are provided with the necessary authority and resources to ensure that they can deliver.

4.3 Evacuation Strategies

At the design stage of the building, a decision will have been taken about the type of emergency evacuation procedure to be used. This decision will have influenced the layout of the building and the fire safety measures incorporated into it.

There are three main strategies commonly used:

- Total evacuation – Everyone in the building begins to evacuate at the same time and the physical arrangements of the building are designed to cope with the maximum numbers. This means that people with disabilities are interacting with others with the potential for movement times to be increased;
- Phased evacuation – This form of evacuation system has a pre-alarm stage in areas remote from those immediately threatened by fire. During this stage, vulnerable people can begin to escape, with a general alarm being raised a short time later. This can be helpful to enable staff to assist people with disabilities to places of safety as quickly as possible; and
- Zoned evacuation – With this system, the building is designed to be evacuated progressively as the extent of the emergency develops and is understood. The construction of the building, including its fire resistance, is arranged so that immediate evacuation is not required from all areas and people are moved progressively away from the area of danger. This is of particular use in buildings where medical care is provided, as people can be evacuated horizontally behind fire-resisting construction and moved vertically only if necessary. With this evacuation philosophy, it is essential to ensure that adjoining zones have sufficient capacity to accommodate the additional occupants from another zone.

When considering the planning of emergency egress, it is important that an understanding of the built-in safety measures is obtained, particularly if the building has been subject to a fire engineering solution for means of escape at design stage.

Changing the evacuation strategies of an existing building may require some degree of work to the building structure and fire safety systems.

4.4 Typical Details Contained Within an Egress Policy

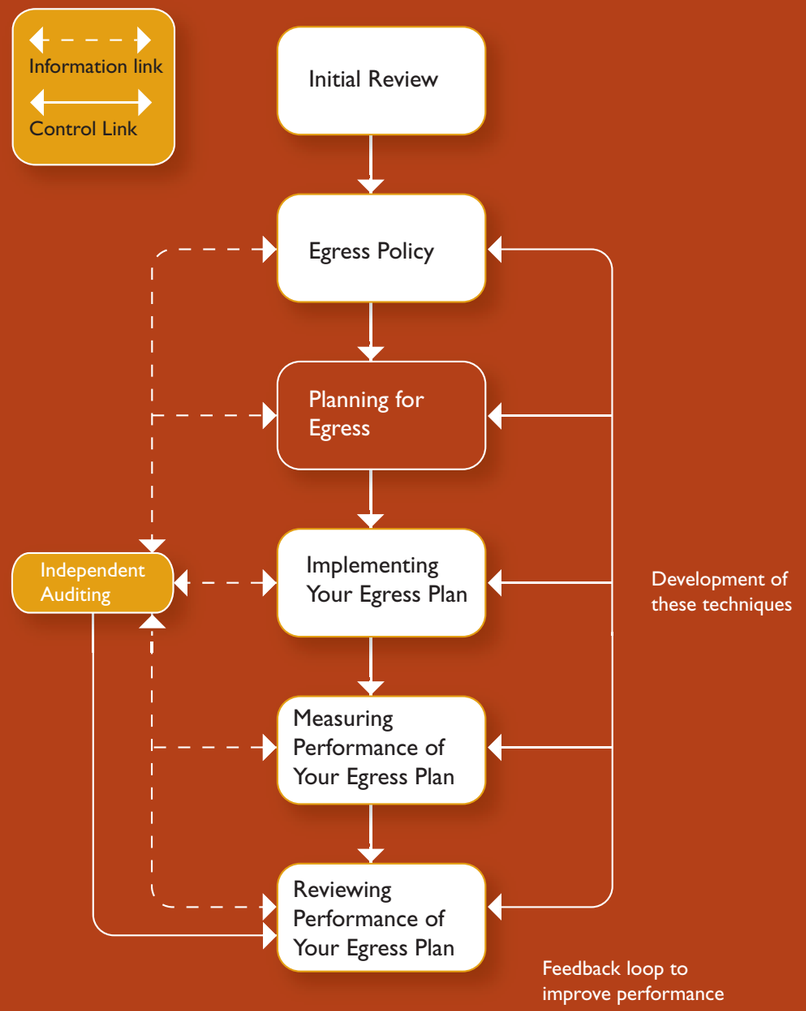
- Summary of legislative obligations;
- Details of designated persons;
- Policy statement of intent (list of aims and objectives);
- Basic statement on the overall evacuation strategy; and
- Dated and signed by senior management.

It is recommended that the egress policy is contained within the organisation's Safety Statement.

4.5 Egress Policy – Summary

- Consider the applicable legislation;
- Review policies that have an impact on egress;
- Clarify who is responsible for safe egress;
- Decide on an evacuation strategy – total, phased or zoned; and
- Gain an understanding of the existing inbuilt fire safety measures.

5 Planning for Egress



Introduction

Organisations need to plan how they will react to emergencies so that a safe outcome can be assured. Planning allows an agreed approach to be developed, recorded, communicated and practised. It allows problems to be discussed and worked through so that confusion and uncertainty are reduced in a real emergency situation. This section provides a great deal of information to enable emergency egress plans to be drawn up for people with disabilities. It looks at how people react in an emergency situation, and indicates how the presence of a disability can affect that reaction. The benefits of a risk assessment approach are discussed, as is the importance of consultation with all stakeholders.

This section outlines the basic principles used when the means of escape from buildings is designed. It provides information on the various aspects of an emergency escape system from warning and wayfinding, through moving horizontally to a place of refuge, to vertical movement to a place of safety.

Information is also given on particular aspects of safe egress for people with disabilities in a range of building types.

This section of the document will assist with meeting the following aims:

- **Aim 1** – to provide the reader with an appreciation of the problem and an understanding of egress issues that particularly affect people with disabilities;
- **Aim 2** – to impart the ability to identify egress features that are normally designed into buildings, and the capability of using this information in preparing risk assessments and emergency evacuation plans;
- **Aim 3** – to give guidance on providing safe egress for people with disabilities; and
- **Aim 4** – to identify good practice in relation to safe egress for people with disabilities.

5.1 Understanding the Problem

In an emergency such as a fire, all building users are put in an unfamiliar situation that can be, in extreme cases, very frightening and potentially life-threatening. In dealing with the problem of ensuring that people are able to evacuate in safety, building design codes take into account a whole range of issues such as:

- type of use;
- number of occupants;
- travel distances; and
- height above ground level.

The design codes attempt to tailor guidance and requirements to match a diverse range of building types and occupancies, but it is difficult to cover all eventualities. While design codes deal adequately with many buildings, there are others that do not fit neatly into the assumptions made about layout, use or occupancy. With the provision of access for people with disabilities to more and more buildings, there is a growing need to give consideration to the resulting egress requirements.

Much is now known about how people react in emergencies. For example, it is accepted that people prefer to use familiar routes and exits in an emergency and will often ignore nearby

emergency exits to go out by the way they entered. The level of familiarity that a person has with the building layout can have an impact on their ability to escape.

Other factors that can influence the time it takes for escape in an emergency include:

- level of alertness – awake, sleeping, cognitive state;
- mobility – level of disability;
- social affiliation – alone or with a group;
- intellectual capacity – ability to understand instructions or procedures;
- mental health status – tolerance to noise or panic situations;
- role and responsibility – staff or public;
- position – standing, seated, lying down;
- commitment – to the activity they are engaged in; and
- presence of focal points within the building – stages or screens.

Figure 2 below represents a timeline for an emergency, which is often used to explain the stages of human behaviour alongside the development of a fire. In an emergency evacuation, the aim is to have the time taken for everyone to safely leave the building less than the time for environmental or structural conditions in the building to become untenable. The time taken to evacuate once the alarm is raised is made up of pre-movement and movement time. The pre-movement time is broken down into recognition time and response time. The movement time is the time taken to travel to safety.

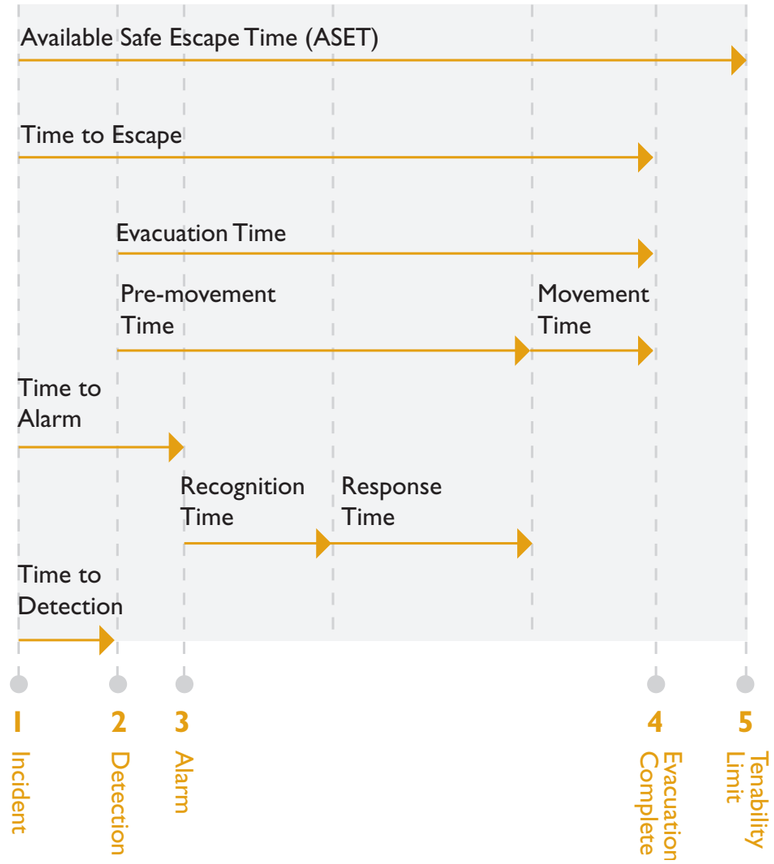


Figure 2: Example of a timeline comparison of emergency development and evacuation
(based on Figure 4 from BS7974: 2001)

Recognition time is the period from when the alarm is raised until people understand that there is a potentially threatening situation. During this time, people are gathering information from alarm signals, clues such as smoke, flame or unusual sounds, or from the reactions of others. Response time is spent by people deciding on the appropriate action to take to deal with the emergency and can often include movement that

is not actually escaping, such as locating family members and gathering up belongings.

When emergency egress is viewed in these terms, it becomes evident that the population of a building at any one time will have a range of characteristics and abilities that will affect individual evacuation times. To design a building that provides safe egress for all means basing the evacuation time on the person who will take the longest time to escape. Special consideration has to be given, therefore, to the needs of people with disabilities when designing and planning for emergency evacuation.

5.2 Egress Issues for People with Disabilities

People have disabilities of various types and of varying levels of severity. These disabilities can take the form of:

- mobility impairment, where the range or speed of movement is affected to varying degrees;
- sensory impairment, where the ability to gather information through the senses such as sight or hearing is affected;
- cognitive or mental health impairment, where the capacity to process information and react appropriately is affected; and
- hidden disabilities, where the disability is not physically apparent, but the stress of an emergency situation may trigger the condition. Hidden disabilities could include such conditions as asthma or heart problems.

People can sometimes have a combination of these types of disabilities. The presence of a disability can have a very significant impact on the time it takes for someone to escape in an emergency. The time needed to escape on the ASET timeline in Figure 2 above will potentially be extended, and an understanding of how this could arise will help planners to anticipate the likely effects.

Effect on recognition time

Although a mobility impairment will have the greatest impact on movement time, the inability for people to quickly investigate unexplained clues could lead to longer recognition times. For some disabilities, it may be impossible for any unaided movement to take place whatsoever.

The inability to hear a fire alarm signal or other warning, either completely or clearly, is very likely to lengthen recognition time. Similarly, if vision is impaired, information about a developing threat or other people's reactions will be missed, leading to delayed recognition of the situation.

A cognitive impairment may leave a person unable to interpret a warning correctly or quickly enough leading to no, or slow, recognition. A further factor to consider is the impact of warning signals, such as sounders and strobes, on people where such stimuli could cause a reaction or event, such as a seizure.

Effect on response time

Response time is characterised by people taking actions that cannot be considered as escaping. In addition to the examples given, such actions might include raising the alarm, fire fighting, checking on others or getting dressed prior to escaping. A mobility impairment could easily reduce the speed of these responses for individuals or make it impossible for them to respond at all.

Given that response time is spent deciding on the appropriate action to take, the fact that sensory impairment might reduce the means available to gather information makes it very likely that more time will be taken before escaping, or that the action taken will not be the best option. Response time is likely to be extended as a result.

