

BS 8300:2009+A1:2010



BSI Standards Publication

Design of buildings and their approaches to meet the needs of disabled people – Code of practice

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This document comprises a front cover, an inside front cover, pages i to x, pages 1 to 216, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 28 February 2009. It was prepared by Technical Committee B/559, *Access to buildings for disabled people* (previously B/209/8). A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

BS 8300:2009+A1:2010 supersedes BS 8300:2009, which is withdrawn.

Information about this document

BS 8300:2009 was a full revision of the standard. The principal changes were to consolidate the changes made in Amendment 1 (2005), and to incorporate changes thought necessary by the Technical Committee following consideration of comments submitted by disability groups and constructional professionals since 2005. The following specific changes were made.

- The recommendations on steps, stairs and handrails reflect those in BS 5395-1.
- There has been a relaxation of the recommendations on the provision of vision panels in doors, and more detailed information is given on the location and design of door opening and closing furniture.
- More information is now provided on means of escape and references are made to BS 9999.
- An increased percentage of accessible bedrooms is now recommended.
- New subclauses have been included on accessible baby changing facilities and Changing Places sanitary accommodation.
- Information on achieving sufficient visual contrast has been revised and included in a new annex that makes reference to BS 8493 on the measurement of light reflectance values.
- A new annex on slip resistance has been included, drawing on guidance issued by BRE and CIRIA.

Issues that require further research will be covered in a subsequent revision.

This standard provides guidance on good practice in the design of buildings and their approaches so that they are convenient to use by disabled people. The recommendations relate not only to the elements of construction and accommodation which are common to different types of buildings, but also to those that are specific to individual building types.

For dwellings, much of the fundamental guidance in BS 5619 was incorporated into the 1999 edition of the Building Regulations 2000, Approved Document M as indicative of a basic minimum provision. This has now been superseded by the 2004 edition [1]. Where still relevant and considered to be helpful, recommendations from BS 5619 were incorporated into general guidance in the 2001 edition of BS 8300.

As a result of proposals in the Department of Communities and Local Government's consultations on the *Code for sustainable homes* [2], and the national strategy for housing in an ageing society *Lifetime homes, lifetime neighbourhoods* [3] for a gradual adoption of lifetime homes standards in both public and private-sector housing, recommendations on the design of dwellings to meet this standard have been published in a Draft for Development, DD 266. If formally adopted as a British Standard in due course, this will replace the current standards originated by the Joseph Rowntree Foundation.

The present edition of BS 8300 no longer gives guidance on individual dwellings, which are now covered in DD 266. However, some of the recommendations given in BS 8300 could be used to supplement guidance on the design of dwellings where appropriate.

The design recommendations in the 2001 edition of this British Standard were, where relevant, based on user trials and validated desk studies which formed part of a research project commissioned in 1997 and 2001 by the Department of the Environment, Transport and the Regions.

In 2005, as a result of concerns within the industry and among building control professionals on the application of a number of recommendations, previous research was revisited and revised guidance incorporated in Amendment 1. The principal amendments related to door closing forces and visual contrast. In the present revision of BS 8300, information on visual contrast has been developed further.

The start and finish of text introduced or altered by Amendment No. 1:2010 is indicated in the text by tags **A1** **A1**. Minor editorial changes are not tagged. The principal changes introduced by Amendment A1 are to the handrail dimensions.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

The recommendations in this British Standard are accompanied by scene-setting commentary that places the recommendations in context for readers not familiar with the difficulties experienced by disabled people when approaching and using buildings. In some instances, recommendations are quite specific; in others, they include dimensional ranges. Where dimensions and/or measurements are stated, they are subject to tolerances. Dimensional ranges are intended to provide designers with some flexibility of design solution.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Attention is particularly drawn to:

- the Disability Discrimination Act 1995 [4];
- the Disability Rights Commission Act 1999 [5];
- the Planning and Compulsory Purchase Act 2004 [6];
- the Disability Discrimination Act 2005 [7];
- the Equality Act 2006 [8].

Introduction

This British Standard explains how the built environment can be designed to anticipate, and overcome, restrictions that prevent disabled people making full use of premises and their surroundings.

An accessible environment is one which a disabled person can enter and make use of independently or with help from a partner or assistant, including being able to escape in the event of fire or other emergency.

Some facilities can be designed in such a way as to incorporate access for disabled people. In other situations, additional features such as grab rails, touch-legible signs and hearing enhancement systems might be needed.

The guidance in this standard covers a wide range of disabilities and the use of the built environment by disabled people who can be residents, visitors, spectators, customers, employees, holders of public office, or participants in sports events, performances and conferences.

Reference is made on occasions to ways in which management and maintenance can affect safe access and use of facilities by disabled people. The potentially beneficial effect of good management cannot be overemphasized.

It is advisable for the recommendations given in this standard to be applied at the earliest possible stage in the design process. It is also advisable for checks to be made before handover of a building to ensure that the recommended facilities have been correctly installed.

1 Scope

This British Standard gives recommendations for the design of new buildings and their approaches to meet the needs of disabled people. It applies to car parking provision, setting-down points and garaging, access routes to and around all buildings, and entrances to and interiors of new buildings. The recommendations also apply to routes to facilities associated with and in the immediate vicinity of buildings.

NOTE 1 The recommendations in this British Standard mainly cover access to buildings. The standard makes reference to egress in the event of fire or other emergency, but the main recommendations for means of escape are given in BS 9999.

The recommendations given in this British Standard also apply for assessing the accessibility and usability of existing buildings and, where practicable, as a basis for their improvement. The extent to which the recommendations apply to listed and historic buildings is determined on a case-by-case basis.

This British Standard applies to the following types of building:

- a) transport and industrial buildings, e.g. rail, road, sea and air travel buildings and associated concourses, car parking buildings and factories;
- b) administrative and commercial buildings, e.g. courts, offices, banks, post offices, shops, department stores and shopping centres, and public service buildings, including police stations;
- c) health and welfare buildings, e.g. hospitals, health centres, dental practices, surgeries and residential homes;
- d) refreshment, entertainment and recreation buildings, e.g. cafés, restaurants, public houses, concert halls, theatres, cinemas, conference buildings, community buildings, swimming pools and sports buildings;
- e) religious buildings and associated facilities, e.g. church halls;
- f) educational, cultural and scientific buildings, e.g. schools, universities, colleges, zoos, museums, art galleries, libraries and exhibition buildings;
- g) residential buildings, e.g. hostels and hotels, residential clubs, university and college halls of residence, nursing homes and prisons, as well as the common parts of multi-occupancy residential buildings.

This British Standard does not apply to individual dwellings, to residential buildings designed specifically to meet the needs of severely disabled people, or to temporary structures.

NOTE 2 This British Standard does not give recommendations for management and maintenance in occupied buildings, but a list of issues to be considered is given in Annex A.

Although this British Standard is aimed specifically at the design of buildings to meet the needs of disabled people, its recommendations are also likely to benefit the population in general, e.g. elderly people, people with children in pushchairs and those carrying heavy luggage.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 3621, *Thief resistant lock assembly – Key egress*

BS 4787-1, *Internal and external wood doorsets, door leaves and frames – Part 1: Specification for dimensional requirements*

BS 5499-4, *Safety signs, including fire safety signs – Part 4: Code of practice for escape route signing*

BS 5499-5, *Graphical symbols and signs – Safety signs, including fire safety signs – Part 5: Signs with specific safety meanings*

BS 5839-1, *Fire detection and fire alarm systems for buildings – Part 1: Code of practice for system design, installation, commissioning and maintenance*

BS 6180:1999, *Barriers in and around buildings – Code of practice*

BS 6262, *Code of practice for glazing for buildings*

BS 6262-4, *Glazing for buildings – Part 4: Code of practice for safety related to human impact*

 Reference deleted 

BS 6440, *Power lifting platforms for use by disabled persons – Code of practice*

BS 6571-4, *Vehicle parking and control equipment – Part 4: Specification for barrier type control equipment*

BS 7036-1:1996, *Code of practice for safety at powered doors for pedestrian use – Part 1: General*

BS 7036-2, *Code of practice for safety at powered doors for pedestrian use – Part 2: Straight and curved sliding doors and prismatic and folding doors*

BS 7036-3:1996, *Code of practice for safety at powered doors for pedestrian use – Part 3: Swing doors and balanced doors*

BS 7036-4, *Code of practice for safety at powered doors for pedestrian use – Part 4: Low energy swing doors*

BS 7036-5, *Code of practice for safety at powered doors for pedestrian use – Part 5: Revolving doors*

BS 7594, *Code of practice for audio-frequency induction loop systems (AFILS)*

BS 7953, *Entrance flooring systems – Selection, installation and maintenance*

BS 8213-1, *Windows, doors and rooflights – Part 1: Design for safety in use and during cleaning of windows, including door-height windows and roof windows – Code of practice*

BS 8233, *Sound insulation and noise reduction for buildings – Code of practice*

BS 8621, *Thief resistant lock assembly – Keyless egress*

BS 9999:2008, *Code of practice for fire safety in the design, management and use of buildings*

BS 10621, *Thief resistant dual-mode lock assembly*

BS EN 81-1, *Safety rules for the construction and installation of lifts – Part 1: Electric lifts*

BS EN 81-2, *Safety rules for the construction and installation of lifts – Part 2: Hydraulic lifts*

BS EN 81-28, *Safety rules for the construction and installation of lifts – Part 28: Remote alarm on passenger and goods passenger lifts*

BS EN 81-70, *Safety rules for the construction and installation of lifts – Part 70: Particular applications for passenger and good passenger lifts – Accessibility to lifts for persons including persons with disability*

BS EN 115, *Safety rules for the construction and installation of escalators and passenger conveyors*

BS EN 179:2008, *Building hardware – Emergency exit devices operated by a lever handle or push pad, for use on escape routes – Requirements and test methods*

BS EN 1125:2008, *Building hardware – Panic exit devices operated by a horizontal bar, for use on escape routes – Requirements and test methods*

BS EN 1154:1997, *Building hardware – Controlled door closing devices – Requirements and test methods*

BS EN 1155, *Building hardware – Electrically powered hold-open devices for swing doors – Requirements and test methods*

BS EN 1303, *Building hardware – Cylinders for locks – Requirements and test methods*

BS EN 1935, *Building hardware – Single-axis hinges – Requirements and test methods*

BS EN 1991-1-1, *Eurocode 1: Actions on structures – Part 1-1: General actions – Densities, self-weight, imposed loads for buildings*

BS EN 10535, *Hoists for the transfer of disabled persons – Requirements and test methods*

BS EN 12051, *Building hardware – Door and window bolts – Requirements and test methods*

BS EN 12209, *Building hardware – Locks and latches – Mechanically operated locks, latches and locking plates – Requirements and test methods*

BS EN 12414, *Vehicle parking control equipment – Pay and display ticket machine – Technical and functional requirements*

BS EN 60118-4, *Electroacoustics – Hearing aids – Part 4: Induction loop systems for hearing aid purposes. Magnetic field strength*

ISO 9386-1, *Power-operated lifting platforms for persons with impaired mobility – Rules for safety, dimensions and functional operation – Part 1: Vertical lifting platforms*

ISO 9386-2, *Power-operated lifting platforms for persons with impaired mobility – Rules for safety, dimensions and functional operation – Part 2: Powered stairlifts for seated, standing and wheelchair users moving in an inclined plane*

3 Terms and definitions

For the purposes of this British Standard, the following terms and definitions apply.

3.1 access

approach, entry, internal circulation or exit, including in cases of emergency

3.2 accessible

capable of being accessed and used by disabled people

3.3 accessible bedroom

bedroom with en-suite sanitary facilities (shower room or bathroom) designed for the convenience and safety of people with a wide range of disabilities, including not only wheelchair users, but also people with limited dexterity or mobility, blind or partially sighted people, or people who are deaf or hard of hearing

NOTE In larger premises, an accessible bedroom might also be provided with a hoist to transfer a person from the bed to the sanitary facilities.

3.4 accessible route

any route that is used to approach a building, or to move between buildings or within a building, and is accessible to disabled people

3.5 access statement

explanation of philosophy and approach to inclusive design adopted in the design and construction of a building

3.6 blister pedestrian crossing surface

form of tactile paving whose surface has parallel rows of flat-topped blisters (domes) to warn blind and partially sighted people of the proximity of a carriageway at pedestrian crossing points and other access points to a carriageway

NOTE The paving is installed at the dropped kerbs of both controlled and uncontrolled crossings. The colour of the paving is red for controlled crossings (e.g. crossings associated with traffic lights) and generally buff at other crossings.

3.7 components of ramps, steps and stairs

3.7.1 flight

continuous series of steps or ramp between two levels

3.7.2 going

horizontal distance between two consecutive nosings, measured along the walking line; horizontal distance between each end of a ramp

3.7.3 handrail

component of stairs, steps or ramps that provides guidance and support at hand level

NOTE A handrail may form the top rail of guarding (balustrading), be supported independently from guarding or be supported from a wall.

3.7.4 landing

level platform or part of a floor at the end of a flight, ramp or floor

3.7.5 nosing

front edge portion of a tread or landing

3.7.6 ramp

length of inclined surface that provides access between two levels

NOTE An access route that has a gradient of 1:20 or steeper is assumed to be a ramp.

3.7.7 rise

vertical distance between the horizontal upper surfaces of two consecutive treads, or between a tread and a floor or a tread and a landing; vertical distance between each end of a ramp flight

3.7.8 riser

vertical component of a step between one tread and another or a landing above or below it

3.7.9 stair width

surface width of a stair on plan perpendicular to the walking line of a stair

NOTE Measured to the face of the enclosing wall, string, balustrade or upstand, whichever is closer to the walking line.

3.7.10 tread

horizontal component of a step

3.8 controlled door closing device

device that is capable of closing a door from any angle and against any latch fitted to the door

NOTE Rising butt hinges that do not meet these criteria are acceptable where the door is in a cavity barrier.

