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# Foreword

Inclusive design benefits all of us and I welcome this guidance to enable a better understanding of the inclusive design requirements of the Building Regulations.

The Building (Scotland) Regulations 2004 as amended provides the minimum building standards for accessibility to and within buildings which are constructed, converted, altered or extended. This design guide aims to provide additional information and guidance in terms of inclusive design. It does not cover everything or have all the answers but aims to provoke designers into thinking about all of the population when designing facilities.

Produced by the Scottish Association of Building Standards Managers (SABSM) with the support of the Scottish Government's Building Standards Division, formerly the Scottish Building Standards Agency, this document is written in simple language with references to detailed technical guidance.

I am confident the clear guidance and the practical approach this handbook contains will give invaluable information on how to accomplish inclusive design.

I wish to thank all those involved with this work, in particular the SABSM Members who formed the group who worked with the publishers to produce this worthwhile publication, namely, David McDowall, who led the working group, Donald Fullarton, George Brown, Susan Fulton and Derek Brama. I would also like to thank May Giovannetti and Jean Barr for their work on the document and the Local Authorities who contributed some of the photographs for this publication.

**Mervyn Toshner**

**President of the Scottish Association  
of Building Standards Managers**

We very gratefully acknowledge the support of the firms whose advertisements appear throughout this publication.

As a reciprocal gesture we have pleasure in drawing the attention of our readers to their announcements. It is necessary however for it to be made clear that, whilst every care has been taken in compiling this publication and the statements it contains, neither the promoter involved nor the Publisher can accept responsibility for any inaccuracies, or for the products or services advertised.

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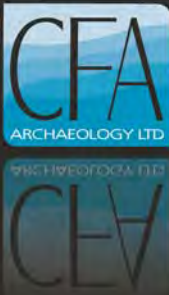


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## Inclusive Design... A Guide

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# SCOTTISH ASSOCIATION OF BUILDING STANDARDS MANAGERS (SABSM)

The Scottish Association of Building Standards Managers had its origins in a meeting held in Stirling, on 24th February 1976, when senior local government officers working in Building Control formed a new association to be known as the "Scottish Association of Chief Building Control Officers". (SACBCO).

This Association continued until 22 October 2003 when Members approved a name change to the Scottish Association of Building Standards Managers (SABSM) to reflect local government evolution and to coincide with the new Building (Scotland) Act 2003. This Act introduced a new procedural system from 2005 designed to reflect the needs of the 21st century, and reflect the European dimension in which building standards now operate.

SABSM membership includes senior managers, who must be principally engaged in provision of the Building Standards service, nominated by all the 32 Scottish Local Authorities. SABSM has a President, Vice-President, Secretary, Treasurer and Assistant Secretary, who, together with the Management Committee, direct the business of the Association. Business conducted by the Management Committee is reported to members at the quarterly general meetings.

SABSM's business has evolved over the last 5 years during the implementation of the Building (Scotland) Act 2003 and currently covers:

- Liaising with the Scottish Government's staff at the Building Standards Division who are responsible for implementing Ministerial decisions in the development of the Building Standards;
- Reviewing new government strategies and legislation affecting the Built Environment;

- Advising on technical matters relating to service provision;  
"<http://www.cosla.gov.uk/>" \t "\_blank" COSLA
- Developing national policy on Building Standards issues;
- Issuing guidance notes to members reflecting best practice across the country;  
"<http://www.sabsm.co.uk/sabsm/guidance.htm>"
- Publishing building standards leaflets to assist the general public and the building industry;  
"<http://www.sabsm.co.uk/sabsm/guidance.htm>"
- Developing training initiatives for Building Standards Managers and Surveyors;
- Management of the Scottish Type Approval Scheme (STAS) which enables developers to seek national approval for domestic housing; and
- Active membership of the Consortium of European Building Control (CEBC).

SABSM gratefully acknowledges the Scottish Government, RIBA publications and the Scottish Local Authorities for permission to reproduce their material in the publication. Whilst every care has been taken to compile the information in this guide, the publishers and promoters cannot accept any responsibility for incorrect information. Building Standards are subject to change and if in doubt you should contact your Local Authority Building Standards office via the link "<http://www.sabsm.co.uk>" [www.sabsm.co.uk](http://www.sabsm.co.uk) to check if the information is still current.

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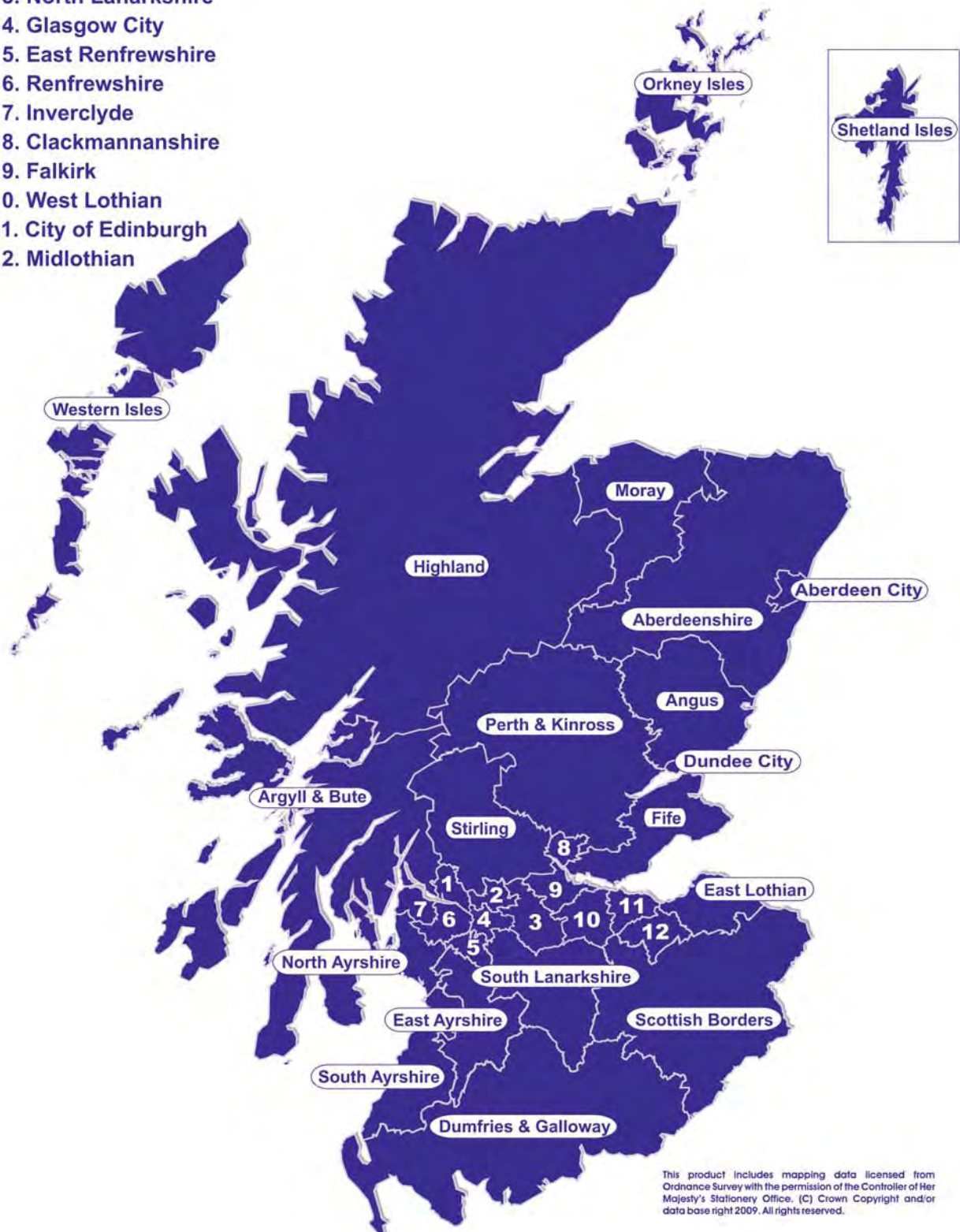
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4. Glasgow City
5. East Renfrewshire
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# DESIGN & ACCESS STATEMENTS

The Planning etc. (Scotland) Act 2006 came onto the statute books in 2006 and at the time of writing, the accompanying regulations (Statutory Instruments) have not yet been published. However, it is recognised that there may be a requirement for a Design and Access Statement to accompany certain applications although the specific details have yet to be finalised.

A design and access statement is simply a document that explains the thinking behind the design process and it should show how the designers have thought about how everyone – irrespective of their age, ability or gender – can use and access the proposed facility. Additional guidance has been produced by the Commission for Architecture and the Built Environment; Design and access statements – how to write, read and use them. Contact information may be found on page 75.





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# INCLUSIVE DESIGN

An inclusive environment is one which can be accessed and used by everyone, irrespective of their age, ability or gender. In order to achieve this designers need to be aware of people's differing abilities and widen the user group they design for.

Inclusive facilities do not just mean buildings but relate to all elements of the surroundings including public open spaces which also serve to link different parts of the built environment together.

By considering people's diversity, inclusive design seeks to provide an environment which addresses everyone's varying needs. To do this, designers should involve potential users at all stages of the design process; from the design brief stage to the detailed design. One method of meeting this requirement is to involve Access Panels.

## Access Panels

Access Panels are members of the community who either have a disability or have an interest in accessibility issues. The vast majority of the 32 local authorities in Scotland have an associated Access Panel and some local authorities employ individuals in the capacity of an Access Officer. However the title differs for each authority and the person is not always employed within Building Standards. A full list of local authorities can be found at [www.sabsm.co.uk](http://www.sabsm.co.uk)

The remit of the Panels vary but some review planning and building warrant applications and will provide comments on the design based on their own personal experience rather than technical guidance. If designers want to be inclusive they should contact the Access Panel for that particular geographical area. Contact details may be held by either the local authority for that area or the Scottish Disability Equality Forum – [www.sdef.org.uk](http://www.sdef.org.uk)

The Panel will be happy to discuss the proposals at the earliest opportunity and the ethos of many Panels is if a facility is accessible for someone with a disability then it will be accessible for the majority of the community. Contact at the earliest possible stage means that any changes may be made at the drawing stage and not later on in the design process which may be expensive. If a facility is inclusive it will also be sustainable as expensive retrofits may not be required.



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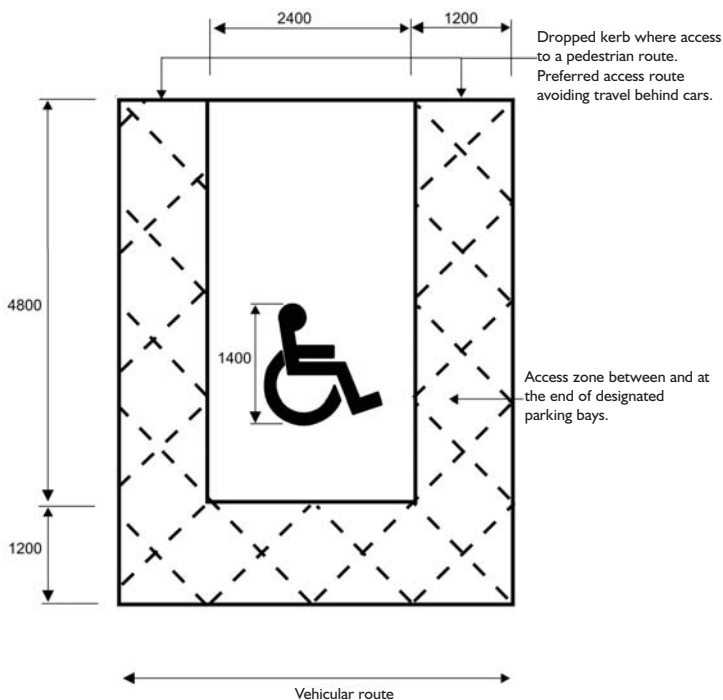
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## Car Parking and Drop Off Points

Access to a building or facility is important irrespective of whether people arrive on foot, by car or bus.

- For some disabled people, car access is vital. In car parks, provision should be made for blue badge holders which should be as close to the main entrance as possible (within 45m). It is also advisable to provide this parking in an area where people do not have to cross roads.
- The surface of a designated parking bay should be firm and level, slip resistant and have a 1200mm transfer zone alongside and at the rear of the vehicle. A coloured surface to the bay is good practice and readily identifies the area for blue badge holders. Similarly contrasting coloured bays for parent and child parking is also good practice.



Dimensions of parking bay are to centre lines of markings.

**Fig. 1**

- If people need to obtain tickets for pay and display parking, the ticket dispensing machines need to be accessible to wheelchair users and people of short stature. Ideally they should be adjacent to the designated parking and have controls between 750mm and 1200mm from ground level.
- Accessible car parking should be provided on a ratio of 1:20 but this could increase, dependent upon the building type and prospective users.
- It is recognised that bollards sometimes have to be installed in certain locations. If they have to be installed at the end of accessible car parking bays it is important that they are not located at the end of the hatched area which can be used by some wheelchair users to access the adjoining pavement/hard standing area.
- Bollard design is important in that it should be at least 1m high, contrast with the adjoining background and have a contrasting band around the top.
- If a drop off point or setting down point is to be provided, there should be associated dropped kerbs with tactile warning within 45m of the main entrance.
- Signage should be provided to highlight the accessible route to the main entrance.
- Additional guidance on designated parking, ticket dispensing machines, vehicular control barriers, multi-storey car parks and many other issues can be found in BS 8300 Design of buildings and their approaches to meet the needs of disabled people – Code of Practice.



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Regardless of how they arrive at a building, a person should be able to travel conveniently and without assistance to the entrance of that building. The surface should be firm, uniform and of a material finish that will permit ease in manoeuvring and it should provide a degree of traction that will minimise the possibility of slipping.

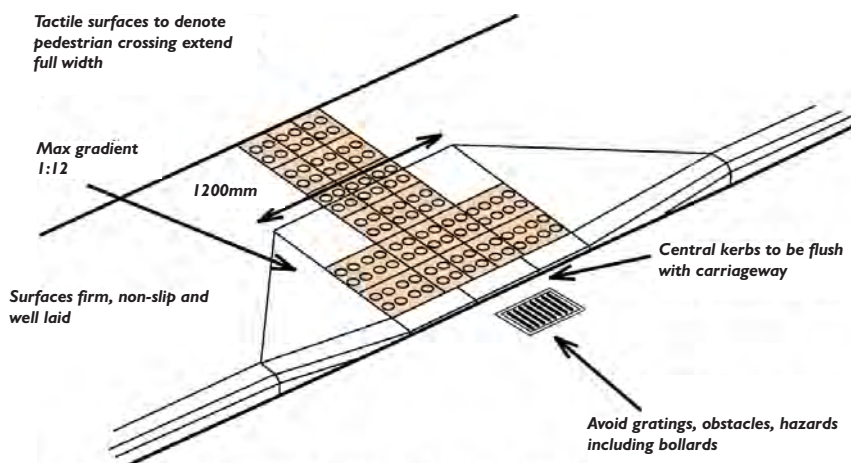
- The use of tactile paving is important for individuals who have a visual impairment to alert them to a potential hazard. More information can be found in Department of Transport publication – Guidance on the use of tactile paving surfaces. When moving about the pedestrian environment, some visually impaired individuals will actively seek and make use of tactile information underfoot, particularly detectable contrasts in surface texture. It is important that the correct warning paving is used:
  - red blister surfaces should only be used at controlled crossings (Zebra, Pelican, Puffin, Toucan and traffic signal junctions with pedestrian phases)
  - contrasting colour usually buff but not red should be used at uncontrolled crossings (side road crossings, busy crossovers (vehicle crossings)), crossings away from junctions, kerb

to kerb flat top road humps, signal controlled junctions without pedestrian phases

- corduroy surfaces should be used for any situation (except at pedestrian crossing points) where visually impaired individuals need to be warned of a hazard; top and bottom of steps, foot of or a ramp to an on-street light rapid transit (LRT) platform but not at any other ramps, level crossing, where a footway / footpath joins a shared surface route.
- Routes of travel across grass or paved areas should be highlighted. This can be achieved by contrasting colour, texture or by directional paving.
- Covers and gratings should be flush with pavings, the maximum gap being 18mm.
- Define footpath edges with either kerb, low rail or a surface change so that cane users can determine the route of travel. However, care should be taken that these elements do not become hazards.
- Low level bollard and chains are particularly hazardous for some people and should be avoided.

**Fig. 2**

*Tactile surfaces to denote pedestrian crossing extend full width*



*This layout is a general detail only. Further advice on exact layouts should be sought from the local Roads Authority*







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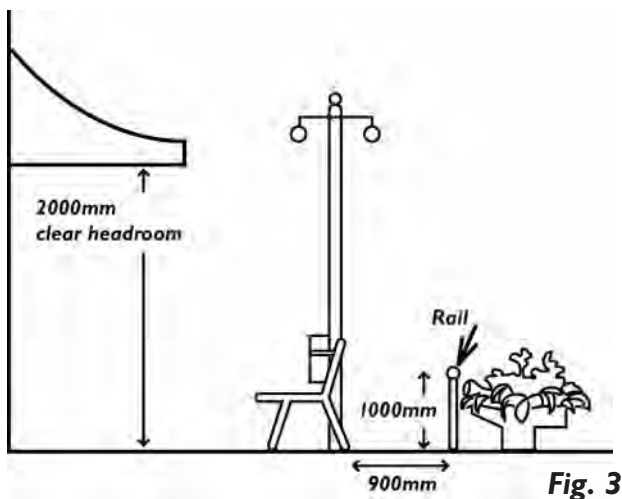
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## External Hazards

### LANDSCAPE FURNITURE

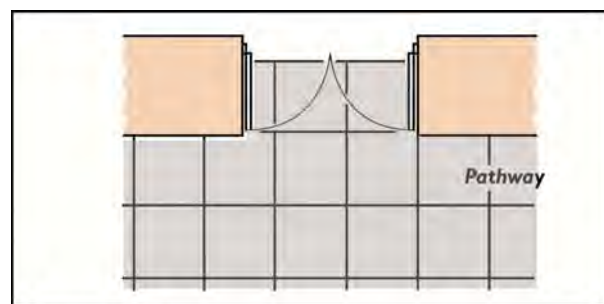
- The provision of landscape furniture requires careful thought. It needs to be made distinguishable from the background, i.e. by colour contrast and should be detectable at low level for people with impaired vision.
- Space should be left either side of fixed seating to allow wheelchair users and buggies to sit at the same area. The fixed sections should contrast in colour with the background.
- Avoid overhangs, especially at ground level.
- Guard against building projections by the use of (1) rails, (2) textured surfaces, (3) kerbs and planting, etc.



- Where possible, lighting columns, signposts, litter bins and seats should be located at or beyond the boundaries of the access route.

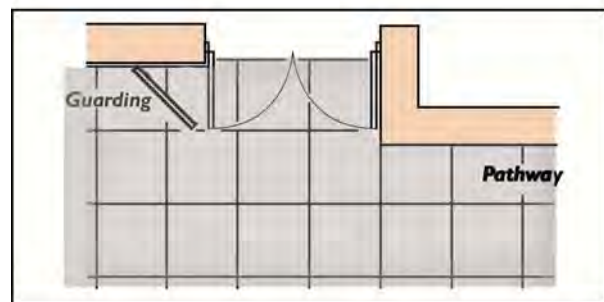
### DOORS

- Doors which open outwards should not cause an obstruction on a path which runs along the face of a building, i.e. recess the doors or provide suitable guarding which should contrast in colour with the background.



*Recessed doors*

**Fig. 4**



*Angled Guarding*

**Fig. 5**



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# ACCESS TO BUILDINGS

## Approach to the Building Including Ramped Access

Everyone has a different preference on how they access a building; some people may prefer to use steps utilising the handrails whilst others may have a preference to use a ramp. Good practice recommends that where there is a difference in level greater than 300mm separate steps should be provided as well as a ramp and these should be clearly signposted.

The gradient of a ramp is important; if it is too steep there is a danger that anyone in a wheelchair may topple over. The severity of the gradient and the associated landing can also have an impact on anyone pushing a wheelchair or buggy.