A cognitive impairment may leave a person unable to interpret the information available about the evolving emergency situation and mean that the action taken is inappropriate. Response times will be longer and no appropriate response may result.

Effect on movement time

For simplicity, most design codes split movement, or travel distance as it is commonly described, into horizontal and vertical components. Horizontal movement describes movement on the same level, such as within the floor on which the person is located at the time of the evacuation. Vertical movement refers to situations where it is necessary to change levels, between floors for example, when escaping.

A mobility impairment can have a great impact on movement time. Fire safety design codes tend to be based around the assumption that all people in an emergency evacuation are able to move independently and all move at the same speed – that of a fit and fully mobile adult. It stands to reason, however, that not all people will fit into this assumption. It is only to be expected that some people will not be able to move independently and that some will have a range of movement abilities that will make their movements much slower than for others. In some instances, depending on what activity they are engaged in at the time, users of wheelchairs may have to transfer into their chairs prior to moving. Some might need to wait for a carer to assist and then wheel them to safety. There will, in many cases, be doors fitted with automatic closers to negotiate, adding to the time taken to escape. Other situations will exist where people are confined to bed, such as in hospital wards or residential homes. Movement in these cases might require medical equipment to be transported at the same time.

Aside from the speed of movement of those with mobility impairments, it is possible that queuing will occur if, for example, a wheelchair user is moving ahead of a group of other people. The flow rate for the evacuation will reduce accordingly if there is insufficient room for people to pass. This could be a particular problem in narrow corridors or at obstructions such as doorways. Walking aids, such as rollators or crutches, take up additional space that is not generally considered in the models used to predict the flow rate of people escaping from buildings.

Vertical movement presents particular problems for people with disabilities. It is common practice for passenger lifts not to be used in emergency evacuations and, in most cases, evacuation plans exclude them. This is because of the danger of a power failure trapping people in the lift, of the lift being inadvertently called to the floor where the incident is located or because the lift will not always be enclosed in fire-resisting construction. Further details of the design and use of evacuation lifts are given in Section 5.10.

In many buildings, lifts are the only method for people with mobility impairments to move between floors. Access legislation is resulting in the installation of passenger or platform lifts in more and more buildings. The problem

created for evacuation is obvious and the solution usually adopted in fire safety design is to provide safe areas, sometimes known as refuges, where people can wait for assistance. More detail on the design of refuges is included in Section 5.9 Refuges. Whilst waiting, movement stops and the overall time taken to escape mounts. Often, the only way for wheelchair users to move between floors is to abandon their chairs and be carried or otherwise assisted along the stair. Again, this takes time and adds to the overall escape time. Another factor with mobility impairment is the knock-on effect that can occur when slowly-moving evacuees cause the formation of bottlenecks and queues of other occupants. It follows, therefore, that organisations must anticipate the needs of people with disabilities in their emergency evacuation policies, planning, training and practicing.

Other difficulties faced by those with mobility impairments include the opening of fire doors against the resistance of door closers or pressurisation systems, and the negotiation of doors which, whilst held open magnetically in normal circumstances, are released to close in the event of a fire to prevent the passage of smoke and flame. Another factor for some is the difficulty of moving safely in a closely-packed crowd when strength and stability levels are reduced. Others will find it difficult to travel even relatively short distances without resting. Wayfinding is an important issue for people escaping in an emergency situation. Time spent locating exits and finding the appropriate route to take can add significantly to the overall escape time. A vision impairment would normally be expected to make it more difficult for someone to identify exits and follow exit signage and, coupled with the difficulty of identifying the location of a fire, the recognition and travel times can often be extended.

For many people with vision impairments, the move into unfamiliar terrain, such as an escape route never used before, will cause great stress and result in a slowing down of movement. It will also affect a person's ability to observe and follow the escape behaviour of others.

A hearing impairment could also add to the time taken to escape, not least if it makes it difficult to understand and react to the instructions of others such as fire wardens. In some circumstances, for example where an individual with a vision impairment is very familiar with their surroundings, the difficulties of low light levels and smoke obscuration can become less of an encumbrance than for a person without a vision impairment.

Efficient use of time in the movement phase of an emergency evacuation requires information to be processed quickly. A cognitive impairment may slow or prevent the assimilation and interpretation of this information, with a resulting increase in the overall time taken to escape.

From the above, it is clear that special consideration of egress requirements is needed to take account of the needs of people with disabilities. In many cases, disabilities are "hidden" and it will not be obvious at the time that there is a need for extra steps to be taken.

5.3 Assessing the Risk

The Safety, Health and Welfare at Work Act (2005) places obligations on employers to ensure that employees are safe when at work. The Act makes specific reference to emergency egress. The legislation requires hazards and the resulting risks to be identified within workplaces, to ensure that appropriate

control measures are taken to mitigate the effects on those who would be exposed to the risk.

This risk assessment approach is very useful for those responsible for managing emergency egress and is applicable when planning for all users of buildings, not just employees.

An assessment of the risks to people with disabilities who are known to use the building, or who could be anticipated to be there, will determine the physical measures and management strategies that are required to ensure adequate means of egress are maintained.

An important aspect of the Health, Safety and Welfare at Work legislation is the Safety Statement, which employers are required to prepare.

The Safety Statement specifies the manner in which the safety, health or welfare of employees at the place of work will be secured. It is intended:

- to involve management up to the highest level in a clear programme of action;
- to stimulate action to ensure compliance with the statutory safety and health provisions;
- to identify hazards and to prioritise remedial action based on the risk of injury to exposed persons;
- to ensure safety measures are kept in place and monitored on a regular basis;
- to identify and assign clear responsibilities in relation to safety and health matters;
- to ensure systematic follow-up of problems, once identified;
- to ensure that resources are assigned to safety and health; and
- to gain the commitment of all persons in the workplace.

These aims are exactly those that an organisation will wish to achieve in their system for managing emergency evacuation. It makes sense to use the Safety Statement as a means to integrate emergency egress planning for all staff, visitors and other users of the building.

The Health and Safety Authority (HSA) guidance document, referred to in Section 2.2 and used to define the structure of this document, outlines an appropriate system for managing emergency evacuation.

The HSA has a considerable amount of further information, on assessing and managing risk, available on its website. Readers of this guide are advised to visit www.hsa.ie for additional information.

Risk assessments need to be continually reviewed and must reflect changes in the physical environment as well as changes in people, procedures and legislation.

The review and auditing process, to ensure that all measures required to protect people with disabilities and others are adequate, is an essential part of managing emergency egress.

A risk assessment checklist is included in Appendix 3. This checklist can be used to develop a safety strategy that is appropriate to the needs of people with disabilities.
It is by no means exhaustive in its content and those assessing the risks to people with disabilities in the event of an

emergency evacuation should use it as a guide, adding any other issues that emerge.

For ease of use, the checklist has been divided into separate sections headed:

- Policy;
- Procedures;
- People; and
- Premises or plant.

5.4 Consultation

An important part of preparing emergency plans and procedures that meet the needs of people with disabilities is to consult with those who are directly affected.

In many circumstances, it will be easy to identify those who need to be consulted, such as when considering the needs of employees with disabilities. In such cases, direct consultation will ensure that management understands clearly what needs to be put in place to ensure the employees safety, and the employee will be aware of the arrangements and have an increased level of confidence about them. This is an integral part of preparing a Personal Emergency Egress Plan.

Other groups, such as visitors and the general public who use buildings, are more difficult to consult directly. The needs of these people will have to be anticipated when planning for emergencies and it is important that the suitability of the arrangements put in place is checked. This can be achieved by consulting with disability organisations who represent particular groups of people with disabilities. In some cases, it might be necessary to consult with medical or occupational health professionals, particularly when planning for people with severe disabilities.

Consultation will also be required with those members of staff who will be expected to implement the emergency procedures. This may involve negotiation with staff representatives.

The NDA publication 'Ask Me – Guidelines for Effective Consultation with People with Disabilities' provides advice and guidance on how to consult with people with disabilities.

At a technical level, when drawing up emergency evacuation plans and procedures, it might be helpful to consult with the Fire and Rescue Service who would respond to a call out to the building concerned. It is important to ensure that the evacuation procedures put in place by the building management will not conflict with the fire-fighting procedures that the fire service will adopt when they arrive on site.

If the building being dealt with is in multiple occupation or is rented from a landlord, it is likely that the egress plan for one occupant will interact with those of others. It is important that all parties are consulted at an early stage.

5.5 General Means of Escape Design Principles

When buildings are constructed, legislation ensures that provision for means of escape in the event of fire is incorporated into the structure. Although the focus is on fire safety, the guidance used ensures people will be able to escape quickly in any emergency. The legislation is inclusive of people with disabilities.

Part B of the Building Regulations sets out the functional requirements for fire safety under the broad headings of:

- B1 Means of escape in case of fire;
- B2 Internal fire spread (linings);
- B3 Internal fire spread (structure);
- B4 External fire spread; and
- B5 Access and facilities for the fire service.

Technical Guidance Document (TGD) B is applicable to most building types and is provided as a guide to the minimum standards that will meet the requirements of the Building Regulations.

TGD B does not give much direct guidance on egress for people with disabilities but instead refers to BS5588-8: 1999 'Code of Practice for Means of Escape for Disabled People'. The basic design principles contained in BS5588-8 are for people with disabilities to be able to move horizontally to a place of refuge where they can wait for assistance with the vertical part of their escape to a place of safety. It should be noted that this code of practice makes no recommendations requiring the provision of refuge spaces in "small" premises consisting only of a basement, ground and first floor with no floor area over 280m². Good practice, however, would be to always provide a sufficiently-sized refuge space, or an alternative solution, when lift access is provided, irrespective of whether the lift access is a statutory requirement or not.

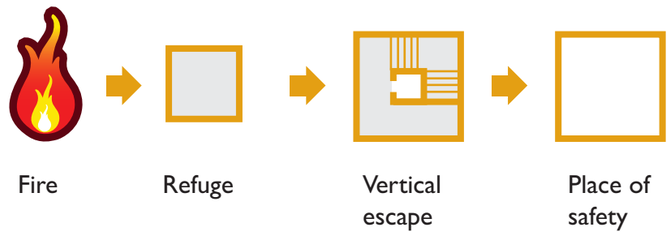


Figure 3: Principles of evacuation from BS5588-8

The guidance in BS5588 also covers, to some degree, the features needed in warning and alarm systems to help those with hearing impairments and makes recommendations for assisting people with vision impairments.

A number of sources of further information on emergency egress for people with disabilities, which reflect international research and good practice, have been included in the appendices to this guide. One document that will be of interest to those with responsibility for designing for egress is DD9999: 2005 'Code of Practice for Fire Safety in the Design, Construction and Use of Buildings'. This document is produced by BSI as a "Draft for Development" and is intended to replace the BS5588 series in due course. It reflects more recent thinking on egress for those with disabilities and could be used as an alternative to BS5588-8, with agreement of the relevant enforcing authorities.

The following sections look at each stage of the emergency escape process in some detail under the following headings:

- General Warning and Alarm;
- Wayfinding;
- Horizontal Movement;
- Refuges; and
- Vertical Movement.

5.6 General Warning and Alarm

In the event of an emergency, some form of warning system is required to alert people throughout the building. The alarm will either be raised by an individual who becomes aware of the incident or by automatic detection in the case of a fire.

Conventional alarm systems may not always meet the needs of people with disabilities, both from the perspective of

triggering the alarm to warn others and in terms of recognising a warning given.

In situations where the alarm system is manual, i.e. relying on the actions of a person to activate it, it is necessary to consider the number, height and location of break glass call points to ensure that someone with a disability can quickly and easily locate and reach them. This will necessitate an assessment of the likelihood that someone with a disability will be expected to activate the fire alarm. Consequently, it may require the inclusion of additional features to the fire alarm system such as additional call points, lowering of call points or the use of other means of activation such as ceiling cord switches. The use of automatic fire detection will provide a backup to manually raising the alarm. Such systems are increasingly common in public buildings.

Hearing and recognising the alarm is a problem for those with hearing impairments. In general, given the sound levels generated by a fire alarm, people with impaired hearing will usually either be able to make out the alarm signal or be alerted by the actions of other occupants. This will not be the case for everyone and consideration must be given to other ways of raising the alarm including visual alarms, paging system, vibrating devices and tailoring of the sound frequencies delivered.

When selecting the appropriate system, consideration should to be given to other impacts that the alarm could have for people with disabilities. These include risks to persons with epilepsy through use of flashing beacons, causing inner ear discomfort or making normal communication impossible due to high levels of background alarm. Specialist advice should be sought on the most suitable location and type of sounder.

Vibrating alerts

Vibrating alert systems are available which take the form of a local area paging system linked to the fire alarm system through an interface. Activation of the fire alarm system will trigger any paging devices within range of the transmitter.