3.9 exit devices**3.9.1 emergency exit device**

exit device intended for use in situations where people are familiar with the emergency exit and its hardware, having prior knowledge of its operation, and therefore a panic situation is unlikely to develop

3.9.2 panic exit device

exit device intended for use where panic situations might arise in public areas where the public are admitted and are not familiar with the surroundings

3.10 corduroy hazard warning surface

form of tactile paving whose surface that has raised ribs to warn blind and partially sighted people of a potential hazard ahead

NOTE The ribs, spaced at 50 mm centres, are installed at right angles to the direction of travel.

3.11 illuminance

amount of light falling on a surface, measured in lumens per square metre (lm/m²) or lux (lx)

3.12 lifts**3.12.1 conventional passenger lift**

lift designed to meet the requirements of the Lifts Regulations 1997 [9], operating at speeds greater than 0.15 m/s, for any travel distance, and able to transport passengers and goods without the need for instructions in its safe use

NOTE Such lifts are normally designed in accordance with BS EN 81.

3.12.2 evacuation lift

lift used as part of the evacuation sequence for people requiring assistance, which has appropriate structural, electrical and fire protection and is capable of being taken under control by an authorized person

3.12.3 fire-fighting lift

lift with fire protection measures, including controls that enable it to be used under the direct control of the fire and rescue service in fighting a fire

3.12.4 stairlift

appliance for transporting a person, either seated, standing or in a wheelchair, between two or more landings by means of a guided carriage moving in an inclined plane

3.12.5 chair stairlift

stairlift with a seat, which can be fixed or folding

3.12.6 wheelchair stairlift

stairlift with a horizontal platform which accommodates a wheelchair user

3.12.7 vertical lifting platform

device permanently installed to serve fixed landings comprising a guided platform whose dimensions and means of construction are primarily intended to permit the access of persons with limited mobility

NOTE This is also known as a platform lift.

3.13 light reflectance value (LRV)

total quantity of visible light reflected by a surface at all wavelengths and directions when illuminated by a light source.

NOTE Surfaces that differ sufficiently in LRV can be distinguished from one another by blind and partially sighted people (see Annex B).

3.14 manifestation

permanent markings or features within areas of full-height transparent glazing, glazed walls or screens, fully glazed doors or glass doors, which help to prevent collisions by making the glazing more visible to building users

3.15 refuge

area that is both separated from a fire by fire-resisting construction and provided with a safe route to a storey exit, thus constituting a temporarily safe space

3.16 spillover

interference within one induction loop from a signal from another induction loop nearby

3.17 tactile paving

profiled paving surface providing guidance or warning to blind and partially sighted people

NOTE The most common forms of tactile paving are blister pedestrian crossing surface (see 3.6) and corduroy hazard warning surface (see 3.10).

3.18 unisex

<of sanitary accommodation> designed for use by either sex with or without assistance by people of the same or opposite sex

3.19 visual contrast (or contrast visually)

perception of a difference visually between one surface or element of a building and another by reference to their light reflectance values (LRV)

NOTE See Annex B.

4 Car parking, garaging, and setting-down and picking-up points

COMMENTARY ON CLAUSE 4.

Car parking, garaging, setting-down and picking up are important activities at the beginning or end of journeys. Car parks can be open or multi-storey; setting-down and picking-up points can be on- or off-street; journeys can end inside a garage or an enclosed car parking space.

The driver of a vehicle (alone or accompanied) or a passenger might be disabled and might need to enter or leave the vehicle using a transfer hoist that is usually semi-permanently attached to the vehicle. Alternatively, it might be necessary for an assistant to alight from a vehicle first, then assist a disabled companion to do the same. When picking up, an assistant might need to park temporarily to escort disabled people who are waiting inside premises back to their vehicle.

Designated parking bays are for the exclusive use of vehicles displaying an official disabled person's parking badge (e.g. blue badge), providing the badge holder is either a driver or a passenger in the vehicle.

In some instances, a disabled person might need to drive a powered wheelchair or scooter through the rear or side entrance of a vehicle, requiring a larger than standard designated parking bay. Users of electric wheelchairs need a suitable battery charging facility, either at work or at home.

It is important that car park entry and payment equipment is accessible to, and usable by, disabled people.

Drivers, whether disabled or not, expect to use many types of equipment without leaving their vehicle.

When parking is associated with a non-domestic building, such as public or commercial buildings, a number of spaces need to be designated for disabled motorists, whether they are visitors or permanent staff members.

The provision for disabled motorists will depend on whether the building is new or existing (where the number of disabled motorists who are employees is known).

After parking a vehicle, a disabled person needs to be made aware of the accessible route away from the car park to the accessible entrance to the building, this route being quite separate from any vehicular route.

Not all people arrive at their destinations in their own transport and, therefore, the provision of a setting-down point on a level surface, close to the entrance of the building, is important.

4.1 Designated on-street parking

COMMENTARY ON 4.1.

Some disabled people have difficulty transferring from vehicle to wheelchair or to footway, if the pavement is above the level of the carriageway. However, wheelchair-accessible taxis and other rear- and side-entry vehicles are easier to access from a raised kerb.

Where designated on-street parking bays are provided, they should be sited where road gradient and camber are reasonably level, e.g. 1:50.

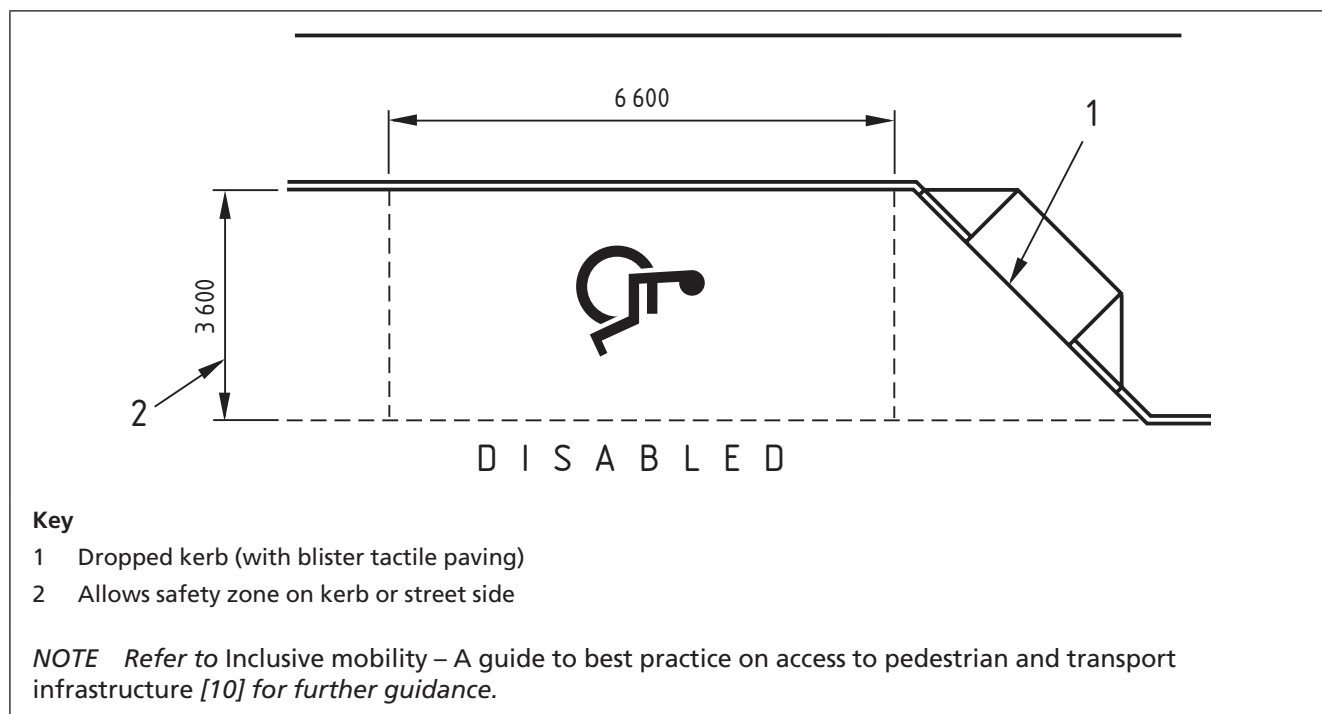
A dropped kerb (with associated blister paving) (see Figure 1) or level

surface should be provided to permit convenient access from the parking bay onto the pavement.

The dimensions of such parking bays, parallel to the kerb, should be as shown in Figure 1, to permit access to the rear of a vehicle to use a ramp or tail lift and to enable the driver or passenger to alight on the side where traffic might be passing.

NOTE Further guidance is given in Inclusive mobility – A guide to best practice on access to pedestrian and transport infrastructure [10].

Figure 1 **Example of a designated on-street parking bay**
Dimensions in millimetres



4.2 Designated off-street parking

4.2.1 Provision of designated parking spaces

4.2.1.1 General provision

Designated parking spaces should be provided for each employee who is a disabled motorist (driver or passenger) and for other disabled motorists visiting the building. Spaces designated for disabled employees should be differentiated from spaces designated for other users. In addition, a number of enlarged standard spaces of A_1 3.6 m A_1 wide $\times$ 6 m long that could be adapted to be designated parking spaces should be provided to reflect changes in local population needs and allow for flexibility of provision in the future. Initially, these spaces will benefit non-blue badge holders who need extra width to enter, or exit from, their vehicles.

Where space permits, at least one large designated parking space, 4 800 mm wide $\times$ 8 000 mm long, should be provided to cater for commercial vehicles converted for side or rear access using hoists or ramps. Such spaces should follow the recommendations in 4.2.2 and 4.2.3.

NOTE 1 See Annex C for information on the space required to access different sized vehicles in different ways.

NOTE 2 The use of designated parking spaces needs to be monitored regularly to limit misuse by non-disabled motorists and to confirm that the number of designated spaces remains appropriate for the number of disabled motorists using the building. In circumstances where the function of the building is to provide services to a population that includes a greater than normal proportion of disabled people, the number of designated parking places needs to be increased above the minimum provision, based on experience.

4.2.1.2 Workplaces

For workplaces, the minimum number of designated spaces should be one space for each employee who is a disabled motorist, plus 5% of the total capacity for visiting disabled motorists. A further 5% of the total capacity should be enlarged standard spaces (see 4.2.1.1).

4.2.1.3 Shopping, recreation and leisure facilities

For shopping, recreation and leisure facilities, the minimum number of designated spaces should be one space for each employee who is a disabled motorist, plus 6% of the total capacity for visiting disabled motorists. A further 4% of the total capacity should be enlarged standard spaces (see 4.2.1.1).

Hotels should have at least one designated car parking space per accessible bedroom.

NOTE The numbers of designated spaces might need to be greater at venues that specialize in accommodating groups of disabled people.

4.2.1.4 Railway car parks

For railway car parks, the minimum number of designated spaces should be one space for each employee who is a disabled motorist, plus 5% of the total capacity for visiting disabled motorists. A further 5% of the total capacity should be enlarged standard spaces (see 4.2.1.1).

Where car parking is split into short and long stay, all designated parking bays and enlarged standard spaces should be located together, as near as feasible to the station entrance.

4.2.1.5 Religious buildings and crematoria

For religious buildings, such as places of worship, and for crematoria, the minimum number of designated spaces should be two spaces or 6% of the total capacity, whichever is the greater. A further 4% of the total capacity should be enlarged standard spaces (see 4.2.1.1).

4.2.1.6 Sports facilities

Designated parking provision for sports facilities should be determined according to the usage of the sports facility.

NOTE A simple percentage provision is not relevant to sports facilities. Detailed guidance on parking provision for sports facilities can be found in the Sport England publication Accessible sports facilities [11].

4.2.2 Access to, and location of, designated off-street parking spaces

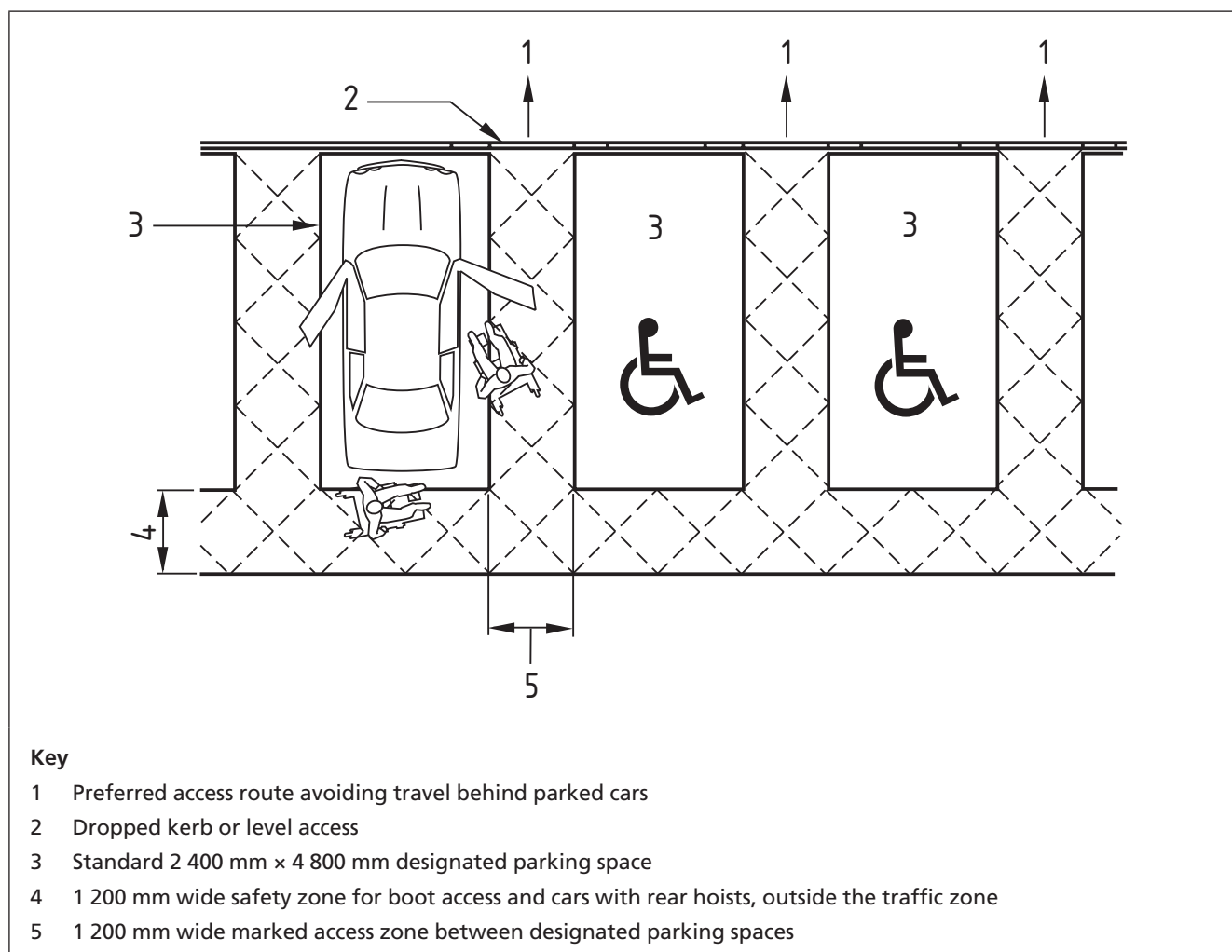
Designated parking spaces in uncovered parking areas should be located on firm and level ground, as close as is feasible to the accessible entrance to the building with which the parking spaces are associated.