There should be convenient access into buildings for everyone including disabled people, whether they are visitors to the building or work in it and whether they arrive on foot or in a wheelchair.

- If space outside the principal entrance is restrictive, an alternative accessible entrance in common use should be provided and appropriately signposted.
- Car parking spaces should be provided adjacent to the principal entrance or the accessible entrance in common use.
- The surface of the ramp should be slip resistant and of a colour that contrasts visually with that of the landings.

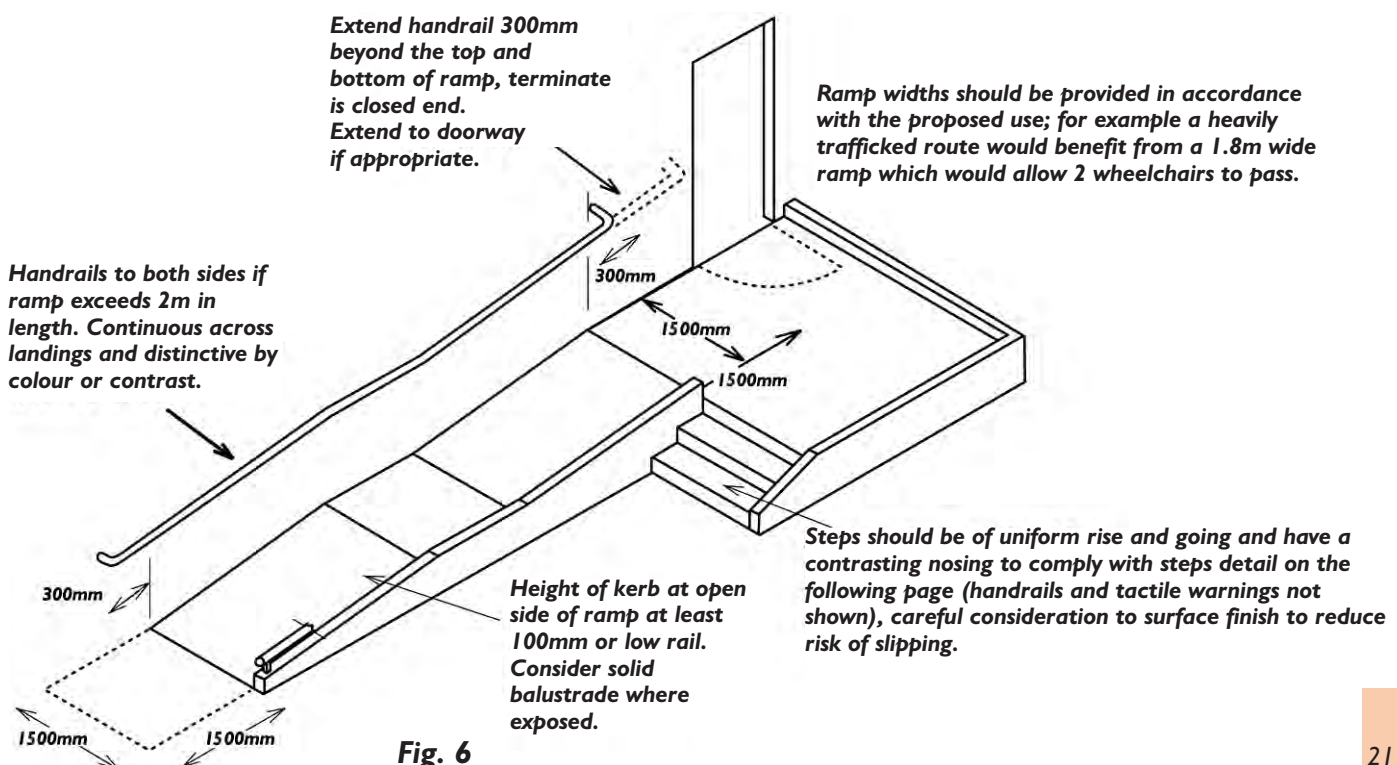
Gradients steeper than 1:12 are not recommended.

- Consideration should be given to the potential users of the building in terms of the ramp width; a potentially busy route might benefit being 1.8m wide so that two wheelchairs/ buggies can pass with ease.
- If shared landing is provided for the steps and a ramp, care should be taken so that the tactile surface is not provided in a location that will interfere with the wheels of buggies or wheelchairs.

**Table 1 Limits for ramp gradients**

Going of a flight	Maximum gradient	Maximum rise
10m	1:20	500mm
9m	1:19	473mm
8m	1:18	444mm
7m	1:17	411mm
6m	1:16	375mm
5m	1:15	333mm
4m	1:14	285mm
3m	1:13	230mm
2m	1:12	166mm

**Notes:**  
Gradients steeper than 1:12 are not recommended.





# ACCESS TO BUILDINGS

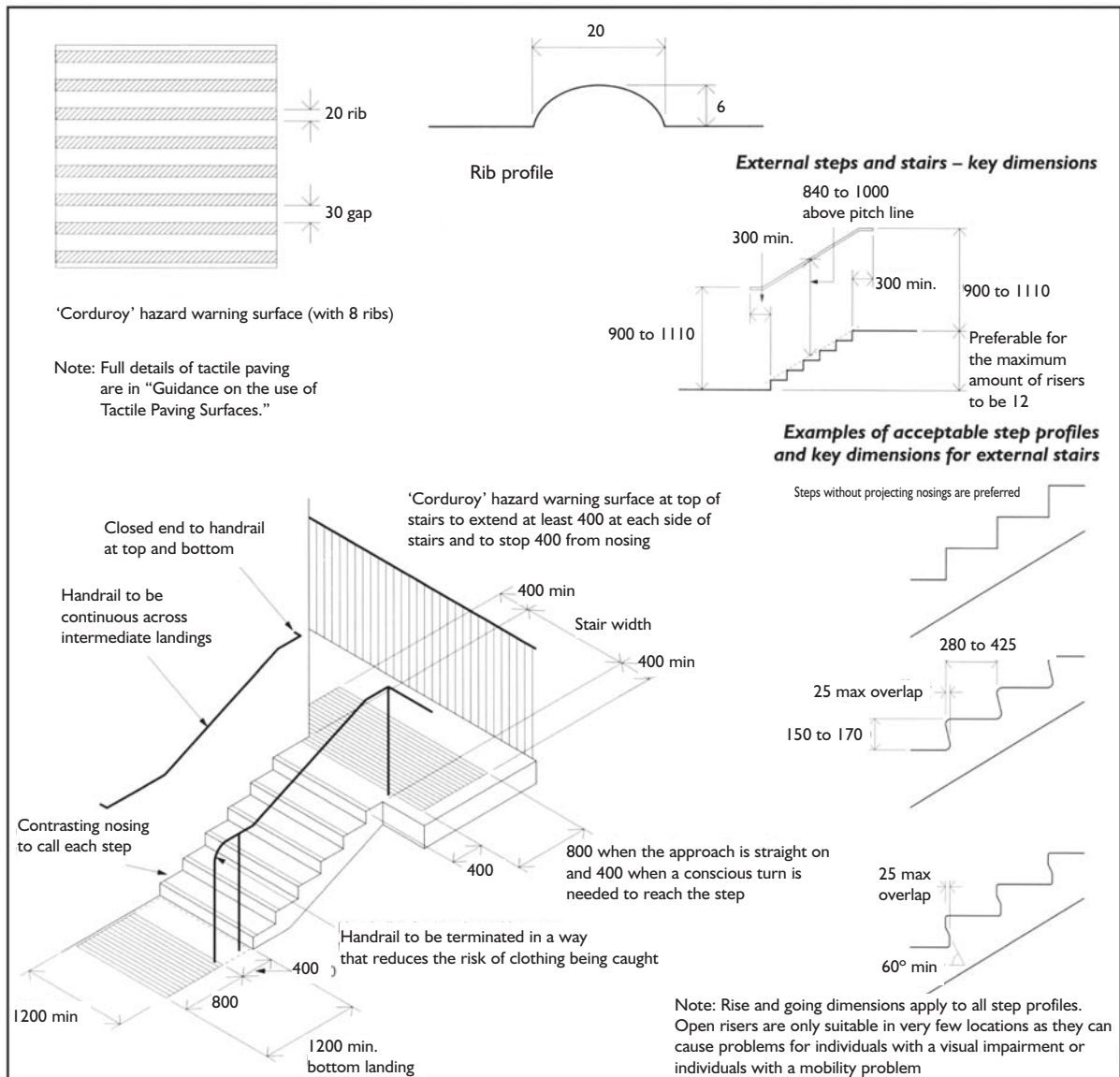
## Stepped Access

Many people use steps in different ways depending upon their age, ability or gender or perhaps even what they are wearing; for example some people prefer to run up or down and cover two or more steps at the same time whilst others may be children or individuals who have a condition which limits their mobility. It is therefore recommended that the design of steps should accommodate the majority of society and the potential users in the given location.

- Ideally, the rise of each step should be between 150mm and 170mm.

- Ideally, the going of each step should be between 280mm and 425mm.
- Rise and going of each step should be uniform throughout the flight.
- Width of the flight should not be less than 1.2m.
- A corduroy hazard warning surface should be provided at top and bottom landings of a series of external flights to give advance warning of a change in level.

**Fig. 7 Stepped access – key dimensions and use of hazard warning surface**

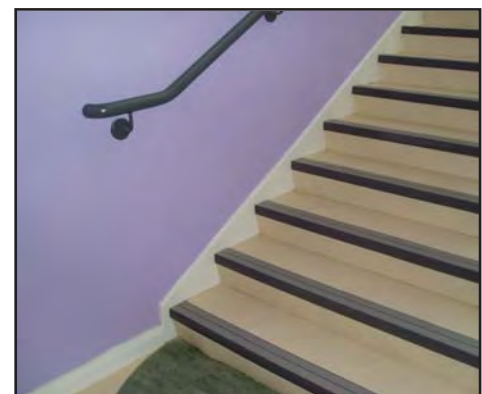
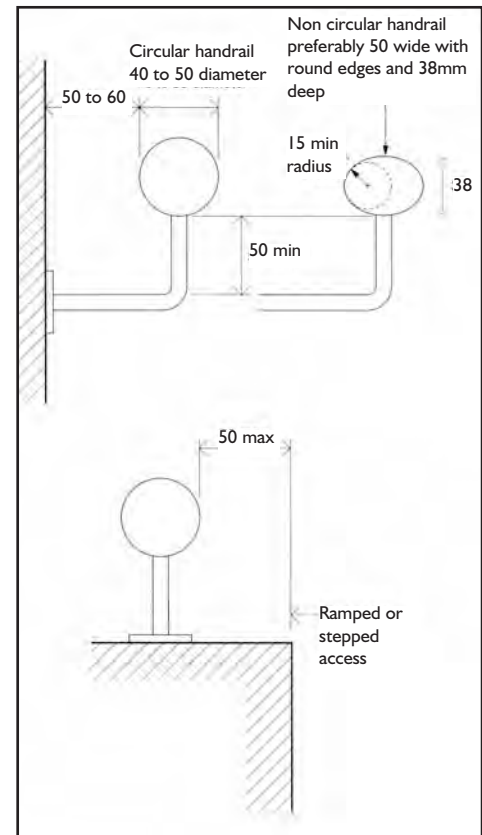


### HANDRAILS

Handrails are an important element associated with steps and ramps. Many people rely on the handrail to steady themselves and they should therefore be provided in a form that is easy to use. Consideration should be given to children when designing handrails.

- Should be between 840mm and 1000mm above the surface of the ramp or stairs.
- Should be continuous along the flights and landings of steps and ramps.
- Should extend at least 300mm beyond the top and bottom of ramps and a flight or flights of steps whilst not projecting onto an access route.
- Should contrast visually with the background without being reflective.
- The surface should be slip resistant and not cold to the touch.
- The profile should be circular with a preferable diameter of between 40mm and 50mm or oval, with a diameter of 50mm.
- Should protrude no more than 100mm into the surface width of ramp or stairs.
- Should have a clearance of between 50mm and 60mm between the handrail and any adjacent wall surface.
- Some people may be weaker on one side, therefore it is good practice to provide handrails on both sides.

Fig. 8 Handrail design







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## Accessible Entrances

The entrance of a new building should be accessible to everyone irrespective of their age, ability or gender. Where an existing building is to be altered every attempt should be made to make the main entrance accessible. If the building is listed, reasonable adjustments should be considered in the same way as for other buildings.

### ACCESSIBLE ENTRANCES

- Should be clearly signposted and should include the international symbol of access, from the edge of the site, and the principal entrance if this is not the accessible entrance.
- Any structural supports at the entrance should not be a hazard to visually impaired individuals.
- Should have a level landing at least 1500mm by 1500mm clear of any door swings immediately in front of the entrance and be of a material that does not impede wheels.
- Door entry systems should be accessible to deaf and hard of hearing and people who cannot speak (e.g. LED display and induction couplers fitted) 1400mm is the upper height limit.
- It is important that where practical the principal entrance to a building is inclusive and the following should be considered: the prominence of the entrance, the type of the threshold to allow convenient access, the ease of operation of the door, and the provision of an overhead canopy should the door require to be kept locked.

### DOORS TO ACCESSIBLE ENTRANCES

Entrance doors can be manually operated, or power operated under manual or automatic control.

**Table 2 Width of doors**

Minimum corridor width at door (mm)	Minimum clear opening width (mm) [1]
1500	800
1200	825 [2]
900 [3]	850 [2]

**Notes:**

1. the projection of any ironmongery that extends across the width of a door leaf, such as an emergency push bar to a fire exit or horizontal pull handle to accessible *sanitary accommodation*, should be subtracted when calculating the clear opening width.
2. the clear opening width may reduce to 800mm where a door is approached head-on.
3. a corridor width of less than 1.2m should not be present within *new buildings* but may be found within some *existing buildings*.

- Vision panels enable individuals to see people on the other side of doors and should comply with the minimum zone of visibility of between 500mm and 1500mm from floor level, if necessary interrupted between 800mm and 1150mm from floor level to accommodate a horizontal grab-rail.
- It should be noted that double buggies are wider than wheelchairs and this should be borne in mind when designing certain types of buildings.

### MANUALLY OPERATED NON-POWERED ENTRANCE DOORS

- A non-powered door fitted with a self-closing device capable of closing the door against wind forces and the resistance of draught seals is unlikely to be easily openable by a wheelchair user or someone with limited strength or a child.
- The opening force at the leading edge should be no greater than 30N for the first 30 degrees.



# ACCESS TO BUILDINGS

## Accessible Entrances

### POWERED ENTRANCE DOORS

Powered entrance doors benefit everyone who is trying to enter or leave a building whether they are in a wheelchair, pushing a buggy, carrying items or have limited strength.

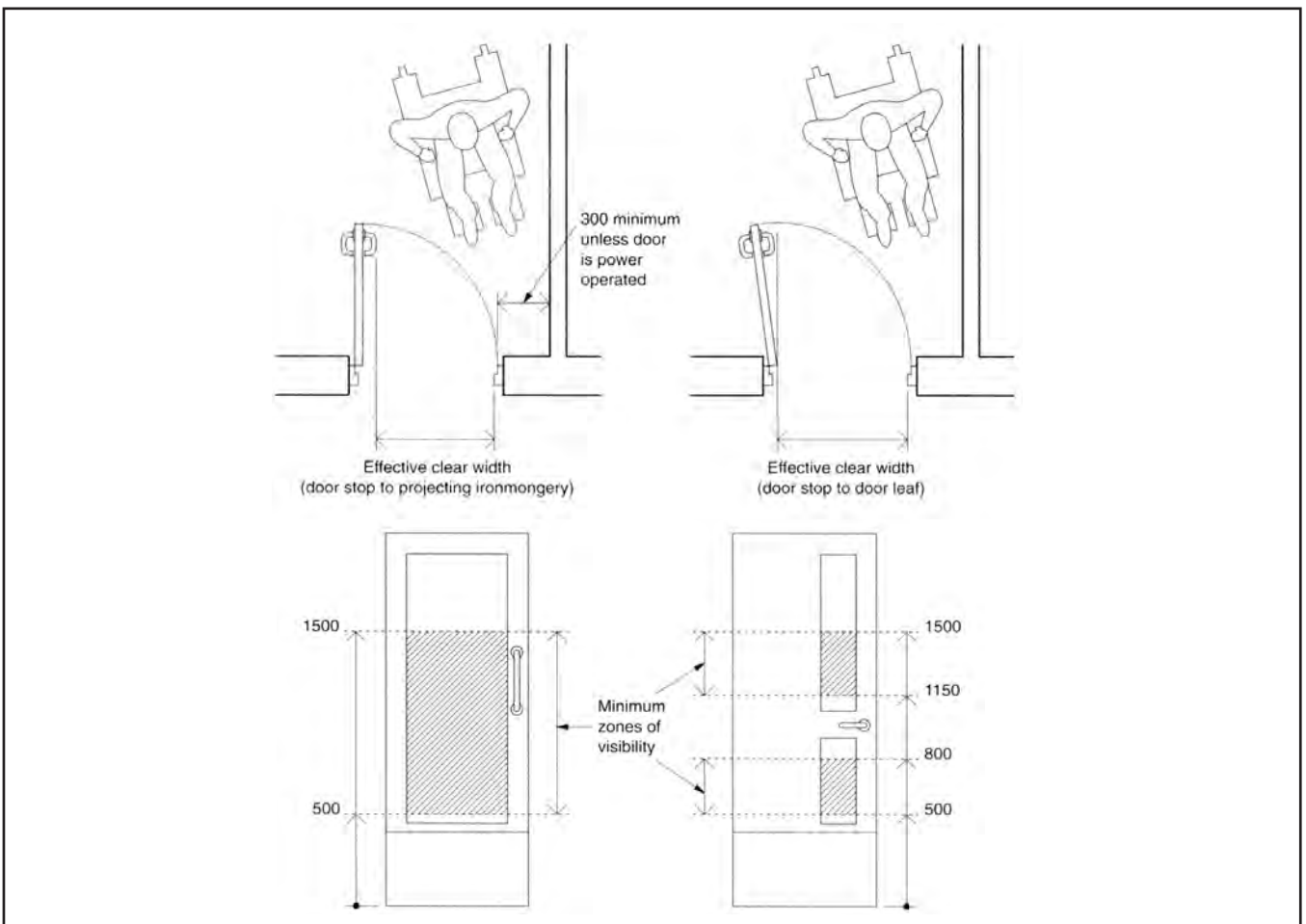
- Manual control for powered entrance doors should be clearly distinguishable from the background, and located between 750mm and 1000mm from the ground level (to include swipe cards etc). Care should be taken on the location of the control so that it is in an accessible location.
- Where the doors swing towards people approaching them visual and audible warnings

should be provided. They should incorporate a safety stop if someone is passing through and revert to manual control or stay open in a power failure.

### GLASS ENTRANCE DOORS AND GLAZED SCREENS

- Should be clearly defined with manifestation on the glass at two levels, 850mm to 1000mm and 1400mm to 1600mm (above floor level). Manifestation is a sign or a logo at least 150mm high.
- Care should be taken that any manifestation applied contrasts with the surrounding/adjacent background.