Depending on the system installed, as well as vibrating, a visual message can be displayed on the device screen and an intense audible tone can be emitted.

Figure 4: Deaf Alerter logo (courtesy of Deaf Alerter plc)

The system is therefore capable of alerting those with moderate to severe hearing impairments and can offer the added advantage of making users identifiable to staff members through the audible tone. The system will need to have battery backup and fault monitoring to the same standard as the fire alarm system. In large buildings, multiple transmitters may be required to ensure full coverage. Some systems allow the devices to be used for general paging, through multiple channels controlled by software installed on a linked PC.

The use of a vibrating pager alert system requires good management systems to identify those who need to carry

pagers, ensure they are trained in their use, and to manage the signing in and out of the units. Maintenance of the units is also important, particularly with regard to ensuring they are fully charged. The portable nature of the pagers means that this can be a relatively cost-effective way to cover all areas of a building.

Such systems tend to be easier to manage in buildings such as offices where those who could benefit are known. Buildings open to the public are more difficult to manage but the system can still work effectively. Problems to be overcome are the potential for pagers to go missing and the uncertainty about how many are required to be available to cope with demand.

Other forms of vibrating alert available are able to wake those sleeping through the use of a pad that is placed under the pillow. Some systems allow the standard paging device to be docked in a cradle at night time. Activation of the alarm triggers the vibrating pillow pad and flashes a strobe light. Some systems allow the cradle to be portable meaning that those with hearing impairments are not restricted to using particular rooms. These systems are particularly suited to hotels or student accommodation.

As new technologies develop, it may be possible to have paging systems that can provide information on people's location within a building.

A drawback to the use of paging systems is the fact that their use requires the people with hearing impairments to identify themselves and go through a registration process not applicable to those without a hearing impairment.

Vibrating paging systems for use as fire alarm warning systems should comply with the relevant parts of BS5839-1: 2002 and EN54 .

Strobes

It is not likely that simply locating a strobe beside each sounder will give full coverage. Consideration is required of particular room layouts, the directions in which people are likely to face and the presence of fixtures, fittings and furniture within rooms.

Figure 5: Example of strobe equipment

A further factor to consider if strobe beacons are to be used is the possibility of a negative reaction to the pulsating light in those with disabilities such as epilepsy. Care needs to be taken to ensure that the strobe frequency chosen is satisfactory. Frequencies of 5 hertz and above are to be avoided as the range of frequencies from 5 to 30 hertz is generally considered most likely to trigger a reaction. It is recommended by epilepsy organisations that strobes operate at a frequency of 2 to 4 hertz and be synchronised so that the frequency is not increased in spaces with multiple units. Further guidance on visual alarms can be found in BS5839-1: 2002 – Section 2, Clauses 17 and 18.

5.7 Wayfinding

Wayfinding in an emergency evacuation is a major problem for everyone who is unfamiliar with the building layout. As

most escape routes tend to be located in areas not in normal everyday use, the presence of suitable escape signage is essential. By their very nature, many escape routes will appear off limits during normal use of the building and tend to be rejected by users in the event of fire. The obvious solution is to make escape routes a normal means of access where possible.

Wayfinding is a research subject for a number of institutions internationally, with one of note being the Research Group for Inclusive Environments at the University of Reading. Areas being researched include the legibility and conspicuousness of signage through to the behaviour of people in smoke-filled environments. For further information, please refer to www.extra.rdg.ac.uk/ie

The problems are compounded for people with vision impairments such as macular degeneration or cataracts. One aid for those with vision impairments is the use of photo-luminescent wayfinding guidance systems. These systems typically make use of continuous strips of photo-luminescent material located in the floor covering or at low levels on walls, to indicate the direction to the nearest emergency exit. The strips are brightly coloured and highly conspicuous in normally lit situations and remain visible in low light conditions by emitting light themselves. The photo-luminescent material used absorbs energy from the natural or artificial lighting, stores it and re-emits it as light. The systems are of benefit to all building users and are of real benefit for evacuation along routes that are partially smoke logged. The idea of low level directional indication of exits has a long history in the aviation industry but is not commonly used in buildings as yet.

Another wayfinding aid is the use of handrails on horizontal circulation routes, commonly provided in hospitals and other healthcare buildings, which, apart from providing support to users, also provide assurance on escape routes within buildings.

Irrespective of their location, it is important that handrails are colour contrasted against their background to ensure that they are easier for people with vision impairments to see, even in normal lighting conditions. It is possible to use the handrails in a building to convey information to the people who are vision impaired through the use of raised detail. This information can signify the floor level, the direction for escape or the location of refuge areas.

The level of lighting to escape routes is very important for those with vision impairments, and should be of the highest standard possible. Lighting will, at different times, be provided through daylight, normal artificial lighting and emergency escape lighting.

The most critical will be that provided by emergency escape lighting in the event of a power failure to the building. Guidance is available in Building Regulations on the areas and types of building requiring emergency lighting. However, consideration should always be given to the provision of emergency lighting to accommodate people with vision impairments. The required luminance level at the floor of defined escape routes is 0.5 lux and 1.0 lux in open areas of accommodation or undefined escape routes, as they are known. Emergency lighting systems are required to achieve this level of luminance within five seconds of a power failure or the failure of a lighting circuit, which allows for the time taken by fluorescent tubes to warm up. Generally, lighting

levels at head height will be at a higher value than at floor level as the light source is usually located at ceiling level. Further information on emergency lighting systems is available in IS3217: 1989 and BS EN1838: 1999.

It should be noted that, over time, the efficiency of light fittings degrades and the lighting level of a newly installed system should be designed well in excess of the minimum recommended lux levels in IS3217.

Signage

The legibility and conspicuousness of escape signage is very important. This can be improved by relatively simple measures such as using illuminated exit signs and removing glare and clutter due to other signage for other purposes such as advertising. The requirement for the graphic design of signage is covered by European Council Directive 92/58/EEC. The design of escape signage provides a degree of uniformity for Irish citizens as well as visitors from other countries. Guidance on the graphic design, size and location of escape signage can be found in BS5499 Parts 1, 4 and 5. The National Council for the Blind of Ireland have produced information on signage strategy and should be referred to for further guidance (see www.ncbi.ie). Building owners do have a choice on the type of illumination they provide for escape signage. Signs can be internally or externally illuminated, or in some cases photo-luminescent.

Research is available from the University of Reading which demonstrates that the latest generation of light emitting diode (LED) illuminated signs can improve the legibility and conspicuousness for those with vision impairments. LED signs tend to be more expensive to install but offer lower power consumption and extended lamp life, which will have ongoing maintenance benefits.

In addition to the luminance levels of signage, the provision of tactile information on signs can be of considerable benefit to people with a vision impairment. This is particularly the case where a person with a vision impairment might have to wait within a refuge space and need information about the arrangements for egress from the location.

Improving the luminance of escape signage is easy to do, technically, and should be a measure implemented through planned maintenance or as part of a building upgrade or refurbishment. Maximum and minimum luminance levels of signage are given as 300 cd/m² and 15 cd/m² respectively in IS413: 1989 but, as with emergency lighting systems, consideration has to be given to the reduction in lighting levels over time.

Directional sound

The use of directional sound is a developing technology with many applications, one of which is in assisting with wayfinding in emergency evacuations. Directional sound is essentially broadband, multi-frequency sound that is easily and quickly located by the human ear. Standard alarm systems give no information on the location of exits, but directional sound systems use sounders located at strategic points which emit rapid bursts of broadband sound. The sounds can be tailored to identify particular building features such as stairs or emergency exits and indicate the vertical direction to be taken on stairways.

Tests have shown that the time taken to locate exits is dramatically reduced when directional sound is used.

The technology is of particular benefit to those with vision impairments as it adds an extra layer of information received aurally.

The main drawback with the system is one of familiarity. Fire alarm signals are universally recognised and understood but the use of directional sound systems is not yet widespread enough to be sure that building users would know how to react without individual training. For this reason, its use would perhaps best suit buildings where people can be made familiar with the method of operation.

5.8 Horizontal Movement

Ideally, horizontal circulation within buildings will be level with suitable ramps and complementary steps where level circulation is not possible due to building and site constraints.

With new buildings, level approach to and within the internal spaces is delivered through application of Part M of the Building Regulations. Part M is a minimum standard and more comprehensive guidance is available from other international publications such as BS8300.

In the event of an emergency evacuation, people with disabilities may not be able to avail of the circulation routes designed for access and, consequently, escape routes need to be designed so that they are suitable for all of the building's occupants.

Horizontal movement can be difficult for those who are wheelchair users, people with arthritis, expectant mothers and parents using prams.

To facilitate unrestricted egress:

- changes in level on circulation routes should be designed out where possible;
- ramps, if required, should comply with recommendations of Technical Guidance Document M or BS8300 with graspable handrails to each side having a "diameter" of 38 to 50mm. Whilst it is not essential that the handrails are circular in profile, designers should note that this shape is generally most suitable for people with manual dexterity problems to grip; and
- final exits should have level thresholds, even those opening onto external flights.

5.9 Refuges

As many people with disabilities are unable to use stairs unassisted, it is necessary to ensure that they can stay in a safe location until help arrives. A common way to facilitate this need is through the provision of safe areas within protected stair enclosures. This is not always possible and may not always be desirable, particularly when dealing with existing buildings where space in the stairs is limited or where larger numbers of people who require assistance to escape are anticipated.

The use of refuge areas will often require a person with a disability to wait whilst others escape past them. It should be realised that people can become fearful and concerned about being left behind. It is essential that the use of refuges is discussed fully in advance with those who might need to use them. This will need to be discussed with employees as part of the drawing up of Personal Emergency Egress Plans. Where people are unfamiliar with the use of refuge spaces or the

spaces' locations in a building, the intervention of staff will be necessary to provide direction and reassurance. It may also be necessary for staff to remain with those waiting in refuge areas to assist with the use of communication systems or provide general support.

Refuges should be provided so that people with mobility difficulties are not placed at a greater risk from fire than other occupants. This will usually require an assessment of the numbers of people likely to require the use of a refuge space and assistance with vertical evacuation of the building. Inherent in this assessment is the availability and suitability of appointed staff who can provide assistance, their general fitness, health and their ability to re-enter the building as necessary in order to render further assistance, which is unrealistic even in low-rise buildings of three or more storeys above ground level.

Figure 6: Example of refuge location

As a minimum requirement, refuges should have the following features:

- where a single refuge space is considered sufficient, a 1400 x 900mm space clear of the escape route;
- be enclosed in not less than 30 minutes fire-resisting structure, with a 30 minute fire-resisting, self-closing fire door fitted with cold-smoke seals;
- be provided with 30 minutes fire-resisting construction (integrity and insulation) from a fire inside the building, where the refuge is external;
- located either within, or be a space with direct access to, each protected stairway required for means of escape;
- have a two-way communication system, to suit a range of disabilities, linked between the refuge and the management control point, compliant with the recommendations of BS5839-9: 2003;
- contain no glazing between the general accommodation and the refuge space;
- clear signage indicating that the space is designated for refuge and identification of the floor level; and
- have a notice providing guidance on procedures in event of fire.

Figure 7: Example of two-way communication system

An alternative to the location of refuge spaces within stair enclosures, which may be useful in existing buildings or for larger numbers, is the use of fire-resisting accommodation adjacent to protected stairs as refuge space. To be suitable, such accommodation should have the same period of fire resistance as the protected stairs and have direct access to the stairs or to a lift suitable for evacuation.

A further option could be to subdivide a room or storey into separate fire-resisting compartments, each of which has at least one independent escape route and adequate provision to allow movement between compartments. Often this will necessitate the provision of more than one intercommunicating door between the compartments to ensure that a route is always available. This approach is often used in healthcare premises where the evacuation of patients using stairs is even more difficult. Where one of these alternative approaches is used, careful consideration has to be given to the location of two-way communicating equipment and evacuation aids. Current standards only require a minimum number of refuge spaces, but it is clear that this provision could be inadequate for many buildings where the potential for those requiring assistance to escape exceeds the number of refuges provided.

This will often be the case in publicly accessible buildings where it might be appropriate to introduce cellular areas of fire-resisting construction so that it becomes possible for people with disabilities to progressively move away from the risk of fire whilst allowing groups such as families to remain together. This would not generally be feasible within the confines of a 1400 x 900mm refuge space.

For example, consider the potential for three wheelchair users on the upper storey of a building that is provided with two escape stairs and only two refuges. This has the potential to leave someone in a vulnerable and potentially dangerous situation. Limiting the number of wheelchair users to two on the upper storey would not be acceptable in access terms and might not achieve a satisfactory solution anyway as the route to one of the escape stairs could be impassable due to smoke or other untenable conditions. In such a situation, a solution would be to go beyond the minimum standards and provide either larger or additional refuge spaces throughout a property.

