

BS 8300-2:2018



BSI Standards Publication

Design of an accessible and inclusive built environment

Part 2: Buildings — Code of practice

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Summary of pages

This document comprises a front cover, and inside front cover, pages i to viii, pages 1 to 220, an inside back cover and a back cover.

Foreword

Publishing information

This part of BS 8300 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 January 2018. It was prepared by Technical Committee B/559, *Access to buildings for disabled people*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

Together with BS 8300-1, this document supersedes BS 8300:2009+A1:2010, which is withdrawn.

Relationship with other publications

BS 8300 is published in the following parts:

- Part 1: *External environment – Code of practice*;
- Part 2: *Buildings – Code of practice*.

Information about this document

A full revision of BS 8300:2009+A1:2010 has been undertaken. The principal change overall is to split the document into two parts, as discussed below. The principal changes in respect of the buildings content are:

- addition of recommendations for inclusive design;
- updating of recommendations for assistive listening systems;
- revision of recommendations for counters and reception desks;
- revision of recommendations for shops and supermarkets;
- addition of recommendations for quiet spaces.

During the revision, some changes were required to consolidate the changes made in BS 8300:2009+A1:2010, and many others to incorporate changes thought necessary by the Technical Committee following consideration of comments submitted by the public, organizations of disabled people and built environment professionals. More fundamentally, changes in the content have been necessitated by the decision to restructure BS 8300 into two parts, one to cover buildings and one to cover the external built environment.

Following the precedent established by the first edition of BS 8300, the structure of the two new parts follows the logic of the “journey sequence”, starting with the new BS 8300-1 dealing with the wider external built environment, and BS 8300-2 dealing with the building itself. In the course of restructuring the document, the drafting panels have also taken the opportunity to update the guidance and recommendations in the light of current good practice, including a comprehensive introduction to inclusive design and its place in the wider design process, and to take into account the content of new or revised standards published since 2010.

BS 8300 no longer gives guidance on individual dwellings as this is now covered by [BS 9266](#).

The provisions in BS 8300 are based on ergonomic research conducted in 1999. The Technical Committee responsible for BS 8300 is aware of changing requirements relating to the variety of mobility aids now available and the physical space needed to use such devices, as well as the implications of the increasing use of technology and new building construction methods. However,

at the time of publication of this edition of the standard, the committee does not know of any new ergonomic research on which to base changes to the space recommendations within the standard.

Many of the general access requirements of disabled children will be addressed by the recommendations in the standard. However, at the time of publication of this standard, the committee does not know of any ergonomic research that would justify any more specific recommendations being given. Detailed guidance on designing schools for disabled children and children with special educational needs is available in Building Bulletin 102 [1].

Since publication of the amended 2009 edition of BS 8300, the International Organization for Standardization (ISO) has published ISO 21542, which covers accessibility and usability of the built environment and is undergoing revision at the time of publication of this edition of BS 8300. Also, the European Commission has issued a mandate (Mandate 420) to European Standards bodies CEN and CENELEC to prepare a European Standard on accessibility requirements for public procurement in the built environment. The outcome of these processes will be taken into account in the next regular review of BS 8300.

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 barriers experienced by disabled people when using the external environment and approaching 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 of 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.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Websites referred to in this standard were last viewed on 3 January 2018.

Contractual and legal considerations

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

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

Particular attention is drawn to the following legislation:

- Equality Act 2010 [2];
- Building Regulations 2010 and subsequent amendments [3];
- Building (Amendment) (Wales) Regulations 2014 [4];

- Building (Scotland) Regulations 2004 and subsequent amendments [\[5\]](#);
- Building Regulations (Northern Ireland) 2012 and subsequent amendments [\[6\]](#);
- Regulatory Reform (Fire Safety) Order 2005 [\[7\]](#);
- Fire Safety (Scotland) Regulations 2006 [\[8\]](#);
- Fire Safety Regulations (Northern Ireland) 2010 [\[9\]](#).

Attention is also drawn to Article 9 in the UN Convention on the Rights of Persons with Disabilities, which states that appropriate measures should be taken to ensure that disabled people have access on an equal basis with others to the physical environment, transportation, information and communications, and to enable them to live independently and participate fully in all aspects of life.

Introduction

This British Standard explains how buildings, their approaches and immediate surroundings can be designed, built and managed to achieve an inclusive environment. It complements and is intended to be read in conjunction with the recommendations given in BS 8300-1.

The aim of this British Standard is to give built environment professionals the information they need at the outset of a project to achieve an accessible and inclusive environment and to anticipate and overcome any restrictions and barriers that prevent any user making full and independent use of the built environment. It recognizes that everyone wishes to use the built environment in different ways, for example as residents, visitors, spectators, customers, employees, holders of public office, or participants in sports events, performances and conferences. Everyone, including disabled and older people with particular access requirements, should be able to enter, use and leave a building easily, comfortably and independently, including being able to escape in the event of fire or other emergency.

Previous editions of BS 8300 have advised specifically on designing for disabled people. The new BS 8300-2 explains how to design, build and manage the built environment in a way that is inclusive. Designing to address and integrate the access requirements of all people, irrespective of their personal circumstances, as part of mainstream design, and thus achieve an inclusive environment, is always preferable to designating separate or specific features.

There will be situations where features that address a particular need, such as additional grab rails, touch legible signs and assistive listening systems, might be needed to enable easy use by a disabled person. Recommendations are given on these features. However, it is recognized that there are still areas (such as specific facilities that address the requirements of people of particular faiths) where further knowledge and expertise is needed. Efforts have been made to include reference to people's neurological requirements in this revision and extension of BS 8300; however, further work is required in this area.

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, and that arrangements for their continued maintenance are in place. Reference is made on occasions to ways in which management and maintenance can affect safe access and use of facilities. Good management is often vital and a prerequisite to making facilities work as they were intended. The beneficial effect of good management cannot be overemphasized.

Creating an accessible and inclusive environment is integral to the economic, social and environmental dimensions of sustainable development. Meeting the recommendations in BS 8300 can contribute to achieving sustainable development.

1 Scope

This part of BS 8300 gives recommendations for the design of buildings to accommodate users with the widest range of characteristics and capabilities. It applies to:

- a) external features of a building or group of buildings, such as entrances, outward opening doors and windows, where they affect external access routes; and

NOTE 1 The recommendations in this part of BS 8300 mainly cover access within buildings. The standard also makes reference to design of some environments which might be either internal or external, such as some transport-related buildings, but the main recommendations for design of external environments are given in BS 8300-1.

- b) interiors of buildings such as entrances and reception facilities, horizontal and vertical movement, and facilities in the building.

NOTE 2 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](#) and [BS 9991](#).

The recommendations given in this part of BS 8300 apply largely to new buildings, but can also be used when 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 part of BS 8300 applies to a wide range of buildings such as:

- 1) transport buildings;
- 2) industrial buildings;
- 3) administrative and commercial buildings;
- 4) health and welfare buildings;
- 5) refreshment, entertainment and recreation buildings;
- 6) religious buildings and associated facilities;
- 7) educational, cultural and scientific buildings;
- 8) residential buildings (e.g. nursing, residential and care homes, student accommodation, common parts of blocks of flats);
- 9) temporary structures accessible to or usable by the general public.

This part of BS 8300 does not apply to individual dwellings, or to residential buildings that are designed specifically to meet the requirements of people with complex or multiple impairments.

NOTE 3 [BS 9266](#) gives recommendations for the design of accessible and adaptable general needs housing, whether in the form of flats or individual houses.

NOTE 4 This part of BS 8300 does not give recommendations for management and maintenance in occupied buildings, but a list of issues to be considered is given in [Annex A](#).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions 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](#), Lock assemblies operated by key from both the inside and outside of the door

[BS 4787-1](#), *Internal and external wood doorsets, door leaves and frames — Part 1: Specification for dimensional requirements*

[BS 5499-4](#), *Safety signs — Part 4: Code of practice for escape route signing*

[BS 5839-1](#), *Fire detection and fire alarm systems for buildings — Part 1: Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises*

[BS 6180:2011](#), *Barriers in and about buildings — Code of practice*

[BS 6259](#), *Code of practice for the design, planning, installation, testing and maintenance of sound systems*

[BS 6262](#), *Glazing for buildings*

[BS 6262-4](#), *Glazing for buildings — Part 4: Code of practice for safety related to human impact*

[BS 6440](#), *Powered vertical lifting platforms having non-enclosed or partially enclosed liftways intended for use by persons with impaired mobility — Specification*

[BS 7036-0](#), *Power operated pedestrian doorsets — Safety in use — Part 0: Code of practice for risk assessment and risk reduction*

[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](#), *Guidance on sound insulation and noise reduction for buildings*

[BS 8300-1](#), *Design of an accessible and inclusive built environment — Part 1: External environment — Code of practice*¹

[BS 8621](#), *Lock assemblies operated by key from the outside of the door and by handle or thumb turn from the inside of the door*

[BS 9999](#), *Fire safety in the design, management and use of buildings — Code of practice*²

[BS 10621](#), *Lock assemblies in which the operating mode can be switched between the normal BS 8621 operating mode and a secure mode in which no egress is possible*

[BS EN 81-20](#), *Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 20: Passenger and goods passenger lifts*

[BS EN 81-28](#), *Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 28: Remote alarm on passenger and goods passenger lifts*

[BS EN 81-40](#), *Safety rules for the construction and installation of lifts — Special lifts for the transport of persons and goods — Part 40: Stairlifts and inclined lifting platforms intended for persons with impaired mobility*

[BS EN 81-41](#), *Safety rules for the construction and installation of lifts — Special lifts for the transport of persons and goods — Part 41: Vertical lifting platforms intended for use by persons with impaired mobility*

[BS EN 81-70](#), *Safety rules for the construction and installation of lifts — Particular applications for passenger and goods passenger lifts — Part 70: Accessibility to lifts for persons including persons with disability*

¹ This part of BS 8300 also gives informative references to BS 8300-1:2018.

² This part of BS 8300 also gives informative references to BS 9999:2017.

[BS EN 81-72](#), *Safety rules for the construction and installation of lifts — Particular applications for passenger and goods passenger lifts — Part 72: Firefighters lifts*

[BS EN 115-1](#), *Safety of escalators and moving walks — Part 1: Construction and installation*³

[BS EN 179](#), *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](#), *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 12051](#), *Building hardware — Door and window bolts — Requirements and test methods*

[BS EN 16005:2012](#), *Power operated pedestrian doorsets — Safety in use — Requirements and test methods*

[BS EN 12209](#), *Building hardware — Mechanically operated locks and locking plates — Requirements and test methods*

[BS EN 60118-4](#), *Electroacoustics — Hearing aids — Part 4: Induction-loop systems for hearing aid purposes — System performance requirements*

[BS EN ISO 7010](#), *Graphical symbols — Safety colours and safety signs — Registered safety signs*

[BS EN ISO 10535](#), *Hoists for the transfer of disabled persons — Requirements and test methods*

3 Terms and definitions

For the purposes of this part of BS 8300, the following terms and definitions apply.

3.1 access

approach, entry, horizontal and vertical movement or exit, including in cases of emergency

3.2 accessible

capable of being independently accessed and used

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 impairments, including not only wheelchair users, but also people with limited dexterity or mobility, and people who need assistance with personal activities of daily living

3.4 accessible route

any route that is used to approach a building, or to move between buildings or within a building

³ This part of BS 8300 also gives informative references to BS EN 115-1:2017.