Fig. 9 Effective clear width and visibility requirements of doors



# ACCESS WITHIN BUILDINGS

## Entrance Lobbies

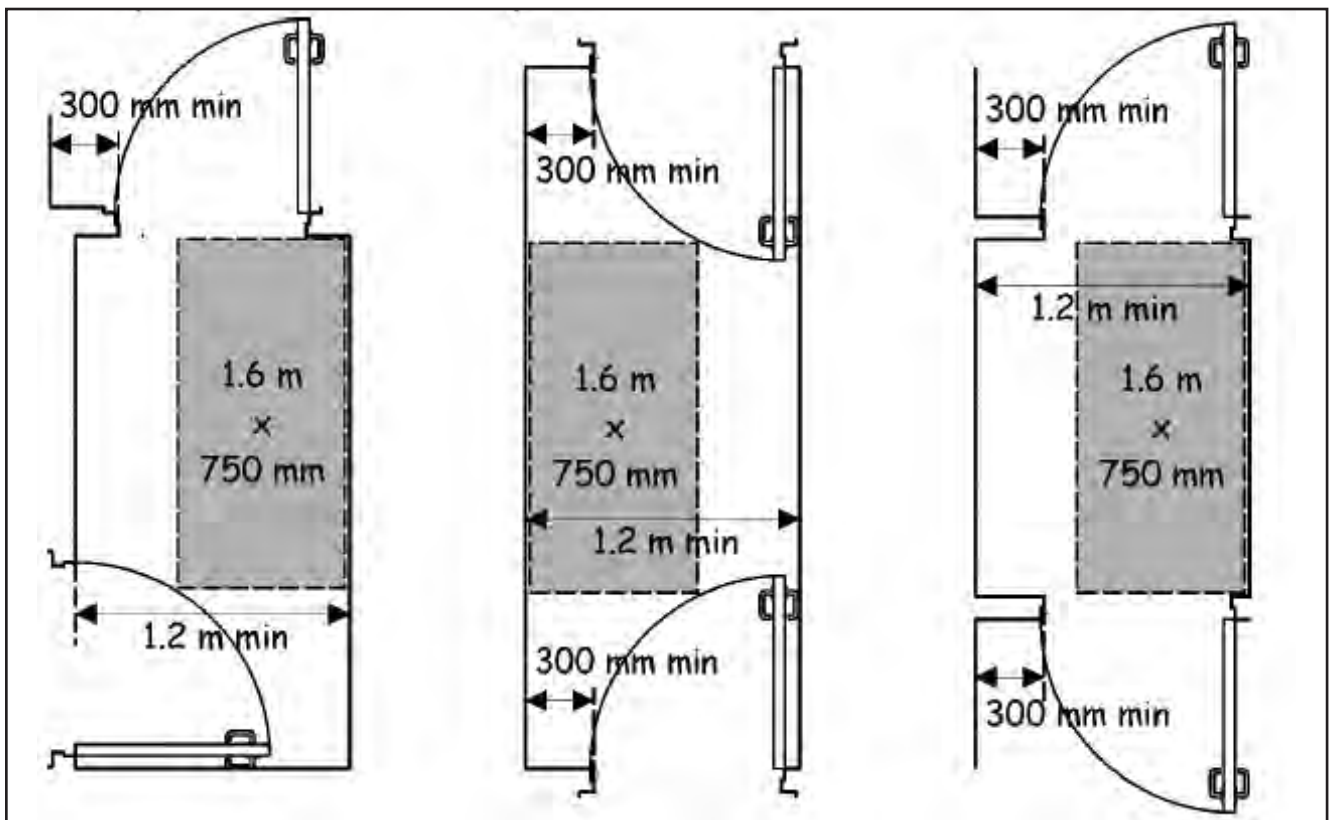
Manoeuvring through a heavy set of doors can be problematic for some people; children, people with assistance dogs, wheelchair users and individuals with low upper body strength. Wheelchair users find it easier to open a door by pushing it rather than pulling it towards them.

- Where entrance lobbies are incorporated in buildings, adequate space must be provided between doors. There should also be space for someone assisting a wheelchair user and for someone passing in the opposite direction.
- Thresholds should be flush, 15mm maximum, at both doorsets.
- The door opening widths should apply to the inner doors as well as the outer doors.
- If there is a harsh difference between the outdoor strong sunlight and the immediate interior of the building it can cause difficulties for

visually impaired individuals therefore lighting to reduce the contrast between the outside and the building's interior should be considered.

- The floor surface should be level, slip resistant and not impede the movement of wheels. Barrier matting should be provided and be of material and design that would not cause a trip hazard.
- Ensure any changes in floor materials do not create potential trip hazards, and be mindful that thick pile carpets are not easy to manoeuvre over.
- Highly polished tiled floors can quite often cause glare which can make it difficult for individuals with a visual impairment to navigate around the space. Similarly highly patterned floor coverings can cause confusion to visually impaired individuals when trying to move around.

Fig. 10 Examples of accessible lobby dimensions





# ACCESS WITHIN BUILDINGS

## Reception Area/Service Points

The main reception area of any building may be the first area that the public visit therefore it is important to be inclusive. Suitable reception facilities including appropriate signage are important within this area.

- Any reception point should be easily identifiable from the entrance doors or lobby and have a direct approach and be free from obstructions. The reception desk or service point should be accessible to cater for the majority of users' needs irrespective of whether they are seated or standing.
- Dimensions for an accessible counter; for standing users within a range of 950mm and 1100mm high, for seated users a surface 700mm above floor level (to the underside) with a knee recess of at least 500mm deep.
- In order for wheelchair users or individual pushing buggies a clear manoeuvring space of 1200mm in front is desirable.
- A bevelled edge to the desk aids individuals when picking up paper, coins etc.
- Reception points should be provided with a hearing enhancement system but care should be taken over the design and any potential conflicts; for example there may be confidentiality issues. There is also evidence that some security systems interfere with the frequency of certain loop systems. It is also important that regular testing of hearing enhancement systems is carried out.
- Some individuals who have a hearing impairment may lipread, therefore good lighting at reception areas will help.
- Signage plays an important part in way finding and good clear accessible signage with the incorporation of symbols will aid most visitors to a building where for example English is not their first language or they have a learning disability.
- If seating is to be provided within a waiting area it is good practice to provide seats at differing heights with or without arms and also that they contrast in colour with the adjoining surfaces.
- It is good practice in waiting areas to provide space for buggies, wheelchairs and assistance dogs.
- If information is to be made available to visitors it is good practice to have it placed at various heights and for there to be provision in alternative formats and languages.



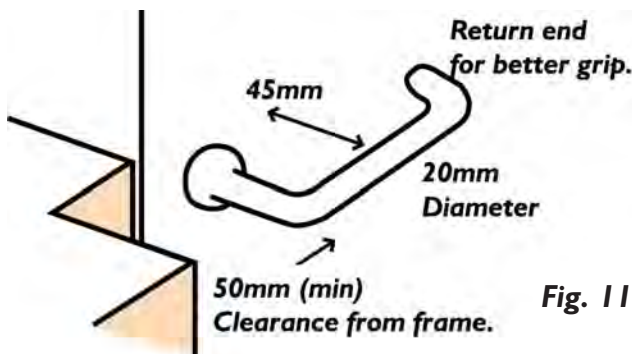
# ACCESS WITHIN BUILDINGS

## Internal Doors

Design considerations similar to those for entrance doors apply to internal doors  
Refer to Table 2 and Fig. 9.

The design and weight of doors within a building will play a role in determining how accessible a venue is. Many people find it difficult to open, manoeuvre through and close heavy doors. People pushing buggies, wheelchairs and wheelchair users find it more difficult to pull a door open rather than pushing it.

- The force needed to open the door manually should not exceed 30N for the first 30 degrees.
- Doors should be distinguishable from the adjacent facades, as should be ironmongery (i.e. pull handles) from the actual door itself.
- It is good practice to highlight the leading edge of any doors in a different colour.



- Lever handles are preferable to knob sets and still suit most individuals with manual dexterity issues or carrying items.
- Doors should have a zone of visibility between 500mm and 1500mm from the floor, if necessary interrupted between 800mm and 1150mm from the floor, to accommodate an intermediate horizontal rail.
- Incorporate low-level protection from wheelchairs at least 400mm high. Thresholds should be level with adjacent floor finishes.
- Fire doors can be heavier than standard doors. If they are located in corridors it is best practice for them to be held open with an electro-magnetic device, but self-close when:
  - Activated by a smoke alarm or fire alarm
  - Power supply fails
  - Activated by a hand operated switch.
- Fire doors to individual rooms should be fitted with swing-free devices that close when activated by smoke detectors, fire alarms and power failure.

# ACCESS WITHIN BUILDINGS

## Corridors and Passageways

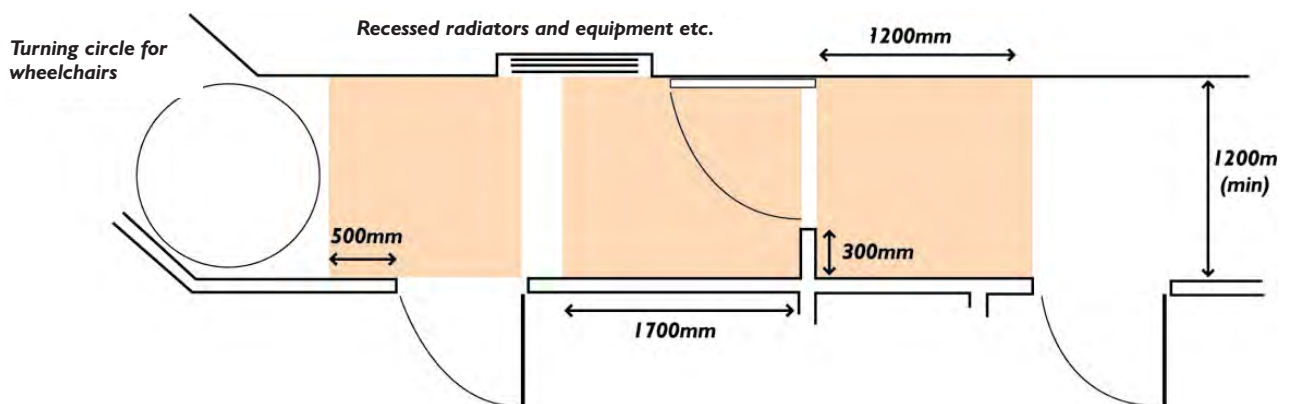
Ease of manoeuvrability throughout circulation areas benefits everyone, therefore corridors need to be of a sufficient width to accommodate all users.

- Elements such as columns, radiators and fire hoses should not protrude into the corridor, or where this is unavoidable a means of directing people around them, such as a visually contrasting guardrail should be provided. Another method of directing people around columns can be seen in the photograph where the bottom on the columns have been highlighted with a contrasting colour.
- The unobstructed width should be at least 1200mm excluding any projections into the corridor.
- Where the unobstructed width of the corridor is less than 1800mm, passing places should be at least 1800mm long and 1800mm wide at reasonable intervals to allow wheelchairs to pass at corridor junctions and similar.
- Corridors of gradient between 1:20 and 1:60 should have a rise no more than 500mm without a level rest area at least 1500mm long.
- If the corridor is 1:20 or steeper, refer to ramp details.

- Any door opening towards a corridor which is a major access route, should be recessed so that when fully open it does not project into the corridor. The leading edge of doors which require to stay open should ideally have a contrasting colour to their leading edge.
- On a major access or escape route the wider leaf of a series of double doors with leaves of unequal widths should be on the same side along the length of the corridor.
- Floor finishes should be slip resistant.
- Glass screens should have suitable manifestation.



**Obstructions such as a radiator (if it cannot be recessed) may project up to 100mm reducing a corridor width to 1.1m, over a maximum length of 900mm.**



**Shaded areas show required unobstructed space requirements for approaching doors. All dimensions are clear widths.**

**Fig. 12**



# ACCESS WITHIN BUILDINGS

## Internal Stairs

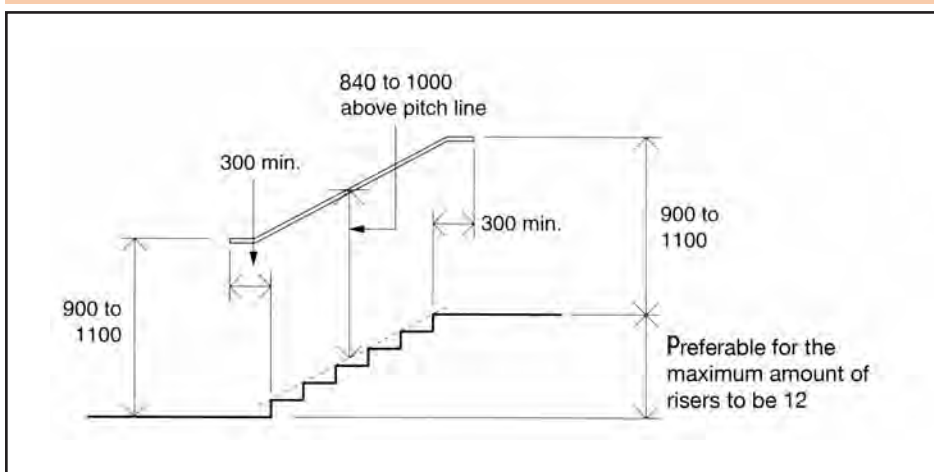
### Guidance as for external stepped access except:

- It is not reasonable to require a hazard warning surface at the head of internal stairs (since there is no recognised warning surface for use internally, which can be guaranteed not to constitute a trip hazard when used alongside flooring surfaces with different frictional resistance characteristics).
- On a lengthy flight of steps, the continuation of the handrail at intermediate landings will alert any visually impaired individuals to the next flight.
- Ideally, a flight between landings should contain no more than 12 risers.
- The rise of each step should be between 100mm and 170mm.
- The minimum going of each step should be at least 250mm minimum with a pitch not exceeding 34 degrees.

- The provision for handrails is the same as for external stepped access.
- One method of providing a warning to some visually impaired individuals of an impending flight of internal steps is to provide a contrasting coloured surface to the top and bottom landing.



Fig. 13 Internal stairs – key dimensions



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# ACCESS WITHIN BUILDINGS

## Guide to the Provision of Lifts

It is clearly the intention of The Technical Standards to make as much of the built environment accessible as possible to all irrespective of age, ability or gender. Therefore, the provision of lifts must be seen as the obvious solution for vertical travel.

As there is no floor area rule to be guided by, it is important to recognise that whilst the provision of a passenger lift (or, in certain situations a lifting platform) is the preferred option, each application should be looked at individually, as each situation will differ in some way.

In new buildings, it is hoped that every attempt will be made to allow for some sort of lifting device. It is more likely that problems in making a building fully accessible will be put forward for an existing building. This is why, whilst ascertaining what is reasonable in the circumstances of each case must be looked at, it must be remembered that it is the intention of the Building Standards that all new buildings and existing non-domestic buildings that are materially altered or extended are accessible to all.





# ACCESS WITHIN BUILDINGS

## Vertical Circulation within the Building

A passenger lift is the most suitable means of vertical access for everyone and should be provided wherever possible.

However given the space constraints in some existing buildings it may not always be possible to provide a full passenger lift.

- Signs indicating the location of a lifting device should be clearly visible from the building entrance. Additionally a sign indicating the floor reached should be provided on each landing that can easily be seen from the lifting device and is visually contrasting in the background.
- Whatever lifting device is chosen, internal stairs should always be provided.

### Provision of Lifting Devices

- A conventional passenger lift should be the preferred option to provide comprehensive access for all users to levels in a building. However, in existing buildings where access to such a lift is not possible, a platform lift should be provided as an alternative option.
- Existing buildings may in exceptional circumstances have a wheelchair platform stairlift.
- There is a requirement to provide access between storeys, however consideration will be given to smaller storeys. The larger the lift car size the more accessible it will be for wheelchair

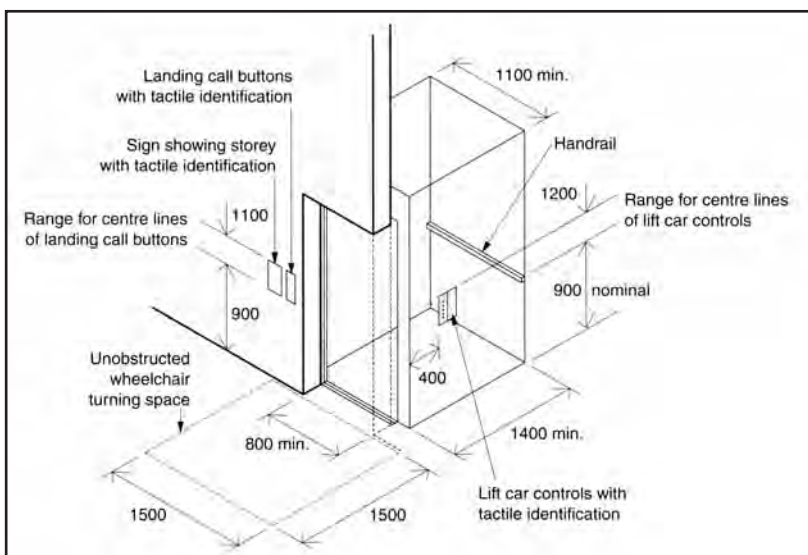
users and individuals pushing buggies in that they will be able to turn around and face forward to exit rather than reversing out.

### Passenger Lifts

- Minimum dimensions of the car should be 1100mm wide and 1400mm deep. However, it should be noted that this dimension will not allow a wheelchair user to turn around. This may also hinder anyone pushing a buggy/pram in terms of turning around to exit the lift car.
- For a lift that does not have room for a wheelchair user to turn around, a mirror should be provided to allow the user to see the space behind the wheelchair in order that they can exit safely.
- As polished stainless steel is a material which can cause glare, this should be avoided in any internal lift car layout.
- Power operated sliding doors should provide a minimum clear opening of 800mm and be fitted with timing and re-opening activators to allow time for people and assistance dogs to enter or exit.
- Controls should be located between 900mm and 1100mm from the car floor and be at least 400mm from any return wall.

- Landing call buttons should be located between 900mm and 1100mm from the floor and at least 400mm from any return wall.
- Lift landing and car doors should contrast visually from adjoining walls.
- Audible and visual indication of lift arrival and location should be provided in the lift car and lift lobby. If the lift is to be used in an emergency it should conform with the relevant recommendations of BS 5588 part 8 (Code of Practice for Means of Escape for Disabled People).

Fig. 14 Key dimensions associated with passenger lifts



## Vertical Circulation within the Building

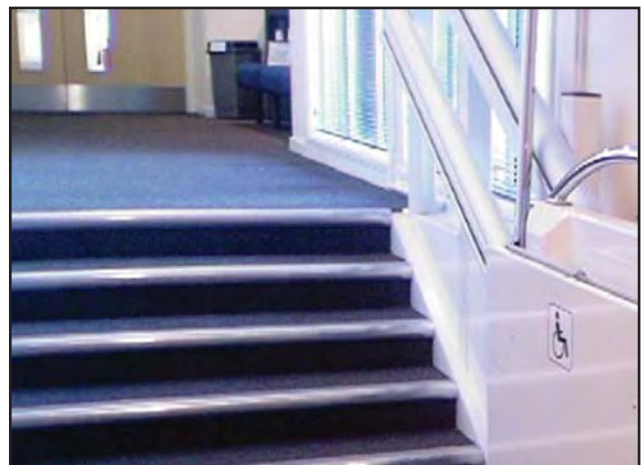
### Lifting Platforms

- Should have a platform size of 1100mm wide by 1400mm deep and a clear opening width to any door of 850mm.
- Controls should be located between 900mm and 1100mm from the floor of the lifting platform and be at least 400mm from any return wall.
- Continuous pressure controls which can be operated by someone with limited manual dexterity should be provided, with landing call buttons the same as for a passenger lift.
- Should be provided with a horizontal handrail, easily gripped 900mm above the floor.
- Should be provided with permanent and clear operating instructions located adjacent to or within the platform.



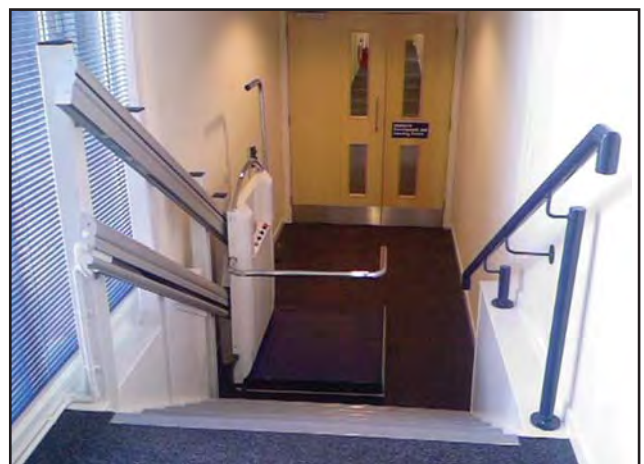
### Wheelchair Platform Lifts

- Wheelchair platform lifts can be of benefit to many wheelchair users however care should be taken to ensure that the means of escape is not compromised in any way.