The nature of the disability, the number of people with disabilities and their position within the building are critical issues requiring careful consideration both at design stage and when the premises are occupied. This is particularly the case when people with disabilities are able to access and occupy above-ground spaces within buildings, most usually the case when buildings are accessible to the public.

In "open" premises, where there is little or no control over access, the designer and management should make provision for the maximum, rather than the minimum, number of people with disabilities that prohibit the unaided use of stairs within buildings and provide sufficient refuge space to meet anticipated needs.

In other circumstances, where there is a high degree of control at the access point to a building, such as in a school or office accommodation, it may be possible to restrict the number of people who require assistance on an upper storey, where there is inadequate provision of suitable refuge space.

Whichever option for refuge is used, the importance of good management procedures and staff training must be emphasised.

5.10 Vertical Movement

Vertical circulation within the building should be no more difficult for people with disabilities than for other users. In access terms, the use of passenger lifts removes barriers to vertical movement. In a fire condition, however, where suitably designed evacuation lifts are not provided, this aspiration is unrealistic and, consequently, refuges need to be provided to facilitate the escape of people requiring assistance from the upper or lower storeys of a building. On ground-floor accommodation, where the egress from the building is not level with the external surface, it may also be necessary to provide refuge spaces external to the building enclosure. This will also be the case on upper storeys where external fire escapes are utilised.

The best means of ensuring that vertical movement is possible for the evacuation of people with disabilities is to provide lifts suitable for evacuation use. Detail of the requirements for evacuation lifts are given later in this section. The benefits of allowing a person with disabilities to exit a building independently are to simplify egress procedures for them and to offer such users equal independence with others.

As buildings are adapted to make them accessible, and lifts are installed to provide access to storeys above or below the entrance level, it makes good sense to upgrade the standard to that of an evacuation lift. This approach means that access and egress issues are dealt with simultaneously, and the reliance on assisted evacuation is reduced.

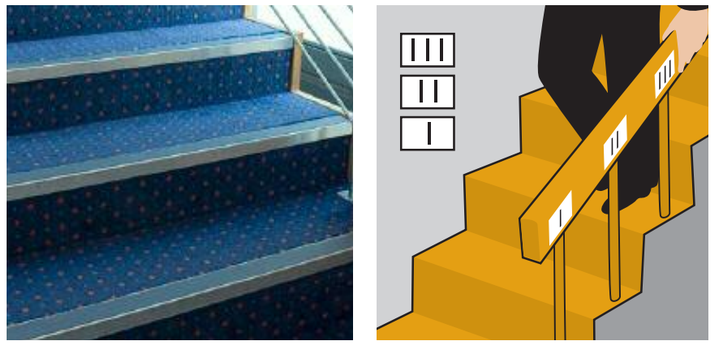


Figure 8: Example of good practice stair design (NDA – Building for Everyone) Note tactile markings on banisters to indicate the end of the flight.

Escape stairs

Currently, new buildings require a single stair, suitable for use by people with disabilities, affording access to and between the various floor levels within a building. In circumstances where a lift is provided, these requirements are diminished in respect of the rise, going, stair profile and overall height of rise between landings. In many circumstances, the stair provided for access may not be intended for use in the event of fire. The requirements for access and egress differ in their extent and it should not be assumed that stairs provided for access will automatically meet egress needs.

It is recommended that all stairs designed for evacuation purposes should fully meet the recommendations of Technical Guidance Document M or BS8300 for access stairs, unless the building is provided with a suitable number of evacuation lifts and the provision of means of escape for those with mobility impairments is sufficiently robust that the need for such stair design can be discounted.

Generally stairs on escape routes should be designed with a closed riser of a suitable profile with a maximum rise of 170mm and a minimum going of 250mm. Intermediate landings should be provided so that the maximum rise of any flight does not exceed 1,800mm. The handrails should have a contrasting colour to the walls, with the handrail design as described in 'Building For Everyone' (2002) Section 6.7.2 and provided as a continuous handrail to both sides of the stairs. Stair nosings should be non-slip and contrasted to the tread finish, with the first and last nosings having a contrasted colour to the remainder. Spiral and helical stairs are not generally considered suitable for escape by people with mobility impairments.

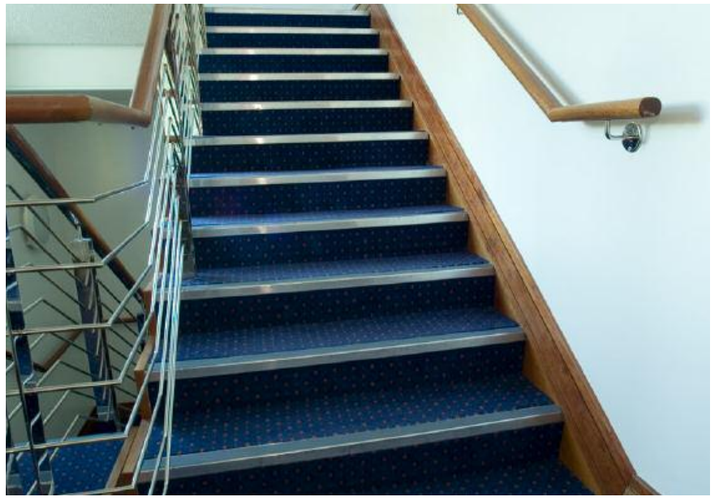


Figure 9: Example of good stair design

Evacuation lifts

For those who are non-ambulant, the presence of lifts in buildings allows them the same level of access as others. Once the fire alarm system is sounded, these occupants are effectively trapped on whichever floor they have travelled to, as the majority of lifts are not suitable for use in an emergency evacuation.

Evacuation lifts are designed to continue operating in the event of a fire and have special design features to ensure safety.

In some buildings, it might be possible to incorporate evacuation lifts, thereby affording unassisted escape in the event of fire. This could be accommodated at either original design stage or during refurbishment. It should be noted that it is the Office of Public Works' policy to incorporate evacuation lifts in all future new buildings. In some new buildings and also in older buildings, the provision of an evacuation lift might be impracticable and suitable evacuation strategies utilising trained members of staff providing physical assistance are required. Appropriate manual handling risk assessments should, obviously, be implemented if this is part of an egress policy.

It should be noted that, even if an evacuation lift is provided, refuge spaces are still required. However, these should open directly onto or be contained within the lift lobby space.

Evacuation lifts, facilitating the management of evacuation of occupants who have a mobility impairment from a building, are clearly a more desirable option where available.

The comparative additional cost of the features required for an evacuation or fire-fighting lift will be relatively minor in a building of more than two to three storeys, particularly where alternative power supplies are being provided for other systems. Compared to the alternative of assisted escape downstairs, evacuation lifts provide the most robust and

effective solution for evacuation of people with disabilities. In particular, evacuation lifts allow many people with disabilities to evacuate a building independently and with dignity, eliminating any dependence on colleagues for assistance.

Assisted escape down stairs can cause problems due to:

- extended escape times caused by contra-flow on stairs as staff return to assist others;
- the possibility of people being without a wheelchair at ground level if the evacuation chair is required for others;
- the cost of supply and training for evacuation chairs and other equipment; and
- the manual handling difficulties and possibility of litigation due to injury.

It should be noted, however, that careful consideration is required before utilising an evacuation lift in a fire condition. It is recommended that evacuation lifts should only open onto protected lobbies enclosed with at least 30 minutes fire-resisting construction, with 30 minute fire-resisting self-closing fire doors, fitted with cold smoke seals.

The design philosophy for fire-fighting lifts is somewhat more complex than for evacuation lifts, with their operation in a fire scenario being very much orientated around the specific needs of fire fighters. The use of fire-fighting lifts might be possible in the early stages of an evacuation in some circumstances; however, their use and operational constraints need to be fully understood by designated users as they are designed not to be available for general use when the fire alarm is activated, with the call points on all landings becoming isolated. If permitted for evacuation of basement or upper storeys, their management and use should be discussed and agreed with the Fire and Rescue Service as part of the emergency evacuation plan. Their use will, in any case, only be possible prior to the arrival of the Fire and Rescue Service at the building.

In exceptional circumstances, the use of passenger lifts, platform lifts and stair lifts might be considered appropriate. However, this should not be permitted without undertaking a thorough risk assessment by a competent person. The competent person will require a clear understanding of the active and passive systems incorporated into the building design, together with a clear knowledge of the specific impairment of any individual proposing to use such equipment. It is evident, therefore, that the use of lifts not specifically designed for use in fire conditions will require a building- and person-specific assessment, otherwise their availability and use should be discounted.

Guidance on evacuation lifts is contained in BS5588-8: 1999 – Section 11.

Such an assessment should include, but not be limited to:

- the total height served by the lift;
- the separation of the lift from the fire compartment;
- the level of fire resistance afforded to the lift at lower storey(s);
- the availability of an auxiliary power supply, including its duration under full load;
- the frequency of maintenance of the equipment and power supplies;
- the availability of fail-safe mechanisms and their practical use; and
- the availability of assistance.

5.11 Advice on Specific Building Types

The use to which a particular building is put can result in a particular emergency egress strategy being required. For example, buildings used for the treatment of people with illnesses, such as hospitals, will have completely different egress needs and characteristics to office buildings. This section provides some advice on egress strategies for a number of common public building types. These are:

- health service buildings;
- educational buildings;
- heritage buildings; and
- public service buildings.

Each of these building types is discussed in turn below.

Health service buildings

Included in this building category are:

- hospitals;
- residential care premises;
- nursing care premises;
- clinics; and
- day centres.

Health service buildings will have a higher proportion of occupants requiring assisted evacuation than any other building use. As a result, the general design guidance used for such buildings takes the needs of people with disabilities into account, and disability issues are accommodated within the more general escape provisions. In addition, patients could require the continued use of equipment, such as monitors and respirators during, and for some time after, an evacuation. Clearly, many of the occupants will be at significantly elevated risk if evacuated to the external air in cold or inclement weather conditions and, consequently, the preferred evacuation strategy is progressive horizontal evacuation between fire compartments, previously referred to as zoned evacuation.

It is not intended to reiterate the guidance contained in 'Firecode', the design guides for hospitals and residential care buildings produced by the Department of Health in the UK, but merely to give a flavour of the underlying philosophy for the evacuation of these type of premises.

The principles utilised in the evacuation of healthcare buildings tend to incorporate all of the aforementioned guidance and good practice, namely:

- high levels of automatic detection and alarm;
- staff available and trained in evacuation procedures;
- staff familiar with various levels of disability;
- high levels of compartmentation and fire resistance;
- separation of higher fire risk areas from patient areas;
- an ability to move horizontally away from an affected fire zone to an adjoining zone before having to evacuate vertically.

These buildings are required to have high levels of fire-resisting construction between floor levels, with every floor being capable of acting as a fire compartment. In addition, floor areas are further compartmented to a maximum size dependant on the height of the floor and the type of healthcare being provided.

These patient care areas are again divided into smaller fire-resisting zones, known as sub-compartments, usually having a reduced period of fire resistance to that of the larger compartment. Central to the design concept is the ability

to move from an affected fire-resisting zone to an adjoining unaffected zone, thereby requiring sub-compartments to have sufficient capacity to accommodate the occupants from an adjoining zone. The height of the building will often dictate if it is necessary to have the ability to move to more than one adjoining zone, i.e. to be able to choose the direction of escape.

Within this context of fire-resistant cellular design, staff/patient ratios and a philosophy for assisted evacuation are also enshrined. As there is an imperative to reduce pre-movement times to a minimum, heavy reliance is placed on automatic fire detection and staff actions. Training and evacuation drills are, therefore, essential. In such circumstances, it is obviously more appropriate for staff members to role play on behalf of patients. However, more active patients may be willing and capable of participating.

In recent years, a shortfall of available nursing staff has resulted in an increase in personnel being recruited from overseas, with a resultant potential for problems arising from communication and language difficulties. Training is essential to ensure that all staff are able to fulfil their role in the evacuation plan.

The physical elements of hospital buildings, as with many heavily used building types, tend to be subjected to abuse. As new technology is installed or maintenance work carried out, fire resistance and compartmentation can often be interfered with. With the importance placed on fire resistance between zones in evacuation strategies for this building type, it is essential that the structure is maintained in good order, particularly those elements not generally seen, such as in voids above ceilings. To this end, in order for the escape philosophy to succeed, it is vital that fire-resisting zones, compartments and sub-compartments are clearly identified, records maintained and breaches prohibited. Any adjustment in the layout of the floor area may require a consequential adjustment of the fire systems, which often lie hidden within the building structure.

Educational buildings

Included in this building category are:

- pre-schools;
- primary schools;
- secondary schools; and
- colleges of further education.