NOTE In some circumstances, the most suitable location for designated parking spaces might not be near to the building entrance. Where this is the case, a covered footway and/or seating at intervals along the accessible route would make the approach to a building more manageable for disabled people.

4.2.3 Design and layout of designated off-street parking spaces

Space should be available to enable a disabled motorist or passenger to open the car door fully, to get in or out of the vehicle, and to manoeuvre around vehicles that are parked perpendicular to the carriageway, as shown in Figure 2.

Figure 2 Access around designated off-street parking spaces

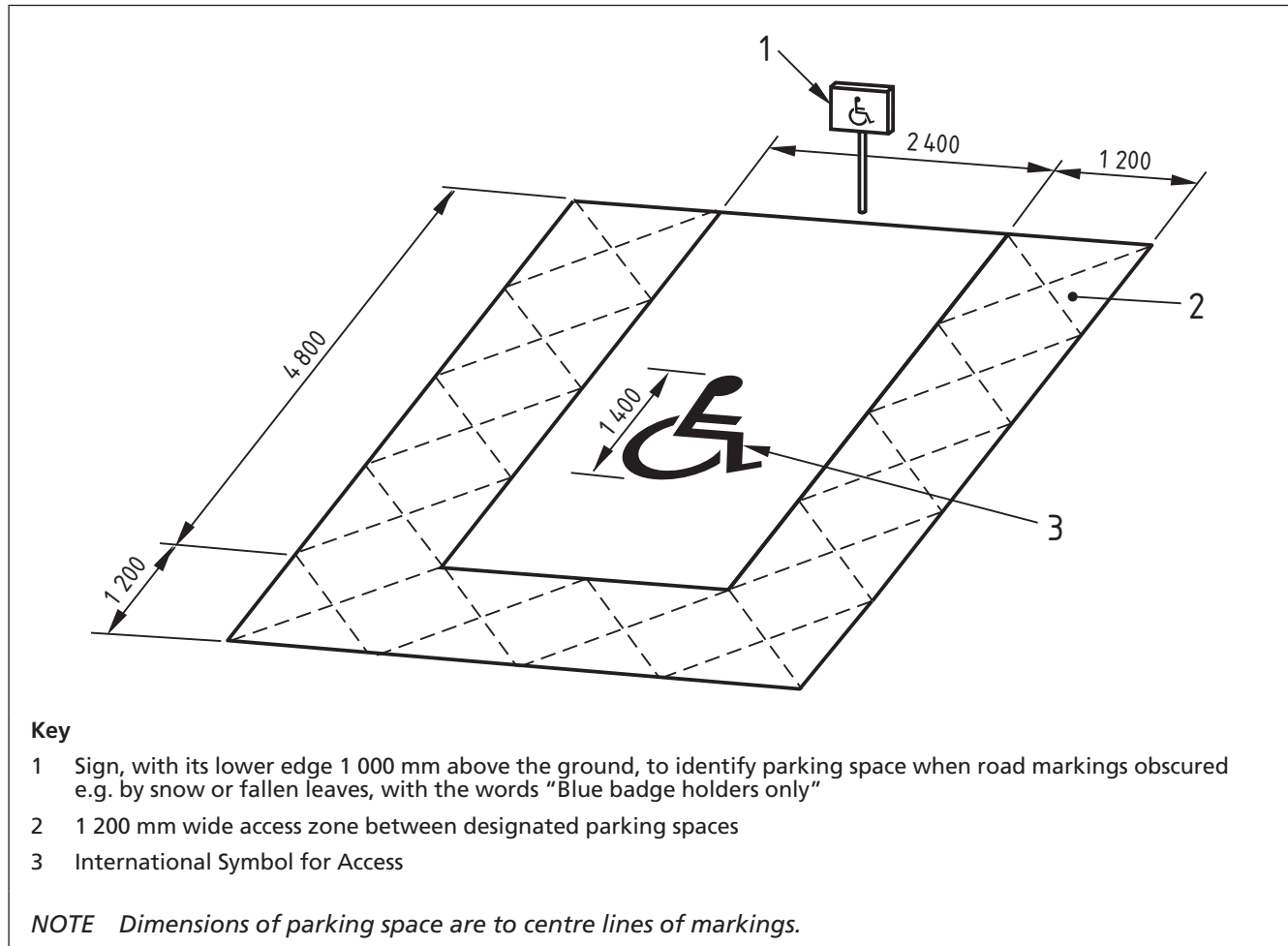


A zone of 1 200 mm wide should be provided between designated parking spaces and between the designated spaces and a roadway (without reducing the width of the roadway) to enable a disabled driver or passenger to get in or out of a vehicle and access safely the boot or rear hoist. These zones should be marked as shown in

Figure 3, with the markings contrasting visually with the surface to which they are applied.

NOTE Access to the rear or side of a vehicle by hoist or ramp will require extra space. The provision of a large designated parking space 4 800 mm wide and 6 000 mm long will benefit people using hoists or ramps to access their vehicles (see 4.2.1.1 and Table C.17).

Figure 3 **Markings for multiple designated off-street parking spaces**
Dimensions in millimetres



The surface of the access and safety zones of a designated off-street parking space should conform to 5.5.1.

If designated parking places are required parallel to the carriageway, they should have the dimensions and markings shown in Figure 1.

Designated parking spaces and any access routes from such spaces to the building entrance should be lit artificially to achieve a minimum illuminance of 20 lux, but with an illuminance of 100 lux on ramps or steps.

4.2.4 Multi-storey car parks

Designated parking spaces should be clearly signposted and at the same level as the accessible entrance to the building or the main access route to and from the car park. If that is not feasible, a suitable passenger lift or ramp should be provided, linking the different levels. Pedestrian ramps should be designed in accordance with the recommendations given in 5.8.

Signs should be provided, indicating the accessible route to the ticket machine, to the lift, to the storey and final exits and then, if appropriate, to the building being visited.

NOTE It is preferable for a disabled person not to pass behind a parked vehicle, other than his or her own vehicle, nor to use a vehicular route when approaching the accessible entrance to the building.

4.3 Garaging and enclosed parking spaces

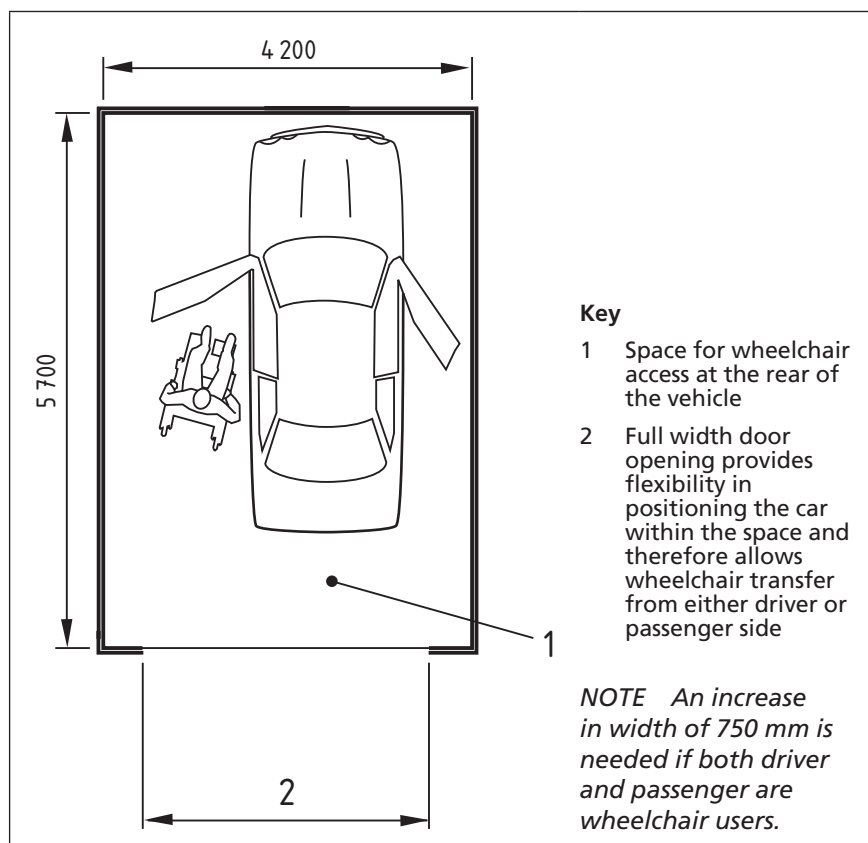
If feasible, access to garages and individual enclosed parking spaces for disabled motorists should be level and under cover. The access to the spaces, including the vehicular entrance and the ceiling level, should permit the use of a wheelchair hoist and have a vertical clearance of not less than 2.6 m.

A single garage or enclosed parking space for use by a motorist who is a wheelchair user should be large enough to allow the wheelchair user to turn around at the side of the vehicle, to access the rear of the vehicle and to get into and out of the space. The space available should also be sufficient to allow a non-disabled person to alight and then, if necessary, to assist a disabled companion to get out of the vehicle and into his or her wheelchair.

Where power-operated doors are fitted to the entrance of a garage or enclosed parking space, they should be operable from inside the vehicle.

The dimensions of a garage or enclosed parking space for use by a wheelchair user and an ambulant driver should be as shown in Figure 4.

Figure 4 **A garage designed for a wheelchair user and an ambulant driver**
Dimensions in millimetres



4.4 Entrances to car parks, and parking controls

4.4.1 Signs to designated parking spaces

A sign or, if appropriate, signs should be provided at the entrance to each car park and at each change in direction to direct disabled motorists to designated parking spaces.

NOTE Further guidance on signage is given in 9.2.

4.4.2 Barrier control systems

COMMENTARY ON 4.4.2.

Ticket, swipe card or key-activated entrance barrier controls to private car parks are often difficult to reach and to manipulate by drivers with limited dexterity. Dual control systems, i.e. having barrier control panels at two different heights, can assist such people; remote control systems are another option for regular users.

The height of ticket, swipe-card or key-activated systems for car park barriers should conform to the requirements of BS 6571-4, with the lower edge of the instructions and control area being between 1 000 mm and 1 100 mm above the carriageway. No plinth should extend into the carriageway by more than 50 mm beyond a line taken vertically from the front face of the control panel.

Means of calling for assistance should be provided, e.g. a call button located on the barrier control panel. An emergency telephone number should also be displayed at the barrier. For the benefit of people who are deaf or hard of hearing, the phone system at the security control point should be capable of receiving texts, or a mobile phone number should also be displayed and permanently manned, as an alternative method of receiving a texted call for assistance.

NOTE Information on the use of LED displays is given in 6.6.2.

4.4.3 Height restriction

Any vehicle height barrier should provide a vertical clearance on level ground of 2.6 m from the carriageway to allow the passage of a high-top conversion vehicle. Alternatively, a facility should exist whereby the user of a high-top conversion can make arrangements to pass through the barrier.

The vertical clearance of 2.6 m should be maintained from the entrance of the car park to (and including) the designated parking spaces and exits from those spaces. The effect of driving a long wheelbase vehicle over any humps or onto a slope should be taken into account when checking the effective vertical clearance.

Height restrictions should be clearly signposted, at a point before drivers begin to enter the car park. For existing car parks, if it is not feasible to maintain the recommended vertical clearance along the route, there should be directions to suitable alternative designated parking spaces.

4.4.4 Parking meters, controls and ticket dispensers

4.4.4.1 Information

Information, including payment terms, should be provided at the entrance to a car park to make it clear whether or not free parking is available to disabled motorists.

4.4.4.2 Pay-and-display systems

Where a pay-and-display system is in operation and free parking is not provided for disabled people, a suitably designed pre-payment machine should be provided conforming to BS EN 12414. The pre-payment machine (e.g. a ticket dispenser) should be positioned close to the designated parking space or spaces.