### Stairlift

- Whilst the provision of a stairlift will aid some individuals it should be noted that not everyone can or may be willing to transfer from their chair to the stairlift.



# FACILITIES WITHIN PUBLIC BUILDINGS

## Audience and Spectator Facilities

Any spectator venue should be accessible for the entire audience. Consideration should therefore be given to accommodating the needs of all visitors/spectators so that they obtain the full benefit from the event.

### General

- People with mobility or sensory impairments may need to view from a particular side or sit in the front to lip read or see sign language interpreters.
- Care needs to be taken so that poor lighting or very bright natural light does not make it difficult to see the interpreter.
- Wheelchair users, people who have difficulty using chairs with fixed arms and those with assistance dogs should have the choice of sitting next to a seated companion or a companion who is a wheelchair user.
- Consideration should be given to providing space by certain seats for assistance dogs to rest.
- Greater spacing between rows of seats at the rear of a block or at the end of rows may provide extra legroom for people of large stature or individuals who use crutches.
- Consideration should be given to the use of removable seating which would allow flexibility.
- The floor at wheelchair spaces should be level as it is uncomfortable for many wheelchair users to sit on a slope.
- Additional information may be obtained from the Guide to Safety at Sports Grounds 5th Edition.

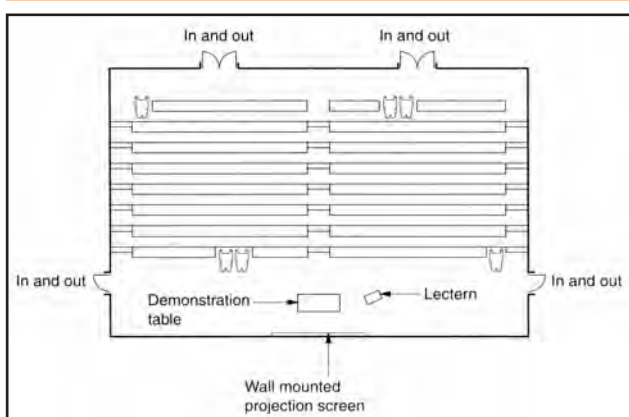
**Table 3 Wheelchair spaces to areas of fixed seating**

Seated capacity	Number of wheelchair spaces
up to 600	1 per 100 or part thereof [1]
601-10,000	1 per 100 or part thereof
10,001-20,000	100 + 5 per 1,000 above 10,000
20,001-40,000	150 + 3 per 1,000 above 20,000
more than 40,000	210 + 2 per 1,000 above 40,000

Notes:

1. In smaller auditoria, the presence of removable seating will offer increased flexibility and should be provided in addition to permanent wheelchair spaces. For each space noted above, removable seating providing one additional space should be present, up to a maximum of 6 spaces in total. For example, a 150 seat auditorium will have 2 wheelchair spaces and removable seating for a further 2 spaces.

**Fig. 15 An example of wheelchair spaces in a lecture theatre**



### LECTURE AND CONFERENCE FACILITIES

- Where a podium or stage is provided wheelchair users should have access to it by means of a ramp or a lifting platform.
- A hearing enhancement system should be provided for individuals with a hearing impairment.



# FACILITIES WITHIN PUBLIC BUILDINGS

## Audience and Spectator Facilities

Fig. 16 Possible location of wheelchair spaces in front of a rear aisle

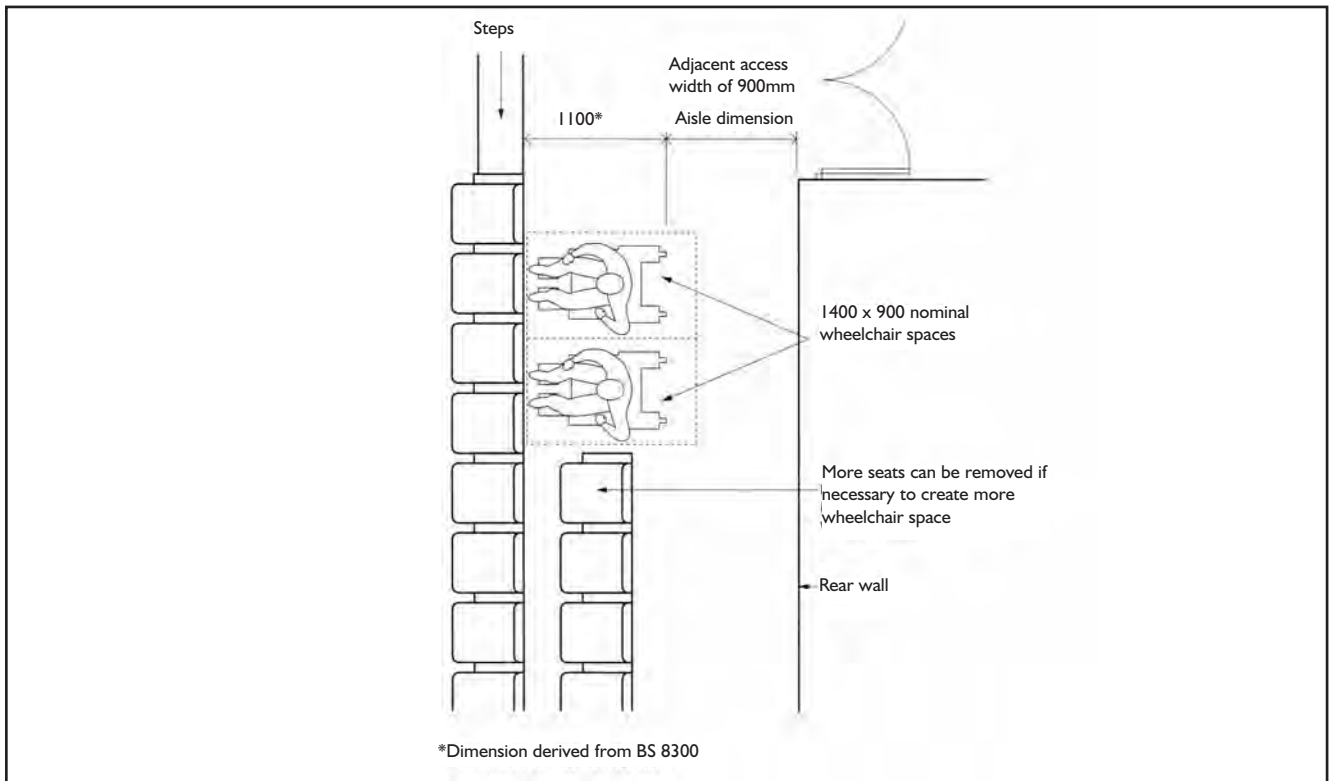
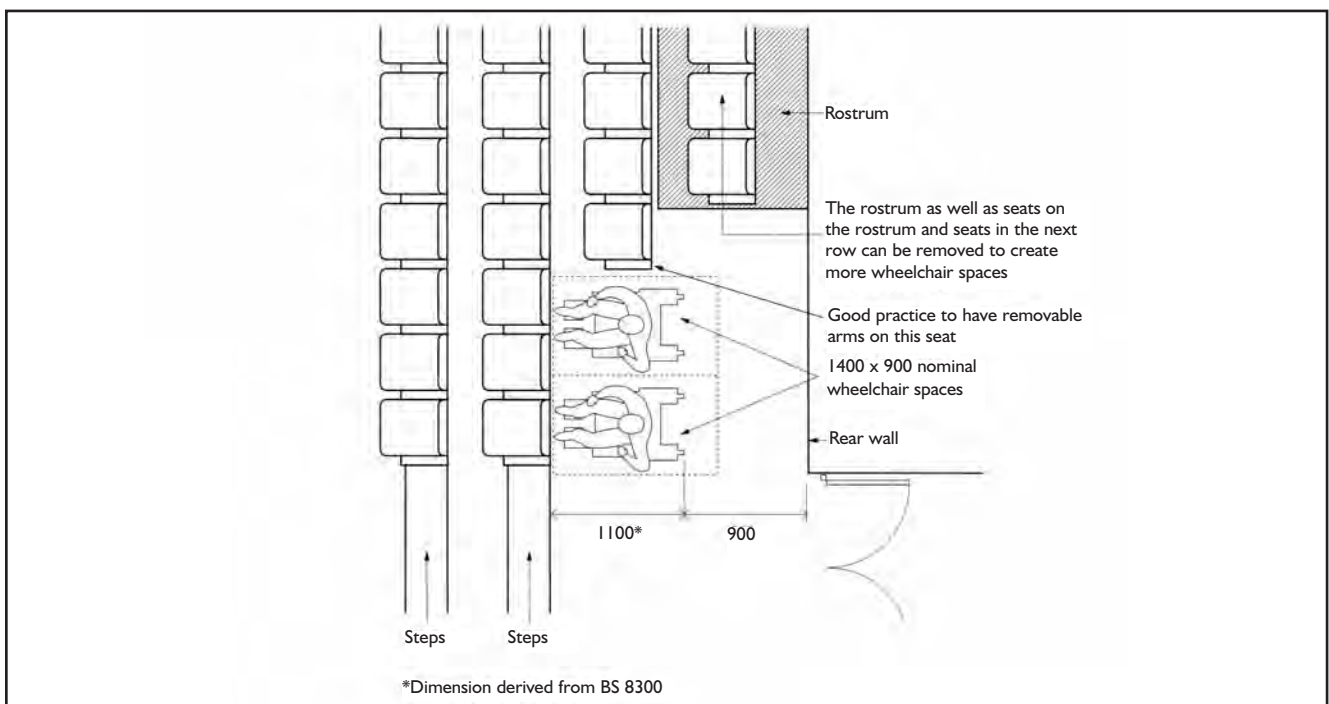


Fig. 17 An example of wheelchair space provision in a cinema or theatre



# FACILITIES WITHIN PUBLIC BUILDINGS

## Refreshment Facilities Including Staff Rooms

All public areas including toilets, public telephones and external terraces should be fully accessible, as should self-service and payment points.

- In many restaurants changes of level are used to differentiate between different functions or to create atmosphere. However, every effort should be made to make all levels accessible so that all potential customers have full and independent access.
- Changes of level should be designed so that equitable access is provided throughout each storey by a ramp or lifting platform.
- The reception desk or service point should be accessible to cater for the majority of users' needs irrespective of whether they are seated or standing.
- Dimensions for an accessible counter, for standing within a range of 950mm and 1100mm high, for seated users a surface approximately 750mm above floor level with a knee recess of at least 500mm deep (and 700mm high to the underside).
- In order for wheelchair users or individuals pushing buggies, a clear manoeuvring space of 1200mm in front is desirable.
- Worktops in shared refreshment facilities, for example tea making areas at work, should be accessible, with a clear space beneath at least 700mm above the floor. Some products are available which rise and fall and can therefore accommodate tall users or individuals who are shorter or who need to sit down.



# FACILITIES WITHIN PUBLIC BUILDINGS

## Sleeping Accommodation

Bedroom accommodation within establishments such as hotels and motels should be accessible to all guests and wheelchair users will benefit from additional space to enable them to manoeuvre.

This guidance should be followed for all bedrooms:

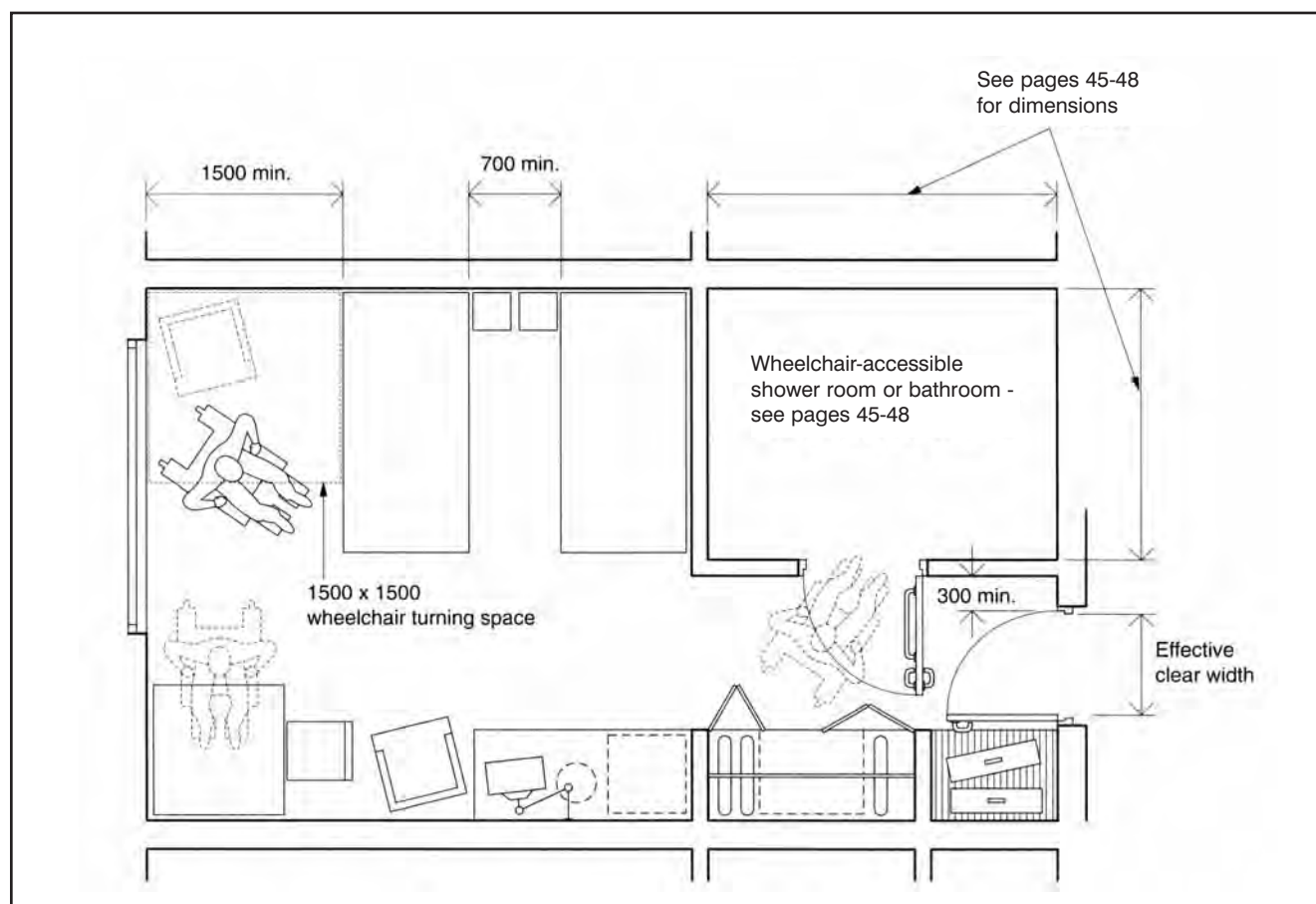
- Effective clear width of the door from the access corridor and the en suite door should comply with Table 2 and have a maximum opening pressure of 30N (page 25).
- Swing doors on wardrobes etc should open through 180 degrees.
- Handles on hinged and sliding doors should be easy to grip and operate and contrast visually with the door.

- All bedrooms should have provision for both audible and visual alarms.
- Room numbers should be indicated in embossed characters.

### WHEELCHAIR ACCESSIBLE BEDROOMS

- At least 1 in 20 bedrooms should be wheelchair accessible.
- The wheelchair accessible bedrooms should be located to provide a choice of location and be on accessible routes to all the facilities.

**Fig. 18 One example of a wheelchair-accessible hotel bedroom with en-suite sanitary facilities**





# FACILITIES WITHIN PUBLIC BUILDINGS

## Sleeping Accommodation

- Consideration should be given to the location of shelving etc as people of shorter stature and/or wheelchair users may find it difficult to reach certain items.
- En suite facilities should meet the requirements for wheelchair accessible bath and shower facilities.
- The size of the room should allow a wheelchair user to manoeuvre at the side of the bed and transfer independently.
- An emergency assistance alarm and reset button should be located in the bedroom and be activated by a pull-cord that can be operated from the bed or the floor.
- On the outside of the room the call signal should be easily seen and heard and linked to a central control point.
- Openable window controls should be located between 800mm and 1000mm above the floor and be easy to operate without the need to use both hands simultaneously. Preferably, window controls should be designed so that they can be operated by someone with a clenched fist.

## Switches, Outlets and Controls

- Wall mounted socket outlets, telephone points and television sockets should be located between 400mm and 1000mm above the floor with a preference for the lower end of the range.
- Switches for permanently wired appliances should be located between 750mm and 1200mm above the floor.
- All switches and controls that require precise hand movements should be located between 750mm and 1000mm above the floor.
- Controls that need close vision should be located between 1200mm and 1400mm from the floor, so readings can be taken from a seated or standing position.
- Sockets should be at least 350mm from any room corners.
- The range for light switches should be within the range between 1000mm to 1200mm from the floor. Where this cannot be achieved pull cords should be provided in the same height range.
- The front plates of sockets should contrast visually with the background and have a clear indication that they are ON.

# FACILITIES WITHIN PUBLIC BUILDINGS

## Sensory Impairment

Sensory impairments affect many millions of individuals within the UK.

Detailed guidance on surface finishes, visual, audible and tactile signs as well as the characteristics and appropriate choice of hearing enhancement systems is given in BS 8300.

- Provision for a hearing enhancement system should be installed in rooms and spaces designed for meetings, lectures, classes, spectator sport or films and at service or reception counters, particularly in noisy areas or where people are separated by glazed screens.
- All facilities should be indicated with the appropriate symbol and signage.
- Where confidentiality issues may arise such as in doctors' surgeries, caution should be exercised regarding the type and range of hearing enhancement system to be provided.
- The term visually impaired can range from individuals who are partially sighted to individuals who have no sight at all. Contrasting colour schemes can aid many individuals in way finding however the Light Reflectance Value (LRV) is also important. LRV is measured on a scale from 0% to 100% and measures how much light a colour reflects and how much it absorbs. 0% is classed as absolute black and 100% is classed as a perfectly reflective white (which in everyday terms do not exist as the average black is approximately 5% and the whitest white approximately 85%).



**Fig. 19**



**Fig. 20**

Additional information is available from Royal National Institute for Deaf People (RNID) and Royal National Institute of Blind People (RNIB).

# FACILITIES WITHIN PUBLIC BUILDINGS

## Sanitary Conveniences

### UNISEX ACCESSIBLE TOILETS

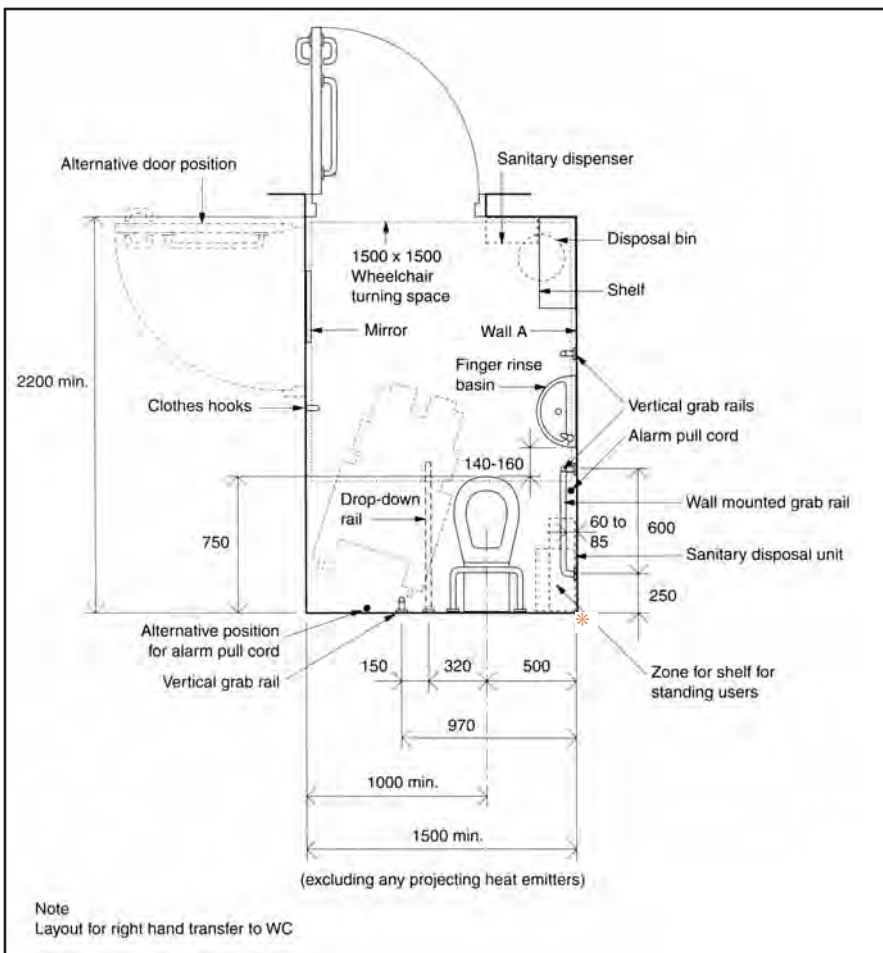
A wide range of people find it either impossible or extremely difficult to use standard WC accommodation, for a variety of reasons. Everyone should have equitable access to toilet facilities irrespective of their age, gender, individual needs or abilities.