These type of premises, particularly schools for younger students, are typically off limits to the general public, with the disposition of disabled staff and pupils being less of an unknown than for other types of public access buildings. General means of escape provisions, together with structural fire precautions, impose limits on the maximum floor area within a compartment to around 800m^2. These design constraints both reduce the level of risk and facilitate the concept of progressive horizontal evacuation more easily than for many other building categories. Coupled with occupant characteristics of discipline and strong focus on teaching staff, these buildings are comparatively straightforward to design and manage around occupants with disabilities.

In a risk assessed approach in existing premises, it might be possible to identify the most suitable location(s) for use by those with mobility impairments, ideally at ground level. These rooms could be used to meet the needs of particular staff or students in lieu of classroom rotation, which is more customary. This principle, of course, will not be so easily applied in

circumstances where specialist equipment, such as required in laboratories, IT suites and workshops, is provided or where a staff member requires access to a staff room. In such circumstances, a similar risk assessment might identify specific features and management protocols that would facilitate the safe evacuation of a student or staff member with a disability from the areas required for access. This could best be achieved through the use of PEEPs as discussed previously. Thus it might be possible to provide comprehensive means of escape provisions to selected areas, matching those to which access is available or has been provided. However, constant review by management is vital where this approach is adopted, as even temporary impairments, such as fractured or broken limbs, might necessitate the relocation of an entire class to another part of the school or campus. It should be noted that, in an attempt to discharge the requirement under the Act to provide access, some designers and building managers have overlooked their responsibility to provide safe egress. In any event, where access is provided in educational buildings, then the principles for unassisted escape should follow the guidance in this document.

Events that encourage access by the wider public, such as parent-teacher meetings or concerts and plays, might frustrate the control measures in place for normal use, and consideration should be given to establishing the specific needs of visitors prior to their arrival. It is recommended that the assembly areas of educational buildings be assumed to require universal access and egress.

New educational buildings should be designed to facilitate access and egress requirements by all users. However, as previously discussed, the provision of refuge spaces should be subject to a specific assessment based on the maximum, rather than the minimum, expected occupant capacity. The concept of progressive horizontal evacuation, utilising the higher levels of compartmentation provided, will merit consideration.

Heritage buildings

Included in this building category are:

- historic buildings; and
- monument sites.

Due to their protected status, heritage buildings can often prove to be the most problematic in terms of affording access to, and consequently suitable egress by, people with disabilities. But it also follows that, unless adequate and reasonable means of escape can be provided, it is irresponsible to provide or allow access. It should not be construed that the provision of access without suitable means of escape is some form of compromise.

Because of their national importance, heritage buildings rarely facilitate entry without some form of access control, if for no other purpose than to prevent vandalism and theft. This prerequisite for managed and supervised access provides an opportunity to assess the impairments of visitors in a dynamic way and, therefore, continually assess the levels of risk and the specific assistance that might be required by visitors at any given time. Obviously, the ability to identify and assess the significance of physical and mental impairments in this way requires a level of training and skill. Thresholds at which entry is restricted or prohibited must be benchmarked against predetermined criteria, and the capacity of staff to deal with the varying permutations of occupant and building constraints should be subject to regular audits across the staff spectrum.

Sensitive smoke detection systems, known as aspirating detectors, can be unobtrusively installed where the internal decoration is of significant historic interest. These detection systems use pipework, about the diameter of a pencil, to "sniff" and sample the internal atmosphere for particles of smoke and can readily detect small ignitions, such as a match being struck. These ultra-fast detectors can dramatically reduce the time to detection, allowing additional time for escape, compared to conventional fire alarm systems, even those provided with automatic detection.

In these types of premises, fire suppression systems, such as sprinklers, can suppress or extinguish a fire in the early development stages. This type of intervention has benefits for both the occupant and the historic building alike. Although their utilisation might not, in the first instance, appear consistent with the environs of a place of historical interest, their workings can nowadays be effectively concealed within the fabric to be totally unobtrusive.

With the availability of other active systems, such as smoke extraction, pressurisation, gas flooding, etc., suitable means of escape can often be "engineered" where traditional physical fire-resisting measures would be considered an unacceptable intrusion.

In addition to active systems, approved methods are available for upgrading floors, walls and doors without affecting their character or appearance; indeed the introduction of self-closing doors or maintaining internal doors in a closed position will provide considerable benefit, even if the doors themselves have only nominal fire resistance.

As stated, the difficulty of providing means of escape from historic buildings should not be underestimated and this constraint is often as applicable to non-disabled people as to those with disabilities. This type of premises will often necessitate the involvement of a fire safety specialist who can assess the implications of the building constraints, such as poor fire resistance or smoke control, together with the physical constraints of its occupants, such as poor mobility or poor vision. It is essential, for this exercise to be meaningful, that the building management are fully engaged in this process.

Public service buildings

Included in this building category are:

- central government premises;
- local authority premises, including motor tax offices;
- libraries;
- police stations;
- motor tax offices;
- passport offices;
- public leisure centres, including local authority swimming pools and gymnasiums; and
- courts of law.

This type of premises is often split between public access and non-public access areas. Within the non-public access areas, i.e. the staff accommodation, the levels of impairment will usually be more easily identifiable and management can establish the appropriate evacuation plans. As a matter of good practice, all staff should be invited at recruitment and at regular intervals thereafter to discuss their needs in the event of an emergency evacuation and develop a PEEP, which should be tested not less than every six months. The risk assessment

process, together with the guidance in this publication should assist.

The public access areas tend to prove more problematic in terms of determining the numbers of occupants with impairments, the degree of impairment and the reduced opportunity to develop bespoke evacuation strategies for the building. Within public access areas, therefore, it should be assumed that the population is representative of the national average and that approximately 10% of the occupants will have some level of physical or intellectual disability. Where no restriction is afforded to access, then there is a clear onus on the building management to ensure that such measures are in place to facilitate either the assisted or unassisted evacuation of all of the building's occupants. In circumstances where access is restricted, and management protocols are in place to evaluate the numbers of visitors with impairments and the nature of their impairments, then it is easier to plan for the assisted or unassisted evacuation of a quantifiable number of people.

5.12 Emergency Planning

A great deal of guidance is provided in BS5588-12: 2004 'Fire precautions in the design, construction and use of buildings – Part 12: Managing fire safety'. This document deals with managing fire safety from the design stage through commissioning to end use.

The aim of emergency evacuation planning is to have in place a system for making sure that everyone in the building can safely escape in the event of a fire or other emergency.

To plan effectively, it is first necessary to have comprehensive information about:

- the layout and design of the building;
- any fire safety strategies proposed as part of the building design;
- the presence and operation of all fire safety systems such as fire alarm or smoke control;
- the maintenance requirements of the fire safety systems;
- the occupancy profile for the building;
- the processes and activities undertaken in the building;
- any special risks associated with the building;
- risk assessments for all hazards identified;
- Fire and Rescue Service response times and requirements and potential unavailability of resources due to other commitments; and
- specific needs of individuals with disabilities.

The occupancy profile for the building will provide information about the likely numbers of people with disabilities and the types of disability that could be expected. In buildings that are open to the public, it is not possible to know exactly what the occupancy profile will be, but assumptions will still need to be made in order to prepare plans. In some buildings, it is possible to have reasonably accurate information about the occupancy profile. This is generally the case in buildings with controlled access, such as hospital wards, residential care premises, student accommodation or office buildings. However, even in these buildings, it is possible for exceptional circumstances to arise when visitors are present or events are being run. Emergency evacuation planning needs to be able to take account of these exceptions.

To provide for the needs of people with disabilities, it is necessary for the emergency evacuation plan to have addressed the following questions:

- Will evacuation be total, phased or zoned?
- How will management be made aware of the presence of those who need assistance with alerting or evacuation?
- How will the alarm be raised and what arrangements are required for those with sensory impairments?
- At which stage are people with disabilities evacuated?
- What staff to occupant ratio is required to ensure safe egress?
- Are lifts available for evacuation?
- What training do staff members require to enable them to provide assistance?
- What aids and equipment will be required to assist with evacuation?
- How can staff be clearly identified to those needing assistance?

Personal Emergency Egress Plans (PEEPs)

In drawing up an emergency evacuation plan, it is essential to consult disability groups or, if possible, building users including staff. Where regular users of the building (including staff, visitors, contractors, etc.) need assistance with evacuation and it is possible to identify them, then it will be essential to develop individual plans which meet their needs. These plans are known as Personal Emergency Egress Plans or PEEPs.

The drawing up of a PEEP must be done in partnership with the person affected and needs to have a degree of inbuilt flexibility to allow for exceptional circumstances. The PEEP is essentially an agreement between the management and the individual on what steps will be taken if an emergency evacuation is required.

The PEEP matches the needs of the person with disabilities to the capabilities of the egress design and management system. Using a PEEP, it is possible to have assistance pre-arranged through a buddy system, with pertinent information about the person's needs conveyed in advance to the helper.

Guidance on the preparation of PEEPs is provided in the 'Access Handbook Template' produced by the NDA (www.nda.ie) and further information is available in a publication produced by The Northern Officer Group (NOG) entitled 'Personal Emergency Egress Plans'.

These documents give comprehensive advice on the preparation of escape plans and make the point that their use is intended to be very specific to individuals.

Important issues in the development and use of PEEPs include:

- consultation with the person for whom the plan is drafted is essential;
- ensuring staff with hidden disabilities can have a PEEP while maintaining appropriate confidentiality;
- ensuring that the needs of staff members with cognitive or mental health impairments (such as understanding alarm warnings, avoiding panic reactions or distress) are met;
- ensuring cover is arranged for PEEP assistants who are on holiday, sick or away from the place of work is vital;

- training needs to be up to date and include practical elements such as drills; and
- PEEPs need to be reviewed regularly and updated as necessary.

A copy of the 'Personal Emergency Egress Plan Template' used in the NDA's 'Access Handbook Template' is included in Appendix 2, together with a copy of the 'Emergency Egress Questionnaire' used in the NOG document.

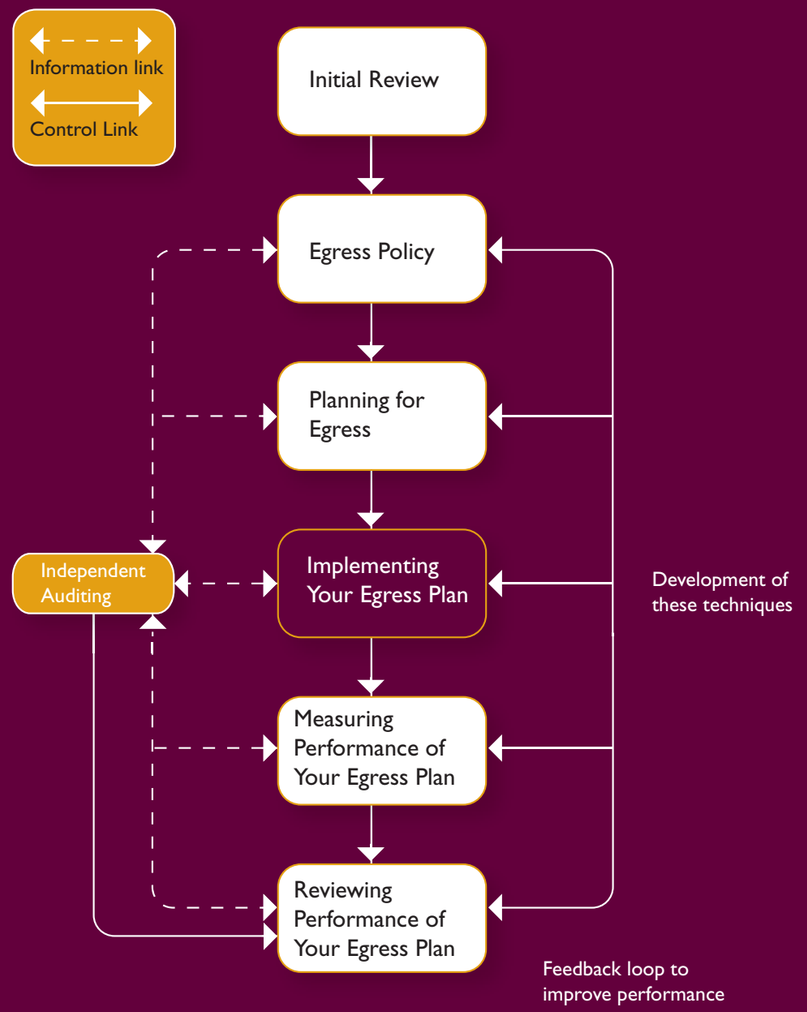
The information supplied in the preceding sections of this document will be of help in planning for safe egress. The number of people involved in drawing up the plan will depend on the size of the organisation. However, even if only one person is involved, it will be useful to have access to a reviewer for comment. It may be beneficial to have assistance from someone in the health and safety or fire safety professions.