4.4.4.3 Ticket dispensers

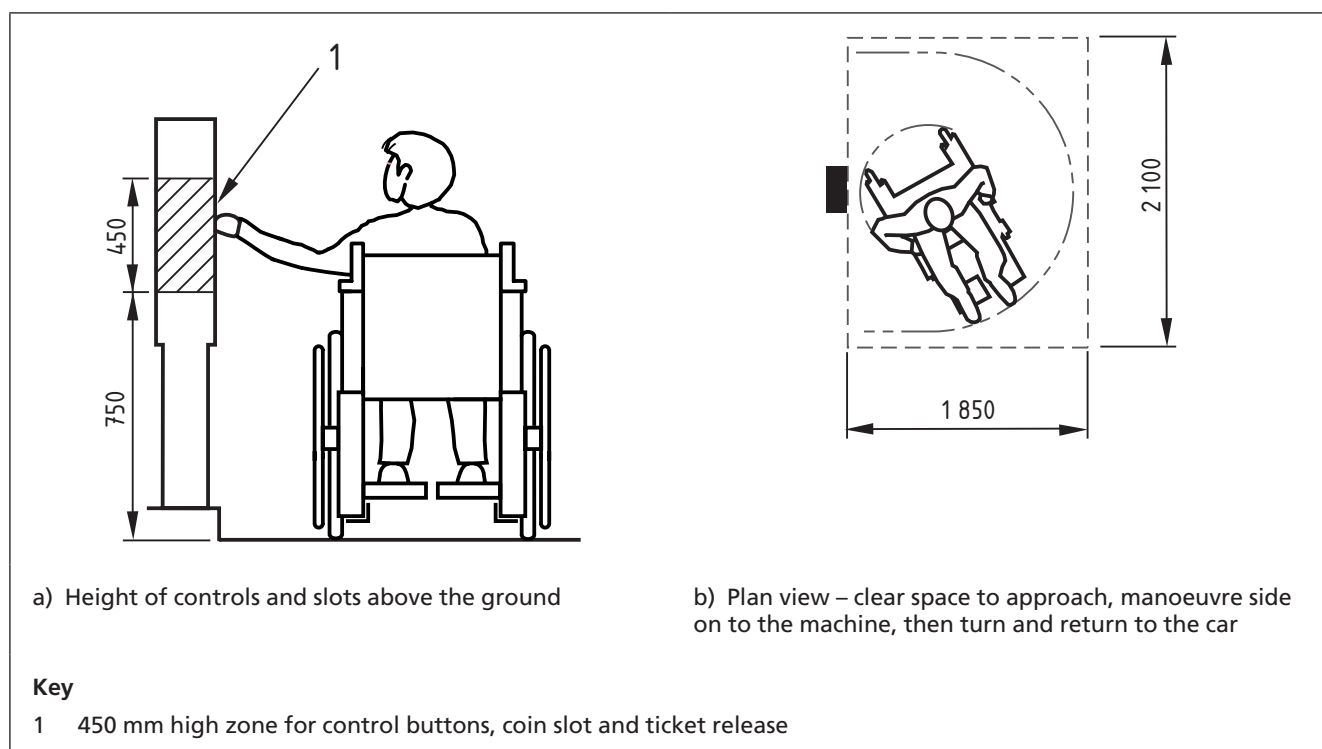
Where there is a charging system for designated parking spaces and only one ticket dispenser is provided, the height above ground of the controls, and of slots for coins or cards, should be at least 750 mm and not more than 1 200 mm, as shown in Figure 5. The dispenser should be located as close as possible to the designated spaces, on a route that is clear of obstructions, and in such a position as to allow clear access to the dispenser by a wheelchair user.

Where more than one ticket dispenser is provided, the height of the controls on the additional dispensers may be between 1 000 mm and 1 400 mm (see BS 6571-6), for use by non-wheelchair users. However, at least one ticket dispenser for use by wheelchair users should always be provided.

NOTE Where there is no charging system for designated parking spaces, a low-level ticket dispenser would still be of assistance to those people of short stature who do not have a blue badge.

The space in front of a meter or a ticket dispenser associated with a designated parking space, or designated parking spaces, should be level, free from obstruction, and of the dimensions shown in Figure 5.

Figure 5 **Key dimensions relating to ticket dispensing machines for use by wheelchair users**
Dimensions in millimetres



The plinth below a ticket dispenser or car park barrier control box should not restrict the ability of a wheelchair user to operate the equipment, and should not project beyond the face of the equipment in a way which prevents convenient access.

4.5 Setting-down and picking-up points

A designated setting-down point suitable for disabled passengers should be provided on firm and level ground, close to the accessible entrance to a building. Its location should be clearly indicated. This setting-down point should be provided in addition to designated parking spaces near entrances for disabled passengers in taxis or dial-a-ride vehicles. If feasible, a short-term waiting area for drivers of vehicles picking up disabled passengers or a disabled driver waiting for passengers should also be provided in addition to the setting-down point.

The surface of the footway, alongside a setting-down point, should be level with the carriageway at that point, to allow convenient transfer into and from a wheelchair.

In addition, an area of the footway with a kerb should be assigned as a setting-down/picking-up point for people using taxis and other vehicles that have ramps designed to transfer directly to the footway.

If feasible, a setting-down point should be covered to provide protection from the weather.

5 Access routes to and around buildings

COMMENTARY ON CLAUSE 5.

It is important to restrict the number of barriers, restrictions or other hazards that disabled people encounter on their approach to and from a building. Low-level bollards and chain-linked posts, for example, are particularly hazardous to blind and partially sighted people.

For disabled people who need a generous amount of space when moving about, the provision of narrow approaches creates difficulties.

Uneven surfaces, surfaces of loose materials (e.g. unbonded gravel) and large gaps between paving materials cause problems for wheelchair users, blind and partially sighted people and people who are, generally, unsteady on their feet.

Street furniture, flower tubs, litter bins and signposts are all intended to improve the environment but, whether free-standing or projecting from a building, they are hazardous if not carefully designed and positioned. For blind and partially sighted people, the presence of warnings that can be detected during the sweep of a cane, the absence of projections and overhangs, and good visual contrast with the background, will reduce the risk of colliding with items located along the access route.

5.1 General

Continuous accessible routes to and around buildings should be provided in the following locations:

- a) from public transport stops and designated car parking spaces to the accessible entrance to the building;
- b) to and from facilities associated with, and in the immediate vicinity of, buildings, including emergency egress assembly points (see BS 9999);

- c) externally, between the accessible entrance and any other subsidiary entrances and buildings, if external circulation is provided between them;
- d) between buildings.

Access routes should not contain steps, stairs, turnstiles, revolving doors, escalators or other features which constitute a barrier to disabled people unless a suitable means for bypassing the barrier has been provided close by and is always available for use.

The location of emergency egress points should not cause difficulties for disabled people, particularly those people with limited mobility.

Access routes on level ground should have resting places not more than 50 m apart for people with limited mobility.

Seating in resting places should meet the following recommendations.

- 1) There should be a variety of seat heights, ranging from 380 mm to 580 mm, within which a height of 480 mm is suitable for wheelchair users.
- 2) Armrests should be provided to help people lower themselves onto the seat and stand up.
- 3) Where the seat is set at a height suitable for wheelchair users, armrests should not be at the extreme end of the seat but set in so as not to restrict the lateral transfer from a wheelchair to the seating. They should also not restrict front or oblique transfer.
- 4) A supportive back-rest should be incorporated for at least 50% of the length of the seat.

5.2 Width and height of an access route

To be accessible, the minimum surface width of an access route (i.e. between walls, kerbs or path edgings) should be:

- a) at least 1 800 mm for general routes (see Note 1);

NOTE 1 The minimum space required for wheelchairs and people to pass each other on an access route is 1 800 mm, as shown in Annex D. However, a width of 2 000 mm is preferable.

- b) at least 1 500 mm, if passing places are provided (see 5.3);
- c) at least 1 200 mm in existing developments, subject to a case being made in an access statement.

These widths should be maintained up to a height of at least 2.1 m above ground level, subject to the recommendations regarding hazard protection set out in 5.7.2.

NOTE 2 Sports facilities have their own requirements for widths of access routes (see Accessible sports facilities [11]).

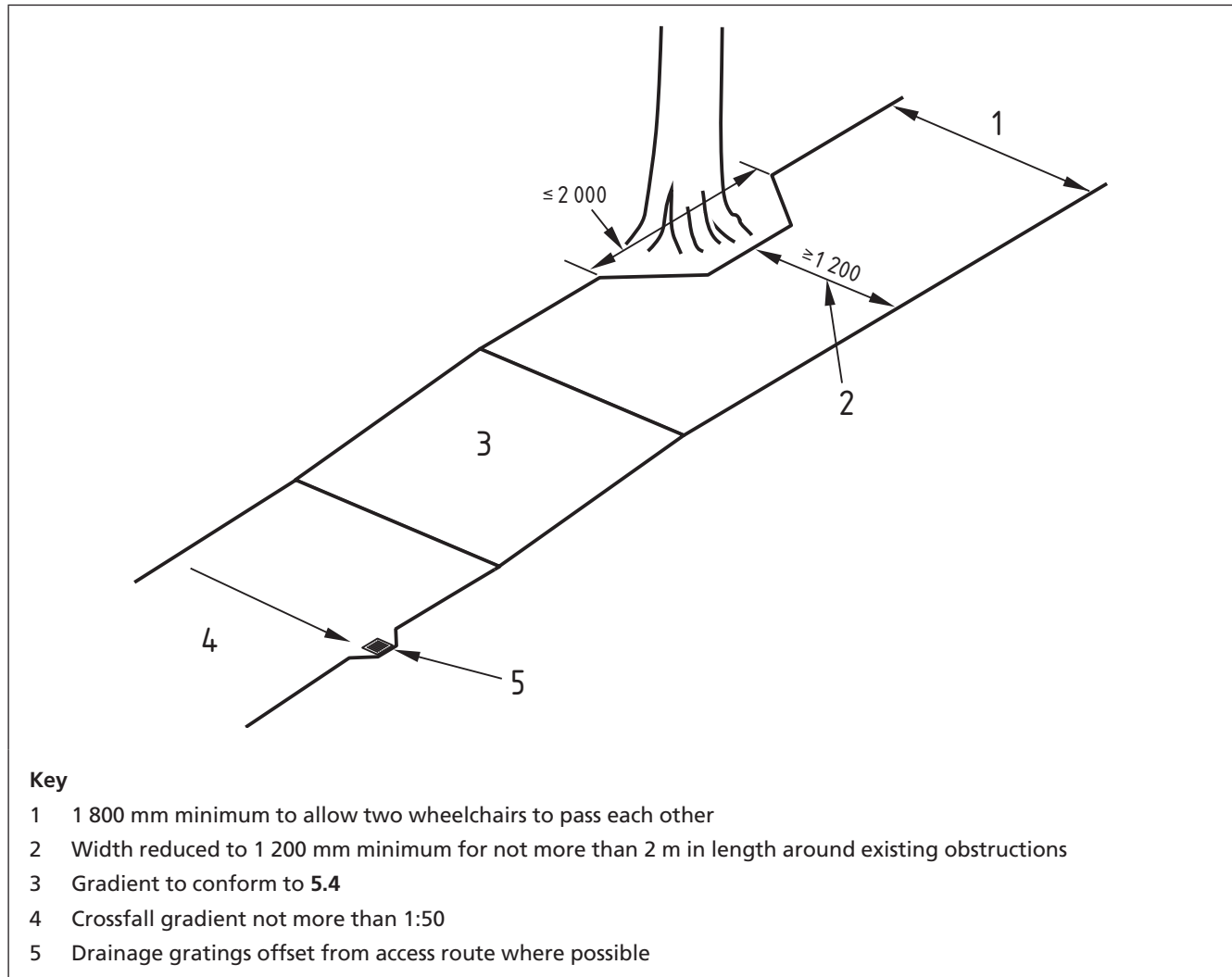
5.3 Passing places on access routes

Where the surface width of an access route is less than 1 800 mm, passing places should be provided to allow two wheelchair users to pass each other. Passing places should also be provided at junctions (e.g. corners) along an access route.

A passing place should be 2 000 mm long and 1 800 mm wide and located within direct sight of another passing place, or at a maximum distance of 25 m from another, whichever is the closer.

Where it is necessary to introduce occasional narrowing of the access route, the restricted width should be at least 1 200 mm and should extend for not more than 2 m in length (see Figure 6). However, measures should be taken to prevent narrowing being a hazard (see 5.7.2).

Figure 6 **The design of access routes**
Dimensions in millimetres



5.4 Gradients on access routes

An access route should either be level along its length or (where the topography of the land prevents this) should be gently sloping or incorporate a ramp or ramps in accordance with 5.8. Where the change in level is sufficient to avoid a single step, a stepped approach should also be provided (see 5.9).

NOTE 1 It is assumed that a gradient of 1:60 or less steep is level; steeper than 1:60 (but less steep than 1:20) is gently sloping; and 1:20 or steeper is a ramp.

Where an access route has a gradient steeper than 1:60, but not as steep as 1:20, it should have a level landing for each 500 mm rise of the access route. A level landing should also be provided wherever a change of direction occurs.

The crossfall gradient across a level access route should not exceed 1:50, except when associated with a dropped kerb.

NOTE 2 While it is acknowledged that cross-fall gradients present difficulties for wheelchair users, there is the risk that surface water will form puddles then freeze unless a cross-fall gradient ensures effective drainage.

5.5 Footway and footpath surfaces

5.5.1 General

An access route should have a firm, slip-resistant and reasonably smooth surface. Cobbles, bare earth, sand and unbonded gravel should not be used.

NOTE For guidance on slip resistance, see Annex E.

With the exception of recognized tactile paving surfaces, undulations in the surface of paving, whether paving slabs, split York stone, blocks, bricks or formless materials such as concrete or asphalt, should not exceed 3 mm under a 1 m straight edge.

The joints between adjacent paving units or utility access covers and paving units should be finished using any of the following techniques.

- a) Where joints are filled to the surface, the difference in level between adjacent units should be no more than twice the joint width, subject to a maximum difference in level of 5 mm.
- b) Where the joints are filled but recessed below the surface, the difference in level between adjacent units should be no greater than 2 mm, with the joints no wider than 10 mm and the recess no deeper than 5 mm.
- c) Where the joints are unfilled, the difference in level between adjacent units should be no greater than 2 mm, with the joints no wider than 5 mm.

5.5.2 Tactile paving

Tactile paving with blister surface (see 3.6) should be used, where necessary, on access routes to provide blind and partially sighted people with an indication of pedestrian crossing points etc.