- Where there is space for only one toilet in a building, it should be a unisex wheelchair

accessible toilet in accordance with the layout in figure 21. At least one unisex wheelchair accessible WC should be located where toilets are provided for customers, visitors or staff.

- One should be located as close as possible to the entrance or waiting area of a building and be located in a similar position on each floor of a multi storey building. There should be right and left handed transfer on alternative floors.

Fig. 21 Unisex wheelchair-accessible toilet with corner WC



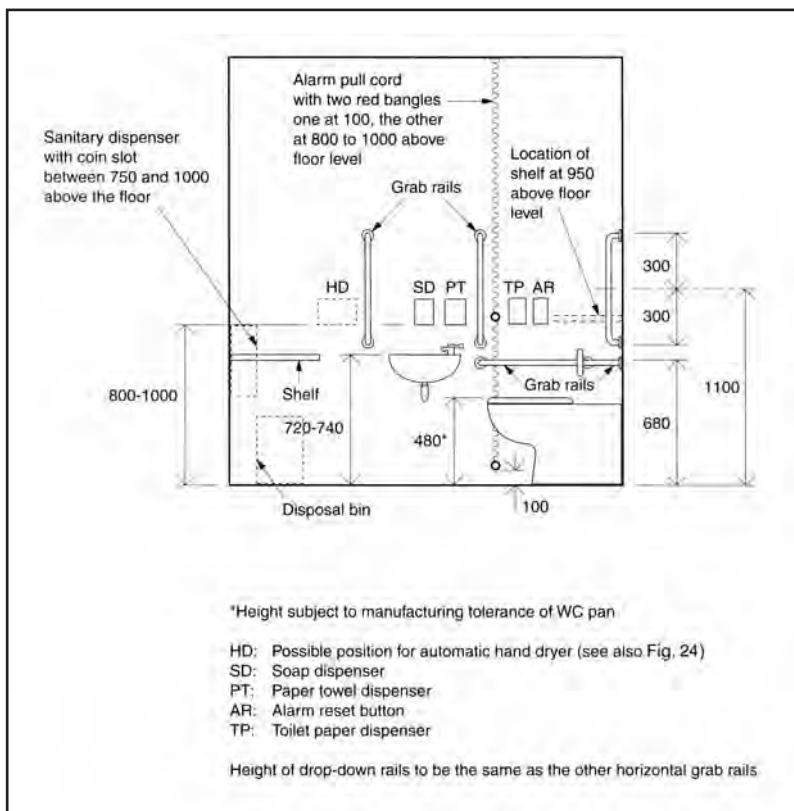
\* If a Soil Vent Pipe is located within the corner of the wc space, there is a chance that it will compromise the location and proximity of the wash hand basin to the wc as the horizontal grab rail will not be fitted along the wall; there is a chance that the distance between the edge of the wc and whb will be greater than it should be. Similarly, any boxing in of the whb drainage may compromise the space allowed for anyone wishing to transfer from the front or stay seated whilst using the toilet.

- If two unisex facilities are provided side by side, left and right hand transfer should be accommodated including appropriate signage.
- Doors should be outward opening with a horizontal closing bar on the inside face if not fitted with a self closer. However, sliding and bi-fold doors might be acceptable dependent on the building users.
- For some individuals excessive travel distances to toilet accommodation can be not only uncomfortable but impossible, therefore accessible facilities must be located within a reasonable distance from, for example, the reception area of a building.
- A wheelchair user should not have to travel more than 40m on the same floor or more than 40m combined horizontal travel if the toilet is on another floor of the building and is accessible by passenger lift. In buildings with a lifting platform vertical travel to the toilet should be limited to one storey.



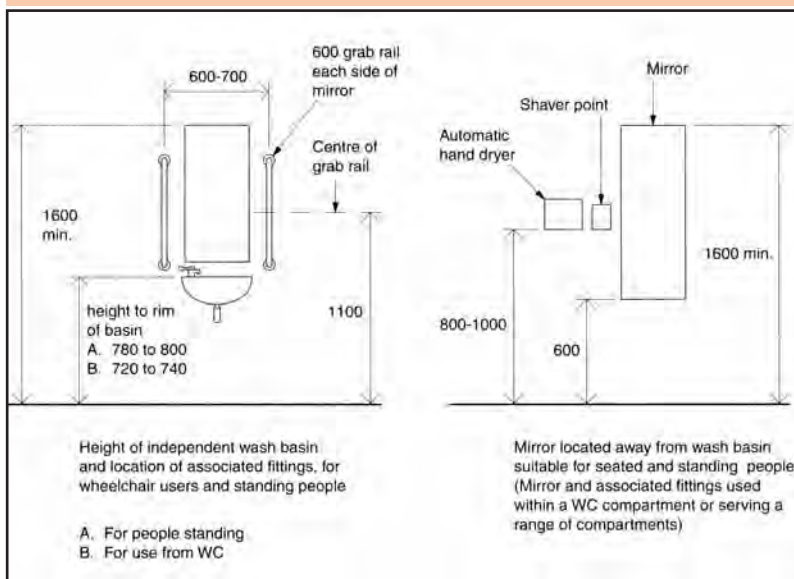
## Sanitary Conveniences

**Fig. 22 Heights and arrangement of fittings in a unisex wheelchair-accessible toilet (looking towards wall A in Fig. 21)**



- Heat emitters should be screened or their surface temperature kept below 43 degrees centigrade.
- All fittings and grab-rails should contrast visually with the background wall, and there should be contrast between the walls and floor to aid visually impaired users.
- Although accessible toilets benefit many individuals, there are still a great number of people who require additional space and fixtures and fittings. For more information on adult toilet and changing facilities, please go to [www.changing-places.org](http://www.changing-places.org)

**Fig. 23 Heights of various fittings in toilet accommodation**



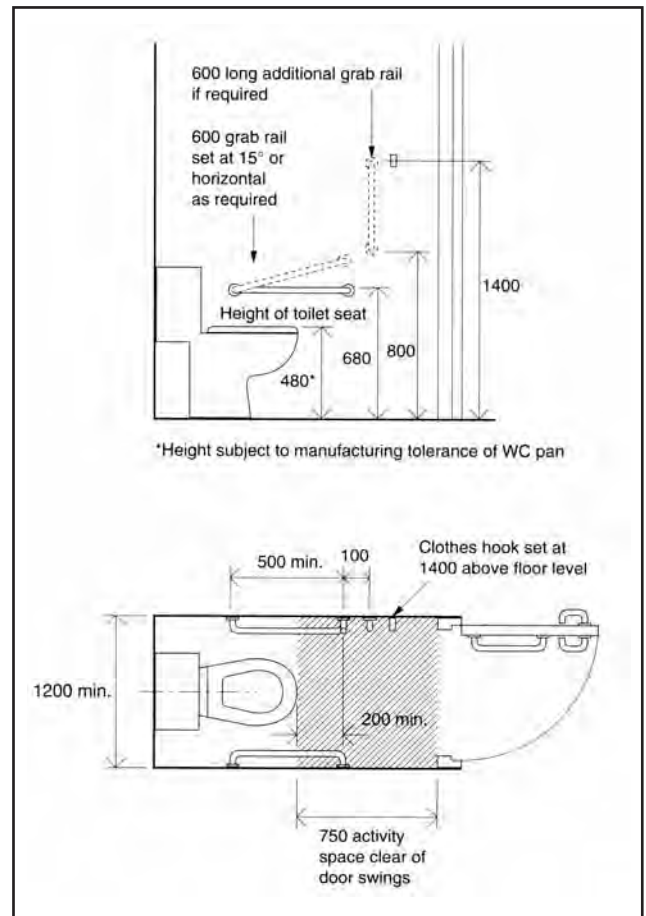
# FACILITIES WITHIN PUBLIC BUILDINGS

## Sanitary Conveniences

### GENERAL ADVICE

- Where there are four or more cubicles in a same sex toilet one of these should be larger for use by people who need extra space, like parents with young children or people with shopping or luggage. Minimum width of these toilets should be 1200mm (please refer to Fig 24).
- Where possible, independent baby change facilities should be provided which should be accessible to everyone.
- Taps on baths or wash basins should be designed to be operated using a closed fist, e.g. lever action.
- Door handles and other ironmongery should be easily operable and contrast visually.
- Doors to WC compartments, and wheelchair accessible unisex toilets, changing or shower rooms should be fitted with light action privacy bolts so they can be operated by people with limited dexterity. If required to self-close, they should be openable with a force no greater than 30N.
- Any fire alarm should emit a visual and audible signal.
- Emergency assistance alarms should have:
  - Visual and audible indicators to confirm an emergency call has been received.
  - A signal which is different from the fire alarm.
  - A re-set control reachable from the wheelchair or shower or changing seat.
  - Lighting controls to conform with the provisions for switches and controls.
- Heat emitters are screened or their surface temperature is kept below 43 degrees centigrade.

**Fig. 24 Enlarged cubicle which can accommodate families or individuals who require extra space**



- All fittings and grab-rails should contrast visually with the background wall and floor finish and there should be contrast between the walls and floor.

### URINALS

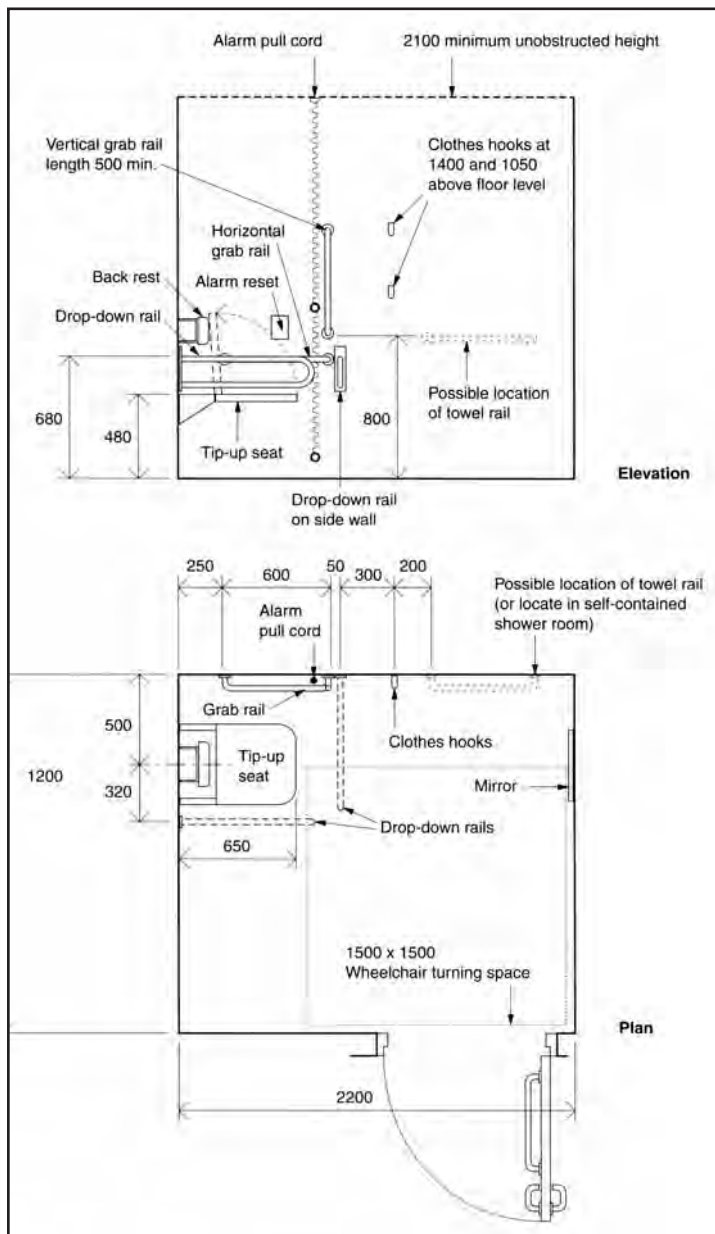
The design of urinals may determine whether some boys or men can use them. Consideration should be given to the provision of individual urinals at different heights to allow individuals of all heights and abilities to use them. Shy bladder syndrome affects up to 4 million people in the UK (the majority of whom are men); the installation of privacy screens would help those individuals. Some wheelchair users prefer to stand from their chairs and the provision of grab rails will help them.

# FACILITIES WITHIN PUBLIC BUILDINGS

## Wheelchair Accessible Changing and Shower Facilities

Where a building requires to provide changing and showering facilities accessible self contained units should be incorporated.

**Fig. 25 An example of a self-contained changing room for individual use**



- Where more than one unit is provided provision for left or right handed transfer should be made.
- Should provide wall mounted drop down support rails and wall mounted, slip resistant tip up seats (not spring loaded).
- In sports facilities individual self-contained shower facilities should be provided in addition to communal separate sex facilities.
- A shower curtain should be provided that covers the seat and rails when in the horizontal position and can be opened and closed from the shower seat.
- A shelf that can be reached from the seat or wheelchair should be provided for toiletries.
- An emergency assistance pull cord should be easily identifiable and can be reached from the seat or the floor, the assistance alarm should be as for sanitary accommodation.
- Facilities for limb storage should be included for the benefit of amputees.
- When associated with shower facilities the floor should be level and slip resistant when dry or wet.
- There should be a manoeuvring space of at least 1500mm deep in front of lockers which should be provided at an accessible height.

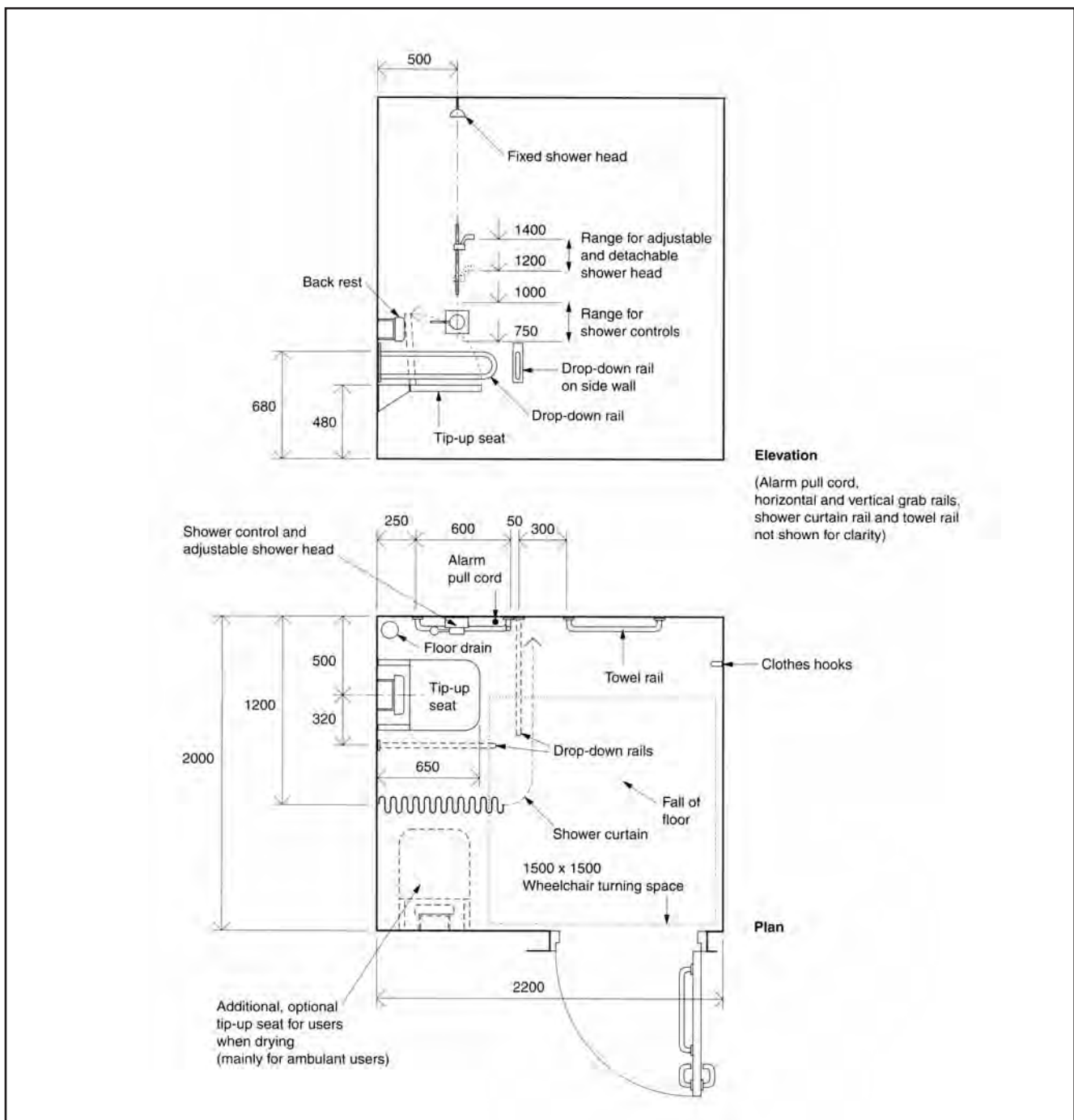


# FACILITIES WITHIN PUBLIC BUILDINGS

## Wheelchair Accessible Changing and Shower Facilities

- Where showers are provided in commercial developments for the benefit of staff, at least one wheelchair accessible shower compartment should be provided.
- Shower controls in communal showers should be positioned between 750mm and 1000mm above the floor.