When the emergency egress plan has been produced and tested to ensure that it meets the needs of people with disabilities, it should be incorporated into the Safety Statement required under health and safety legislation.

5.13 Planning for Egress – Summary

- Gain an understanding of the factors affecting means of escape generally, including the timeline for available safe egress time (ASET);
- Consider the particular difficulties faced by people with disabilities – on recognition time, response time and movement time;
- Complete risk assessments for all activities where egress is an issue – the checklist in Appendix 3 will be of help;
- Use the Safety Statement as a means to integrate egress planning into general health and safety;
- Consult with employees, visitors, other building occupiers, special interest groups and enforcement agencies, etc. to identify their needs;
- Understand general principles for means of escape for people with disabilities;
- Identify types of fire warning systems installed and consider alternative features to assist people with disabilities;
- Consider wayfinding issues for people with disabilities and the possible technological solutions available;
- Review horizontal circulation within the building in the context of Technical Guidance Document M and BS8300;
- Consider the design, location and use of refuges and safe areas in the building;
- Look at vertical circulation within the building – stairs and lifts – and the possible methods for moving wheelchairs vertically;
- The use of evacuation lifts for vertical escape is recommended as good practice;
- Develop PEEPs for all who require them; and
- Produce an emergency egress plan which draws from the information and understanding of the safe egress for people with disabilities, and incorporate this into the Safety Statement.

6 Implementing Your Egress Plan



Introduction

Once developed, the emergency egress plan will need to be implemented in a structured way to ensure it is successful. An implementation programme will be needed which covers making any necessary changes to the building or systems, communication of the plan to all those who need to know about it, training staff on its operation and testing to ensure suitability.

This section will meet the following aim of the document:

- **Aim 3** – to give guidance on providing safe egress for people with disabilities.

For organisations to be confident that the emergency egress needs of people with disabilities will be met, careful consideration must be given to the building design so that features which are needed to ensure safety are built in. This is only one aspect of the emergency escape performance of the building, however. Once a building is in use, it is important that sound operational management systems for egress are in place which give clear guidance to all building users on what they need to do to ensure their own safety and that of others.

There are a number of aspects to providing good operational management systems. The first is to have in place clear management policies that define the organisation's overall approach to emergency egress in general and emergency egress for people with disabilities in particular. A robust risk management regime needs to be in place which ensures continuing assessment of risks as the organisation develops and changes. Risk assessment needs to be backed up by procedures and plans that will deliver the policy outcomes. Staff training is also an aspect of good operational management systems, which is of paramount importance. A further aspect is the regular testing and practicing of emergency evacuation plans to ensure familiarity and continuing suitability. There is also a need to ensure adequate communication of the egress plan, policies and procedures to all potential users.

Managing egress can range from taking very simple actions such as evaluating meeting and conference rooms or event spaces for disability egress and planning meetings in the most appropriate rooms to developing complex evacuation plans using active fire systems.

To this end, it is important that building operators enquire of all people making group bookings if there are requirements needed with regards to disability or other issues so that it can be confirmed that means of escape provisions are adequate.

6.1 Making Changes to the Building

If alterations to the building structure or systems are required to meet the egress needs of people with disabilities, this work will need to be carried out as soon as possible. It is important to remember that such work may affect the Fire Certificate for the building and require the consent of the local authority. If it is likely that some time will be taken to make changes, it is worth looking at temporary measures or arrangements to ensure safe egress for people with disabilities.
It is recommended that, during any refurbishment works, consideration is given to upgrading the accessibility of the property and enhance facilities for all potential users.

6.2 Communicating the Plan

The emergency egress plan will need to be communicated to all those who have a role to play. Stakeholder groups who may need to know about the emergency egress plan will include:

- fire wardens;
- staff and contractors;
- landlord;
- other tenants or building occupiers;
- general public and visitors;
- fire service; and
- insurers.

The form of communication and the amount of detail provided will depend on which stakeholder group is being targeted. Staff who act as fire wardens will need detailed knowledge of the plan, which is best achieved through training sessions, whilst visitors will need only basic information, perhaps delivered via signage, verbally at reception or by public announcement at the start of a seminar for example. People with disabilities who are the subject of a PEEP will need to have full understanding of all aspects which affect them directly. The most effective form of communication for staff will be a combination of awareness sessions, documentation and drills. The fire service may be interested in visiting the premises to familiarise the operational crews with the emergency egress plan and to establish that it will co-ordinate with their fire-fighting procedures.

6.3 Evacuation Aids

Some equipment is available to assist people with disabilities and those managing the evacuation process. Equipment is available to make the giving of warnings about an emergency more effective, to provide assistance with wayfinding and to make movement towards escape, particularly vertically, easier.

Evacuation chairs

Ascending or descending stairs remains the most difficult part of escape travel for people with mobility impairments. As mentioned elsewhere, the use of passenger lifts for emergency evacuation is not advised due to the potential for people to be trapped if the power supply is interrupted and the dangers of the lift being opened inadvertently on the fire floor with the potential to expose occupants to danger. In buildings not equipped with evacuation lifts, the normal approach is for those requiring assistance with mobility to move or be moved to safe areas, where they are protected from the fire, to await the assistance of trained staff. Where wheelchair users need to be evacuated up or down stairs, it is not considered safe to evacuate them in their own chairs as this poses unacceptable risks to those providing assistance as well as the person in the chair.

Commercially available evacuation chairs can be used to evacuate people downwards in a controlled manner. The chairs are designed to fold into a compact size for storage within protected escape stairs. Suppliers of the chairs provide training on their operation, which needs to be given to a sufficient number of people to ensure adequate levels of trained personnel are available at all material times. The person requiring assisted escape must first transfer to the evacuation chair and may require assistance. The descent of

the chair is under the force of gravity and chairs are fitted with a braking system that allows the rate of descent to be controlled by a single person. Evacuation chairs are not designed for upwards escape, such as would be the case for basements.

Other devices are available that can ascend or descend stairs using a battery-powered motor. These can be divided into devices which require no attachments to be fitted to wheelchairs in advance and those which do. The former devices involve a tracked platform or support frame onto which a user's wheelchair is strapped. A battery-powered motor enables the platform to ascend or descend stairs with minimal effort on the part of the assistant. Other stair-climbing devices require a bracket to be fitted to the wheelchair to be evacuated, onto which the device is attached when needed. This means that stair climbing devices are generally only suitable for evacuation of staff members or others whose presence in the building can be anticipated, and to whose chairs the necessary brackets have been pre-fitted. It might be possible to make stair climbers of more general use by fitting brackets to a spare conventional wheelchair which is stored at the vertical escape route.

The choice of evacuation aid will be informed through the preparation of a risk assessment. Technological advances are being made in the design of evacuation aids as industry reacts to increased demand brought about by the introduction of legislation. It will be important, therefore, for building managers to keep abreast of innovations.

Figure 10: Example of evac+chair in use
(courtesy of Evac+Chair International Ltd)

If evacuation chairs are to be used, the following points must be considered:

- the location and number of evacuation chairs required depends on the number of people anticipated to require assistance and other factors, such as the density of distribution of people around the building and the number of floors served by each stair. It would be good practice to provide a minimum of one evac+chair within each refuge;
- the need for wheelchairs to be available for onward transportation outside the building or for personal chairs to be brought to the egress floor at the same time;
- the time required for transfer to and from the chair;
- the acceptability of use of evacuation chairs in fire drills;
- the need for training on transferring and operation of evacuation chairs; and
- the fact that it might be very difficult or impossible for a wheelchair user to transfer to an evacuation chair or that some people might be unwilling to transfer for personal reasons.

The presence of a tactile corduroy warning surface at the bottom of stairs can pose a difficulty for certain evacuation chairs due to the small wheel size used. Although current guidance in TGD M requires the provision of this type of tactile warning, some of the more recently produced codes in the UK have moved away from its provision at internal flights.

As discussed above, the use of an evacuation chair will require the transfer of a wheelchair user from their personal chair to the evacuation chair. This can be difficult for some people depending on their particular condition. Reluctance to use an evacuation chair may arise from a lack of confidence in the staff or equipment, or from concerns about aggravating a particular condition or injury. Evacuation chairs are not customised to fit individual users needs and there may be some discomfort experienced during the evacuation. It is possible that someone might refuse to transfer to the evacuation chair, creating a problem for the staff who are assisting. In such cases, the development of a PEEP provides an opportunity for discussion and evaluation of options.

The use of an evacuation lift will always be the best option for the vertical escape of those who require assistance. In buildings where an evacuation lift is not provided, and people are unable or unwilling to use an evacuation chair, then the building management will need to make every effort to instil confidence in the person with a disability that those operating the evacuation chairs are fully trained and capable. If this is not achievable, the organisation will need to give consideration to restricting access for some people to areas from which safe egress can be guaranteed.

6.4 Staff Training

The presence of trained staff to assist with the evacuation of a building can add considerably to the level of safety achieved and reduce the time taken to escape. Staff intervention can have a very real impact in situations where visitors who are not familiar with the building are present, where people have mobility problems or where people are involved in activities to which they are very committed.

Effective staff intervention can reduce response and recognition time for people with disabilities and can enable staff to safely assist those who need help with getting around.

In some situations, staff intervention is absolutely essential, for example where a person who uses a wheelchair to move around needs to descend an escape stairway to get to safety. It is a common misconception that management responsibility ends with getting people with disabilities to the safe areas on upper floors and the Fire and Rescue Service will do the rest. Whilst fire fighters will, no doubt, do whatever is necessary to save life, it is of enormous benefit if the evacuation of people with disabilities is started before the fire service arrives at the scene, so that fire fighters are free to concentrate on other aspects of dealing with the incident. It is the responsibility of the building management to make every effort to get everyone to safety. It is, therefore, essential that organisations provide sufficient levels of trained staff to deal with the safe evacuation of everyone in the building.

Staff can also be trained in the appropriate and safe use of first aid fire-fighting equipment. However, only competent and willing personnel should be encouraged to attend this specific training.

To enable the safe egress of people with disabilities, particular emphasis needs to be placed on the training of staff in the following areas:

General evacuation procedure training

All staff require a level of training on the emergency procedures that have been put in place for the building. This should form part of induction training for new staff.

Specific evacuation procedure training

Those staff who are given particular responsibilities in an emergency evacuation, such as fire wardens, will need more in-depth training to enable them to complete their duties successfully and safely. Staff members with PEEPs will require appropriate training and support to ensure the PEEP can be implemented safely.

General disability awareness

It is important that staff who will be required to intervene in an emergency evacuation have an understanding of general disability issues. This will enable them to appreciate the difficulties faced by people with disabilities and to anticipate the type of assistance that might be required. Of particular importance is an understanding of cognitive and mental health impairments and an appreciation of "hidden" disabilities that might be overlooked. Staff should be trained in techniques to minimise the panic that some people with cognitive or mental health impairments may experience in the event of an emergency evacuation, and the importance of providing and reiterating clear instructions on evacuation procedures.

Assisting with mobility

Staff will need specialist training on particular aspects of assisting with mobility. Examples might include the transfer of people from a bed or personal wheelchair into an evacuation aid, or the safe use of an evacuation chair used to descend stairs. Manual handling training is also required so that staff know how to safely manage heavy or awkward loads.

Communications training

It may be necessary for staff to have the ability to communicate with people who have hearing impairments. This might require a number of staff to have a basic understanding of sign language.

An important aspect of staff training is to ensure that there are sufficient people trained to provide adequate cover at all material times. This means that sufficient numbers of trained staff must be available to cope with contingencies such as absences due to holiday or illness, out-of-hours use of buildings, or abnormal occupancy levels. At times, it may be possible to have unusually high numbers of people with disabilities in a building simultaneously. In such circumstances, it is essential that the appropriate number of trained staff is available.

A further imperative for staff training is that it is refreshed at regular intervals and that a system is in place to ensure that staff turnover does not create gaps in cover.

6.5 Evacuation Drills

BS5588-12 recommends that the emergency evacuation plan and procedures be tested twice yearly and that a full evacuation be carried out once each year. Testing procedures and running

evacuation drills demonstrates that the emergency evacuation plan is valid, enables fine tuning of the plan and ensures that staff are familiar with the steps to take and have had a chance to practice. It is important for procedures testing and drills to reflect actual evacuations. This may include having people with disabilities involved in the exercises or having role players. The maximum benefit is achieved from testing and drills if a debriefing takes place after each and the learning that results is used to review the plans and procedures.