NOTE For detailed guidance on the use and layout of tactile warning and information surfaces see the DTRL publication Guidance on the use of tactile paving surfaces [12].

5.6 Drainage gratings

If feasible, drainage gratings should be positioned beyond the boundaries of the access route. Gratings within an access route should be set flush with the surrounding surface.

Slots in gratings should be not more than 13 mm wide and should be set at right angles to the dominant line of travel.

The diameter of circular holes in gratings should be not more than 18 mm.

NOTE This is intended to reduce the risk of trapping the ends of canes and of wheelchair wheels becoming stuck.

Dished channels should not be incorporated within an access route as they increase the risk of tripping.

5.7 Barriers, restrictions and hazards

5.7.1 Hazards on an access route

5.7.1.1 Location of street furniture

Street furniture, such as signposts, litter bins and seats, should be located at or beyond the boundaries of an access route.

If, for practical reasons, it is necessary to locate items of street furniture within an access route, their presence should be clearly apparent, e.g. by ensuring that they contrast visually with the background against which they will be seen (see Annex B).

5.7.1.2 Free-standing posts and columns

Each free-standing post, e.g. a lighting column, within an access route should contrast visually with the background against which it is seen (it is desirable also to incorporate a band, 150 mm high, whose bottom edge is 1 500 mm above ground level, and which contrasts visually with the remainder of the column or post) (see Annex B).

Free-standing columns that support an entrance canopy should not be positioned within the width of an access route.

Low-level posts, e.g. bollards, should not be located within an access route. They should be at least 1 000 mm high and should contrast visually with the background against which they are seen (it is desirable also to incorporate a 150 mm deep contrasting strip at the top). They should not be linked with chains and should have no horizontal projections; they may taper towards the top but should not taper towards the ground.

NOTE Further guidance is available in Inclusive mobility – A guide to best practice on access to pedestrian and transport infrastructure [10].

5.7.2 Provision of hazard protection within an access route

The swing of entrance and exit doors, and windows, should not extend into an access route. However, if this is unavoidable, hazard protection should be provided.

No hazard protection needs to be provided if objects (e.g. vending machines):

- a) project not more than 100 mm into an access route, or not more than 100 mm from their base if the base projects not more than 100 mm into the access route; or
- b) project more than 100 mm into an access route, but their lower front edge is less than 300 mm above the ground and their upper front edge is at least 1 200 mm above the ground (see Figure 7).

Visual contrast should be provided regardless of whether or not hazard protection is needed.

Hazard protection should be provided if objects project more than 100 mm into an access route and their lower front edge is more than 300 mm above the ground (see Figure 8).

Hazard protection associated with such objects should take the form of a tapping rail, with its underside no higher than 150 mm above

floor level, or similar barrier so that a blind or partially sighted person can detect the hazard using a cane. The hazard protection should not extend beyond the front edge of the object, nor should it be set back more than 100 mm from its front edge. It should contrast visually with the background.

In addition to a means of cane detection, guarding at a level between 900 mm and 1 100 mm from the surface of the accessible route should be installed each side of the obstruction (see Figure 8).

Figure 7 Projections into an access route that do not need hazard protection

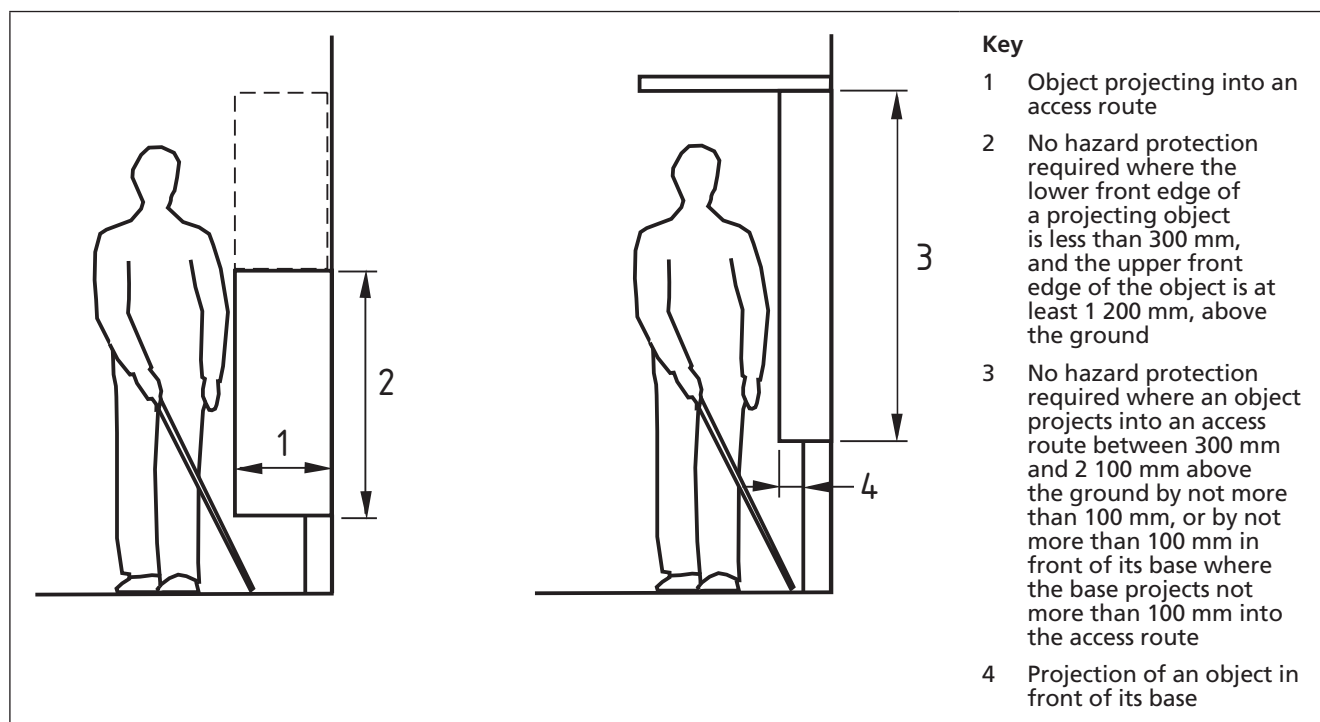
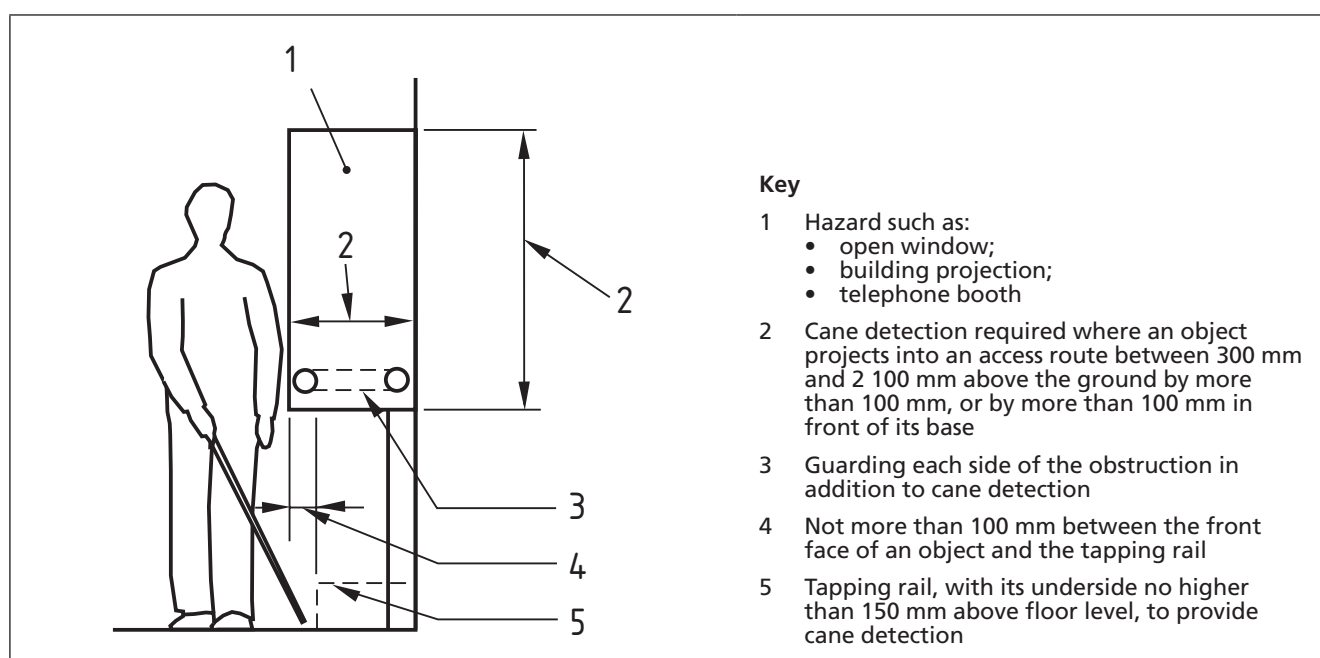


Figure 8 Projections into an access route that need hazard protection



5.7.3 Hazard protection beneath stairs and ramps

Where possible, areas below stairs or ramps should be enclosed where the soffit is less than 2.1 m from floor level.

At any point where the clear height is less than 2.1 m, and the area below the soffit is not enclosed, the risk of people colliding with the underside of a ramp or stair should be limited by providing:

- a) a protective guardrail and low-level cane detection; or
- b) a continuous barrier, e.g. a raised flower bed which extends at least 900 mm above ground level.

NOTE Tapping rails or low kerbs can be a tripping hazard and are to be avoided beneath free-standing stairs.

5.8 External ramped access

COMMENTARY ON 5.8.

This British Standard recommends that the approach to a building is level (see 5.4 and 5.8.1). If a change in level along the access route is unavoidable, it will be necessary to provide a sloped surface on which a wheelchair user can travel. However, as some ambulant disabled people have difficulty using ramps, it is undesirable for a ramp to be the only approach to a building.

The key issues in the design of a ramped access route are the gradients of flights and the distances between landings. Where the gradient is too steep or an individual flight too long, a wheelchair user might not have sufficient strength to propel him- or herself up the slope. In the same situation, a companion who is pushing a wheelchair user is also likely to encounter the same difficulties. If the gradient is too steep, there is also the danger of a wheelchair user falling out forwards when going downhill, or of a wheelchair tipping over backwards when going uphill. Control and braking are also difficult on steep gradients. Excessive cross-gradients present further difficulties when manoeuvring on ramps.

An existing building might need to be equipped with a portable ramp if modification of the existing structure is considered inappropriate. Alternatively, it might be appropriate to install a vertical lifting platform close to the entrance.

5.8.1 General

The relative levels of the accessible entrance to the building and the entry point to the site (as well as access routes across the site) should be designed to eliminate, as far as is practicable, the need for ramped access (see 5.4). Where the change in level is such that a portion of the access route needs to have a gradient of 1:20 or steeper, the access should be ramped.

NOTE Where the change in level is less than 300 mm, a ramp is the only viable means of access, as it avoids the need for a single step (see 5.9.3).

The existence and location of a ramp should be clearly indicated as a person approaches a building. If the beginning of the ramp cannot be located close to the accessible entrance, information should be provided at that point to direct users to the correct location. The text should be in large characters, contrasting visually with their background, and be accompanied by the International Symbol for Access (see 9.2.1.4).

5.8.2 Gradient of a ramp

A ramp should have the lowest practical gradient within the range 1:20 to 1:12.

The gradient of a ramp flight in relation to its going should be no steeper than that shown in Table 1.

NOTE Different design solutions might be needed in transport infrastructure (see [10]).

Table 1 Limits for ramp gradients

Going of a flight	Maximum gradient	Maximum rise
10 m	1:20	500 mm
9 m	1:19	473 mm
8 m	1:18	444 mm
7 m	1:17	411 mm
6 m	1:16	375 mm
5 m	1:15	333 mm
4 m	1:14	285 mm
3 m	1:13	230 mm
Not exceeding 2 m	1:12	166 mm

No individual flight of a ramp should have a going of more than 10 m or a rise of more than 500 mm.

If a series of ramp flights rises more than 2 m, an alternative means of step-free access, such as an enclosed lift, protected from the weather, should be provided.

The cross-fall gradient of a ramp should be not more than 1:50.

5.8.3 Ramp widths

The surface width of a ramp, between walls, upstands or kerbs, should be not less than 1 500 mm (see 5.2).

Where the width between the handrails of a ramp exceeds 2.5 m, the ramp should be divided into two or more channels, with a distance between handrails of not less than 1 m and not more than 2 m, to ensure that all users have access to a handrail. Where a ramp is divided into channels, at least one channel should have a surface width not less than 1 500 mm.

NOTE 1 A surface width of 1 800 mm is the minimum that permits two wheelchair users to pass each other.

NOTE 2 Sports facilities have their own requirements for ramp widths (see Accessible sports facilities [11]).

5.8.4 Landings

Landings should be provided at the foot and head of a ramp. They should be at least the width of the ramp and not less than 1 500 mm long, clear of any door swing or other obstruction.

Any intermediate landings along a series of ramps in a straight line should be at least 1 500 mm long, clear of any door swing or other obstruction. If an intermediate landing is a quarter-turn or half-turn

landing, the width of the ramp should be maintained throughout the turn or turns.

Unless it is under cover, a landing should have a slight cross-fall gradient, not exceeding 1:50, to help drain surface water.

NOTE It is advisable to increase the surface width of an intermediate landing to 1 800 mm so that it can serve as a passing place.

Balustrades should conform to the recommendations of BS 6180.

5.8.5 Handrails to ramps

Handrails to external ramps should conform to the recommendations given in 5.10.

5.8.6 Edge protection to ramps

A continuous upstand at least 100 mm high, or an equivalent barrier, should be provided at any open edge of a ramp, in conjunction with a barrier (including a handrail component) positioned directly over the upstand. The upstand should contrast visually with the surface of the ramp (see Annex B).