3.5 controlled door closing device

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

3.6 exit devices

3.6.1 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

3.6.2 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

3.7 illuminance

amount of light falling on a surface, measured in lumens per square metre (lm/m^2) or lux (lx)

3.8 inclusive design

approach to the design of the environment, including buildings and their surrounding spaces, and managed and natural landscapes, to ensure that they can be accessed and used by everyone

3.9 lifting appliances

3.9.1 conventional passenger lift

lifting appliance within the scope of [BS EN 81-20](#), operating at speeds greater than 0.15 m/s, for any travel distance, and intended for the transport of persons or persons and goods

NOTE Such lifts are designed to meet the requirements of the Lifts Regulations 2016 [10].

3.9.2 enclosed vertical lifting platform

vertical lifting appliance within the scope of [BS EN 81-41](#) with enclosed liftway, a speed not greater than 0.15 m/s, a carrier which is not completely enclosed, and primarily intended to permit the access of persons with limited mobility

3.9.3 evacuation lift

conventional passenger lift used as part of the evacuation sequence for persons with disability and persons requiring assistance, which has appropriate structural, electrical and fire protection and is capable of being taken under control by a trained and authorized person

3.9.4 firefighters lift

conventional passenger 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

3.9.5 non-enclosed vertical lifting platform

vertical lifting appliance within the scope of [BS 6440](#) having non-enclosed or partially enclosed liftways, a carrier which is not completely enclosed, a speed not greater than 0.15 m/s, and intended for use by persons with limited mobility

3.9.6 slow speed lift

vertical lifting appliance with enclosed carrier, operating at speeds not greater than 0.15 m/s, and intended for use by persons, including disabled persons

NOTE Such lifts are designed to meet the requirements of the Supply of Machinery (Safety) Regulations 2008 [11].

3.9.7 wheelchair stairlift

appliance within the scope of [BS EN 81-40](#) for transporting a person in a wheelchair, between two or more landings by means of a guided carriage moving in an inclined plane

3.10 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 people who are blind or partially sighted (see [Annex B](#)).

3.11 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

3.12 passageway

route through a physical space bounded by either walls or permanent or temporary obstructions

3.13 ramps, steps and stairs

3.13.1 flight

continuous series of steps or continuous ramp between two landings

3.13.2 going

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

3.13.3 handrail

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

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

3.13.4 landing

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

3.13.5 level

gradient not steeper than 1:60

3.13.6 nosing

front edge portion of a tread and riser or landing and riser

3.13.7 ramp

one or more inclined surfaces with a gradient between 1:20 and 1:12

3.13.8 rise

<of stairs> vertical distance between the horizontal upper surfaces of two consecutive treads, or between a tread and a floor or a tread and a landing

<of ramps> vertical distance between each end of a ramp flight

3.13.9 riser

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

3.13.10 slope

inclined surface with a gradient steeper than 1:60 and shallower than in 1:20

3.13.11 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.

3.13.12 tread

horizontal component of a step

3.14 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

3.15 spillover

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

3.16 unisex

<of sanitary accommodation> designed for use by all, with or without assistance

3.17 visual contrast

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

NOTE Guidance on LRVs is given in [Annex B](#).

3.18 way-finding

means of ensuring that someone can find their way, avoid obstacles, and know when they have reached their destination

4 Integrating inclusive design principles into the development process**COMMENTARY ON CLAUSE 4**

An inclusive environment recognizes and accommodates differences in the way people use the built environment. It facilitates dignified, equal and intuitive use by everyone. It does not physically or socially separate, discriminate or isolate. It readily accommodates and welcomes diverse user requirements – from childhood to adulthood through to old age, across all abilities and embracing every background, gender, sexual orientation, ethnicity, religion or belief, and culture (i.e. protected characteristics). It helps people to live independently and participate fully in all aspects of life.

An inclusive environment:

- *creates buildings, places and spaces that can be used easily, safely and with dignity by everybody;*
- *provides choice, is convenient and avoids unnecessary effort, separation or segregation;*
- *goes beyond meeting minimum standards or legislative requirements;*
- *recognizes that everyone benefits from improved accessibility, including disabled people, older people and families with children, carers, and people who do not consider themselves to be disabled.*

An inclusive environment works better for everybody, whether a place is a home, school, office, factory, park, street, hospital, nursing, residential or care home, bus route or train station.

It is not just disabled and older people, or families with small children who benefit from a well-designed and managed built environment – everyone benefits. Good design is inclusive design.

Achieving an inclusive environment is the responsibility of everyone who works in the built environment, from those who commission new buildings, places and spaces, to planners, designers, engineers and surveyors, and to the owners, interior designers and facilities managers responsible for the building, place or space in use. Further guidance is given in the Construction Industry Council's advice on achieving an accessible and inclusive environment entitled Essential principles for built environment professionals [12].

The Design Council, in its Inclusive Design Hub⁴, advises that applying the following five principles of inclusive design⁵ from the outset of a project can help achieve an accessible and inclusive environment.

- a) *Place people at the heart of the design process.*
- b) *Acknowledge diversity and difference.*
- c) *Offer choice where a single design solution cannot accommodate all users.*
- d) *Provide for flexibility in use.*
- e) *Provide buildings and environments that are convenient and enjoyable for everyone to use.*

Integrating the principles of inclusive design into the design, development and management process from project inception to completion and occupation is critical to the achievement of an accessible and inclusive environment. Accessibility and inclusivity issues need to be addressed from the outset of any project, but this has traditionally been left to the planning application and detailed design stages, which can often result in compromises and missed opportunities for achieving social and physical inclusion.

4.1 Inclusive design strategy

COMMENTARY ON 4.1

An effective way of ensuring that the principles of inclusive design are applied and integrated from the outset of a project is by producing an inclusive design strategy. Such a strategy is an effective way of demonstrating to the client, contractor, user groups and others involved in the development of the project, how the inclusive strategic vision will be developed and implemented over the course of the project. It helps to inform the developer's initial vision, the project's strategic brief and the procurement process. It also provides the opportunity to identify people and expertise necessary to deliver an inclusive environment and to monitor consistent implementation of the principles throughout the later stages of the project, particularly if a design and access statement is needed at planning application stage and/or if an access strategy is needed at building control stage.

⁴ See <http://www.designcouncil.org.uk/what-we-do/inclusive-environments>.

⁵ For further information see the CABI publication *The principles of inclusive design – They include you* [13].

An inclusive design strategy should be produced at the outset of the project. The strategy should explain how the principles of inclusive design are to be addressed and implemented in the project stages shown in [Table 1](#).

NOTE The management of inclusive design is described in [BS 7000-6](#).

Table 1 — *Inclusive design strategy*

Typical project stage	Typical inclusive design activities
Strategic vision	Commit to implementing an inclusive design process and identify an inclusive environment champion
Initial concept brief	Embed principles of inclusive design into brief
Budget estimates	Ensure that costs address accessibility and inclusivity, including costs of access expertise on project team from inception through to completion
Procurement process	Incorporate principles of inclusive design into procurement requirements
Development agreements	Make explicit reference to meeting best practice standards in any development agreements
Master plan and outline designs	Initiate early consultation and engagement with strategic user groups representing people with protected characteristics
Planning application	Use the design and access statement to demonstrate how the highest standards of access and inclusion have been achieved
Building control application	Demonstrate in any access strategy how access solutions have met the vision of an inclusive environment
Detailed design and product selection	Maintain vigilance in the detailed design and product selection to ensure that inclusive access and facilities are delivered
Construction phase	Ensure that any value engineering or other changes during the construction phase are not to the detriment of inclusive design or accessibility
Appraisal at project completion	Audit accessibility and means of escape provisions prior to completion using access expertise
Fit-out and post-occupancy evaluation	Maintain levels of accessibility and ensure that staff are fully trained in use of facilities
In-use management policies, practice and procedures	Monitor future changes and embed principles of inclusive design into planned maintenance programmes
Long-term occupancy, end-user/public feedback	Review end-user feedback, tailored audit changes and customer surveys, for inclusive design lessons learned

4.2 Design and access statements

COMMENTARY ON 4.2

A design and access statement is a concise report accompanying certain applications for planning permission and applications for listed building consent. They provide a framework for applicants to explain how the proposed development is a suitable response to the site and its setting, and demonstrate that it can be adequately accessed by prospective users. Design and access statements can aid decision-making by enabling local planning authorities and third parties to better understand the analysis that has underpinned the design of a development proposal.

A design and access statement should be consistent with the inclusive design strategy.

It should demonstrate:

- that the applicant has thought carefully about the design of the development given its context;

- that the principles of inclusive design have been applied throughout the planning process;
- how everyone will be able to use the places and spaces that are proposed;
- what inclusive design solutions have been adopted.

It should illustrate, in drawings and text, how the proposal meets legal requirements and technical access standards, including the provisions in this British Standard. It should justify the decisions taken, especially any deviation from accepted good practice.

The level of detail in a design and access statement should be proportionate to the complexity of the application.

4.3 Access strategy

COMMENTARY ON 4.3

An access strategy can be used at building control stage to enable the applicant to clearly communicate to the building control body how their chosen approach meets the accessibility requirements of the likely end users of a building, place or space. It also provides the opportunity to demonstrate compliance with this British Standard and with the initial inclusive design strategy developed at the outset of the project.

An access strategy should be consistent with the project's original inclusive design strategy and, where applicable, with the design and access statement. It should explain the approach to inclusive design to be adopted in the detailed design and construction of the building, place or space, and in any ongoing management and maintenance issues that could affect the accessibility and usability of the building, place or space (see [Annex A](#)).

Where alternative access solutions to those recommended in this standard have been proposed, the access strategy should describe how the same or improved level of access will be achieved.

NOTE 1 The access strategy could be further developed by the building operator and included in their policies, practices and procedures (including staff training) to show how the accessibility of the building and its facilities will be managed and maintained, including when alterations are carried out and when procedures or tenants change.

NOTE 2 An access strategy could also be developed following an access audit of an existing building or space or following a major refurbishment. Under such circumstances it is accepted that it might not be possible to adapt the existing building or space to meet all the recommendations of this standard. However, if this is the case, the access strategy would need to explain why the standards cannot be met or why the same level of access cannot be achieved, and to identify the implications for users and what means are being provided to lessen the impact.

5 Strategic site and building layout

COMMENTARY ON CLAUSE 5

The initial master planning/outline planning permission stage allows an opportunity to assess the context of the site, its topography and whether the buildings and their approaches can be arranged in such a way as to maximize the accessibility of the development. For example, early assessment of gradients across the site, the orientation of the buildings and their entrances and their relationship with car, cycle and mobility vehicle parking, pedestrian entrances and access to public transport can dictate how accessible the development will ultimately be.

5.1 Site planning and position of buildings and other features

Buildings should be positioned and organized on the site in a way that:

- a) makes optimum use of contours and levels for ease of access and egress;
- b) enables easy navigation around the building without confusion, logically integrating way-finding and signage;

- c) makes the entrance(s) and reception point(s) prominent and legible;
- d) prioritizes key facilities around an entrance hub and along any axial routes on the principal level within the building;
- e) accommodates the anticipated level and volume of use;
- f) locates means of horizontal and vertical movement appropriately;
- g) locates other facilities such as lifting appliances and toilets appropriately;
- h) ensures that all exits from a building are inclusive and can be easily found;
- i) locates building entrances and exits, including emergency exits, to enable easy management of emergency evacuation according to anticipated numbers and diversity of need.