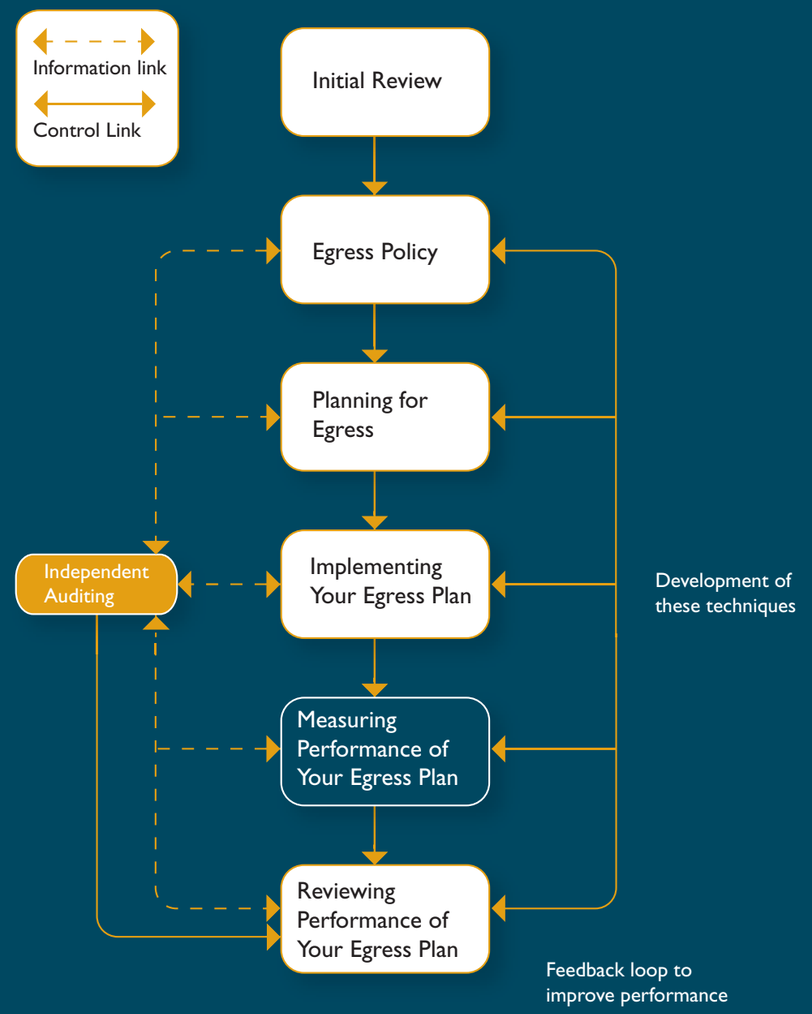
Drills can be either announced or unannounced and it is preferable that both take place. Announced drills are useful for training purposes but unannounced drills will enable the effectiveness of the procedures to be tested. It must be remembered that drills do not always accurately reflect the situations that can arise in a real emergency such as the presence of smoke, flame or injured people. Allowances need to be made in the emergency plan for these eventualities.

It is essential that accurate records of all drills are kept to comply with health and safety legislation and to ensure that any corrective action required is implemented.

6.6 Implementing Your Egress Plan – Summary

- Carry out any alterations required to meet the egress needs of those with disabilities;
- Communicate the plan to all those who need to know;
- Consider simple aspects of building use that impact on the egress plan;
- Investigate the use of evacuation aids such as evacuation chairs;
- Develop staff training programmes to cover all aspects of the egress plan; and
- Arrive at a schedule for emergency evacuation drills (twice per year), both announced and unannounced.

7 Measuring Performance of Your Egress Plan



Introduction

Measurement is essential to ensure egress performance is kept at a high level. When performance falls below this level then corrective action should be taken. Procedures to monitor, measure and record egress on a regular basis should be developed along with other key health and safety performances indicators. Records should be kept in the Fire and General Records Register as required by health and safety legislation.

This section will help to meet the following aims of the document:

- **Aim 2** – to impart the ability to identify egress features that are normally designed into buildings and the capability of using this information in preparing risk assessments and emergency evacuation plans;
- **Aim 3** – to give guidance on providing safe egress for people with disabilities; and
- **Aim 4** – to identify good practice in relation to safe egress for people with disabilities.

7.1 Demonstrating Performance

Good egress performance could be demonstrated by showing evidence that:

- monitoring takes place at least annually during live drills;
- scenarios are included in fire drills to replicate eventualities, such as the loss of an exit due to fire;
- egress policy reflects current situations;
- the egress system provides effective monitoring and reporting on performance;
- the evacuation plan is modified to deal with changing circumstances;
- someone at senior management level has executive responsibility for ensuring safe egress;
- management at all levels take ownership of egress responsibilities;
- an egress risk assessment process is in place and remains effective;
- significant egress failures are formally identified and recorded and that appropriate corrective action is taken;
- PEEPs are reviewed at least annually; and
- inspections and tests have been carried out and records maintained.

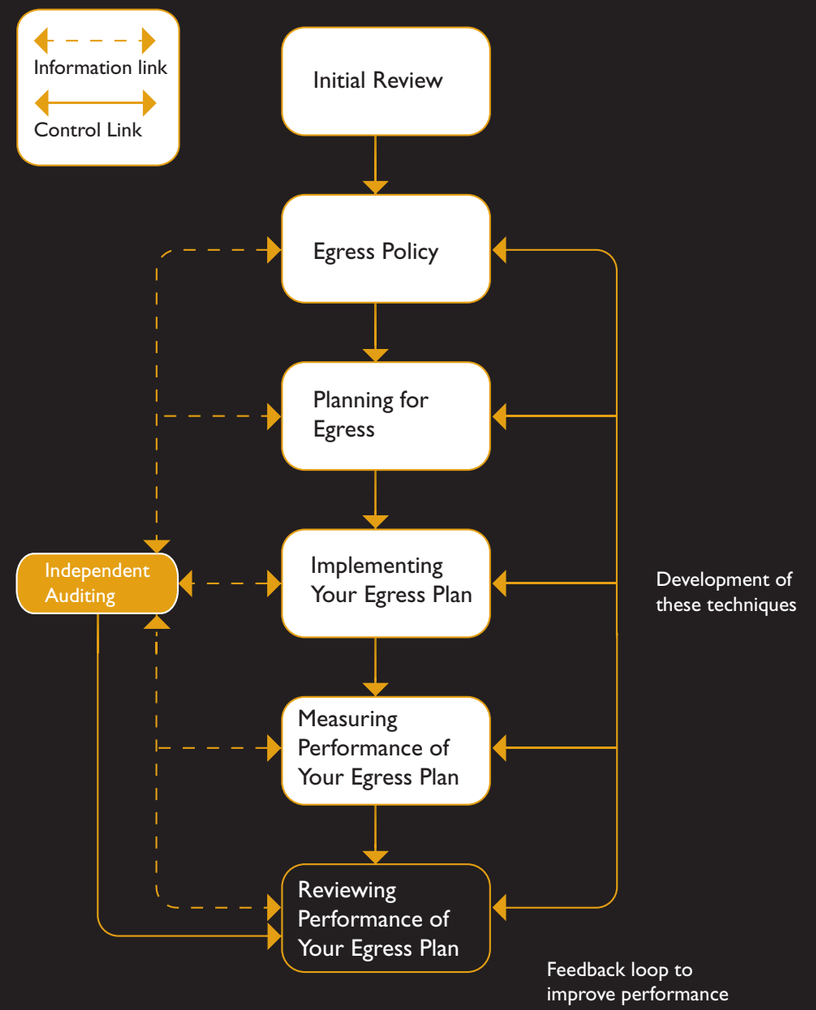
Some examples of measurements that could be of benefit include:

- availability of fire wardens or PEEP buddies;
- occupation levels as a percentage of the total potential occupancy;
- evacuation times for fire drills;
- satisfaction of people affected;
- level of staff knowledge with egress procedures;
- level of liaison with Fire and Rescue Service;
- levels of maintenance of fire safety systems and aids;
- frequency and nature of "near misses" during evacuations;
- frequency and timing of fire safety training; and
- number of staff meetings held to discuss egress plans.

7.2 Measuring Performance of Your Egress Plan – Summary

- Develop a range of measurements that allow the performance of the egress plan to be quantified; and
- Regularly measure performance, report to senior management and ensure that appropriate action is taken.

8 Reviewing Performance of Your Egress Plan



Introduction

Testing of the emergency egress plan is necessary to ensure that it has met the objectives established at the initial review. Once implemented, regular reviews are required to ensure that the plan continues to deliver and remains appropriate to deal with changes in circumstances.

This section will help to meet the following aims of the document:

- **Aim 2** – to impart the ability to identify egress features that are normally designed into buildings and the capability of using this information in preparing risk assessments and emergency evacuation plans;
- **Aim 3** – To give guidance on providing safe egress for people with disabilities; and
- **Aim 4** – To identify good practice in relation to safe egress for people with disabilities.

8.1 Regular Reviews

Some examples of changes that could require alterations to the emergency egress plan include:

- alterations to the building construction, layout or systems;
- changes to accessibility of the building;
- changes in Fire and Rescue Service response or procedures;
- changes to legislation;
- changes in staffing levels;
- changes in the number of people with disabilities employed;
- changes in the services provided or products available from the building;
- changes in current good practice; and
- outcomes from fire risk assessments.

Regular reviews will ensure that management have continuing confidence in the plan and will indicate the need for amendment or redesign.

The organisation will need to decide on the frequency of reviews and come up with appropriate methods for reviewing the plan. The aim of each review is to come up with required actions and have these assigned to individuals for action within an agreed timeframe. If serious defects with the plan are identified, it will be necessary to react quickly to ensure that safe egress is maintained for all.

To enable reviews to be carried out, it is necessary to have access to the measurements outlined in Section 7. An assessment will need to be made of the accuracy of the information gathered through these measurements.

Techniques that can be used to assist with reviews include:

- desktop appraisals of measurement information;
- involvement of external agencies such as the Fire and Rescue Service in participating or monitoring drills;
- systematic inspection of fire safety measures and the recording of defects noted;
- surveys of staff, building users and visitors to establish effectiveness of evacuation provision; and
- networking and benchmarking with other organisations and industry professionals.

The outcome of the review process should be a continually evolving and increasingly robust emergency evacuation plan.

A further desired outcome from regular reviewing should also be the identification and implementation of good practice and improvements in technology.

8.2 Audit

The review process described above will normally be carried out by those who developed and implemented the emergency egress plan. It will also be necessary to have the plan independently audited periodically. This has the benefits of enabling a fresh look to take place, of allowing other ideas to come forward and of giving some rigour to the checking process. Independent audits should be carried out to an agreed timeframe, perhaps one year after implementation and then at longer intervals subsequently. The independent review could be carried out by someone responsible for safe egress in another branch of the organisation, for example, or through a reciprocal arrangement with an unrelated organisation. Alternatively, it may prove beneficial to engage the services of a health and safety or fire safety professional to carry out the audit. As with any review feedback, it is important that senior management are aware of performance, that people are given responsibility to act on recommendations and that appropriate resources are available to make necessary changes.

8.3 Reviewing Performance Of Your Egress Plan – Summary

- Monitor performance of the egress plan against the objectives set;
- Regularly review the plan in the light of changing circumstances, both internal and external; and
- Have independent audits carried out at agreed intervals.

9 Conclusion

Through the use of this document, the designated manager with responsibility for safe egress should have a clearer understanding of the issues requiring consideration for people with disabilities.

It should be noted that the building, its usage and the varying levels of ability of the potential occupants dictate that the assessment of the suitability of the means of escape must be case-specific. Generic assessments and broad brush policy approaches are not likely to be suitable.

Inherent in successful egress management will be the communication and agreement of the egress procedures with those likely to require assistance, in order to instil confidence that the arrangements are sufficiently robust and effective to ensure the expedient and safe evacuation of all.

In some buildings, it may not be possible to discuss procedures or assess the specific needs of all visitors to the building. In such circumstances, it may be necessary to consult widely to ensure that, as far as practicable, every eventuality has been considered. In every circumstance, the implementation of the management system outlined in this document should ensure that suitable evacuation strategies are deliverable.

The key elements of the management system are:

- carry out an initial review;
- develop an egress policy;
- plan for safe egress;
- implement your egress plan;
- measure the performance of your egress plan; and
- review the performance of your egress plan.

Appendix List

1. Glossary of Terms
2. PEEP Questionnaire and Template
3. Risk Assessment Checklist
4. Further Information

Appendix 1

Glossary of Terms

Accessibility

Ease of independent approach, entry and/or use of a facility with an assurance of individual health, safety and welfare during the course of those tasks, usually to a widely accepted standard such as BS8300.

Compartment

A part of a building (comprising one or more rooms, spaces or storeys) constructed to prevent the spread of fire or smoke from another part of the same building.