Fig. 26 An example of a self-contained shower room for individual use



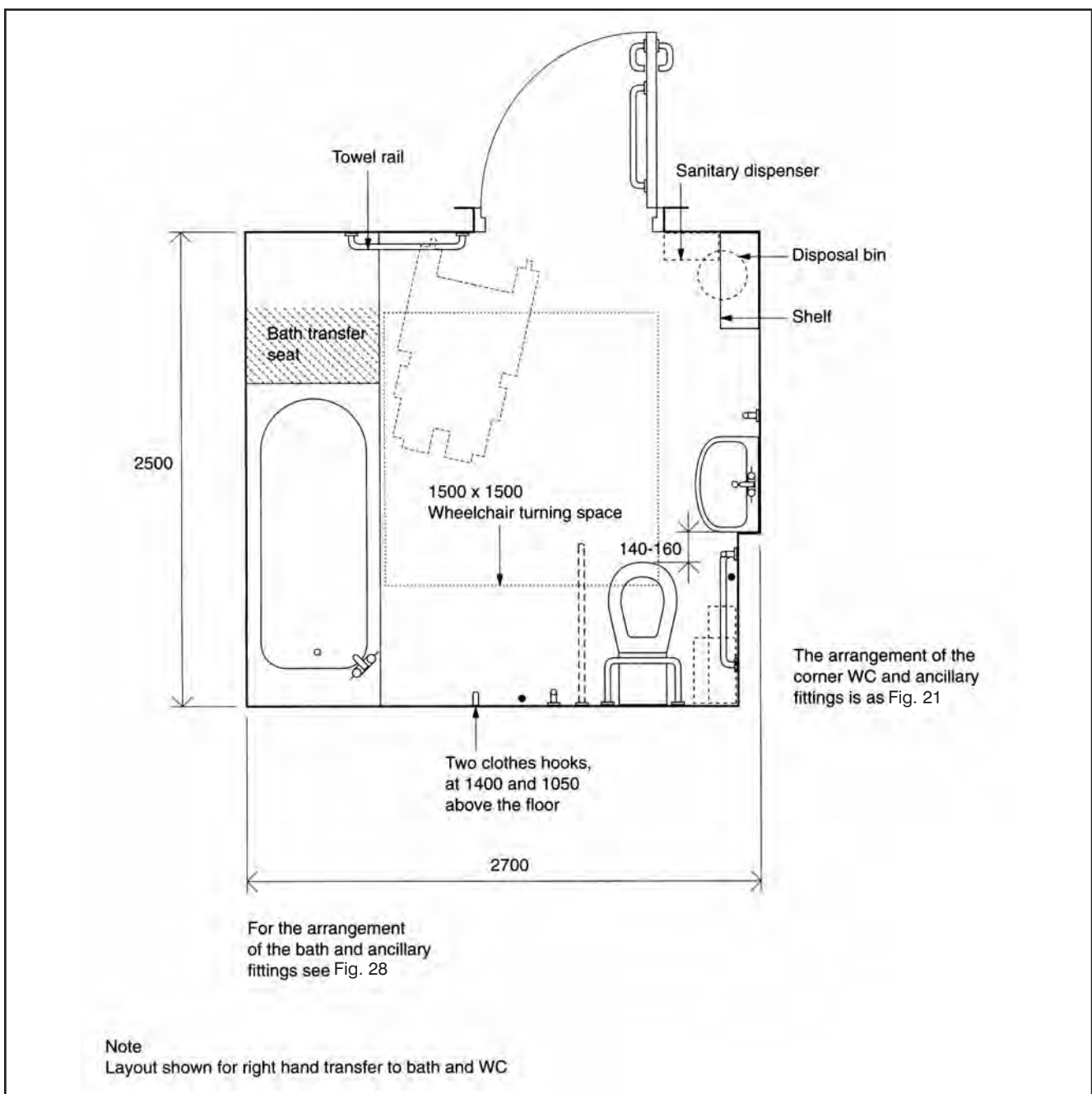
# FACILITIES WITHIN PUBLIC BUILDINGS

## Wheelchair Accessible Bathrooms

This guidance covers wheelchair accessible bathing facilities in hotels, motels, student accommodation and relatives' accommodation in hospitals.

- A choice of left or right handed transfer should be provided where more than one accessible bathroom is provided.
- The bath should be provided with a transfer seat 400mm deep and equal to the width of a bath.

Fig. 27 An example of a bathroom incorporating a corner WC

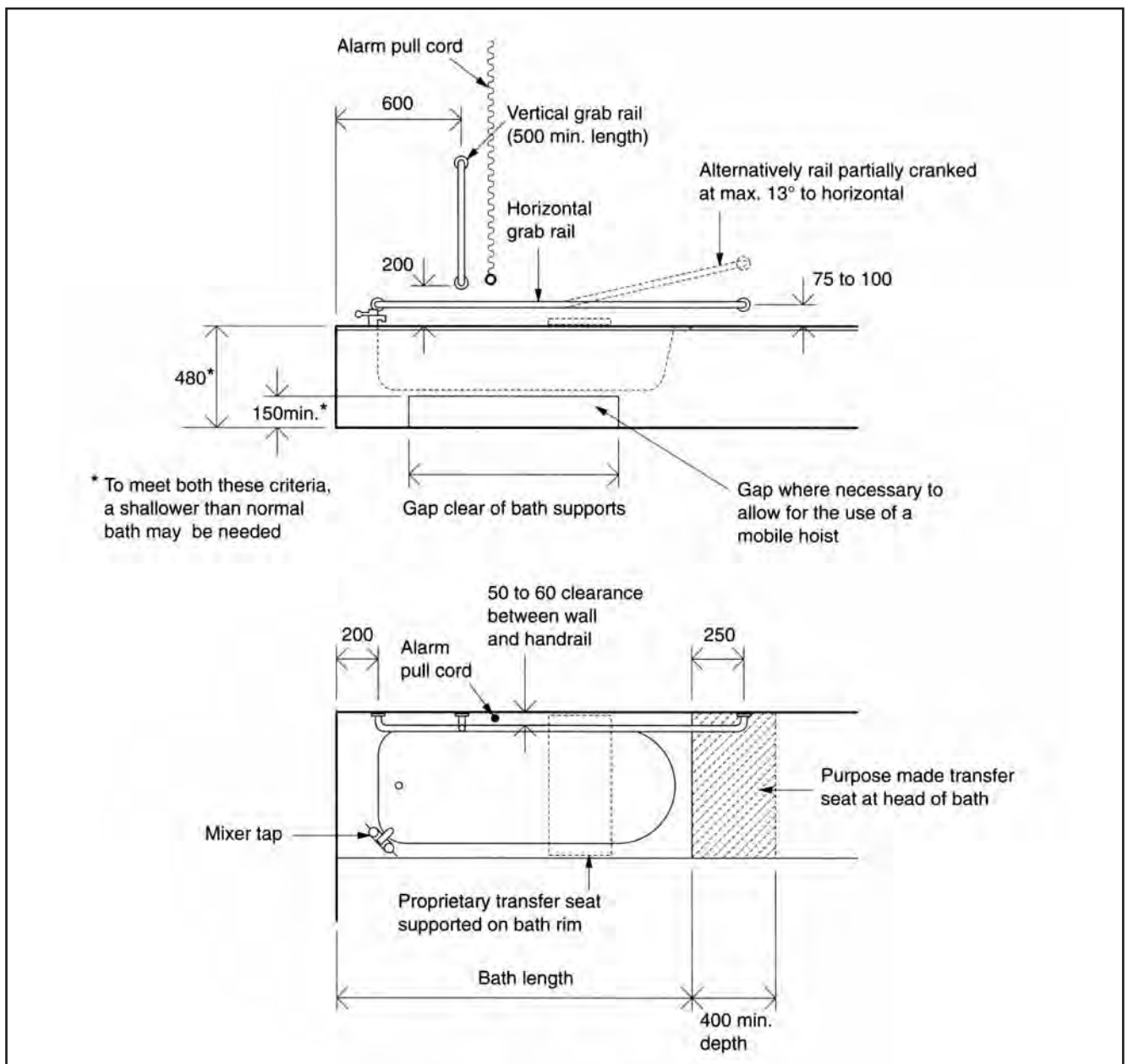


# FACILITIES WITHIN PUBLIC BUILDINGS

## Wheelchair Accessible Bathrooms

- Doors should open outwards and be fitted with a horizontal closing bar fixed to the inside face.
- It is worth noting that some disabled people do prefer a bath rather than a shower and in some cases will have their own transfer seat therefore space is required at the head of the bath to allow for this.
- The room should be fitted with a pull cord and assistance alarm.

Fig. 28 Grab rails and fittings associated with a bath





## Means of Escape/Egress

In any fire event we all want to evacuate safely from a building and although the fire and rescue service are responsible for fighting fires and protecting life and property it is the responsibility of the individual(s) "responsible" for the building in ensuring that there is a suitable emergency fire action plan in place to enable safe evacuation of all building users.

Changes to the Building Standards over the years have ensured that accessibility to and within buildings has improved however, provision for emergency egress should also be to the same standard so that individuals can safely evacuate a building and careful consideration should be given to this in the design process.

### Management Procedures

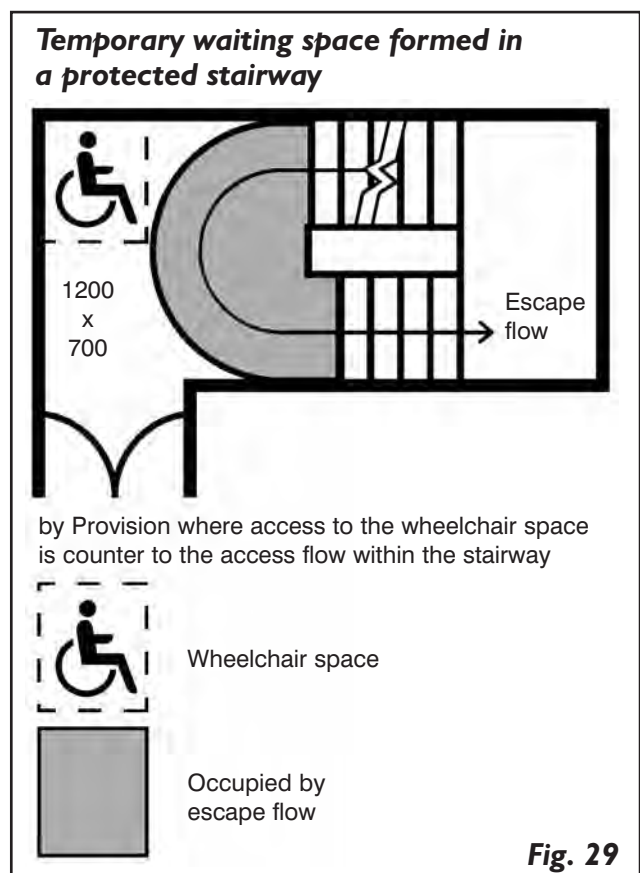
1. It is important that the building management have a procedure in place for the safe evacuation of employees and visitors including individuals with disabilities.
2. Employers should ensure that all staff, including individuals with disabilities, are fully aware of the emergency evacuation procedures for the building. Staff with disabilities should also be consulted about what assistance they may require to exit the building safely in an emergency.
3. Visitors should also be aware of the evacuation procedure. Members of staff should be responsible for ensuring all visitors are escorted out of the building, or to a place of safety.
4. Under new Fire Safety legislation (Fire (Scotland) Act 2005), the building owners or occupier have a responsibility to carry out a risk assessment of the building. This must include evacuation procedures in case of emergency.
5. A Personal Emergency Egress Plan or Personal Emergency Evacuation Plan (PEEP) is a recommended method of documenting a safe arrangement for evacuation for all building users. This should be compiled taking consideration of disabled staff and users/visitors to the building. Above all, a PEEP should consider the capabilities of all individuals who might require assistance in any emergency

situation and does not necessarily mean everyone who is a wheelchair user e.g. pregnancy, injuries such as a broken leg, individual with a cognitive or sensory impairment, children etc.

6. When considering means of escape in case of fire, the ultimate consideration is the amount of time it will take for a person(s) to travel from a place threatened by fire to a place of safety.
7. For further information on this responsibility, please contact your local Fire and Rescue Service. The Practical Fire Safety Guidance: The Evacuation of Disabled Persons from Buildings is also a useful document.

### General

- Routes of travel should be free from any obstacles which may impede escape, e.g. thresholds or steps.
- Ramps that are designed as shown on page 21, are suitable for changes in level.



# MEANS OF ESCAPE

## Means of Escape/Egress

- The width of escape routes and exits should be sufficient to accommodate the evacuation of mixed-ability occupancies.

### Temporary Waiting Spaces

Most people with disabilities should be able to reach the safety of a protected escape route or a final exit independently due to the limitations of travel. However, it should be recognised that some may require additional time to evacuate. It is when stairways are encountered that some people will rely on assistance. It is for this reason a waiting area should be provided in a safe area, so a person requiring assistance can wait in safety until evacuated.

- Although dimensions are provided for temporary waiting spaces, consideration should be given to the proposed building type and potential users as there may be a requirement for more than one individual at any given time.
- Audible alarms within the temporary waiting spaces can be deafening for many individuals, dependent upon how long they have to wait, therefore it is not recommended that they are located within this space.
- Temporary waiting spaces should be provided for each protected stairway affording egress from each storey. The temporary waiting space need not be located within the stair enclosure but should enable direct access to the stair.
- A temporary waiting space should be located in either:
  - Protected lobby, or
  - Protected corridor, or
  - Protected stairway
- A temporary waiting space should not encroach into the escape flow space
- A temporary waiting space should have dimensions of at least 1200mm x 700mm
- Temporary waiting spaces should be provided for each stairway on each storey
- Communication should be an integral part of the fire safety management plan and

consideration should be given to the provision of a two way communication system at each temporary waiting space.

## LIFTS

There are 3 main types of lift

- Passenger Lift
- Evacuation Lift
- Firefighting Lift

### Passenger Lift

Generally to gain access to the upper floors, a passenger lift is required by the Technical Standards. These lifts should not be used as a means of escape in case of fire.



## Means of Escape/Egress

### Evacuation Lift

Designers may wish to give consideration to the provision of fire evacuation lifts in high risk areas where appropriate e.g. hospitals, high rise buildings. Consultation with the local Fire and Rescue Service is recommended.

### Firefighting Lift

Similar in design to an Evacuation Lift but with additional fittings which are generally to aid firefighters in their operations. Firefighting lifts should not be used by occupants of the building in case of fire.

### Stairlifts

Stairlifts should not be used in an emergency evacuation; they should be fitted with a battery back up system, which will take the lift to the ground floor if the power fails.

### Lightweight Evacuation Chairs

Commonly known as Evac Chairs, these are often used in office buildings where occupants are familiar with evacuation procedures, however, it should be noted that not everyone can transfer into this type of chair. It is essential that operators are fully trained and the use of the evac chairs is integral to the management procedures for evacuation in case of emergency.

## FIRE ALARMS

The typical fire alarm consists of a bell or siren. Consideration must be given to alerting occupants with hearing difficulties.

### Audible alarms

An audible alarm is the most usual way of alerting people to an emergency situation, and is the best way of alerting someone with a visual impairment.

### Vibrating Alarms

Vibrating pillow pads are very useful for owners of hotels, guesthouses, or anywhere that provides accommodation to alert a hearing impaired person in the event of an emergency. Vibrating pagers are also useful. There should also be a visual alarm, so a hearing impaired person realises it is not just a malfunction of the vibrating alarm.

### Visual Alarms

A visual alarm is a useful addition to the usual audio alarm system to warn those with hearing impairments of an emergency situation and these alarms should be located throughout the building including accessible toilets.

### Training

An essential part of the management procedures is to ensure all staff, including new members of staff, are prepared for an emergency situation.





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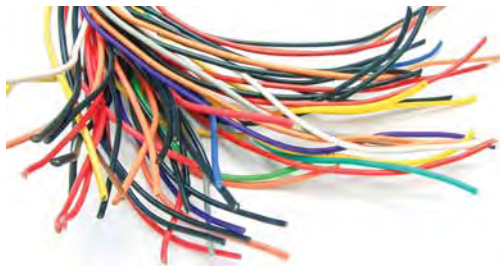


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# HUMAN FACTORS

## Signs and Symbols

Signage plays an important part in the built environment enabling individuals to way find and negotiate their way around an external and or internal space. The design of any signage should take account of the fact that not everyone has English as their first language (e.g. British Sign Language users) and individuals with a learning disability may understand symbols more readily than words.



- The international symbol of accessibility; the setting out of the symbol should be based on a square tile as shown.
- Signs should be consistent, thorough and continuous along routes and should take account of the need for reassurance.

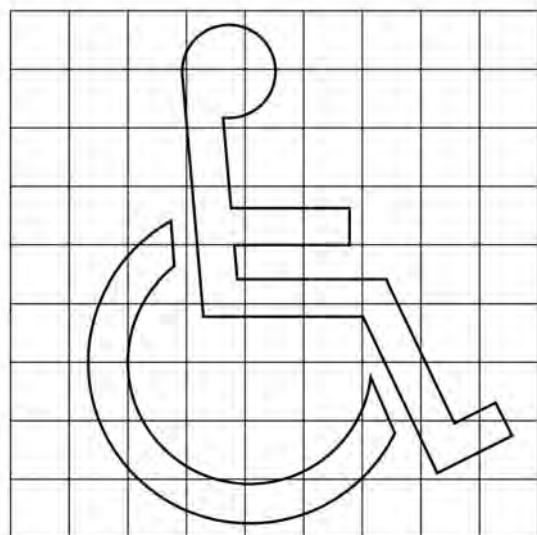
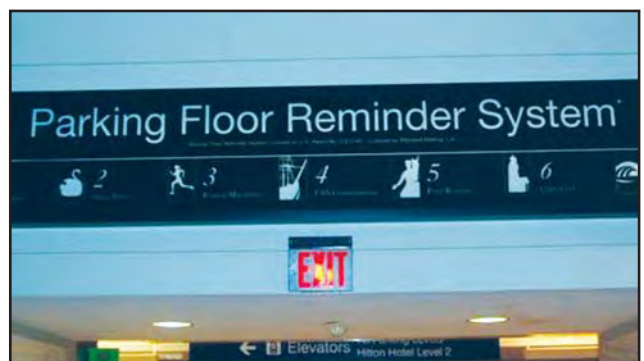


Fig. 30



- Guidance exists on the sizes of lettering and the use of sans serif fonts within the RNIB See It Right Guidelines.
- Ensure legibility of signs and lettering by attention to size and style and by use of strong colours, good immediate background and non-distracting general background and by good lighting without glare.
- Lettering should be within visual range and provide good contrast against the background.
- Raised letters are helpful to blind and visually impaired individuals particularly. They should be within hand reach at a reasonable level. Ensure the background surface is comfortable to touch. Confine to single letters, numerals, symbols and keep to standard positions in a building.
- Symbols should be as near pictorial as possible. Standard symbols should indicate specific facilities, i.e. induction loop information, communications, assistance available if required.





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## Anthropometric Data

- The formulation of design criteria for buildings depends to a considerable extent on the dimensional characteristics of people at rest and moving and on their range of physical capabilities. In the case of people with disabilities, these criteria may be modified by the use of aids such as sticks, artificial limbs and wheelchairs.
- To determine appropriate limits for the range of the population to be accommodated, the statistical technique of percentile distribution is used.
- For example, for the head height of men who are wheelchair users, the value of 1:235 for the fifth percentile means that five per cent of men's head height when in a wheelchair is at 1:235 or less; the value 1:435 for the 95th percentile means that 95 per cent is at 1:435 high or shorter.

The figures below show the relevant dimensions.