5.2 Navigation, orientation and way-finding

5.2.1 General

Buildings should be designed, constructed and managed to facilitate convenient orientation and way-finding. Orientation and way-finding should be planned at the outset of a project to ensure that the arrangement of the buildings and their entrances on a site enable people to navigate and orientate themselves easily.

NOTE Orientation means the relative physical position or direction of someone or something; way-finding means to find one's way, to avoid obstacles, and to know when one has reached the destination.

The ease of orientation in and way-finding around a building is determined by its inherent legibility (see 5.2.2), supported by information systems and signage. A way-finding strategy (see 5.2.4) should be developed as part of the inclusive design strategy.

5.2.2 Legibility of space

COMMENTARY ON 5.2.2

Legibility of space is the degree to which a place has a clear image and is easy to understand. It includes recognizable routes, intersections and landmarks to help people find their way around.

Routes to and within buildings should be designed to provide a strong, legible framework. The layout of a building and location of key facilities, such as entrance doors, reception, and vertical circulation stairs and lifting appliances, should be easily identifiable, predictable and served by direct routes.

5.2.3 Principle of two senses

Supportive measures for information and way-finding should be provided in a format that is accessible to people with sensory impairments, according to the principle of at least two senses.

Audible, tactile, visual and other sensory information should be provided where possible.

NOTE The most common supportive measures are likely to be audible/tactile information and visual information. Different forms of sensory information are not always alternatives but can be complementary. They support people with different access requirements.

5.2.4 Way-finding

Way-finding should use spatial, physical and environmental clues to help people plan and navigate moving from one place to another. Appropriate way-finding clues should be incorporated which could include, but are not limited to:

- a) architectural clarity, for example:
 - logical arrangements and clear identification of routes, entrances and elements;

- landmarks;
 - zones;
- b) graphic communication, for example:
- signs;
 - information;
 - maps and directories;
- c) tactile communication, for example:
- embossed signage;
 - Braille signage;
 - changes in floor surface;
 - changes in level;
 - tapping rails;
- d) audible communication and sounds, for example:
- talking signs;
 - announcement systems;
 - fountains/water features when in operation;
 - changes in walking surface;
 - acoustics that support clear interpretation of sound and speech;
 - way-finding instructions based on indoor audio-based network navigation systems;
 - audio descriptive way-finding information;
- NOTE 1 Some guidance on audio descriptive way-finding information can be found in the VocalEyes publication Museum access information guidelines 2016 [14].*
- e) visual communication, for example:
- visual clarity in terms of colour and contrast;
 - good lighting that avoids excessive reflections, glare, and shadowing;
 - clarity of text and symbols;
- f) the use of personal navigation systems, for example:
- mapping and memory;
 - apps on personal mobile devices.

NOTE 2 Personal navigation systems can be very useful for some people but not all people can use these consistently and reliably to find their way.

NOTE 3 Features such as plants and water features which can change according to day, time, season, etc., cannot be relied on but can provide additional way-finding clues. Similarly, some plants, and areas of buildings such as bakeries, can provide scent clues; these can also change according to day, time, season, etc., and not all people can consistently detect a change in smell, but again this can be a useful additional clue for some people. Refer to Sensory Trust publications and website (<http://www.sensorytrust.org.uk>) for more information.

NOTE 4 Attention is drawn to the significance of communication via pre-arrival and on arrival information. This is because many people begin their journey long before they arrive by seeking out information, particularly information on accessibility. Pre-arrival information may be in the form of printed leaflets, which needs to be

easily readable and available in a range of accessible formats, or information via a website. [BS 8878](#) deals with accessibility within the web environment.

Signage should be in accordance with [Clause 12](#) and lighting with [Clause 14](#).

NOTE 5 Signage types used to support way-finding include information, directional, identification (location/arrival), and safety (fire and mandatory) signage.

NOTE 6 Buildings under development might need to take account of changes in routes through the location as development progresses, and way-finding signage might need to be emphasized accordingly.

6 Arriving at a destination and parking

Setting-down and picking-up points, public transport facilities, car/cycle parking and garaging provision should all be in accordance with BS 8300-1.

7 Access routes to and within buildings

7.1 General

Access routes to buildings should be in accordance with BS 8300-1.

Access routes within buildings should be in accordance with [Clause 9](#) or [Clause 10](#) as appropriate.

7.2 Protection from hazards projecting from a building

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

NOTE For protection from potential hazards at the face of a building, see BS 8300-1:2018, 8.2.2.

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

8 Entering a building

8.1 Entrances

8.1.1 General

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

- the prominence and visual relationship of the entrance with its surroundings both internally and externally;
- the type of threshold needed to allow safe and step-free access;
- the ease of operation of the entrance door;
- the minimum effective clear width through the doorway;
- the provisions for effective drainage whilst retaining level access;
- transitional lighting to minimize the contrast between external and internal lighting levels (see also [Clause 14](#)).

NOTE Many built environments and individual buildings have more than one entrance. It is important to ensure that all pedestrian entrances are accessible.

8.1.2 Visual clarity

Any entrance door, including entrance doors in fenestration, should contrast visually with its immediate surroundings and should be well lit and clearly signed. It should not have a mirrored finish, and the frames to glazed doors should be distinguished from surrounding fenestration.

NOTE For glazed doors or doors within fenestration or other glazed screens, see also [8.3.6](#).

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.

8.1.3 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.

NOTE It can also be beneficial for users of vehicular drop-off points for weather protection to be provided at such locations.

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

8.1.4 Threshold

COMMENTARY ON 8.1.4

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 be level and water dispersed by suitable means such as treatment of external gradients, and/or the use of minimally intrusive gulleys. In exceptional circumstances where the provision of a raised threshold is unavoidable, it 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* [[15](#)].

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

8.2 Entrance doors and lobbies

COMMENTARY ON 8.2

Unless suitably designed, the entrance to a building can be a critical barrier to access for disabled people. However well designed, there remains the possibility that some form of management intervention might be necessary to assist someone experiencing difficulty in gaining access. Factors having a bearing on this which can help to minimize the need for intervention include the prominence and visual clarity of the entrance within its surroundings, the ease with which visitors can be seen, either directly or by electronic means or, when necessary, summon assistance, and the ease with which visitors can identify their intended destination once inside.

8.2.1 Entrance doors

Entrance doors to a building should be usable by all, even though the doors might be designed to be held closed when not in use.

8.2.2 Self-closing swing doors

COMMENTARY ON 8.2.2

Fitting a door closing device to a single swing door can cause significant difficulties for a wide range of people, including children. For example, it is extremely difficult for wheelchair users, and for people who use walking aids or assistance dogs, or who have limited strength or poor standing tolerance, 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, there is a risk that people could be pushed off balance.

For details of door leaves, including effective clear widths, side clearance, vision panels and glass doors, see [8.3](#). 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 [8.4](#).

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 meeting the recommendations in [8.4.2](#).

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 [8.4.2](#), one of the following systems should be used:

- a) a power-operated door – sliding, folding, balanced or swing ([8.2.3](#));
- b) a power-operated revolving door with an adjacent accessible door ([8.2.4](#));
- c) an entrance lobby or airlock system of inner and outer doors ([8.2.5](#)).

8.2.3 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.

NOTE 1 It is preferable for motion sensors to be so located that they are not activated by passers-by.

The provision and installation of power-operated doors should be in accordance with [BS EN 16005:2012](#) and [BS 7036-0](#).

The approach to power-operated pedestrian door systems should be well defined, level and safeguarded in relation to pedestrian flow (see [Clause 7](#)). The approach should be provided with clearly visible warning signs (see [Clause 12](#)).

NOTE 2 Ramped floors leading down to power-operated doors are a potential hazard.

NOTE 3 Safeguarding in relation to the pedestrian flow can be achieved by setting the door into a recess or by guarding rails.

NOTE 4 Other than at power-operated swing doors, audible warning systems are not recommended due to the possibility of confusion about the direction of opening and direction of approach.

Manual activation controls for power-operated pedestrian doors should be located at a height of between 750 mm and 1 000 mm from finished floor level. In order to be clearly visible, they should contrast visually with the surrounding background (see [Clause 11](#)). They should be located as close

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

NOTE 5 Additional activation controls at a lower height that can be operated by the foot rest of a wheelchair can be useful for people with limited upper body strength.

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 EN 16005:2012](#), 4.5.1).

Safety provisions should be in accordance with [BS EN 16005:2012](#), 4.6 and [BS 7036-0](#). The door should also be capable of manual operation in the event of power failure.

NOTE 6 A low energy power-operated door operator may be used on swing doors subject to risk assessment. Low energy controlled 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. 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/pulled beyond approximately 25 mm.

8.2.4 Revolving doors

COMMENTARY ON 8.2.4

Revolving doors are not considered accessible and present particular difficulties to wheelchair users, people with ambulant mobility impairments, people who are blind or partially sighted, people with sensory/neurological processing difficulties, people with assistance dogs, people with young children or pushchairs, and people carrying large items or luggage. 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 and a barrier to many disabled users. For these reasons, automated door systems that do not require segregation of certain user groups are preferred.

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 [11.5](#)).

Where a revolving door is used, an 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 or power-operated. It should be clearly identifiable.

Safety provisions for revolving doors should be in accordance with [BS EN 16005:2012](#), 4.6 and 4.7, and [BS 7036-0](#).

8.2.5 Entrance lobbies

8.2.5.1 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
- b) to assist entry control of strangers when people are entering or leaving a building.

8.2.5.2 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 their wheelchair to pull it open. A space should also be provided for someone helping a wheelchair user to open a door and push (or pull) their 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 1](#). Vision panels in lobby doors should meet the recommendations in [8.3.5](#). 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 with a companion, 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 toilets (irrespective of the provision of accessible facilities within).