Disability

Disability in relation to a person means a substantial restriction in the capacity of the person to carry on a profession, business or occupation in the State or to participate in social or cultural life in the State by reason of an enduring physical, sensory, mental health or intellectual impairment – Disability Act (2005).

Egress

Independent emergence of user(s) from a building and immediate vicinity.

Evacuation chair

An evacuation chair can facilitate the transfer of people with significant physical disability in event of emergency egress. It is a purpose-designed unit which is usually wall-mounted and stored in a refuge area or in a prominent position on the route of escape. These units are not suitable for transfer of all people with disabilities and staff assisting should be trained in their use.

Evacuation lift

A lift designated to have additional protection, with controls that enable it to be used under direct control of the fire brigade or a competent person to assist with evacuation.

Fire-fighting lift

A lift designated to have additional protection, with controls that enable it to be used under direct control of the fire brigade in fighting a fire.

Fire resistance

The inherent capability of a building assembly, or an element of construction, to resist the passage of heat, smoke and flame for a specified time during a fire.

Fire safety strategy

A coherent and purposeful arrangement of fire protection and fire prevention measures which is developed in order to attain specified fire safety objectives.

Inclusive design

Design of an environment that can be used equally by everyone, regardless of disability, age, ethnicity or gender.

PEEP

Personal Emergency Egress Plan is a way of matching the capabilities of an individual building to the needs of individual employees with disabilities.

Refuge area

A building space directly adjoining, and visible from, a main vertical evacuation route – robustly and reliably protected

from heat, smoke and flame during and after a fire – where people may temporarily wait with confidence for further information, instructions and rescue assistance without obstructing or interfering with the evacuation travel of other building users.

Safety zone

Refer to refuge area (above).

Signage

Type of graphics created to display information or directions of a particular location.

Tactile

Profiled surface or finish providing guidance or warning to people with vision impairments, e.g. blister paving is a style of tactile paving used to provide guidance at crossings.

Two-way communication system

This system allows communication typically between occupants of a refuge area and a management control point during evacuation.

Wayfinding

This is the process of identifying, travelling along and adhering to a suitable route – usually comprising two main components – the negotiation of obstructions or features and navigation of a route or direction.

Appendix 2

PEEP Questionnaire and Template

PEEP Questionnaire and Template

Emergency Egress Questionnaire

1. Why you should fill in the form

As your employer, _____
has a legal responsibility to protect you from fire risks and ensure your health and safety at work. To do this properly we need to know:

- if you require information about our emergency egress procedures; and
- if you need assistance during an emergency.

It shouldn't take you more than a few minutes to complete the form.

2. What will happen when you have completed the form

We will be able to provide you with information you need about the emergency egress procedures in the building(s) in which you work.

If you need assistance, we will be able to work out a 'Personal Emergency Egress Plan' for you. To do this, we will discuss the best ways of getting you out quickly and comfortably. We will involve you, your manager and the person(s) in charge of the building(s) in which you work. But don't worry; we do not see you as the problem – you are not a safety risk. The problem belongs to us and the building in which you work.

Name _____

Job Title _____

Department _____

Brief Description of Duties _____

_____

_____

Location

1. Where are you based for most of the time?
   Please name the building, the floor and the room number.

   _____

   _____

   _____

2. Will your job take you to more than one location in the building in which you are based?

   Yes ☐ No ☐

3. Will your job take you to different buildings?

   Yes ☐ No ☐

Awareness of Emergency Egress Procedures

4. Are you aware of the emergency egress procedures that operate in the building(s) in which you work?

   Yes ☐ No ☐

5. Do you require written emergency egress procedures?

   Yes ☐ No ☐

   5a. Do you require written emergency egress procedures to be supported by ISL interpretation?

   Yes ☐ No ☐

   5b. Do you require emergency egress procedures to be in Braille?

   Yes ☐ No ☐

   5c. Do you require emergency egress procedures to be on tape?

   Yes ☐ No ☐

   5d. Do you require emergency egress procedures to be in large print?

   Yes ☐ No ☐

6. Are the signs which mark the emergency exits and the routes to the exits clear enough?

   Yes ☐ No ☐

Emergency Alarms

7. Can you hear the fire alarm(s) provided in your place(s) of work?

   Yes ☐ No ☐ Don't know ☐

8. Could you raise the alarm if you discovered a fire?

   Yes ☐ No ☐ Don't know ☐

Assistance

9. Do you need assistance to get out of your place of work in an emergency?

   Yes ☐ No ☐ Don't know ☐

If No, please go to Question 13

10. Is anyone designated to assist you to get out in an emergency?

    Yes ☐ No ☐ Don't know ☐

If No, please go to Question 12. If Yes, give name(s) and location(s).

_____

_____

11. Is the arrangement with your assistant(s) formal (that is, is the arrangement written into their job description)?

Yes ☐ No ☐ Don't know ☐

11a. Are you always in easy contact with those designated to help you?

Yes ☐ No ☐ Don't know ☐

12. In an emergency, could you contact the person(s) in charge of evacuating the building(s) in which you work and tell them where you are located?

Yes ☐ No ☐ Don't know ☐

Getting Out

13. Can you move quickly in the event of a fire?

Yes ☐ No ☐ Don't know ☐

14. Do you find stairs difficult to use?

Yes ☐ No ☐ Don't know ☐

15. Are you a wheelchair user?

Yes ☐ No ☐ Don't know ☐

Thank you for completing this questionnaire. The information you have given us will help us to meet any needs for information or assistance you may have.

Remember, we do not see you as the problem – you are not a safety risk. The problem belongs to us and the building in which you work.

Please return your completed form to

_____

_____

_____

Personal Emergency Egress Plan

Name _____

Date _____

Position _____

Designated Assistance _____

_____

_____

Assistance Methods/Techniques

_____

_____

_____

Equipment Provided

_____

_____

_____

Emergency Evacuation Procedure(s) (a step-by-step guide, from alarm to safety, of the evacuation procedures from different floors and buildings):

_____

_____

_____

Evacuation Route(s): (preferably with diagrams)

_____

_____

_____

Appendix 3

Risk Assessment Checklist

Risk Assessment Checklist

The checklist below can be used to inform an appropriate plan of action, including the name and role of responsible persons and timeframes, which will ensure that a safe built environment is maintained for all people, regardless of ability.

Ref	Policy	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
1	Does a risk-based emergency evacuation policy exist?						
2	Does the policy meet current legal requirements and/or best practice?						
3	Is the policy known to premises managers and being implemented fully?						
4	Is the policy available in large print, Braille, tape or other alternative formats upon request?						

Ref	Procedures	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
5	Do written procedures for the evacuation of people with disabilities exist?						
6	Are the procedures tested regularly?						
7	Do the procedures take account of : walk through procedures; announced drills; and unannounced drills?						
8	Are there procedures to identify the number and location of people requiring assistance within the building?						

Ref	Procedures (continued)	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
9	Are procedures in place for people with disabilities to make their needs known to staff?						
10	Can existing evacuation procedures cope with the maximum number of people with disabilities likely to be present?						
11	Are measures in place to control access to the building should existing coping mechanisms be at full capacity?						

Ref	Procedures (continued)	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
12	Has account been taken of the likely presence of guide dogs? (NB It is not recommended that any evacuation strategy should suggest separating a dog from its owner)						
13	Are procedures and information regarding the use and non-use of lifts in an emergency in place?						
14	Are pictorial symbols included on all fire evacuation signs?						
15	Do fire exit signs indicate which exits are suitable for wheelchairs?						

Ref	Procedures (continued)	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
16	Are ground floor fire exits level or ramped and is there a suitable external surface?						
17	Are emergency exits checked regularly to ensure they are not blocked or impassable?						
18	Are fire procedure notices, including procedures for the evacuation of anyone requiring assistance, displayed within the building?						
19	Has consideration been given to allowing able-bodied people to evacuate independently of people with disabilities?						

Ref	People	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
20	Is a responsible person nominated to hand over information to Fire and Rescue Services, including information about the presence of people with disabilities and their particular disability? (Give details of nominated person)						
21	Does a means exist for assessing the extent of any assistance that people with disabilities are likely to require?						
22	Is the location of people with disabilities within the building known?						

Ref	People (continued)	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
23	Has a 'buddy' system been considered, with appropriate backups?						
24	Does the 'buddy' system take into account all working patterns?						
25	Has appropriate training in evacuation been given to all 'buddies'?						
26	Have people with disabilities working as lone or sole workers been accounted for and appropriate evacuation measures adopted?						

Ref	People (continued)	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
27	Has provision been made for people with disabilities once they have been evacuated from the building (especially if wheelchair users have been evacuated without their wheelchair)?						
28	Has a full assessment of the needs of disabled staff members been conducted?						
29	Have additional safety measures been identified?						
30	Have the measures been implemented?						
31	Is there a need for a PEEP for any staff member?						

Ref	People (continued)	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
32	Is the PEEP available in the appropriate format?						
33	Is sleeping accommodation present in the building which requires additional equipment or measures?						
34	Have the additional equipment/measures been provided?						
35	Are detailed and up-to-date records kept on staff training, e.g. evac+chair, fire warden, fire extinguisher, first aid, 'buddy' training?						

Ref	Premises or plant	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
36	Have suitable refuges been provided?						
37	Are appropriate communications available within each refuge?						
38	Are escape routes clearly signed?						
39	Is emergency lighting sufficient for people with vision impairments?						
40	Are doorways wide enough for wheelchair egress?						
41	Does the direction of opening of doors hinder the movement of a wheelchair?						

Ref	Premises or plant (continued)	Yes	No	Signpost to evidence / comments	Action / decision	Action by	When
42	Are ramps available on egress routes?						
43	Have visual or sensory alarms been provided for people with poor sight?						
44	Are handrails provided on both sides of stairs?						
45	Does any fire or safety equipment need to be adapted to suit the needs of a person with a disability?						
46	Is all safety equipment subject to regular testing and maintenance?						
47	Are reporting procedures in place for defective equipment?						

Appendix 4

Further Information

Further Information

BS5588, Part 8: 1988, **Fire Precautions in the Design, Construction and Use of Buildings – Code of Practice for Means of Escape for Disabled People**, The British Standards Institution (1988)

BS5588, Part 12: 2004, **Fire Precautions in the Design, Construction and Use of Buildings – Managing Fire Safety**, The British Standards Institution

BS7974: 2001, **Application of Fire Safety Engineering Principles to the Design of Buildings – Code of Practice**, The British Standards Institution

BS8300: 2001, **Design of Buildings and Their Approaches to Meet the Needs of Disabled People – Code of Practice**, The British Standards Institution

Buildings for All to Use – Good Practice Guidance for Improving Existing Public Buildings for People with Disabilities, CIRIA (2004)

Peter Barker, Jon Barrick and Rod Wilson, **Building Sight**, HMSO in association with the Royal National Institute of the Blind (1995)

Code for Lighting, Chartered Institute of Building Services Engineers (2000)

Creating Accessible Environments, College of Estate Management Training Study Pack (2005)

Designing for Accessibility, CAE (2003)

Planning and Access for Disabled People – A Good Practice Guide, Office of the Deputy Prime Minister (2003)

Peter Parker and June Fraser, **Sign Design Guide**, JMU and the Sign Design Society (2000)

How to Develop and Implement a Safety and Health Management System, Health and Safety Authority Guidance Document for the Healthcare Sector

NDA, **Building for Everyone**, The National Disability Authority, Dublin (2002)

The Building Regulations (Ireland), **Technical Document M 2004 – Access for People with Disabilities** (1997-2006)

The Building Regulations (Ireland), **Technical Document B 2006 – Fire Safety** (1997-2006)

The Building Regulations (Northern Ireland), **DFP Technical Booklet E 2005 – Fire Safety** (2000)

The Building Regulations (Northern Ireland), **DFP Technical Booklet R 2006 – Access To and Use of Buildings** (2000)

The Building Regulations (2000), **Approved Document M: Access To and Use of Buildings** (**England and Wales**), Office of the Deputy Prime Minister (2003)

The Building Standards (Scotland) Regulations 1999, Part E 2007: **Means of Escape From Fire, Facilities for Fire-fighting and Means of Warning of Fire in Dwellings**, Scottish Executive

DD9999: 2005, **Code of Practice for Fire Safety in Design Construction and Use of Buildings**

Department of Health, **Firecode – Fire Safety in the NHS – Health Technical Memoranda**

Personal Emergency Egress Plans, The Northern Officer Group (1993)

Access Handbook Template – A Tool to Help Manage the Accessibility of the Built Environment, National Disability Authority

Ask Me – Guidelines for Effective Consultation with People with Disabilities, National Disability Authority

Signage Strategy 2005, National Council for the Blind of Ireland

Dr Karen Boyce, University of Ulster, **FireSert**