### MEN

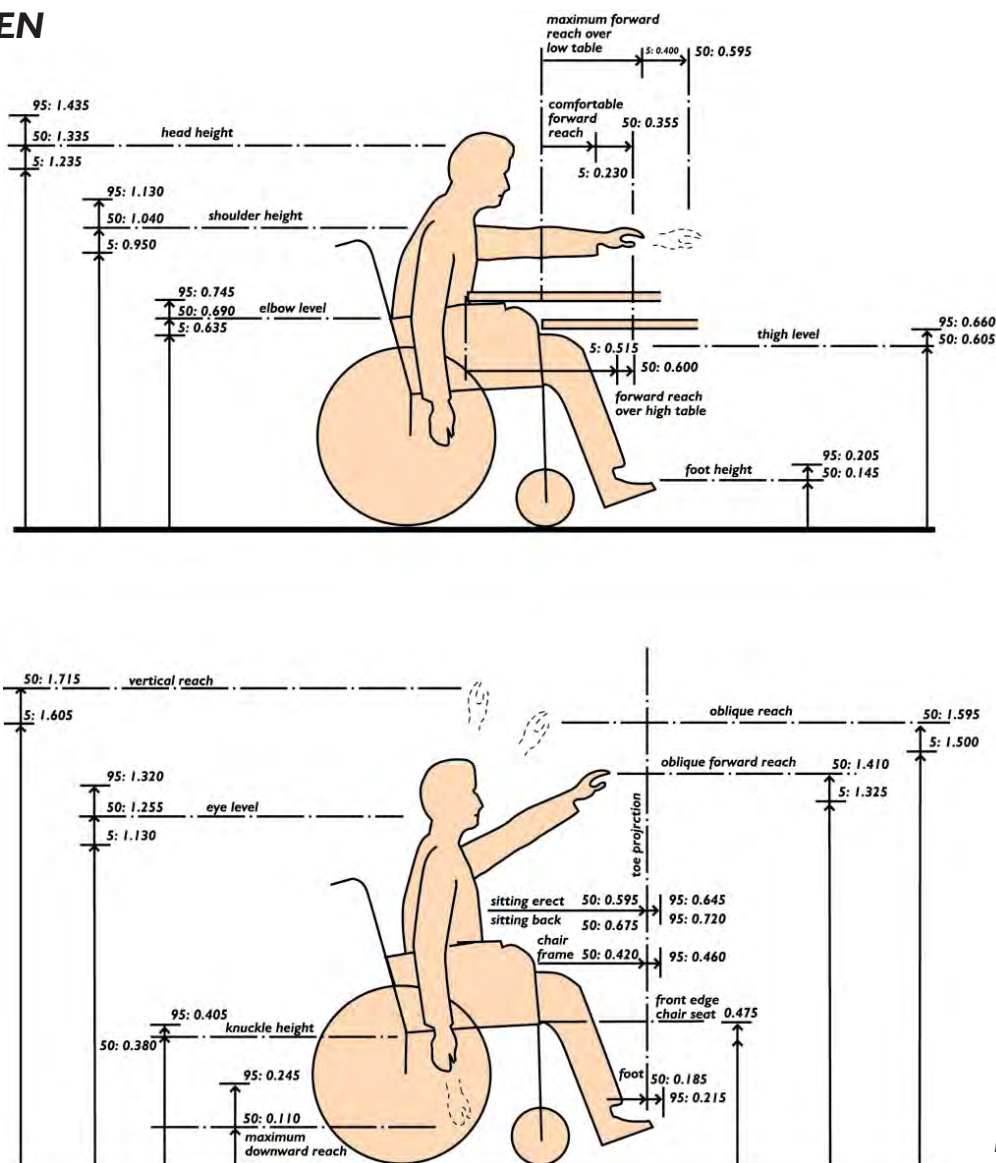


Fig. 31

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## Anthropometric Data

- Although in certain situations, it is appropriate to use the average as a criteria, it must be emphasised that averages should be treated with caution. It is hazardous to make decisions on the basis of catering for the average man or woman. In a representative sample of

population, 50 per cent of measurements will be greater than the average and 50 per cent will be less. Dimensions based on the average will therefore at best satisfy only 50 per cent of potential users.

### WOMEN

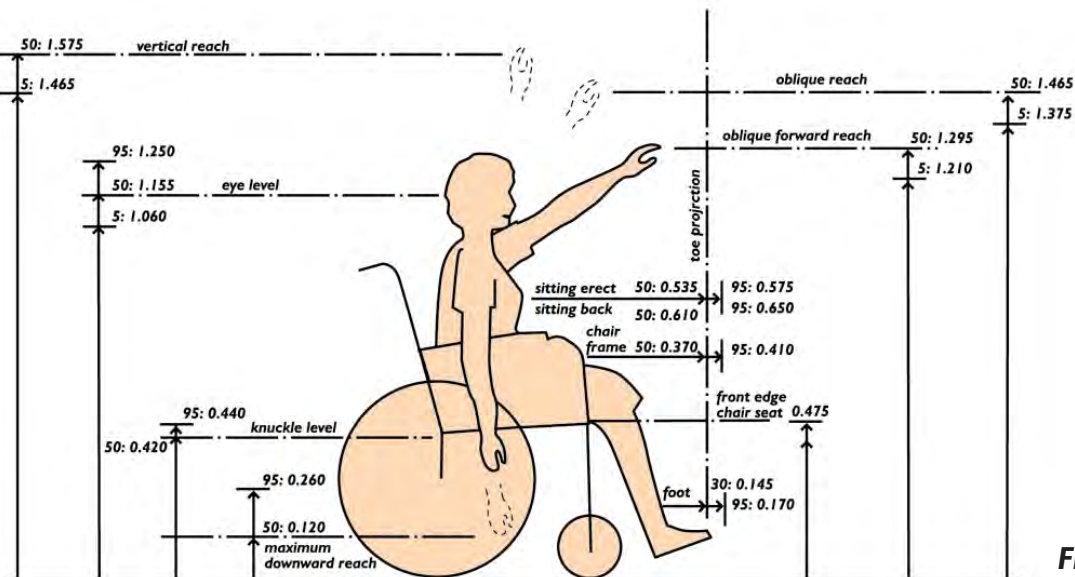
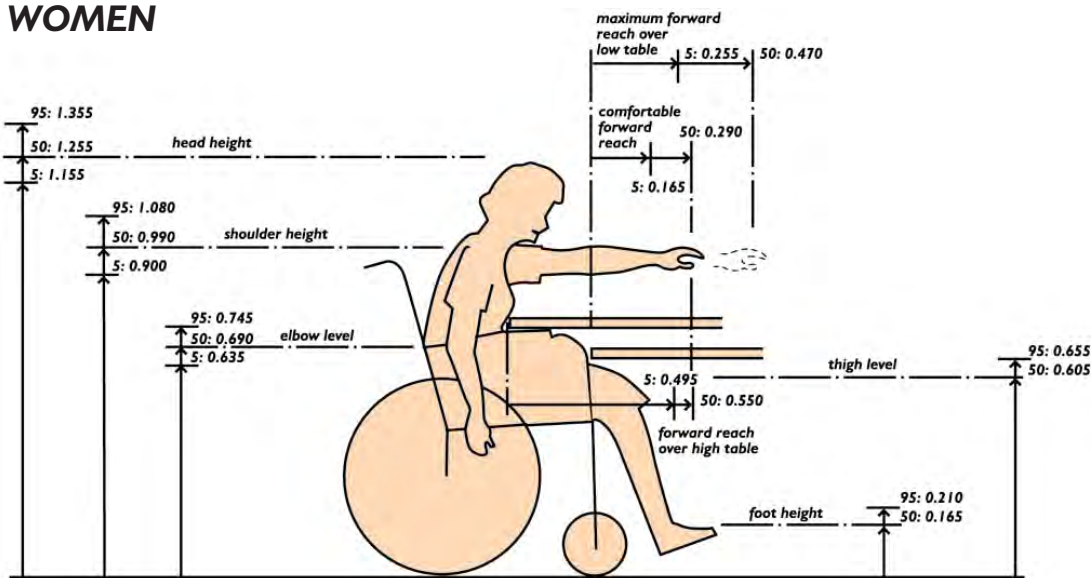


Fig. 32



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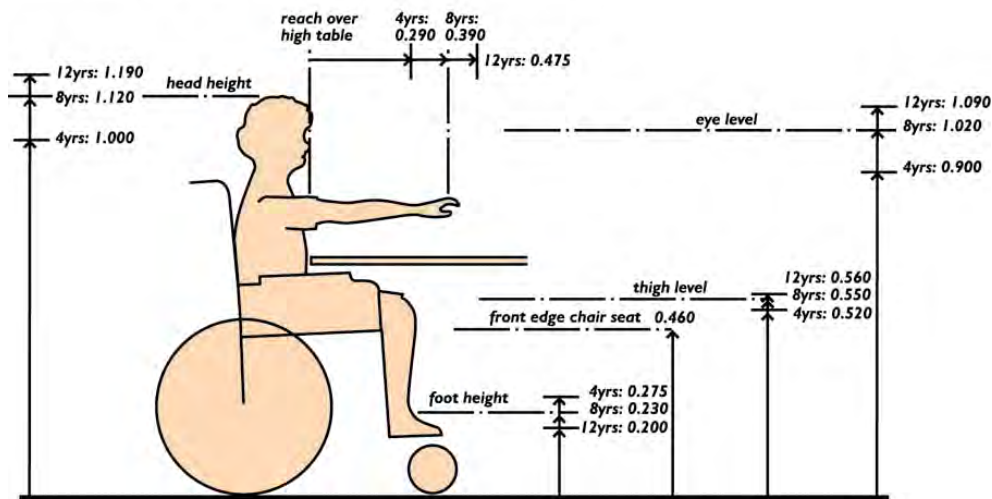
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## Anthropometric Data

- When data is applied to design problems, it is usually found that there is a limiting factor in one direction only, e.g. if the problem relates to obstructions at head-height, the measures of short people are not significant. In applying data, the designer should enquire which dimension is critical.
- It is not the case that whenever the value for the 95th percentile is observed, 95 per cent of the population will be accommodated; if the critical dimension is in the opposite direction, only five per cent will be accommodated and the correct course is to apply the 5th percentile instead.

### GIRLS AGED 4, 8 AND 12



### BOYS AGED 4, 8 AND 12

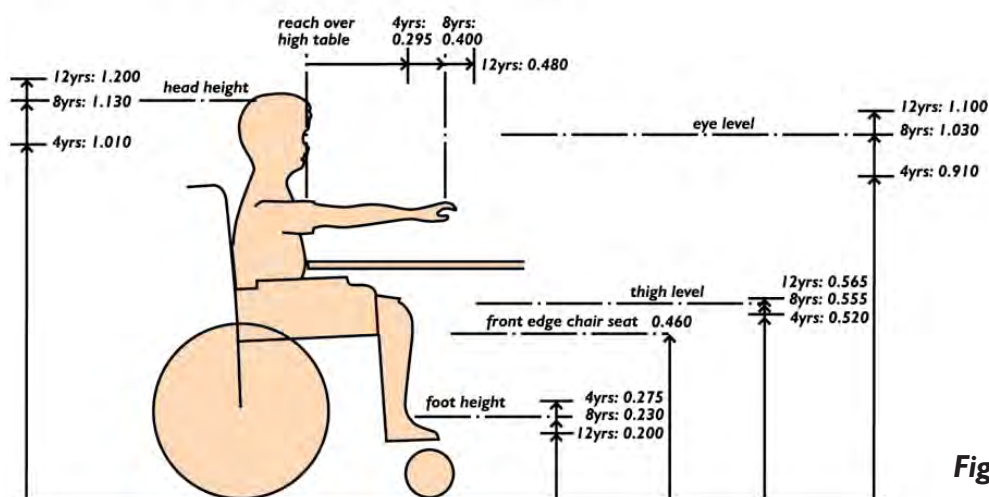


Fig 33

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## Anthropometric Data

### NON DISABLED INDIVIDUALS

- It is not always economic or practicable to cover 100 per cent of the population by catering for people at the extremes. It may not be possible to obtain a solution to a specific design problem, which is equally efficient for a typical ambulant person and a person in a wheelchair.

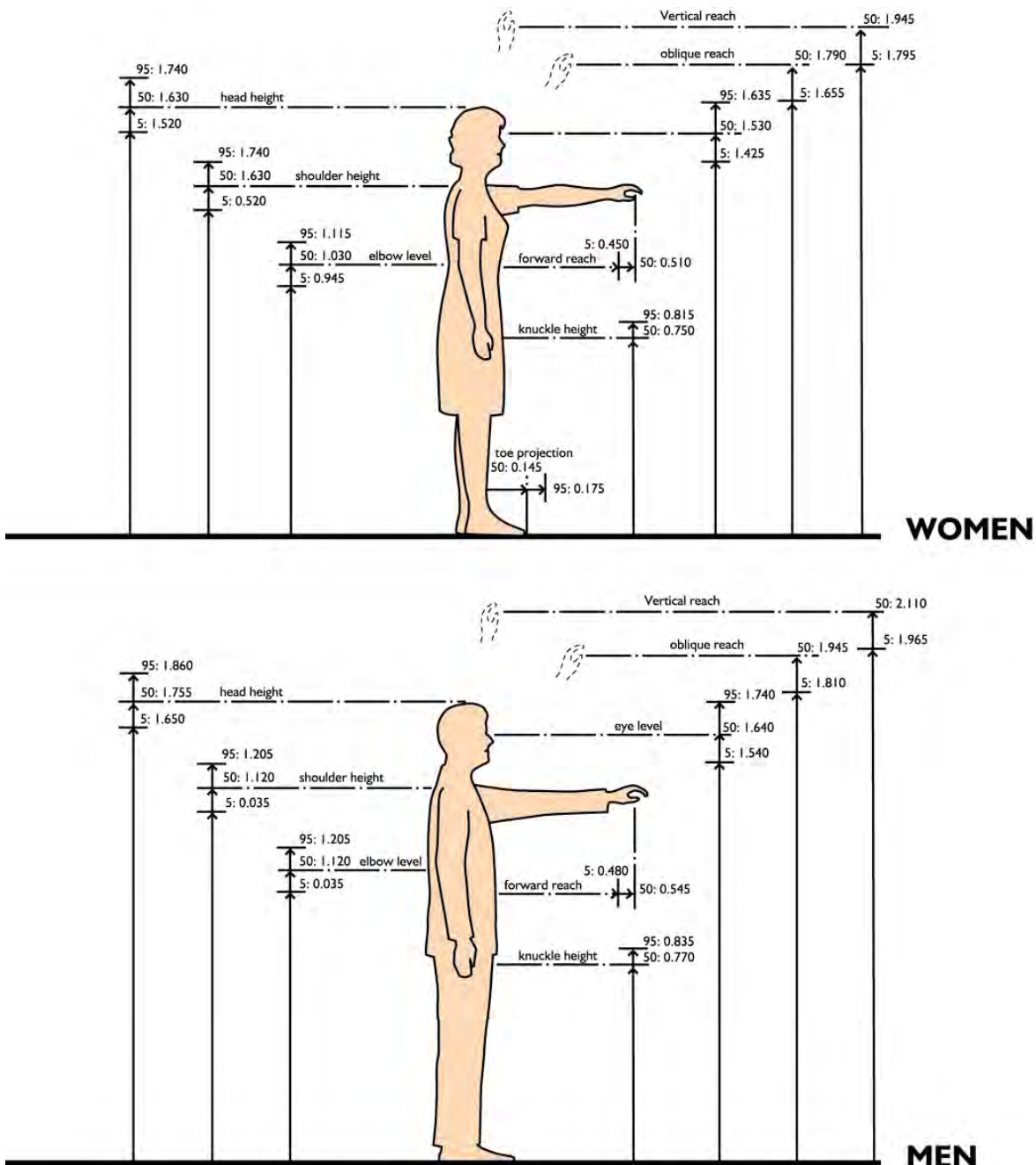


Fig 34



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## Ergonomic Data

### NON DISABLED INDIVIDUALS

- The convenient positioning of fittings and equipment is governed by body and reach dimensions. The general application of the recommendations should ensure that fittings and equipment are suitably located.

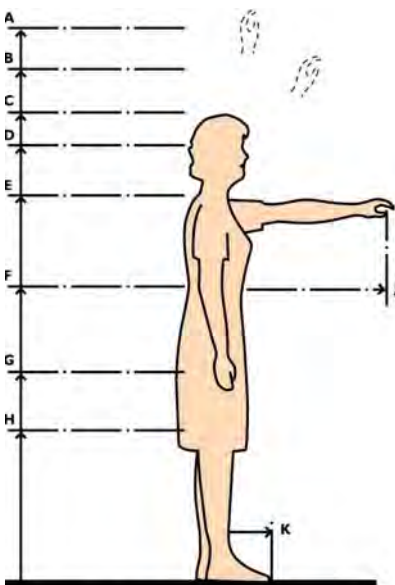


Fig 35

### MEASUREMENTS OF STANDING PERSON

#### A. Comfortable vertical reach

A: minus 0.070: maximum height of storage shelves, allowing access to front of shelf.

A: minus 0.150: maximum height of 0.300 deep storage shelves over 0.600 floor units, allowing access to front of shelf.

#### B. Oblique vertical reach

B: maximum height of window and blind controls.

B: minus 0.060: maximum height of 0.200 deep storage shelves over 0.600 floor units, allowing access to front of shelf.

B: minus 0.080: maximum height of unobstructed storage shelves, allowing reach to back of shelf.

#### C. Head height

C: relate to fixed mirror heights and position of shower fittings.

#### D. Eye level

D: avoid window transoms at this level.

D: related to fixed mirror heights.

#### E. Shoulder level

E: preferred maximum height of switches and controls.

#### F. Elbow level

F: minus 0.130: preferred level of kitchen surfaces where sink rim and general work surfaces are at the same height.

F: minus 0.100: preferred level of sink rim.

F: minus 0.150: preferred level of general work surfaces.

F: minus 0.100: preferred level of wash basin rim.

F: minus 0.250: preferred level of fixed ironing board.

#### G. Knuckle height (comfortable downward reach)

G: lower level of preferred zone for most-used articles stored in kitchen.

G: preferred minimum height of socket outlets and other controls.

G: preferred height of letter basket and delivery shelves adjacent to entrance door.

#### H. Effective downward reach

H: minimum height of storage shelves, socket outlets, heater controls and oven floor.

#### J. Comfortable forward reach

J: plus 0.100: maximum depth of kitchen work surfaces.

J: preferred maximum dimension, sink fascia to sink tops.

#### K. Toe projection

K: preferred minimum depth, toe recesses to kitchen units.





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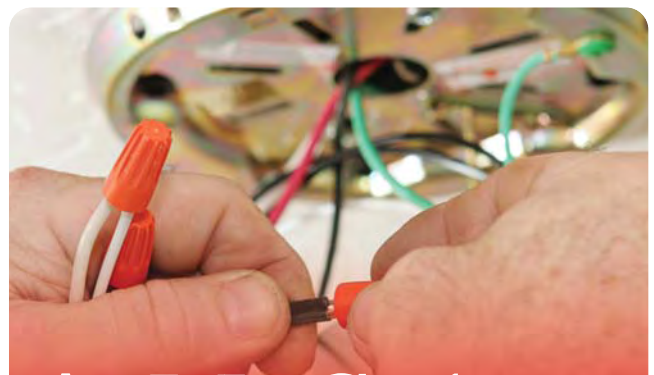
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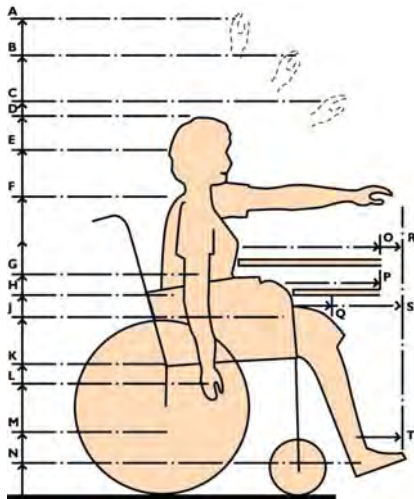


Fig 36

### MEASUREMENTS

#### A. Comfortable vertical reach

A: minus 0.070: maximum height of unobstructed storage shelves with lateral approach, reach to front of shelf.

#### B. Oblique vertical reach

B: maximum height of window and blind controls.  
 B: minus 0.120: maximum height of 0.300 deep storage shelves over 0.600 floor units, allowing reach to front of shelf.  
 B: minus 0.160: maximum height of unobstructed storage shelves with frontal approach, allowing reach to back of shelves.

#### C. Comfortable forward vertical reach

C: preferred maximum height of window and other controls.  
 C: maximum height of electric switches.

#### D. Head height

D: related to height of shower fittings.

#### E. Eye level

E: avoid window transoms at this level; relate to sill heights.  
 E: relate to fixed mirror heights.

#### F. Shoulder level

F: plus 0.100: upper level of preferred zone for most-used articles stored in kitchen.  
 F: preferred maximum height of electric switches.

#### G. Chair armrest level

G: maximum unobstructed dimension below work surfaces or tables to permit close approach.

#### H. Elbow level

H: plus 0.020: preferred height of letter basket and delivery shelves adjacent to entrance door.  
 H: minus 0.030: preferred height of pull-out for food preparation.  
 H: minus 0.040: preferred height of fixed ironing board.

#### J. Thigh level

J: minimum unobstructed vertical dimension for knee recesses to tables, desks, kitchen sink, preparation centre and wash hand basin.  
 J: plus 0.160: preferred height of kitchen work surfaces at consistent level assuming 0.150 deep sink bowl.

#### K. Chair seat level, centre front edge (with cushion if used)

K: preferred level of WC seat, platform at head end of bath and shower seat.

#### L. Knuckle height

L: plus 0.100: minimum height of heater controls.  
 L: plus 0.050: lower level of preferred zone for most-used articles stored in kitchen.  
 L: minimum level of oven floor.

#### M. Comfortable downward reach

M: minimum height of storage shelves.

#### N. Foot height

N: minimum height of toe recesses to kitchen units.