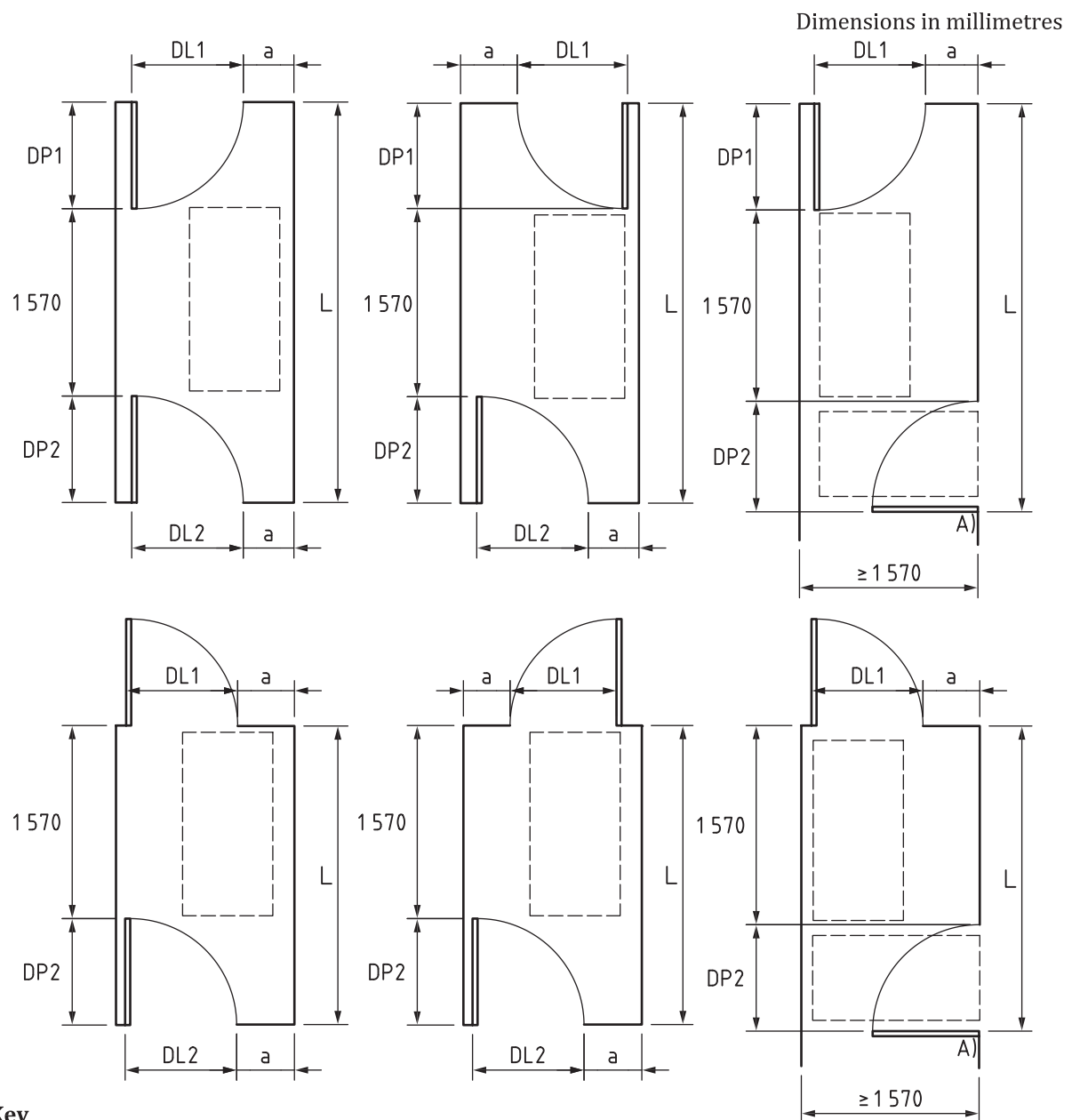
8.2.5.3 Glazing in an entrance lobby

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 [11.5](#), to ensure that all glazing is as visible as possible for as many people as possible.

8.2.5.4 Projections

Columns, ducts and similar full height elements should not project more than 100 mm into the access route within a lobby (see [Clause 7](#)). If such projections are unavoidable, a guard rail or other hazard protection contrasting visually against the background should be provided to guide people who are blind or partially sighted around this type of projection.

Figure 1 — Minimum dimensions of lobbies with single leaf doors**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

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 electric mobility scooter).

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.

8.3 External and internal doors (including lobby doors)

8.3.1 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 effective clear width should be measured as shown in [Figure 2](#).

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

NOTE 2 There are no access 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 wall stop or floor stop.

Table 2 — Effective clear widths of doors

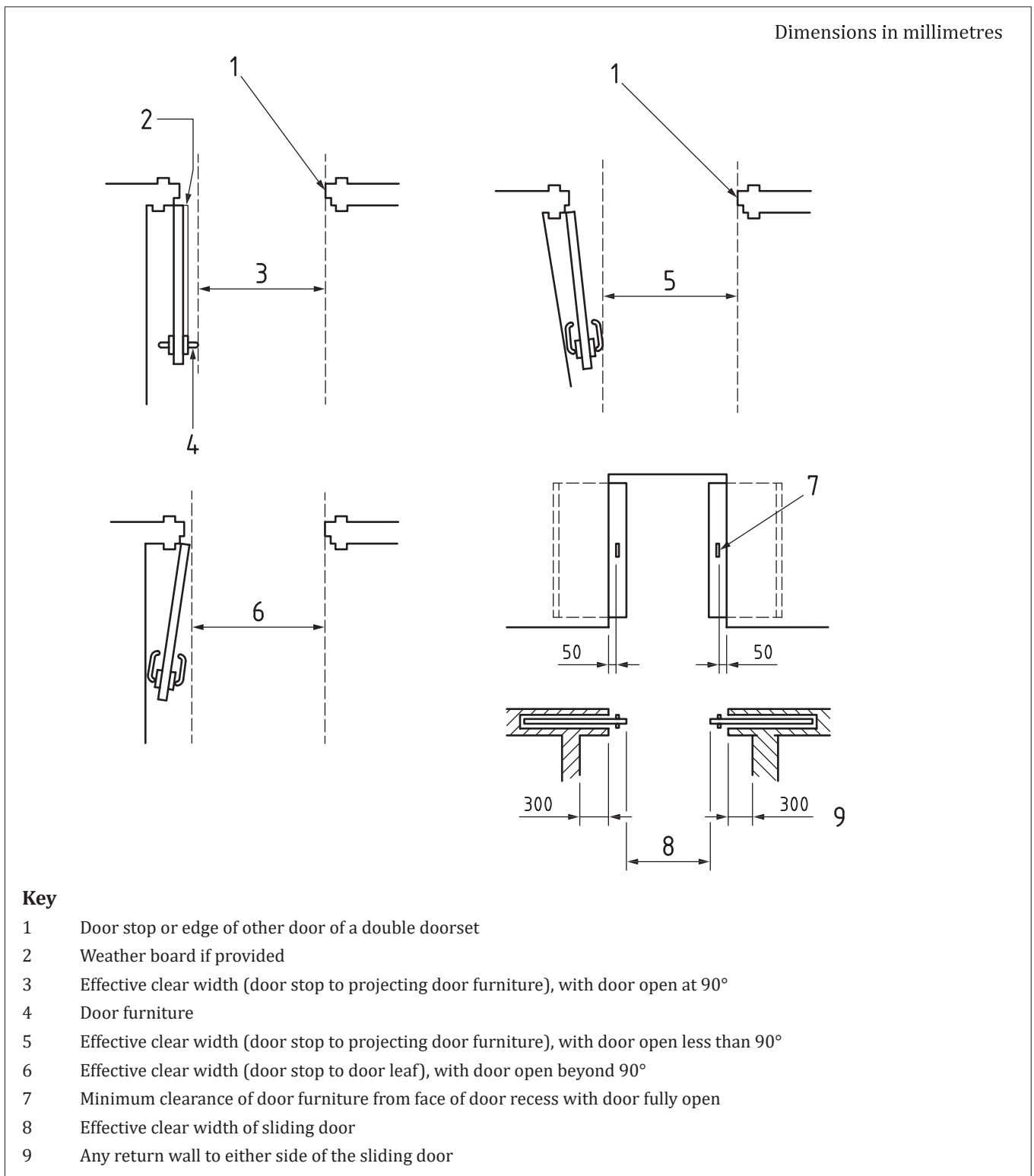
Direction of approach of wheelchair	Minimum effective clear width of door leaf (mm)
All external doors and internal lobby doors at the entrance of buildings	1 000
Straight-on (without a turn or oblique approach)	800
At right angles from an access route at least 1 500 mm wide	800
At right angles from an access route at least 1 200 mm wide	825

NOTE 1 BS 9999:2017 recommends a minimum effective clear width of 850 mm where unassisted wheelchair access is necessary for the purposes of fire evacuation.

NOTE 2 An effective clear width of 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 electric mobility scooters, powered wheelchairs, double pushchairs, 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 3 Effective clear widths of 800 mm and 825 mm are achievable using a standard 926 mm door leaf, provided the door opens beyond 90° and the projection of door furniture does not reduce the effective clear width.

NOTE 4 Sports facilities have their own requirements for the effective clear width of doors, e.g. sports wheelchairs might require a doorway with an effective clear width of greater than 1 000 mm for convenient access (see Accessible sports facilities [16]). Changing Places toilets also have separate provisions (see 18.6).

Figure 2 — *Effective clear width through a doorway*

8.3.2 Location and side clearance of doors

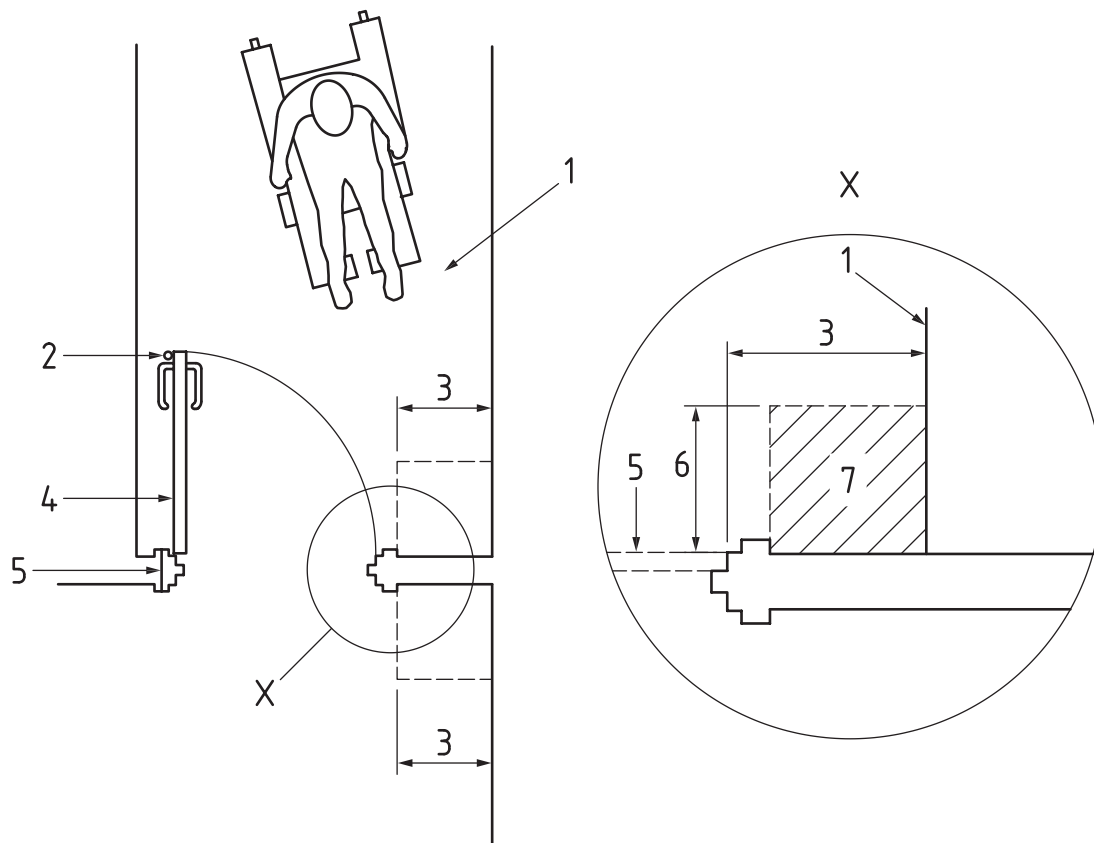
An unobstructed space of at least 300 mm should be provided between the leading edge of a door and a return wall or other obstruction (see [Figure 3](#)).

In a situation where the door has to be recessed, the face of the door should not be recessed beyond the wall or other obstruction by more than 200 mm (see [Figure 3](#)).

NOTE 1 Increasing this space to 600 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 This recommendation also applies to doors within the common areas of blocks of flats.

Figure 3 — Example of door location and side clearance on the pull side



Key

- 1 Return wall, partition or other obstruction
- 2 Door stop where appropriate
- 3 Minimum 300 mm clear space between the line of the leading edge of the door (when closed) and the return wall (may be reduced if door is opened by remote automatic control)
- 4 Door hung from corner of room
- 5 Opening face of door
- 6 Maximum 200 mm
- 7 Zone within which a door reveal, column or other obstruction may be situated

8.3.3 Internal manual sliding doors

COMMENTARY ON 8.3.3

Sliding doors might not always be appropriate as some people might have difficulties operating them.