NOTE 1 The upstand is intended to prevent a wheelchair user falling over the edge of the ramp and provide for cane detection. A permanent design feature (e.g. a planting box) can give additional protection.

NOTE 2 Further guidance on barriers is given in BS 6180.

5.8.7 Surface materials

The surface materials used for an external ramp should be chosen to be durable and easy to maintain, and should be slip-resistant when wet, to allow for rain and other environmental factors.

NOTE 1 Where weather or low temperature results in surfaces being covered in snow or ice, the slip resistance of a surface ceases to be effective. It is therefore important that external ramp surfaces are kept free of snow or ice as part of the management regime of a building.

The surface of a ramp should contrast visually with that of a landing and of the edge protection so that its presence is distinguishable by blind and partially sighted people (see Annex B).

To maintain traction, a sloping surface should have a higher slip resistance than an equivalent level surface. The steeper the slope, the greater the friction needed to maintain contact with the ground without slipping.

Where different materials are used for the flights and landings of a ramp, care should be taken to ensure that their frictional characteristics are similar in order to minimize the risk of stumbling.

NOTE 2 Advice and further references on slip resistance of surfaces is given in Annex E.

5.8.8 Lighting

Care should be exercised in the location and orientation of a ramp to avoid, where possible, glare and cross-shadows which can prevent blind and partially sighted people distinguishing changes in gradient.

Artificial lighting to a ramp should be evenly distributed, with an illuminance at ramp and landing level of at least 100 lux.

5.8.9 Temporary ramps

Temporary ramps that are fixed in place to provide a temporary solution until it is possible to provide a permanent ramp, e.g. during building works, should be designed in accordance with 5.8.1 to 5.8.8.

5.8.10 Portable ramps

Portable ramps should be used only in exceptional circumstances for existing buildings, e.g. if an entrance door opens directly onto the back of a footpath. They should be positioned and their presence identified so that they do not constitute a hazard to passers-by.

Portable ramps should have a surface width of at least 800 mm, a drainable, slip-resistant surface and upstands at least 100 mm high to prevent wheelchair tyres veering off the edge.

Gradients of portable ramps should conform as closely as practicable to 5.8.2 and Table 1.

NOTE Portable two-channel ramps are not suitable.

5.9 External stepped access

COMMENTARY ON 5.9.

Blind and partially sighted people risk tripping or losing their balance if unaware of steps. For such people, the provision, underfoot, of a timely warning that there is a change in level is essential. The greatest risk of tripping is at the head of a flight of steps. The warning needs to be placed sufficiently in advance of the hazard to allow time to stop and not so narrow that it might be missed in a single stride.

5.9.1 Protection for stepped access routes

If feasible, stepped access routes should be protected from inclement weather.

5.9.2 Design of steps and stairs

COMMENTARY ON 5.9.2.

Slips on steps and stairs occur in both ascent and descent, but a slip on descent is more likely to lead to a fall and an injury. Research has shown that slips while descending stairs are more likely to occur when the user oversteps, placing only 50% to 60% of their foot on the tread. The likelihood of an overstep decreases significantly with increased going size, and beyond 300 mm, is very rare. Beyond 350 mm, it is unlikely that a large overstep will occur within the lifetime of the building, even with 2 000 users per day.

Excessively high risers can result in excessive strain being placed on the knee and/or hip joints of ambulant disabled people, when descending flights of stairs.

When ascending a stair, people who wear callipers or who have stiffness in hip or knee joints are particularly at risk of trapping the toes of their shoes beneath projecting nosings, and of tripping as a result. In addition, some partially sighted people can feel a sense of insecurity when looking through open treads, and assistance dogs might refuse to proceed.

The preferred dimensional ranges for steps and stairs are between 150 mm and 180 mm for the rise and between 300 mm and 450 mm for the going.

NOTE There is now compelling research evidence to indicate that a larger going helps to avoid accidents on a stair, particularly in descent, as it allows a person to place more of their foot on the step. Larger goings can also benefit people who wish to pause mid-flight to rest.

The rise and going of each step within a flight, and preferably between a series of flights, should be uniform.

Preferably, a step should not overlap the one below. If there is an overlap, the nosing should not project over the tread below by more than 25 mm.

The riser should not be open and its profile should ensure that people who drag their feet do not trip when ascending.

5.9.3 Rise of a flight

No flight on an external stepped access route should contain more than 20 risers and, as far as possible, the numbers of risers in successive flights should be uniform.

NOTE 1 In determining the number of risers in a flight, designers need to strike a balance between minimizing the number of risers between landings so as to create more frequent resting points, and maximizing the number between landings so that the number of potential accident danger spots (when moving from a landing to a flight) is minimized. The former approach is likely to benefit people with restricted mobility and the latter approach is likely to help blind or partially sighted people.

Single steps should be avoided as, even when highlighted using visual contrast, they present a significant trip hazard. Thus, where there is a change in level of two steps or more, it should be treated as a stair and should include handrails each side and all other features of a stair. A stair should always be provided in addition to a ramp, unless the change in level is less than 300 mm, where it would otherwise be necessary to have a single step (see also 5.8.1).

NOTE 2 The 300 mm dimension assumes a minimum step rise of 150 mm.

5.9.4 Stair width

The surface width of a stair, between enclosing walls, strings, balustrades or upstands, should be not less than 1 200 mm, and the width between handrails should be not less than 1 000 mm.

Where the width between handrails exceeds 2.0 m, the stair should be divided into two or more channels with a distance between handrails of not less than 1 m, or not more than 2 m, to ensure that all users have access to a handrail.

5.9.5 Identification and slip resistance of nosings

Each step nosing should incorporate a permanently contrasting continuous material for the full width of the stair on both the tread and the riser to help blind and partially sighted people appreciate the extent of the stair and identify individual treads. The material should be 50 mm to 65 mm wide on the tread and 30 mm to 55 mm on the riser, and should contrast visually with the remainder of the tread and riser (see Annex B).

NOTE 1 A nosing that wraps around the riser might assist blind or partially sighted people.

NOTE 2 A proprietary nosing can provide a durable solution that satisfies both visual contrast and slip resistance criteria (see BRE IP 15/03 [13]).

The whole tread or the nosing should incorporate a slip-resistant material, starting as close as practicable to the front edge of the nosing and extending the full width of the tread.

NOTE 3 Guidance on slip resistance of surfaces is given in Annex E.

5.9.6 Landings

A level landing should be provided at the top and bottom of each flight of steps. Its length, clear of any door or gate swing, should be not less than the surface width of the flight.

Unless it is under cover, a landing should have a slight cross-fall gradient, not exceeding 1:50, to help drain surface water.

To give advance warning of a step, tactile paving with a corduroy hazard warning surface (see 3.10) should be provided at the top and bottom of each flight. Where the approach to the stair is wider than the flight, the tactile surface should extend beyond the line of each edge of the flight (see Figure 9).

NOTE Further information on the correct choice of tactile warning surface can be found in the DTLR publication Guidance on the use of tactile paving surfaces [12].

5.9.7 Handrails to steps and stairs

Handrails to external steps and stairs should conform to the recommendations given in 5.10.

5.9.8 Artificial lighting on a stepped access route

Each flight and landing of a stepped access route should be well illuminated, providing a clear distinction between each step and riser. The illuminance at tread level should be at least 100 lux.

Lighting that will cause glare (such as poorly located wall lights, spotlights, floodlights or low-level light sources) should be avoided.

5.10 Handrails to ramped and stepped access

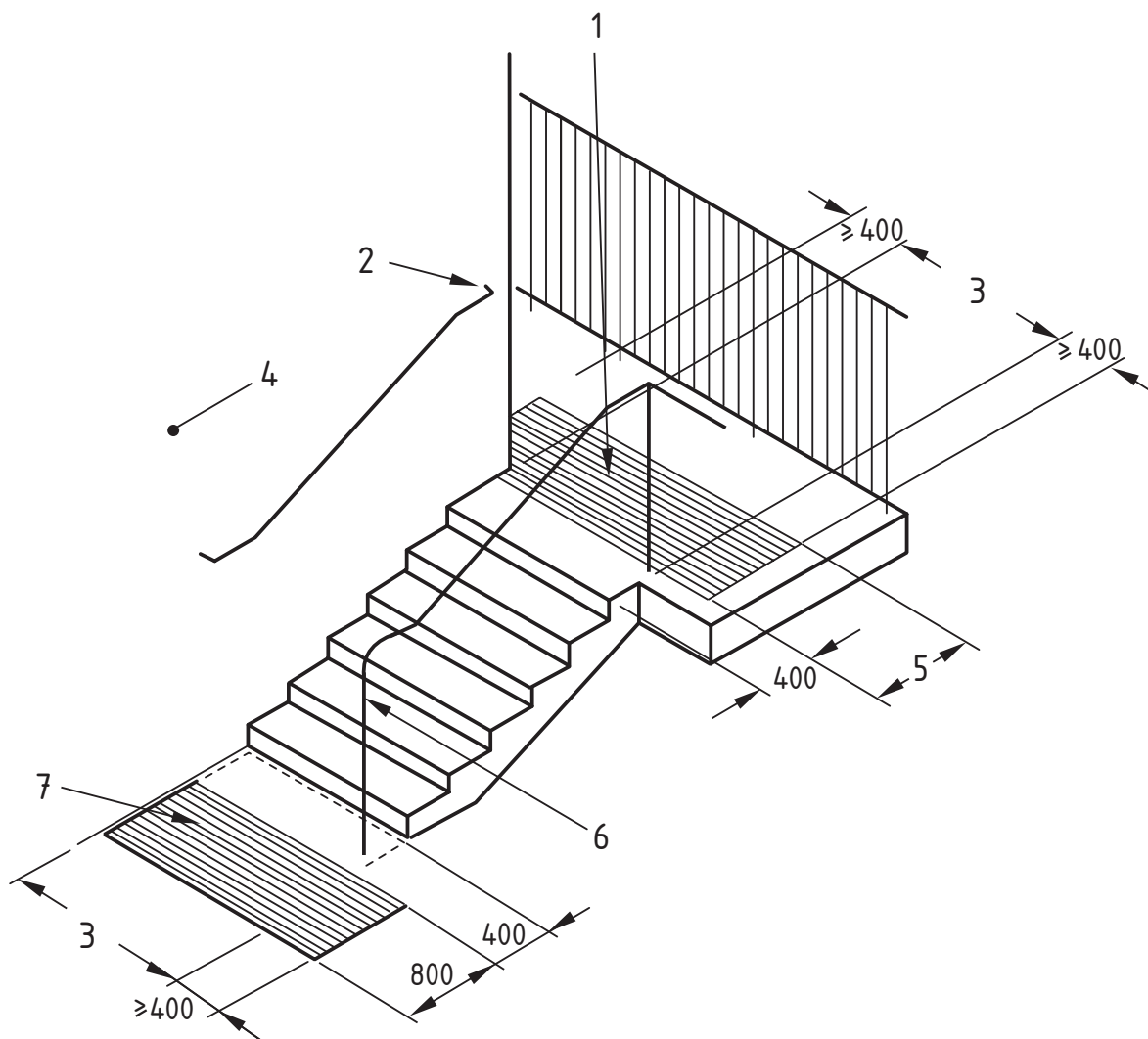
COMMENTARY ON 5.10.

Wheelchair users do not normally need to use handrails to negotiate a ramp. However, in slippery conditions on long and/or steep ramps, handrails can help wheelchair users to steady themselves. An ambulant disabled person might be weaker on one side and, therefore, a handrail on each side of the flight is essential for support, for ascending and descending longer ramps.

Many ambulant disabled people find it easier to negotiate a flight of steps than a ramp and, for them, the presence of handrails for support is essential.

The division of wide flights of ramps or steps into separate channels will allow an individual who might have less strength on one side or the other to be within easy reach of support. This is particularly important when many other people are using the steps or stairs at the same time.

Figure 9 Use of a corduroy hazard warning surface and handrails on an external stepped access
Dimensions in millimetres



Key

- 1 Corduroy hazard warning surface at top of stairs to extend at least 400 mm at each side of stairs and to stop 400 mm from nosing
- 2 Handrail fixed to side wall and terminated with a closed end at top and bottom
- 3 Surface width of stair, at least 1 200 mm wide
- 4 Side wall to staircase
- 5 800 mm when the approach is straight on and 400 mm when a conscious turn is needed to reach the step
- 6 Handrail to be terminated in a way that reduces the risk of clothing being caught
- 7 Corduroy hazard warning surface at bottom of stairs

5.10.1 Handrail provision

A handrail should be provided on each side of a ramp or stair flight, throughout its length (including intermediate landings where this does not obstruct the use of adjoining access routes). The top surface of the handrail should be between 900 mm and 1 000 mm from the surface of the ramp or pitch line of a stair and between 900 mm and 1 100 mm from the landing.

NOTE 1 The height of 1 100 mm above landings allows for a situation where the handrail is the top rail of balustrading and forms part of guarding. Alternatively, the handrail may be separate from but supported from the guarding.

For all buildings used by the general public and buildings designed principally for children, a second handrail should be installed with its top surface 600 mm from the ramp surface or pitch line. Where necessary, structural guarding should be provided of sufficient height to prevent a child falling if they climb on the handrail.

NOTE 2 A lower handrail will also benefit people of short stature.

Balustrades should conform to the requirements of BS 6180 and should be strong enough to withstand inadvertent impact from an electrically powered wheelchair or scooter where that means of access is possible.

5.10.2 Handrail design

COMMENTARY ON 5.10.2.

A non-circular handrail with a broad horizontal face is as easy to grip as a circular handrail and gives better hand and forearm support. The spacing of the handrail from the adjacent wall and the positioning of the handrail support are important in achieving the uninterrupted use of the handrail and avoiding shock through the hand hitting the support.

The horizontal extension of a handrail beyond the first and last steps allows an individual to steady or to brace themselves before ascending or descending. For an individual with impaired vision, the change in slope of the handrail and its return into a wall will signal the start or finish of the flight.