#### O. Effective forward reach

O: maximum depth of kitchen work surfaces.

#### P. Forward reach beyond face of chair arm

P: comfortable reach over low-level tables, etc.  
 P: preferred maximum dimension, sink fascia to sink taps.

#### Q. Knee projection beyond face of chair arm

Q: minimum dimension sink fascia to waste pipe and wash basin fascia to waste pipe.

#### R. Toe projection from front to waist

R: preferred minimum depth of tables and knee recesses to permit close approach.

#### S. Toe projection beyond face of chair arm

S: minimum depth of knee recesses to kitchen sink, preparation centre, wash basin, etc.

#### T. Toe projection at lower leg level

T: minimum depth of toe recesses to kitchen units.

## Accessibility

The Scottish Building Standards have evolved over the years in terms of accessibility. The first requirements entered the then Building Regulations when Part T was laid before Parliament on 14th November 1984 and came into force on 4th March 1985, where basic requirements in non-domestic buildings were introduced for disabled people.

The 5th Amendment of the Building Standards (Scotland) Regulations 1990 which were laid before Parliament on 14th December 1999 and came into force on 17th April 2000 meant that Part T ceased to be a separate section and its requirements distributed among other relevant parts mainly Q and S. The integration was intended to remove any sense of discrimination against disabled people resulting from labelling them as a distinct category with "special requirements".

Further changes came along with the 6th Amendments which were laid before Parliament on 24th September 2001 and came into force on 4th March 2002.

Minor changes were made to Part M and the provision of accessible sanitary accommodation e.g. the provision of larger wc cubicles.

The most major changes to the Building Standards came on 1st May 2005 following the introduction of the Building (Scotland) Act 2003 which received Royal Assent on 26th March 2003. These changes (from prescriptive to performance based standards) meant that there was more emphasis on providing accessible and inclusive facilities within new build and existing buildings which were to be altered.

The change to performance based standards means that there is now a requirement for architects and designers to meet all or part of the 64 functional standards dependent upon their project. Designers have to now show compliance with these standards by either using the guidance contained within the Technical Handbooks or show by another means that they have met the functional standard.

The guidance refers to inclusive design and the requirement to "ensure that buildings are accessible to as wide a range of people as possible" and that "solutions should be integral to a design rather than an afterthought".

### LIFETIME HOMES

The Joseph Rowntree Foundation have developed the concept of Lifetime Homes which comprise 16 Lifetime Homes Standards:

- Car parking width
- Access from car parking
- Approach gradients
- Entrances
- Communal stairs and lifts
- Doorways and hallways
- Wheelchair accessibility
- Living room
- Entrance level bedspace
- Entrance level wc and shower drainage
- Bathroom and wc walls
- Stair lift/through floor lift
- Tracking hoist route
- Bathroom layout
- Window specification
- Controls, fixtures and fittings

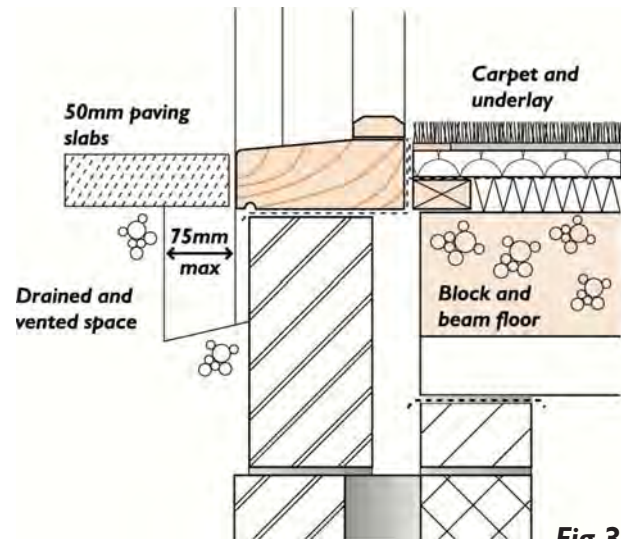
The idea behind these standards is that the dwelling, if constructed to these standards, will be adaptable to the occupiers' varying needs at different stages in life. The houses will be designed in a way that will either allow someone to live in the house if their needs change or will allow minor modifications to be carried out without major disruption.



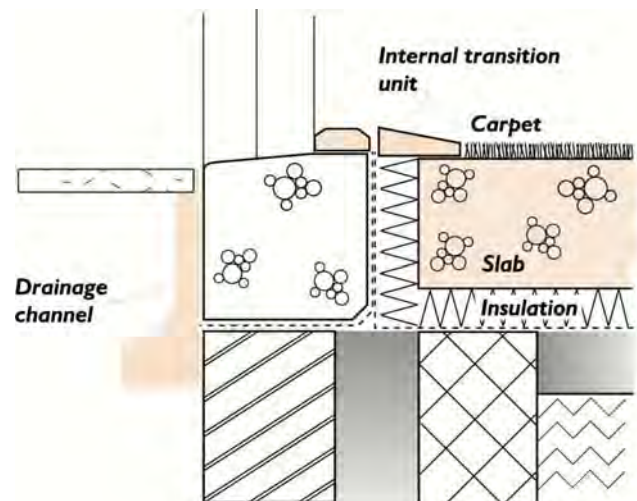
## Accessibility

- The approach cannot be made of loose laid materials such as gravel or shingle.
- The presence of a driveway might provide a better opportunity for creating a level or ramped approach, either from the pavement or footpath or from a car parking space.
- Where car parking is provided within the curtilage of flats or maisonettes it should include accessible spaces.
- It is expected that any car parking within the curtilage of a dwelling should allow someone to travel on a firm level surface to the accessible entrance.
- Routes to an accessible entrance should be of a reasonable gradient (refer to table on page 21 relating to ramp gradients). Where resting points need to be provided they should be at least 1.5m long.
- Access to dwellings should have provision for an accessible threshold in accordance with the accompanying diagrams.
- An accessible threshold should be designed to take into account the requirements of other parts of the Building Standards including resistance to weather and ground moisture.

**Timber sill and external concrete slab paving**



**Concrete sill and internal transition unit**



**Fig. 38**



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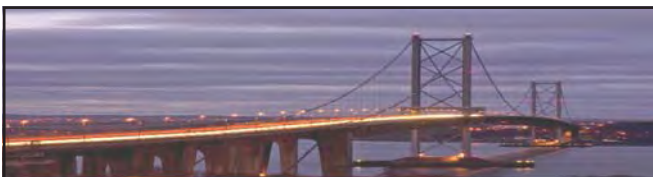
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## Circulation

It is recognised that lack of space within a dwelling will restrict some individuals' ability to freely move around an area. Therefore consideration should be given to providing adequate space in circulation areas.

**Table 4 Width of doors**

Minimum corridor width at door (mm)	Minimum clear opening width (mm) [1]
1500	800
1200	825 [2]
900 [3]	850 [2]

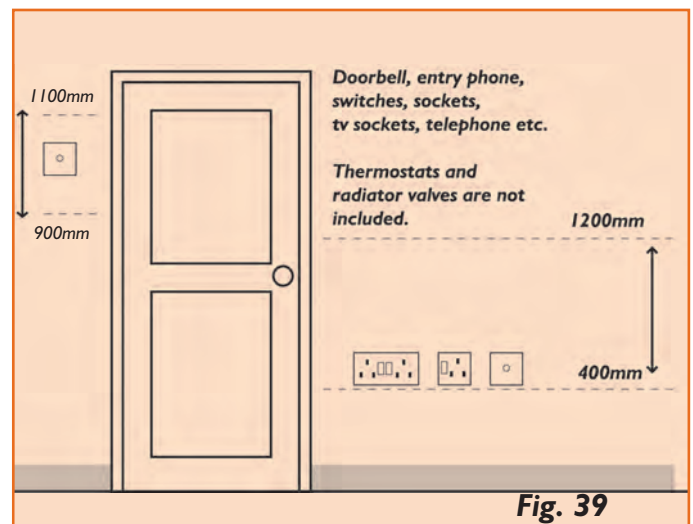
**Notes:**

- the projection of any ironmongery that extends across the width of a door leaf, such as an emergency push bar to a fire exit or horizontal grab rail, should be subtracted when calculating the clear opening width.
- the clear opening width may reduce to 800 mm where a door is approached head-on.
- a corridor width of less than 1.2 m should not be present within *new buildings* but may be found within some existing *buildings*.

- Circulation within the entrance storey of the building must be possible for wheelchair users, providing access via doorways, corridors and passageways to the kitchen, habitable rooms and a room containing a w.c.
- An obstruction free zone of 900mm wide must be maintained outside the w.c. and opposite door openings in general. This zone should extend 200mm both sides of the projected edges of the clear opening.
- Switches and sockets on all levels within the dwelling should be located within an accessible zone. This is to assist people whose reach is limited to use the dwelling more easily.

- Doors can become barriers for certain individuals, dependent upon their age, ability or gender. Guidance contained in table 4 should be referred to when designing doors in common areas.
- The installation of a stairlift at some point in the future must be taken into account in design of new build dwellings.
- Internal doors should be accessible.
- Where a building contains flats and maisonettes and is over 4 storeys in height provision for a lift must be made.
- Circulation routes within common areas e.g. flats should have a minimum clear width of 1200mm and lobbies should be provided in accordance with Fig 10 on page 27.

### Location of switches, sockets, etc for accessibility



**Fig. 39**



# DWELLINGS

## Accessible Sanitary Facilities within Dwellings

The requirement for accessible toilet accommodation on the accessible storey is not necessarily aimed at providing "an optimum standard for wheelchair users" but it is hoped that most individuals will be able to use the WC unassisted.

The WC should be provided on the accessible storey or principal living level of the dwelling. This should be located such that it can be reached from the habitable rooms in that storey without using stairs.

The WC should

- have sufficient space for manoeuvrability and allow someone to close the door behind them
- have the appropriate activity spaces adjacent to each sanitary appliance
- have sufficient headroom above each activity space including baths and showers

N.B. The compartment does not have to fully accommodate a wheelchair, and handrails are not required.

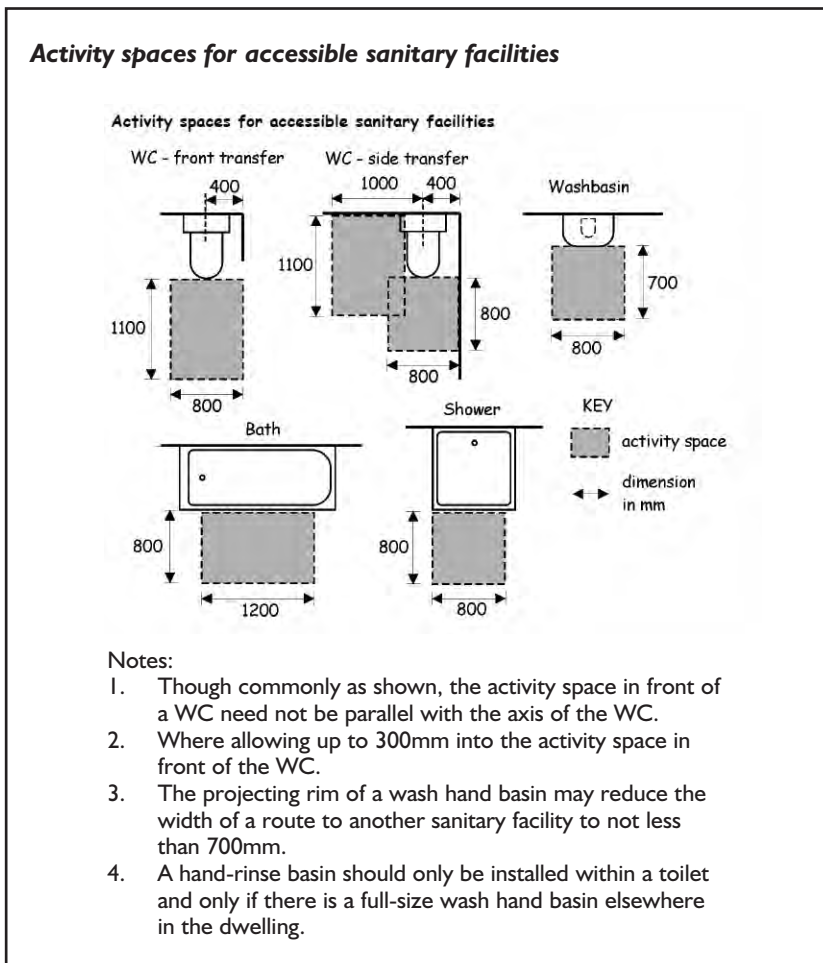


Fig. 40

# LEGISLATION AND BIBLIOGRAPHY

## LEGISLATION

*The following are the most significant Acts of Parliament which affect disabled people.*

Chronically Sick and Disabled Persons Act 1970

Civic Government (Scotland) Act 1982

Disability Discrimination Act 1995 and 2005 as amended

Disabled Persons Act 1981

Disabled Persons Employment Act 1944 (amended 1958)

Fire (Scotland) Act 2005

Fire Safety (Scotland) Regulations 2006

Fire Safety and Safety at Places of Sport Act 1987

Health and Safety at Work, etc Act 1974

Licensing (Scotland) Act 2005

Licensing Acts 1961, 1964, 2003 and 2006

Planning etc. (Scotland) Act 2006

Regulation of Care (Scotland) Act 2001

Safety at Sports Grounds Act 1975

The Building (Scotland) Act 2003

The Building (Scotland) Regulations 2004 as amended and the supporting Domestic and Non Domestic Handbooks

Theatres Acts 1843 and 1968

## REFERENCE & BIBLIOGRAPHY

Sections 2, 3 and 4 from the Domestic and Non Domestic Technical Handbooks

Good Loo Design Guide published by Centre of Accessible Environments and RIBA Enterprises, 2004

Department of Transport – Guidance on the use of Tactile Paving Surfaces

PAN 78 – Inclusive Design

Housing for Varying Needs, Part 1 and 2, Inclusive Mobility

Practical Fire Safety Guidance: The Evacuation of Disabled Persons from Buildings – Safety Scotland, Scottish Government

Fire Safety (Scotland) Regulations 2006

Conversion of Traditional Buildings Application of the Scottish Building Standards Parts 1 and 2

## BRITISH STANDARDS

BS 4787 Internal and External Wood Doorsets, Door Leaves and Frames B.S.I.

BS 5395 Stairs, Ladders and Walkways B.S.I.

BS 5588 Part 8: Code of Practice for Means of Escape for Disabled People B.S.I.

BS 5655 Lifts and Service Lifts B.S.I.

BS 6180 Code of Practice for Protective Barriers in and About Buildings B.S.I.

BS 8300 Design of Buildings and their Approaches to meet the needs of Disabled People B.S.I.

BS 9999 Code of Practice for Fire Safety in the Design, Management and Use of Buildings B.S.I.

## USEFUL DOCUMENTS

*Accessible Threshold in New Housing – Designing for the Disabled – Selwyn Goldsmith*

*Good Loo Design Guide published by Centre of Accessible Environments and RIBA Enterprises 2004*

*Department of Transport – Guidance on the Use of Tactile Paving Surfaces*

*Design and Access Statements – C.A.B.E*

*Designing for Accessibility – Centre for Accessible Environments*

*PAN 78 – Inclusive Design*

*Housing for Varying Needs Part 1 and 2, Inclusive Mobility*

*Practical Fire Safety Guidance: The Evacuation of Disabled Persons from Buildings – Safety Scotland, Scottish Government Fire Safety (Scotland) Regulations 2006.*

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# THE DISABILITY DISCRIMINATION ACT (DDA) 1995 & 2005

The DDA creates rights for any individual, defined by the Act as a disabled person, not to be discriminated against in:

- Employment
- Provision of goods, facilities and services
- The management, buying or renting of land or property
- Education and training
- Provision of transport

The original provisions on education in schools, colleges and universities were significantly amended by the Special Educational Needs and Disability Rights Act 2001, which have become Part IV of the DDA. All training provision is already covered by Part III of the DDA.

**From December 1996**, employers have had to make reasonable adjustments for employees, based upon their specific requirements and the nature of the job. This includes adjustments to policies, procedures and practices and to buildings and the environment.

**From October 1999**, all service providers, including community and voluntary organisations providing any service to the public, including information, advice, training and the involvement of members and volunteers, should be making reasonable adjustments to all policies, procedures and practices to make their services accessible.

This applies to all sizes of service providers and organisations.

**From October 2004**, all service providers are required to alter, remove or provide means of avoiding physical barriers that make it impossible or unreasonably difficult for disabled people, including any volunteers and members, to access their services by making reasonable adjustments to all their buildings and the environment.

## The Disability Discrimination Act 2005

The Act was amended and extended in 2005 and as of the 5th of December 2005 additional definitions are included within the meaning of 'Disability' (i.e. individuals are now covered under the legislation at the time of diagnosis for certain conditions e.g. cancer and HIV). It is also unlawful for Private Members Clubs, with 25 or more members, to treat disabled people less favourably.

As from the 6th of December 2006 additional duties are placed on Public Authorities, and land based Public Transport vehicles are brought within the scope of Part 3 of the Act. For full details contact the Equalities Commission for Human Rights (see contacts page).

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# USEFUL CONTACTS

## **Access Association**

[www.access-association.org.uk](http://www.access-association.org.uk)  
[secretary@accessassociation.co.uk](mailto:secretary@accessassociation.co.uk)

## **Centre for Accessible Environments**

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## **Changing Places (Scotland)**

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[www.changing-places.org](http://www.changing-places.org)  
[PamisChangingPlaces@dundee.ac.uk](mailto:PamisChangingPlaces@dundee.ac.uk)

## **Commission for Architecture and the Built Environment**

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London WC2B 4AN  
Tel. 020 7070 6700  
[www.cabe.org.uk](http://www.cabe.org.uk)  
[enquiries@cabe.org.uk](mailto:enquiries@cabe.org.uk)

## **DisabledGo**

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Gatesway  
Stevenage  
Hertfordshire SG1 3HG  
[www.disabledgo.info](http://www.disabledgo.info)  
[feedback@disabledgo.info](mailto:feedback@disabledgo.info)

## **Equalities Commission for Human Rights Helpline Scotland**

Freepost RRLG-GYLB-UJTA  
The Optima Building  
58 Robertson Street  
Glasgow G2 8DU  
Tel. 0845 604 5510  
Fax. 0845 604 5520  
[www.equalityhumanrights.com](http://www.equalityhumanrights.com)

## **Inclusive Design Toolkit**

[www.inclusivedesigntoolkit.com/betterdesign](http://www.inclusivedesigntoolkit.com/betterdesign)  
[edc-toolkit@eng.com.ac.uk](mailto:edc-toolkit@eng.com.ac.uk)

## **JMU Access Partnership**

RNIB Scotland  
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Dunedin House  
25 Ravelston Terrace  
Edinburgh EH4 3TP  
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## **Lifetime Homes**

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## **National Register of Access Consultants**

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SMS. 07921 700 089  
[www.nrac.org.uk](http://www.nrac.org.uk)  
[info@nrac.org.uk](mailto:info@nrac.org.uk)

## **Research Groups for Inclusive Environments**

[www.rdg.ac.uk/ie/aboutus](http://www.rdg.ac.uk/ie/aboutus)

## **Ricability – Research Institute for Consumer Affairs**

[www.ricability.org.uk](http://www.ricability.org.uk)

## **Royal College of Art**

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# USEFUL CONTACTS



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## **Scottish Association of Building Standards Managers**

[www.sabsm.co.uk](http://www.sabsm.co.uk)

## **Scottish Disability Equality Forum**

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## **Scottish Government**

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## **Surface Inclusive Design Research Centre**

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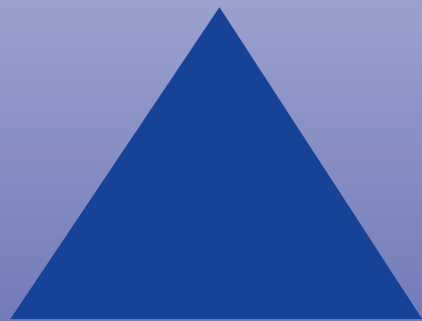
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