Where sliding doors are used, they should achieve the relevant minimum effective clear opening width in [Table 2](#) and [Figure 2](#).

Handles on sliding doors should be easy to grip and manipulate and should meet the recommendations in [8.4](#).

Sliding door gear should have a positive action and be easy to operate with limited force.

An unobstructed space of at least 300 mm should be provided between the opening edge of any manual sliding door when closed and any return wall to either side of the sliding door.

NOTE Increasing this space to 600 mm will improve manoeuvrability, reduce the risk of wheelchairs colliding with the wall, and enable wheelchair users to pass through the door more easily.

8.3.4 Visual contrast of doors and walls

To assist people in navigating and negotiating an environment, sufficient levels of visual contrast should be achieved.

All internal doors should be identifiable and contrast visually with the surrounding wall and floor finishes, achieving a difference of at least 30 points in LRV.

NOTE Detailed recommendations for visual contrast of doors are given in [9.1.5](#).

Door opening furniture should contrast visually with the surface of the door which it operates, achieving a difference of at least 15 points in LRV.

The surface of the leading edge of any door that is not self-closing, or is likely to be held open, should contrast visually with its surroundings, achieving a difference of at least 30 points in LRV.

8.3.5 Vision panels

COMMENTARY ON 8.3.5

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.

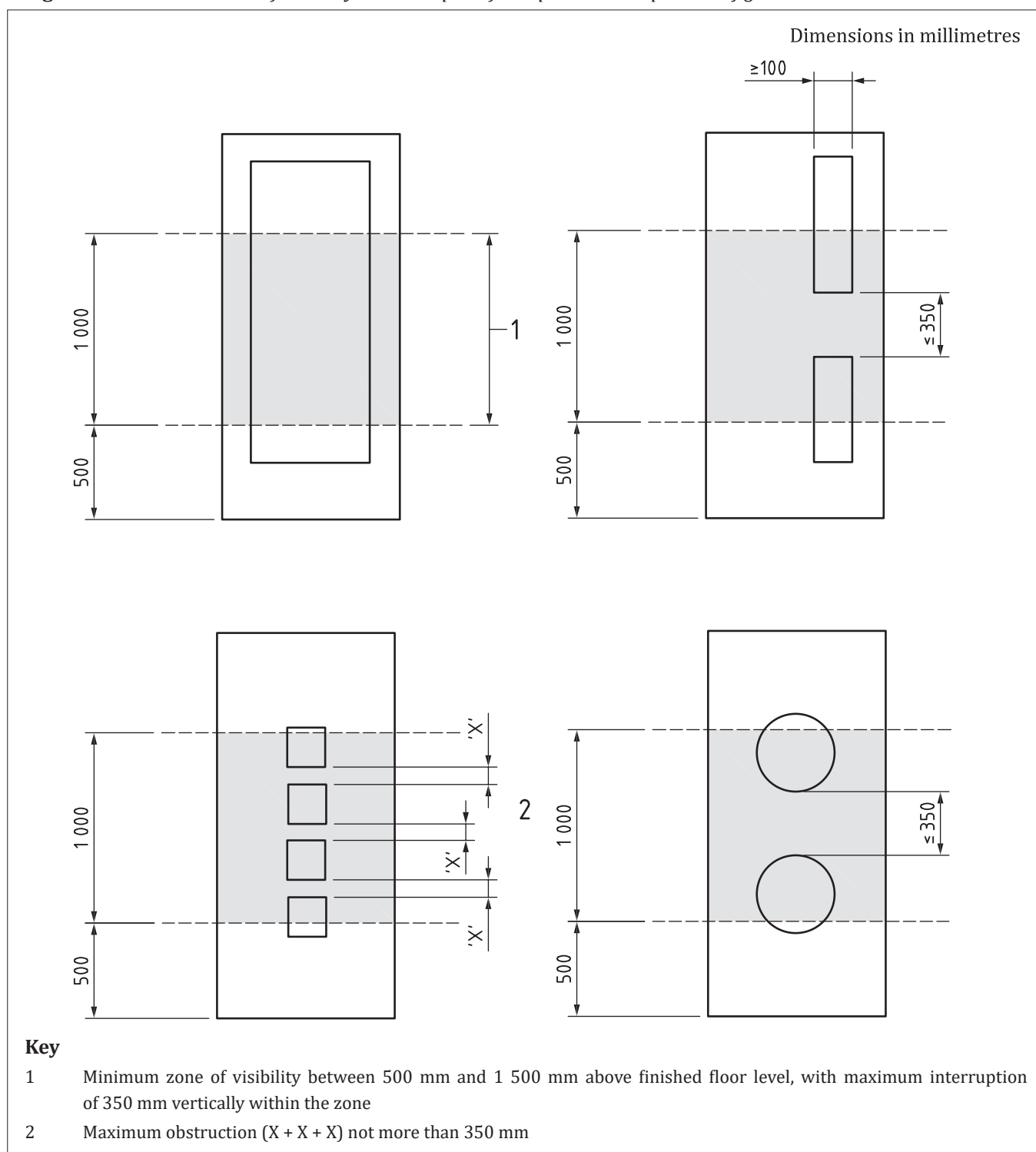
If a door has a single viewing panel, the minimum zone of visibility should be between 500 mm and 1 500 mm from the floor. If a door has multiple viewing panels, the minimum zone of visibility should not be interrupted by opaque areas that obstruct more than 350 mm of the vertical height of the zone. 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 4](#)). Each individual viewing panel should be not less than 100 mm in width.

NOTE 1 Vision panels can extend beyond the minimum zone of visibility limits as long as the recommendations for within the zone are met.

NOTE 2 Vision panels may be less than the minimum size or omitted in doors to spaces that are required to be darkened for their function, e.g. cinemas and auditoria, or in doors to rooms where privacy is required, e.g. sanitary accommodation and changing areas, or for security purposes.

NOTE 3 Glazed panels located towards the opening edge of the door can assist in identifying the presence of someone approaching the door from the other side.

NOTE 4 Obscure glass panels might be advisable where there are issues of privacy, security and safeguarding to identify the presence but not the details of somebody on the other side of the door.

Figure 4 — Minimum zone of visibility and examples of acceptable vision panel configurations

8.3.6 Glass doors

The presence of a glass door, or a fully glazed door with a narrow stile, should be made apparent, with permanent manifestation within two zones, from 850 mm to 1 000 mm from the floor and from 1 400 mm to 1 600 mm from the floor (see 11.5), contrasting visually with the background seen through the glass in all light conditions (see 11.1). The edges of a glass door should also be apparent when the door is open.

If a glass door is adjacent to, or is incorporated within, a fully glazed wall, the door and wall should be clearly differentiated from one another, with the door more prominent.

NOTE 1 Guidance on the design of glazed doors is given in BS 6262.

NOTE 2 For recommendations on glazed walls and screens, see [11.5](#).

NOTE 3 Two-tone manifestation can help to provide effective visual contrast against different backgrounds.

8.4 Door fittings

COMMENTARY ON 8.4

Door opening furniture that is easily reached, and which provides a secure grip, is of critical importance to many disabled people, including some disabled children.

Whilst advantageous for some people, multi-functional door opening furniture can be confusing to some people.

Many people can also find it difficult to open and close doors when door operation is not power-assisted, especially external doors subject to differential air pressures and inclement weather.

8.4.1 Manual door opening and closing furniture

It should be possible to operate all door opening furniture one-handed, without the need to grasp or twist. Care should be taken in the selection of security and fire exit fittings, such as short lever turn buttons, bolts, latches or locks, with the aim of making them manageable for all users.

Wherever possible, door opening furniture used in conjunction with locks and latches should have a lever action.

NOTE 1 Knobs with a spherical, circular or similar design, as well as small symmetrical turn buttons, are difficult to use by many people with limited dexterity or limited upper body strength.

The torque force required to operate keys and cylinder turns should not exceed 0.5 N·m.

NOTE 2 Turnable pad handles may be selected for use with multi-point locking systems.

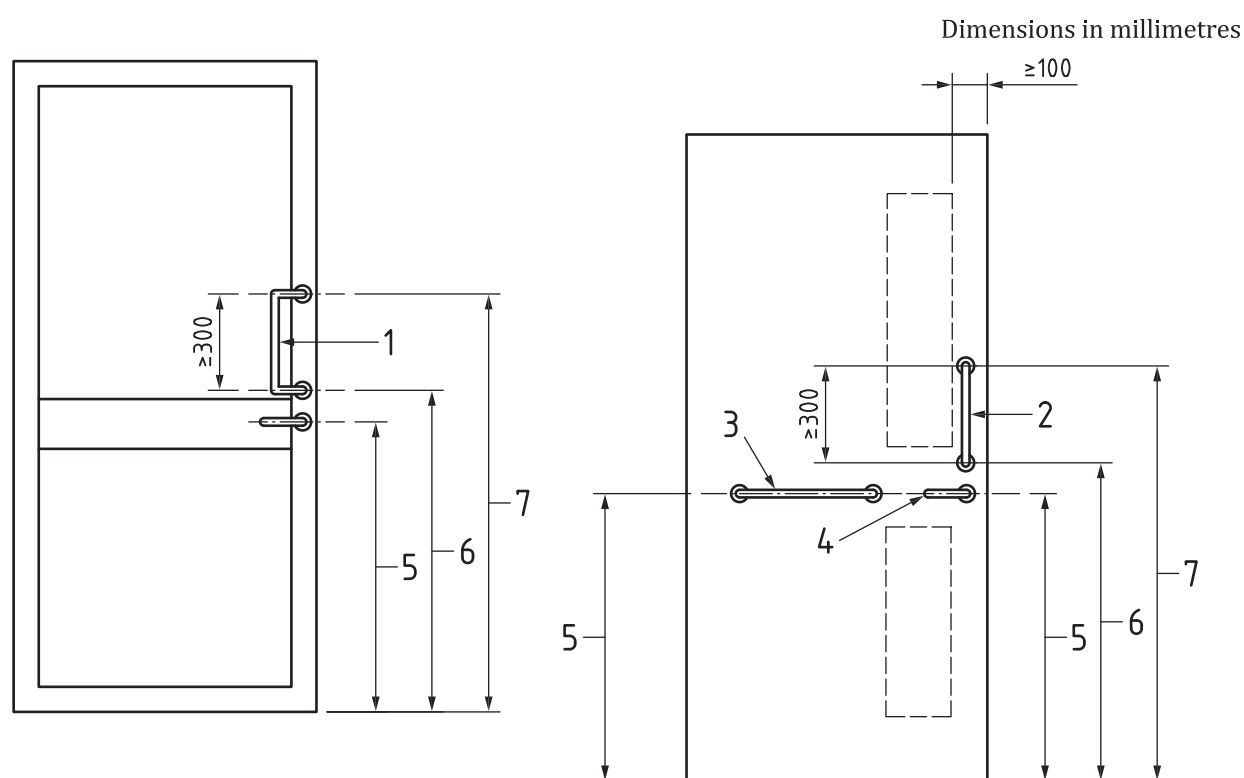
For easy identification, all door opening furniture should contrast visually with the surface of the door.

NOTE 3 It is considered that a difference in LRV between the door opening furniture and the door of at least 15 points is acceptable.

Pull handles should not be fitted to the push side of doors, to avoid giving users misleading information.