A handrail should be:

- a) easy and comfortable to grip with no sharp edges, but able to provide adequate resistance to hand slippage;

NOTE 1 An external perimeter of between 100 mm and A_1 160 mm A_1 is the optimum size to provide a power grip around a handrail. Suitable profiles include circular or oval. A flatter profile gives better forearm support.

- b) continuously graspable along its entire length without obstruction;

NOTE 2 Well-spaced handrail supports are not considered an obstruction (see 5.10.3).

- c) finished so as to provide visual contrast with the surroundings against which it is seen;

NOTE 3 For recommendations on how to achieve visual contrast, see Annex B. Less is known about how to achieve adequate visual contrast in external environments than in internal environments, but the same principles as for the internal environment are thought to apply (see Annex B).

- d) terminated horizontally at least 300 mm beyond the start and finish of the ramp or the last nosing of a stair, at both top and bottom;

- e) terminated in a way that will reduce the risk of clothing being caught;

NOTE 4 This can be achieved by returning the handrail to the wall or floor or, where the handrail extends beyond balustrading, by terminating it with a scroll or similar feature.

- f) strong enough to support users and fixed to the structure in a way that will support the required loading.

5.10.3 Handrail dimensions and spacings

A handrail with an oval profile should have dimensions of 50 mm wide and $\sqrt[4]{A_1}$ 39 mm $\sqrt[4]{A_1}$ deep. The profile should have rounded edges with a radius of at least 15 mm.

Any circular handrail should have a diameter of between 32 mm and $\sqrt[4]{A_1}$ 50 mm $\sqrt[4]{A_1}$.

There should be a clearance of between $\sqrt[4]{A_1}$ 50 mm $\sqrt[4]{A_1}$ and 75 mm between a handrail and any adjacent wall surface, and any handrail support should meet the handrail, centrally, on its underside. The clearance between the bottom of the rail and any cranked support, or continuous balustrade, should be at least 50 mm to minimize the risk of the handrail supports interrupting the smooth running of a person's hand along the rail.

NOTE Where a $\sqrt[4]{A_1}$ 50 mm $\sqrt[4]{A_1}$ diameter circular handrail is used, a $\sqrt[4]{A_1}$ 50 mm $\sqrt[4]{A_1}$ spacing from a wall allows the handrail to project no more than 100 mm into the width of the stair.

The inside edge of the handrail (the edge nearest to the walking line) should be not more than 50 mm outside the surface width of the stair.

5.10.4 Handrail fixings

Handrail fixings should be designed to meet the loading recommendations of $\sqrt[4]{A_1}$ BS EN 1991-1-1 $\sqrt[4]{A_1}$. Care should be taken to ensure that the strength of fixings, attachments or anchorages that secure the handrail to the substrate are adequate for the required loading, taking into account the material of the substrate, the spacing between fixings and, where the substrate is concrete, the position of the reinforcement. If there is any uncertainty as to the strength of any component in the fixing system, the design load should be increased by 50%. Reliance on the pull-out capacity of a single fixing should be avoided (see BS 6180:1999, 6.5).

NOTE It is advisable to discuss suitable fixings with a specialist fixings supplier.

5.10.5 Handrail materials

In locations subject to extremely cold or hot temperatures, handrails should not become excessively cold or hot to touch, while being of a material that, if necessary, is sufficiently robust to resist vandalism or misuse.

NOTE Since handrails are used by some people when using a ramp or stair not only for support, but also to pull themselves up and to reduce the speed of descent when going down, reluctance to use the handrail (or involuntary letting go of the handrail) if it is uncomfortably cold or hot, presents a safety hazard. In extremes of cold, a person's skin can adhere to a very cold handrail and the shock can, in some people, trigger an attack of Raynaud's disease. Handrails whose surface is of a low thermal conductivity, such as timber or nylon-sleeved steel tube, are the most comfortable to touch in extremes of temperature. Handrails fabricated from metals with a relatively low thermal conductivity, such as stainless steel, are more suitable in locations where resistance to vandalism and/or low maintenance are key factors.

6 Entering a building

6.1 The entrance

6.1.1 General

Unless suitably designed, the entrance to a building can often be a barrier to access for disabled people. The following factors should be addressed in the design of the entrance to a building:

- a) the prominence and visual relationship of the entrance with its surroundings;
- b) the type of threshold needed to allow convenient wheelchair manoeuvre;
- c) the ease of operation of the entrance door;
- d) the minimum effective clear width through the doorway.

6.1.2 Visual clarity

The entrance door should contrast visually with its immediate surroundings and should be well lit and clearly signed. It should not have a mirrored finish.

NOTE For glazed doors, see 6.4.4.

Where possible, subject to the needs of security, safety and/or privacy, entrance doors and any associated windows should provide a clear view of the interior of the building, or of the entrance lobby if one is provided.

6.1.3 Weather protection

In order to provide shelter for those having to pause before entering a building, the entrance should incorporate a form of weather protection, such as a canopy or recessed entrance, unless freely accessible automatic doors are installed.

No part of the structure of a canopy should present an obstruction to blind and partially sighted people.

6.2 Threshold

COMMENTARY ON 6.2.

Upstands and gradients impede access. Small variations from any point taken as level can make a threshold inaccessible and potentially dangerous. People pushing wheelchairs also find sharp upstands difficult to manage.

The entrance threshold should either be level or, if the provision of a raised threshold is unavoidable, e.g. to prevent water ingress, should have one or more upstands, provided the cumulative height of such upstands is not more than 15 mm. If raised, the threshold should have as few upstands and slopes as practicable. Any upstand more than 5 mm high should have exposed edges chamfered or pencil rounded.

NOTE Guidance on the design of entrance thresholds is given in Accessible thresholds in new buildings [14].

Thresholds to internal doors should be level at the junctions of different flooring materials.

6.3 Entrance doors and lobbies

6.3.1 Entrance doors

Entrance doors to a building should be usable by disabled people even though they might be designed to be held closed when not in use.

6.3.2 Self-closing swing doors

COMMENTARY ON 6.3.2.

Fitting a door closing device to a single swing door could greatly disadvantage people, including children, with a wide range of disabilities. It is extremely difficult for wheelchair users, and for people with assistance dogs, low upper body strength or walking aids, to manoeuvre through the entrance against the force exerted by the device and additionally any extra resistance exerted by weather seals and/or wind pressure.

If the force required for opening doors is greater than wheelchair users and people with limited strength can manage, they will be unable to continue their journeys independently. If the force of the closing device is too great or its speed too fast, disabled people risk being pushed off balance.

Any self-closing hinged (single swing) or pivoted (single or double swing) entrance doors should have controlled door closing devices and allow independent use by disabled people by conforming to the recommendations in 6.5.2.

NOTE For details of door leaves, including effective clear widths, side clearance, vision panels and glass doors, see 6.4. For details of door fittings, including manual door opening and closing furniture, controlled door closing devices, hinges, locks and latches, as well as panic and emergency exit devices, see 6.5.

Where it is not possible for a controlled door closing device to close an entrance door and keep it closed against external conditions without exceeding the opening force limits set out in 6.5.2, one of the following systems should be used:

- a) a power-operated door – sliding, folding, balanced or swing (6.3.3);
- b) a low energy swing door (6.3.4);
- c) a power-operated revolving door with an adjacent accessible door (6.3.5);
- d) an entrance lobby or airlock system of inner and outer doors (6.3.6).

6.3.3 Power-operated doors

Power-operated pedestrian doors for installation in existing and new construction should be one of the following two types:

- a) a manually activated door controlled by a push pad, coded entry system, card swipe or remote control device; or
- b) an automatically activated door controlled, for example, by a motion sensor or a hands-free proximity reader.

The provision and installation of power-operated doors should be in accordance with BS 7036-1.

Manual activation controls for power-operated pedestrian doors should be located at a height of between 750 mm and 1 000 mm from the finished floor level. In order to be clearly visible, they should contrast visually with the surrounding background (see Clause 9). They

should be located as close to the door as possible without causing a safety hazard (e.g. risk of collision with blind and partially sighted people and wheelchair users) when the door opens.

The approach to power-operated pedestrian door systems should be well defined, level and safeguarded in relation to pedestrian flow (see Clause 5). The approach should be provided with clearly visible warning signs (see Clause 9).

NOTE 1 Safeguarding in relation to the pedestrian flow can be achieved by setting the door into a recess or by guarding rails.

NOTE 2 Audible warning systems are not recommended due to the possibility of confusion about the direction of opening and direction of approach.

Ramped floors leading down to power-operated doors are a potential hazard and should be avoided.

Automatically activated powered entrance doors that open towards people entering a building should incorporate clear text indicating their automatic operation and direction of swing. To ensure that an automatically activated door will open early enough, and stay open long enough, to maintain safe entry and exit, the activation device(s) should be positioned to detect traffic at a suitable distance taking account of the width, mass and operating speed of the door. Detection by presence and motion sensing devices should be incorporated into all installations (see BS 7036-1:1996, 8.4).

Any activation system should be positioned and adjusted so that the door starts to open when a person is no closer than 1 400 mm from the leading edge of the door when fully open which, in the case of swing doors, will normally be when the door is open at 90°.

Safety provisions should conform generally to BS 7036-1:1996, Clause 8, and specifically to BS 7036-2 for straight and curved sliding doors as well as prismatic and folding doors, to BS 7036-3:1996, Clause 5 for swing and balanced doors, and to BS 7036-4 for low energy doors.

The door should also be capable of manual operation in the event of power failure.

6.3.4 Low energy swing door

A low energy power-operated door operator may be used on swing doors with relatively low levels of pedestrian usage as these doors can either work in manual mode or be set to provide powered opening assistance to users when required, either in push-and-go or power-assist modes.

NOTE After a hold-open period, the swing door self-closes in the same way as a conventional door closer. The push-and-go power assist activates when the door is pushed beyond 25 mm.

If low energy swing doors are used, safety provisions for the doors should conform to BS 7036-4.

6.3.5 Power-operated revolving door

COMMENTARY ON 6.3.5.

Revolving doors are not considered accessible and present particular difficulties to ambulant disabled people, blind and partially sighted people, people with assistance dogs and people with young children

or pushchairs. Large-diameter revolving doors, which are increasingly common in large stores, offer greater space in each compartment and are relatively slow-moving, but still present risks to disabled users. The use of glass panels enclosing and adjacent to revolving doors can be confusing, particularly to partially sighted people. In such situations, it is essential that the presence of the glass is clearly identified (see 9.1.5).

Where a revolving door is used, a complementary accessible door should be provided immediately adjacent to the revolving door and available for use at all times. The accessible door could be a swing, sliding or folding door, and be automatic, manual or power-operated. It should be clearly identified and signed to show that it is accessible.

Safety provisions for revolving doors should be in accordance with BS 7036-5.

NOTE It can be beneficial for the complementary door to open automatically.

6.3.6 Entrance lobbies

6.3.6.1 General

A lobby consisting of inner and outer doors may be used:

- a) in an airlock arrangement, to reduce the effects of pressure differential between the inside and outside of a particular building to enable a lower power size controlled door closing device to operate effectively; and/or

NOTE The air lock arrangement is only effective when one door opens in and the other door opens out.

- b) to assist entry control of strangers when residents are entering or leaving medium- and high-rise blocks.

6.3.6.2 Dimensions of lobbies

The dimensions and shape of a lobby should allow a wheelchair user to be able to move clear of one door swing to push open the next door or reverse the wheelchair to pull it open. A space should also be provided for an assistant helping a wheelchair user to open a door and push (or pull) a wheelchair through.

Lobbies with single leaf doors should be avoided wherever possible. Where they are used, the minimum dimensions of such lobbies should be as shown in Figure 10. Vision panels in lobby doors should conform to the recommendations in 6.4.3. Where double doors are used for a lobby, the length of the lobby should be at least the projection of the door or doors, if swinging into the lobby, plus 1 570 mm.

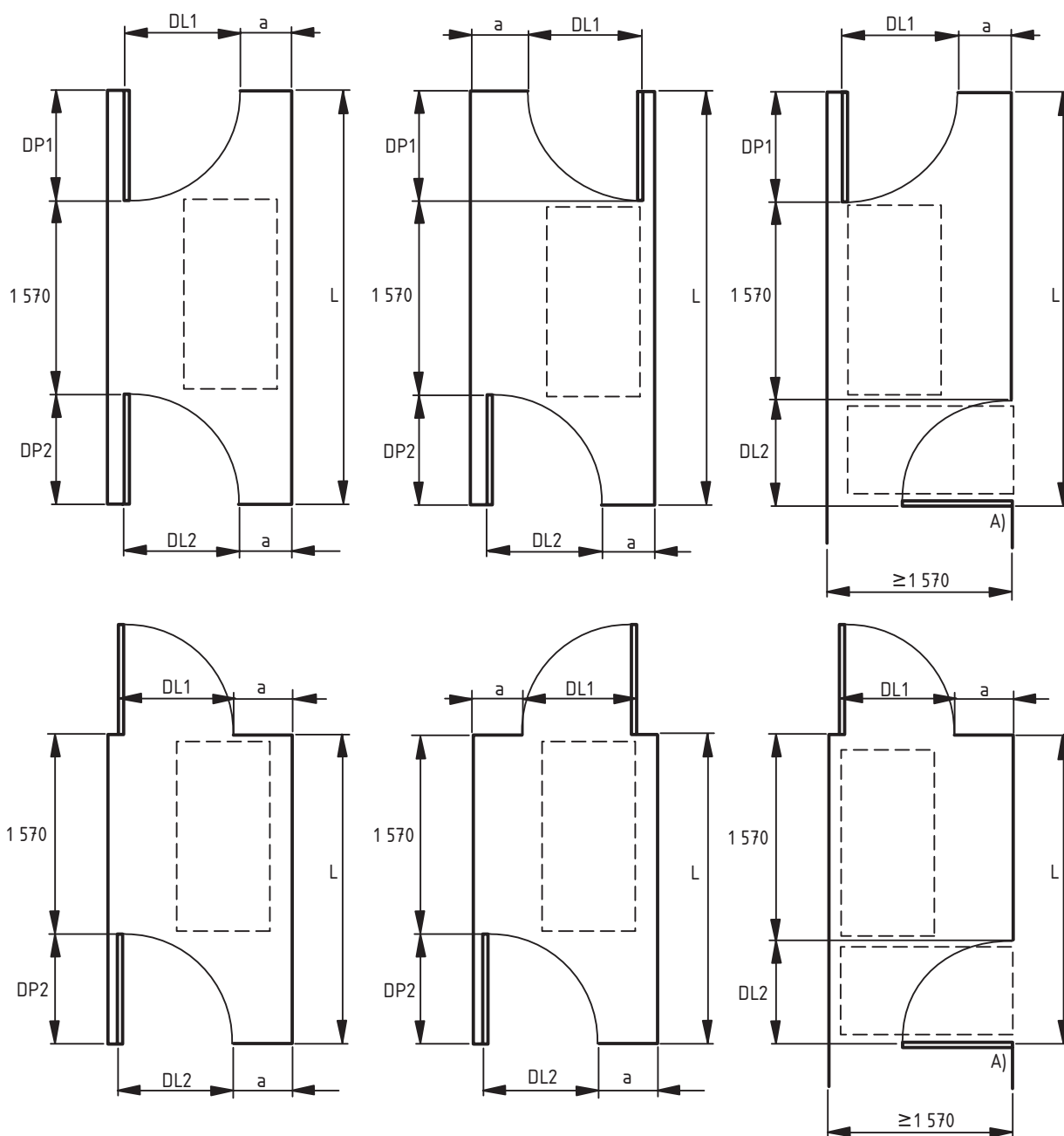
NOTE 1 Double swing doors with vision panels are preferable because they are easier to negotiate in both directions.