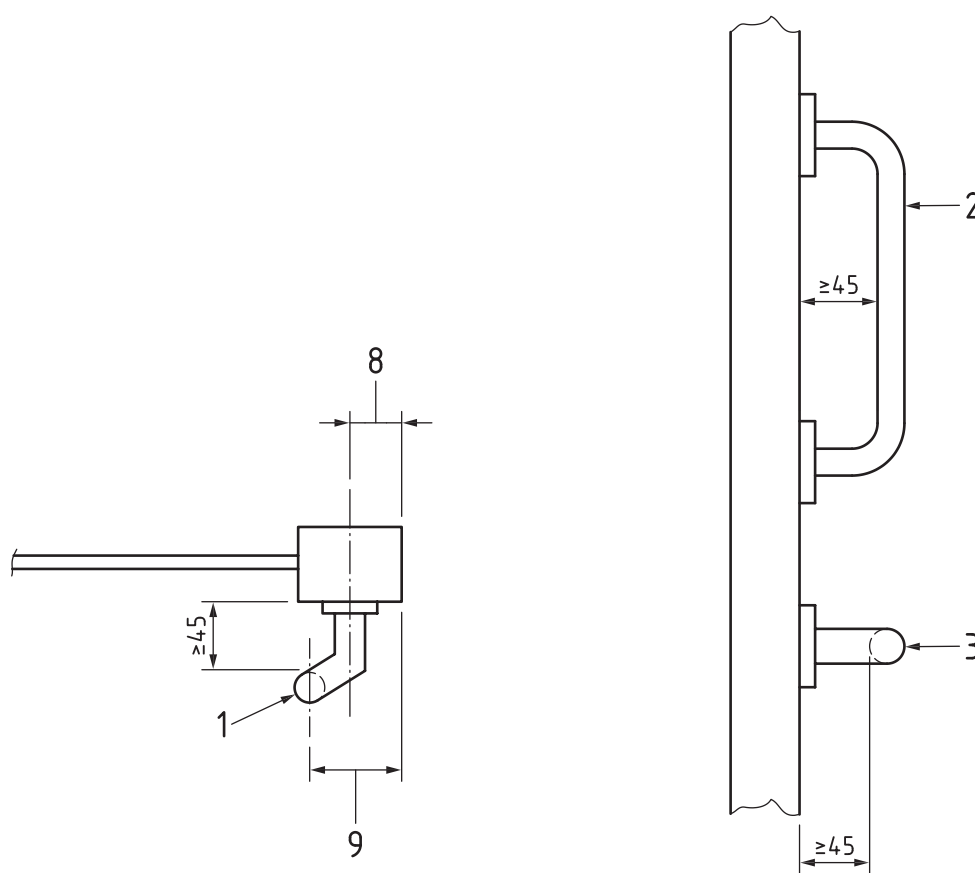
The location and design of lever furniture and pull handles for both external and internal doors should be in accordance with [Figure 5](#) and [Figure 6](#) and, as far as practicable, consistent throughout a building.

Where lever furniture intercepts viewing panels, any projecting glazing beads should not interfere with the operation of the lever or reduce the effective clearance behind it.

Figure 5 — Location of door opening and closing furniture

NOTE 1 Figure 5 continues on the following page, with the key.

Figure 5 (continued)



c) Plan/section of cranked pull handle on a narrow style

d) Vertical section showing a pull handle and horizontal pull rail

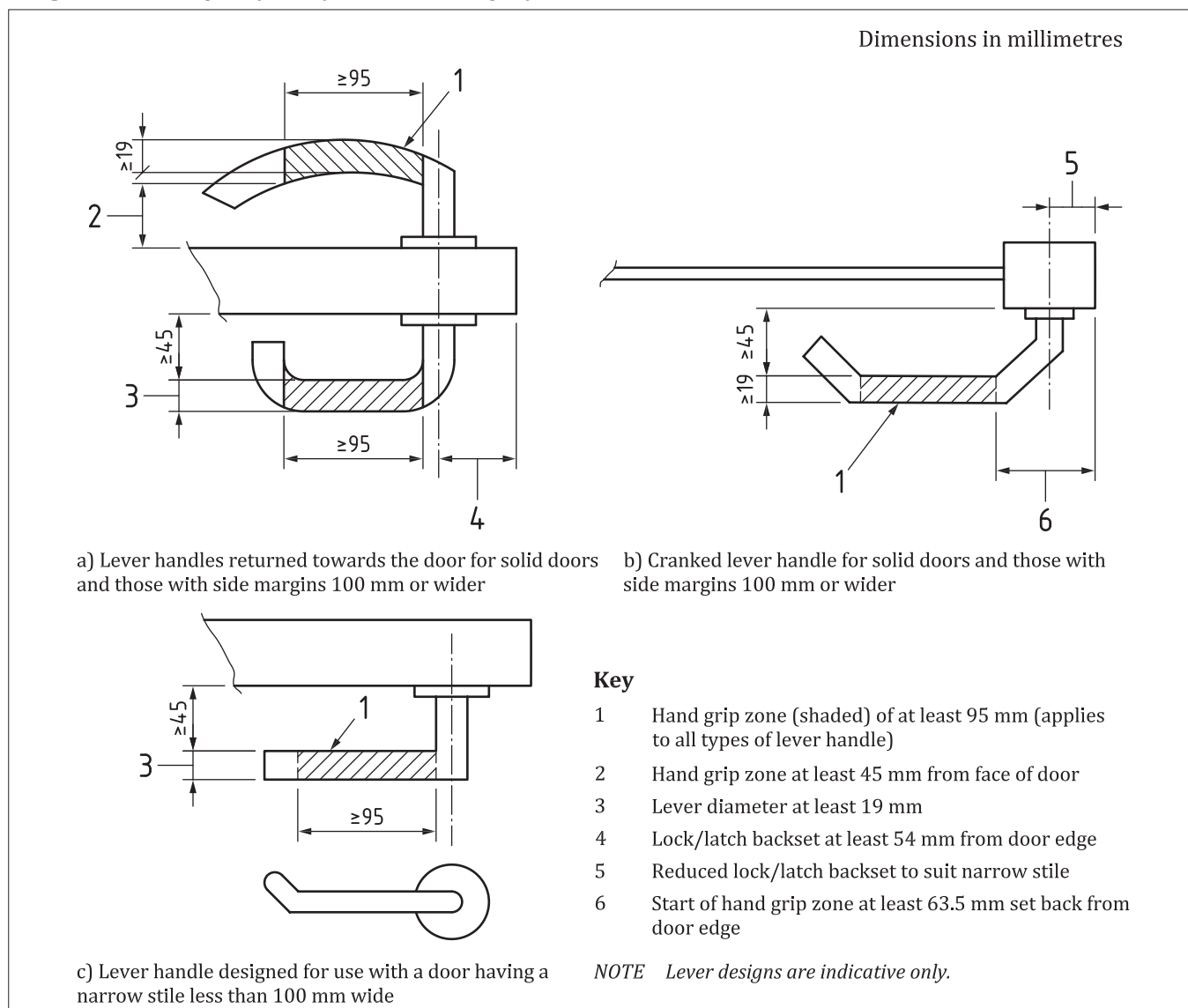
Key

- | | | | |
|---|--|---|--|
| 1 | Cranked pull handle, 19 mm to 35 mm diameter | 6 | Bottom end of pull handle not lower than 700 mm and not higher than 1 000 mm above the floor |
| 2 | Vertical pull handle, 19 mm to 35 mm diameter | 7 | Top end of pull handle not lower than 1 300 mm above the floor |
| 3 | Horizontal pull rail to help people close the door behind them | 8 | Fixing centres close to door edge |
| 4 | Lever handle | 9 | Doors with narrow stiles require cranked pull handles with an offset of not less than 50 mm from the door edge |
| 5 | 800 mm to 1 050 mm (900 mm preferred) | | |

Where locks are not part of a lock set, the positioning of the handle as shown above should take priority over the position of the lock.

NOTE 2 The lever handles and pull handles shown on this drawing will not necessarily be used on the same face of a door.

NOTE 3 Although the conventional "D" pull handle is shown in the figure, other patterns of pull handle are acceptable, provided they meet the dimensional criteria.

Figure 6 — Examples of lever furniture showing key dimensions

8.4.2 Controlled door closing devices

COMMENTARY ON 8.4.2

It is not expected that doors fitted with controlled door closing devices will be independently negotiable by all people. The opening force limits given in this subclause are based on unpublished ergonomic research that was commissioned to determine the extent to which wheelchair users are capable of passing through doors fitted with controlled door closing devices. A comparison with earlier research whose sample was predominantly of people with ambulant mobility impairments indicates that the task of passing through such a doorway is easier for people with ambulant mobility impairments than for wheelchair users. Thus, doors suitable for independent use by wheelchair users are also expected to be negotiable by people with ambulant mobility impairments.

The ergonomic research found that wheelchair users use a variety of techniques to move through doors fitted with a controlled door closing device. However, irrespective of the method used, those people taking part in the research found some difficulty in opening the door against the initial force of the closer, and further difficulty when the door was opened beyond approximately 30°.

For many people to have independent access through single or double swing doors, the opening force, when measured at the leading edge of the door, should be not more than 30 N from 0° (the door in the closed position) to 30° open, and not more than 22.5 N from 30° to 60° of the opening cycle.

The opening force should be checked using a plunger-type force measuring instrument.

NOTE 1 Without regular maintenance of all door fittings, the resistances to opening and closing can increase to an extent that the ability of disabled people to pass through the door can be affected.

NOTE 2 Where measurements cannot be taken at the leading edge, they may be taken at a point on the face of the door up to 60 mm from the leading edge, a position approximately in line vertically with the spindle of a lever handle or the centre line of a pull handle or push plate, in which case the opening force limits can be increased by approximately 2 N. The accuracy of force measuring instruments available on the market varies and there are inherent difficulties in measuring forces on site. It is recognized, therefore, that any measurements are subject to a degree of imprecision which could give rise to variations of between 2 N and 3 N.

The choice of controlled door closing devices should take account of the efficiency of the closer, as well as the resistances from edge seals, hinge friction, latch resistance and differential air pressure.

NOTE 3 The effect of using a low efficiency controlled door closing device is to reduce the closing force to a point where, coupled with the other resistances to closing, the door might not latch, or stay closed if unlatched. The use of high efficiency closers can reduce the force required to open the door and increase the proportion of disabled people who can pass through independently.

A controlled door closing device, with or without a backcheck, should allow the door to open sufficiently to provide the required effective clear width.

NOTE 4 In some locations in a building, a controlled door closing device incorporating a backcheck is sometimes used to prevent damage to adjacent walls or furniture and to the closer mechanism if a door is flung open with some force. However, when the door is opened slowly, the resistance effect is minimal. With some controlled door closing devices, the backcheck starts to become effective when the door is open at 70°.

The maximum closing force exerted by a controlled door closing device should be within 0° and 15° of final closure. Controlled door closing devices that do not have this characteristic should be avoided.

8.4.3 Hinges

Single axis hinges should conform to [BS EN 1935](#).

Where it is important to minimize resistance to door opening and closing, hinges with low friction bearings should be selected to carry the appropriate mass of the door.

Fixing positions of hinges should be in accordance with [BS 4787-1](#), unless otherwise dictated by fire test reports.

NOTE If the effective clear opening width does not meet the recommendations given in [Table 2](#) using conventional hinges, fitting swing-clear hinges will allow the door to align with the doorstop when opened to 90° and thus reduce the projection into the opening space.

8.4.4 Locks and latches

Locks and latches should conform to [BS EN 12209](#). Cylinders, if required, should conform to [BS EN 1303](#).

Locks for providing security should conform to [BS 3621](#), [BS 8621](#) or [BS 10621](#), as appropriate.

NOTE 1 Guidance on the selection of locks/latches to secure doors is given in [BS 8220-2](#) and [BS 8220-3](#).

NOTE 2 The provision of a larger bow on lever and cylinder keys gives users greater control. Alternatively, a hand-grippable key fob can be added to a standard key bow, to aid manipulation of the key.

Where an upright mortice lock/latch is used, to ensure that people who are blind or partially sighted and/or people with limited dexterity have unobstructed access to the keyway, either the cylinder

should be above the lever handle where it is more visible and accessible or, if the cylinder is below the handle, the distance between the handle and the keyway of the locking mechanism should be not less than 72 mm.

Certain mortice locks include a night latch bolt and deadbolt whereby the latch bolt is withdrawn using a key on the outside and a lever handle on the inside. In these circumstances, the height of the lever handle should be in accordance with [Figure 5](#).

Rim nightlatches with larger deadlocking snibs and turns on cylinders should be selected to assist users with limited dexterity.

Where a multi-point locking system is used, it should be capable of being locked/unlocked simultaneously by a single turn of the key. The operating height of the lever/pad handle should be that of the lever handle in [Figure 5](#).

8.4.5 Door bolts

Door bolts should conform to [BS EN 12051](#).

Where doors are required to be bolted for security purposes, one of the following types of door bolt should be used:

- a) knob slide flush bolts or surface bolts with a free moving slide action;
- b) rack and pinion mortice bolts fitted with fixed knobs to enable the user to operate them easily (i.e. without the need to locate a loose key and insert it into a restricted hole);
- c) a surface-mounted or morticed espagnolette bolt with top and bottom shoots or side shoots operated by a single handle positioned at a height between 900 mm and 1 050 mm from finished floor level;
- d) lever-action flush bolts.

Sunk slide bolts (both flush and surface-mounted) should be avoided.

8.4.6 Panic and emergency exit devices

8.4.6.1 Panic exit devices

Panic exit devices operated by a horizontal bar for use on escape routes should conform to [BS EN 1125](#).

8.4.6.2 Emergency exit devices

Emergency exit devices should conform to [BS EN 179](#).

8.5 Access control systems

8.5.1 Door entry systems

Activation points for electronic door entry systems should be located on the latch edge of the door, either on the door face or on the adjacent wall, with the activation point positioned within 200 mm of the door frame (or aperture where there is a glazed façade).

Electronic door entry systems should, where practicable, be operated by a proximity-type card, with the activation point at a height of between 900 mm and 1 100 mm from finished floor level.

Swipe-card and insertion-type systems, which require more precise hand control, should be orientated vertically, within a height range of 900 mm to 1 000 mm.

Controls should where relevant be in accordance with [15.7.1](#).

NOTE 1 Where door entry systems activate power-operated doors, the recommendations in [8.2.3](#) apply.

NOTE 2 Simple manual systems for access control (e.g. key safes) are ideally positioned between 750 mm and 1 000 mm above ground level. They are usually put in an inconspicuous location for security purposes.

NOTE 3 It is helpful for there to be a visual and audible indication (e.g. an LED and a click) that the lock has been activated or deactivated.

Digital locks can be inaccessible to many people. Where isolated locks are installed they should be operable by a fist and only require one hand to operate.

8.5.2 Entryphones

Entryphone systems should be sited for approach and use by all users, including wheelchair users, and should contain a light emitting diode (LED) display to enable people who are Deaf and hard of hearing to use them. The means of indicating that the call is acknowledged and that the lock has been released (if permitted) should be both audible and visible.

The entryphone system should contrast visually with the background against which it is seen.

NOTE 1 Video entryphone systems provide additional benefits for the person answering the call, as well as for the person wishing to gain entry. The cone of vision of any video entryphone system needs to be sufficiently wide to ensure that any visitor is in the line of sight.

NOTE 2 The option to include hearing (induction) loops with entryphone panels is considered desirable; however, to achieve an acceptable signal the induction loop aerial (antenna) needs to extend beyond the casing of the entryphone panel to encompass the space adjacent to the entry phone or be mounted on the internal wall behind the panel. The signal is insufficient for a hearing aid user to pick up if the aerial is mounted within the entryphone panel, and it is advisable to seek expert guidance to ensure that the recommended performance of the induction loop is met.

NOTE 3 It is desirable for entryphone systems to incorporate a means of enabling a visitor with a speech impairment to communicate this to the person answering the call, e.g. a telephone number that can be used to receive text messages.

8.5.3 Turnstiles and security pass gates

Turnstiles and security pass gates should be used only where their use can be supervised. Where turnstiles and security barriers are necessary, bi-parting or folding type installations should be provided.

Rotating devices should be used only in high security instances and where constant supervision can be assured.

NOTE Rotating devices place additional cognitive and mobility demands on users and are less accessible than bi-parting or folding devices as a result.

Where turnstiles and security barriers or other similar forms of access control, e.g. those with rotating arms, are used, a wide aisle gate or complementary side-hung gate, with a minimum 1 000 mm clear opening width, should be installed.

8.6 Entrance and reception areas

COMMENTARY ON 8.6

An entrance area provides the first point of contact between a visitor and the resources and activities available within a building.

Suitable access to a reception point and clear signs indicating routes to other parts of the building are important. In multi-occupancy buildings there might be reception points at other locations and different floor levels.

In buildings where reception points are not provided, sufficient way-finding information needs to be provided at all entrances to allow visitors to locate their destination.

8.6.1 Entrance flooring systems

At entrances to commercial buildings and buildings used by the general public, a suitable entrance flooring system to remove water and debris from the soles of shoes and wheelchair wheels should be provided, taking account of the volume of pedestrian flow and the distance required to accommodate the circumference of a large wheelchair wheel (a minimum of 2 000 mm).

Matting and other floor surfaces should meet the recommendations in [11.3](#).

NOTE 1 Guidance on the selection, planning, installation and maintenance of entrance flooring systems is given in [BS 7953](#).

NOTE 2 Guidance on the slip resistance of floor surfaces is given in [Annex C](#).

8.6.2 Reception areas

COMMENTARY ON 8.6.2

Reception areas are commonly found at the principal entrance to buildings, at separate floor levels or parts of floor levels where a building is subdivided and sublet, sometimes at both, and sometimes at neither. In all cases it is important that visitors to the building who might be unfamiliar with the layout are able to orient themselves, identify their desired destination and find the route to it.

Where no specific reception point is provided (e.g. at railway terminals and shopping malls) directional information should be provided close to the entry point or points to indicate the facilities provided and their location. Signage should be in accordance with [Clause 12](#), and lighting with [Clause 14](#). Where an information point is provided elsewhere in the building its location should be prominently indicated.

Floor surfaces within reception areas should be free from obstructions, have a firm, slip-resistant surface (see [Annex C](#)) and allow easy manoeuvre of a wheelchair.

NOTE More detailed recommendations for surface finishes are given in [Clause 11](#).

Signs and universally accepted symbols or pictograms, indicating lifting appliances, stairs, toilets, circulation routes and other parts of the building, should be provided in the reception area (see [Clause 12](#)).

8.6.3 Reception points

Reception points (see [Clause 16](#)), where provided, should be identifiable and clearly navigable from any entrance to the building or part of the building and easily identifiable by people who are blind or partially sighted.

Reception points should be located in a position where the ability of a person who is Deaf or hard of hearing to lip read is not adversely affected, e.g. by the presence of windows, glazed screens or mirrors behind the reception point. Reception counters should not be placed in front of backgrounds which are patterned. The availability of induction loops should be indicated (see [Clause 13](#)).

The approach from the entrance to the reception point should be direct, free from obstructions, have a firm, slip-resistant surface (see [Annex C](#)) and allow easy manoeuvre of a wheelchair.

NOTE More detailed recommendations for surface finishes are given in [Clause 11](#).

Seating should be provided in reception areas (see [15.1](#)), and available for people who might be less able to stand while queuing, in such a way that their place in the queue is secured.

Signs and universally accepted symbols or pictograms, indicating lifting appliances, stairs, toilets, circulation routes and other parts of the building, should be provided at reception points (see [Clause 12](#)).

8.6.4 Interview rooms

COMMENTARY ON 8.6.4

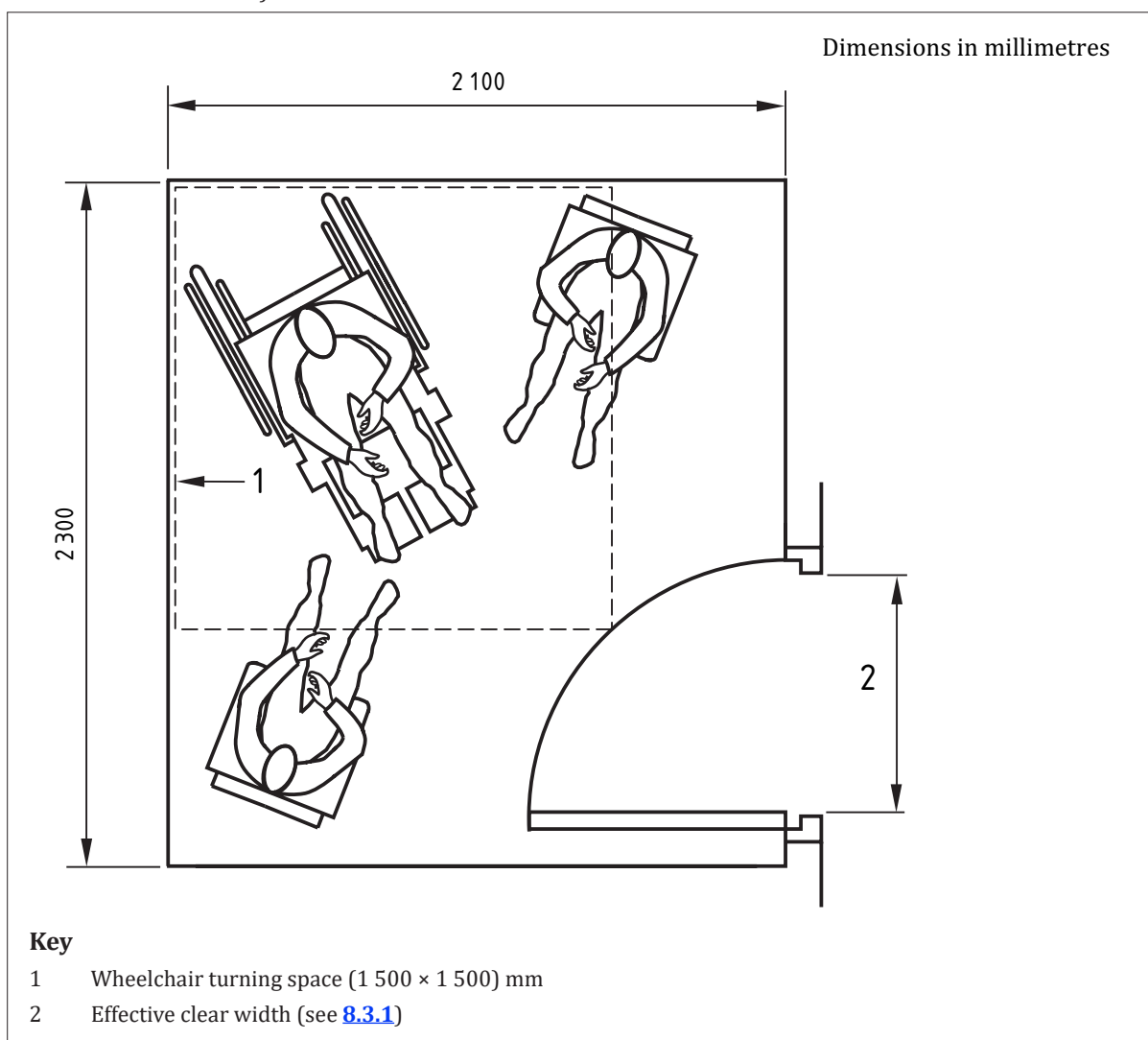
A quiet space or interview room where security or privacy is important can benefit many visitors.