NOTE 2 Minimum lobby dimensions are related to the door size and a representative length of a wheelchair user and an assistant, having regard to the manoeuvring sequence.

Lobby dimensions should be clear of any elements that project into the lobby.

NOTE 3 These recommendations also apply to internal lobbies used as separating elements for the prevention of the spread of fire and smoke, or to shield the view of toilet facilities.

Figure 10 Minimum dimensions of lobbies with single leaf doors
Dimensions in millimetres



Key

- a At least 300 mm wheelchair access space (can be increased to reduce L)
- DL1/DL2 Door leaf dimensions of the doors to the lobby
- DP1/DP2 Door projection into the lobby (normally the door leaf size)
- L Minimum length of lobby, or length up to door leaf for side entry lobby

^{A)} No return wall within 600 mm of the doorway to enable a wheelchair user to manoeuvre into a position straight on to the door.

NOTE 1 For every 100 mm increase above 300 mm in the dimension *a* (which gives a greater overlap of the wheelchair footprint over the door swing), there can be a corresponding reduction of 100 mm in the dimension *L*, up to a maximum of 600 mm reduction.

NOTE 2 The 1 570 mm dimension represents the length of an occupied wheelchair with a companion or assistant pushing (or a large scooter).

6.3.6.3 Glazing in an entrance lobby

Glazing incorporated into an entrance lobby should not create distracting reflections. It should be designed in accordance with BS 6262-4.

Areas of full height glazing, glazed curtain walling or glazed screens surrounding a lobby should display the correct manifestations as stated in 9.1.5, to ensure that all glazing is as visible as possible for as many people as possible.

6.3.6.4 Projections

Columns, ducts and similar full height elements should not project more than 100 mm into the access route within a lobby (see Clause 5). If such projections are unavoidable, a guard rail or other hazard protection contrasting visually against the background should be provided to guide blind and partially sighted people around this type of projection (see Annex B).

6.4 External and internal door leaves (including lobby doors)

6.4.1 Effective clear width through a doorway

The minimum effective clear width of a single leaf door, or one leaf (the primary leaf) of a double leaf door, clear of any projections from the face of the door such as door furniture and weather boards, should be as shown in Table 2. The method of measuring the effective clear width is shown in Figure 11.

NOTE 1 The effective clear width also applies to sliding doors.

NOTE 2 There are no restrictions on the width of the secondary leaf of an unequal double leaf door.

When specifying a door size, designers should take into account the extent to which the door might not be able to open beyond 90°, allowing for the projection of the door furniture or wall configuration.

NOTE 3 The extent to which the effective clear width is reduced by projecting door furniture is dependent on the opening angle of the door.

NOTE 4 The backcheck feature on door closing devices makes doors harder to open to 90° and beyond. The alternative is to fit a backstop.

6.4.2 Location and side clearance of doors

An unobstructed space of at least 300 mm should be provided between the leading edge of a door (when it opens towards you) and a return wall (see Figure 12), unless the door is opened by remote automatic control.

NOTE 1 Increasing this space to 450 mm will improve manoeuvrability, reduce the risk of wheelchairs colliding with the wall, and enable wheelchair users to pass through the door more easily.

NOTE 2 It might also be beneficial to have the 300 mm clear space on the push side of the door.

NOTE 3 This recommendation also applies to doors within the common areas of blocks of flats.

Table 2 Effective clear widths of doors

Direction of approach of wheelchair	Minimum effective clear width of door leaf (mm)	
	New buildings	Existing buildings
Straight-on (without a turn or oblique approach)	800	750
At right angles from an access route at least 1 500 mm wide	800	750
At right angles from an access route at least 1 200 mm wide	825	775
At right angles from an access route at least 900 mm wide	N/A	800
External doors and internal lobby doors at the entrance of buildings used by the general public	1 000	775 ^{A)}

NOTE 1 An effective clear width of less than 800 mm might result in people with poor manoeuvring ability or with large wheelchairs not being able to pass through without damage to themselves or the door or frame. Use of the 1 000 mm effective clear width more easily accommodates people with assistance dogs and where there is heavy pedestrian traffic. For buildings used by the general public, the greater effective clear width is likely to be best achieved using power-assisted doors.

NOTE 2 For new buildings, effective clear widths of 800 mm and 825 mm are achievable using a 926 mm door leaf, provided the door opens beyond 90° and the projection of door furniture does not reduce the effective clear width.

NOTE 3 Sports facilities have their own requirements for the effective width of doors, e.g. tennis sports wheelchairs require a doorway with an effective clear width of 1 000 mm for convenient access (see Accessible sports facilities [11]).

^{A)} Where the entire frontage is being replaced, the width for a new building should be used.

Figure 11 Effective clear width through a doorway

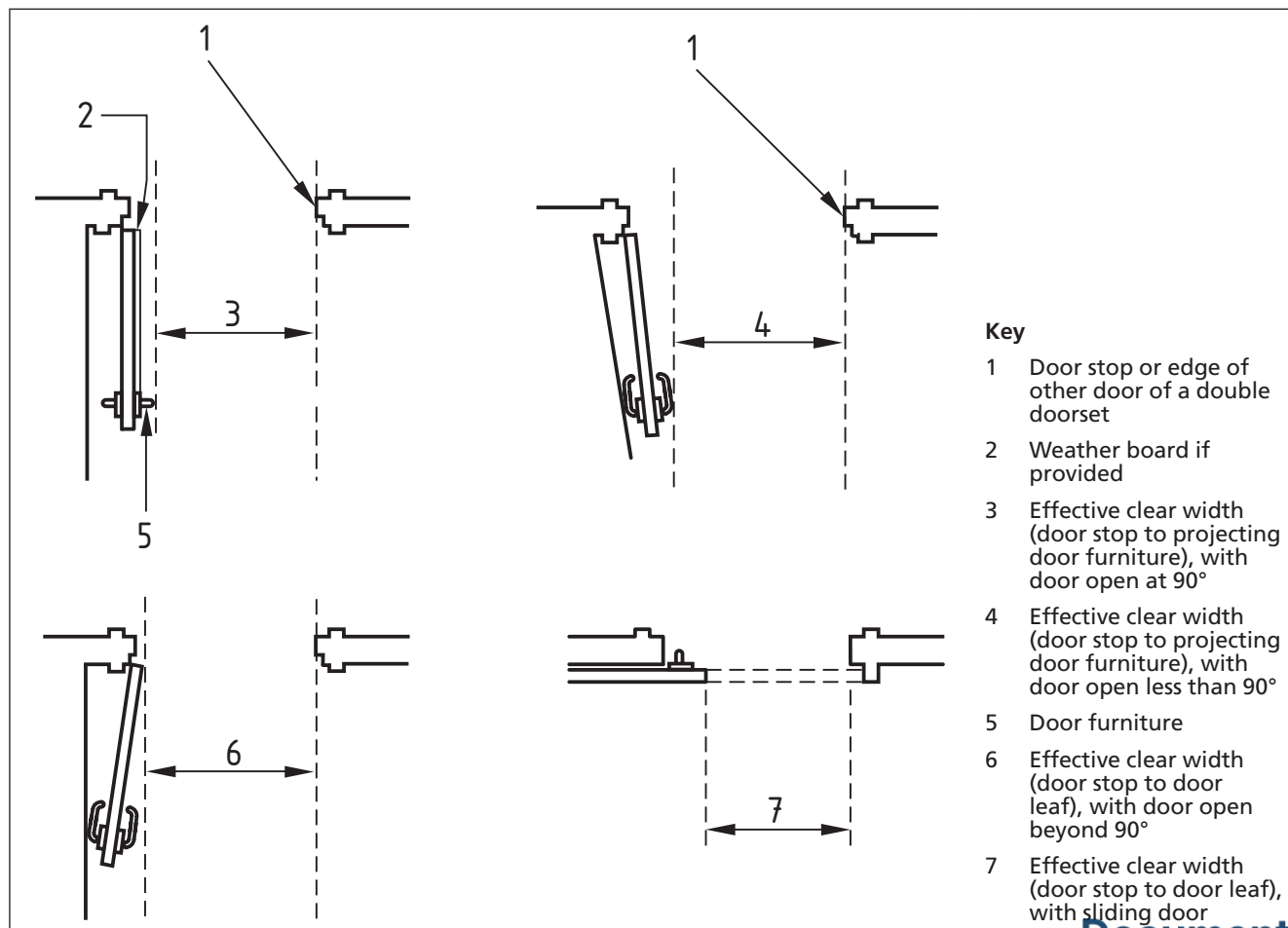
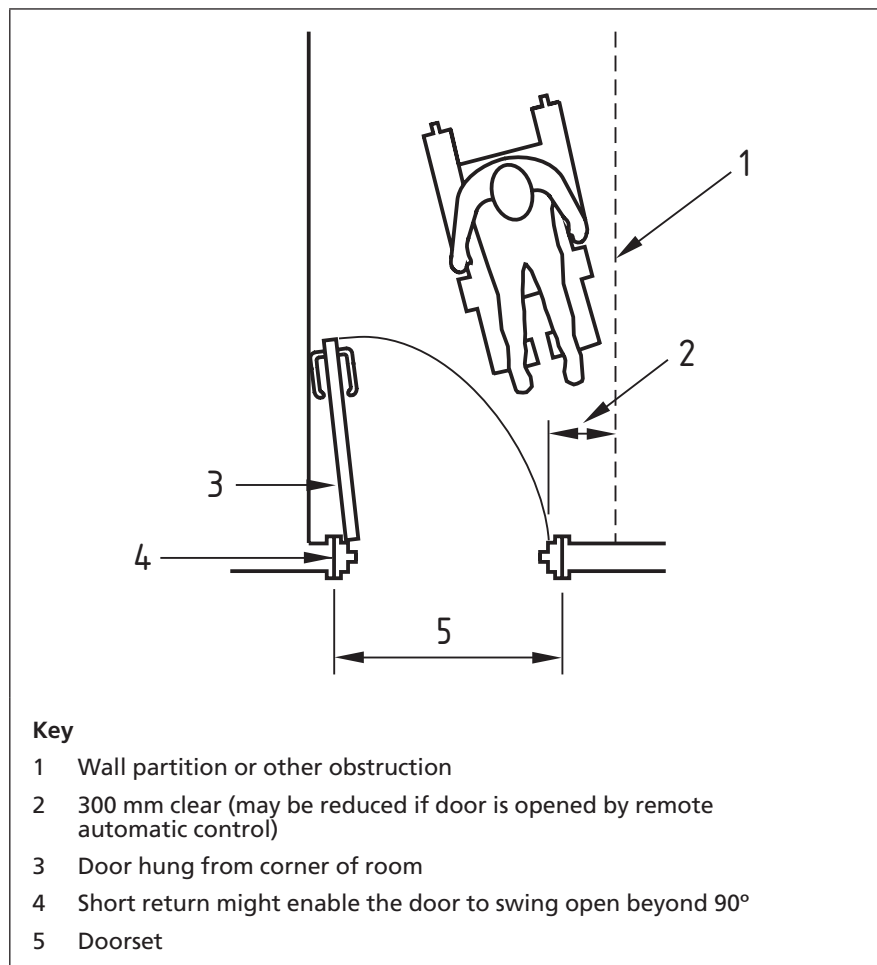


Figure 12 Door location and side clearance



6.4.3 Vision panels

COMMENTARY ON 6.4.3.

The recommendations in this subclause are intended to enable a person of small stature or a wheelchair user (when approaching a door) to see, and be seen by, another wheelchair user or an ambulant person approaching from the other side, while allowing the possibility of having an opaque area across the door to provide strength, or to accommodate door furniture.

Entrance doors and lobby doors should have viewing panels to alert people approaching a door to the presence of another person on the other side.

If a door has a single viewing panel, the minimum zone of visibility should be between 500 mm and 1 500 mm from the floor. If a door has multiple viewing panels, the minimum zone of visibility should not be interrupted by opaque areas that obstruct more than 350 mm of the vertical height of the zone. Where the minimum zone of visibility is interrupted, there should be a vision panel at both the top and bottom of the zone. Vision panels should be positioned centrally on the door or offset towards its leading edge (see Figure 13). Each individual viewing panel should be not less than 100 mm in width.