Where a quiet space or interview room is provided, it should be of sufficient size to accommodate an interpreter or communication support worker, and for a wheelchair user to manoeuvre in and out.

The minimum dimensions of such a room should be as shown in [Figure 7](#); these should be increased if a table is to be accommodated. Where appropriate, the room should allow for separate entrances from customer and staff areas.

The room should incorporate a secure assistive listening system (see [13.2](#)).

Figure 7 — Minimum dimensions of an interview room



9 Horizontal movement

9.1 Corridors and passageways

COMMENTARY ON 9.1

In order for people to use a building independently, circulation routes need to allow easy movement and provide a sense of location and direction. Corridors and passageways need to have sufficient space to provide convenient access to rooms and, if necessary, to turn through 180°. Doors from rooms into corridors and doors across corridors also need to be accessible.

The minimum space required for two wheelchair users to pass each other on an access route is 1 800 mm.

Choosing appropriate floor, wall and ceiling materials that contrast visually with adjacent surfaces, and careful use of natural and artificial lighting, will benefit people who are blind or partially sighted and people with sensory/neurological processing difficulties.

9.1.1 Projections into corridors and passageways

The design of a corridor or passageway should allow people to find their way easily and unimpeded. Localized obstructions, such as radiators and fire hoses, in circulation routes should be avoided wherever possible but, where unavoidable, they should be guarded as described in [7.2](#).

NOTE 1 Continuous surface-mounted damage protection on walls is not considered to be an obstruction.

NOTE 2 Splayed or rounded corners at changes of corridor direction benefit wheelchair users and people who are blind or partially sighted. Projections are particularly hazardous for a person who is blind or partially sighted, even when using a cane.

9.1.2 Dimensions of corridors

The space allowed for the approach to doors in corridors of buildings should be in accordance with [Figure 8](#).

A corridor should either have a surface width of not less than 1 800 mm or, if less, be provided with passing places, 1 800 mm wide and at least 1 800 mm in length, at reasonable intervals. The surface width of a corridor should be not less than 1 200 mm, with the exception of permanent obstructions over a short distance (see [Figure 8](#)).

NOTE Where doors with a minimum effective clear width of 850 mm (see Note 1 to [Table 2](#)) are selected, with a leading edge of 300 mm, a corridor width of 1 200 mm is not adequate.

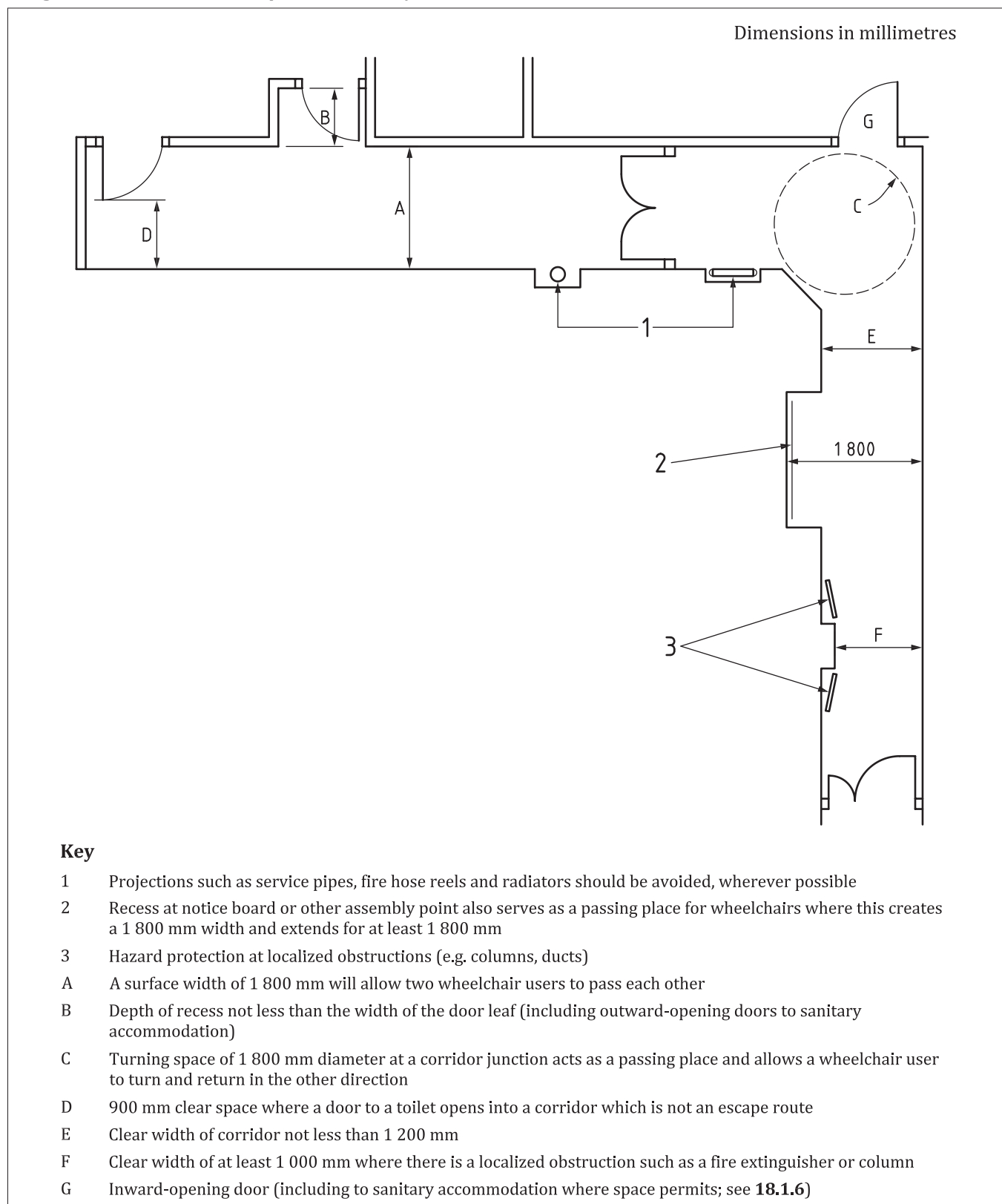
9.1.3 Floors in corridors

Floor finishes should be carefully chosen; for example, floor patterning that could be mistaken for steps, e.g. stripes, should not be used for floors in corridors.

NOTE 1 Other forms of bold and pronounced patterning can be misleading and cause confusion, particularly for people who are blind and partially sighted and people with sensory/neurological processing difficulties.

Floors within a corridor should be level, wherever possible. If a level floor in a corridor is not possible, the slope should be less steep than 1:20, unless the floor is designed as a ramp and includes landings, as necessary, in accordance with [10.2](#).

NOTE 2 Guidance on the slip potential characteristics of floor finishes is given in [Annex C](#).

Figure 8 — Dimensions and space allowances for corridors

9.1.4 Lighting in corridors

NOTE 1 General recommendations for lighting are given in [Clause 14](#).

Lighting in a corridor should be even, diffused and without glare, reflections or shadows. Artificial lighting for corridors that receive no daylight should be designed to achieve an illuminance at floor level of at least 100 lux.

NOTE 2 The Thomas Pocklington guide *Housing for people with sight loss* [[17](#)] makes recommendations for lighting levels that are suitable for people who are blind or partially sighted.

9.1.5 Doors leading into corridors

If a door opens out from a room and has no controlled door closing device, e.g. a door to accessible sanitary accommodation, an additional item of door furniture (such as a horizontal pull rail) should be provided on the closing, or interior, face of the door, in line with the door locking mechanism, to help people close the door behind them (see [Figure 5](#) and [18.1.6](#)).

NOTE 1 The door to a unisex accessible toilet may open into a corridor only where it is located at the end of a dead end.

NOTE 2 The use of reduced-swing doorsets, which have a sliding/folding action, reduces the extent to which the door swings into the room and corridor and thus facilitates manoeuvring in and out of rooms such as toilets and bathrooms. From the safety perspective, designers need to be aware that approximately one third of the door leaf projects into the outside circulation space when the door is open.

The leading edge of any door that is likely to be held open should contrast visually with the remaining surfaces of the door and its surroundings to help identification by people who are blind or partially sighted. The doorway should be easily identifiable when the door is in the closed position, and when the door is in the open position if the door is not provided with a controlled closing device designed to return it to a closed position during normal operation. Identification of the doorway should be provided if the door is designed to be held open against a controlled closing device. Visual contrast should be provided to the identifying features against the wall surfaces surrounding the doorway (see Notes 2 and 3 to [11.1](#)).

NOTE 3 The inclusion of a visually contrasting intumescent seal, minimum 15 mm wide, in the edge of the door for the full height of the leaf (excluding any locks), or a contrasting self-adhesive strip positioned on the edge of the door for a height of 1 000 mm from 500 mm to 1 500 mm above the floor, and covering at least 60% of the door thickness, are two examples of how a visually contrasting leading edge might be achieved.

NOTE 4 Where the door is fitted with a controlled closing device intended to return the door to a closed position during normal operation, the door itself could be the identifying feature and provide the visual contrast. Where the door is manually closed or designed to be held open, the architrave, or frame where no architrave is present, the floor coverings, manifestation and signage are examples of how identification of the presence of a doorway can be achieved. These identifying features might need to be used in combination to achieve satisfactory identification of the doorway.

9.1.6 Doors across corridors

Doors across corridors should be in accordance with [8.3.1](#) and [Table 2](#).

Self-closing hinged (single swing) or pivoted (single or double swing) doors across corridors and passageways, which can be pushed to open in both directions, should meet the recommendations in [8.2.2](#) and, if on escape routes, in [BS 9999](#).

NOTE 1 Pivoted swing refers to doors which are mounted on pivots that support the door on the head and bottom rails.

NOTE 2 It might be beneficial if doors across corridors and passageways are capable of being held open, but see [9.2.2](#) for fire-resisting doors.

Doors across corridors and passageways should have a viewing panel, or panels, that meet the recommendations in [8.3.5](#) and [Figure 4](#).

Glass doors across corridors and passageways should be avoided wherever possible. If they are used, they should meet the recommendations in [8.3.6](#). The architrave, or frame where no architrave is present, should contrast visually with the wall surfaces surrounding the doorway (see Notes 2 and 3 to [11.1](#)).

Where double doors of unequal width are used along the length of a corridor, the wider leaf should be on the same side of the corridor throughout its length.

Cross-corridor fire-resisting doors should be in accordance with [9.2.2](#).

9.1.7 Fire escape routes via horizontal movement

The unobstructed width of an escape route should be not less than 1 200 mm, with the final escape route having an unobstructed width at least as great as the stair leading to it. Fire escape routes should be in accordance with [BS 9999](#).

9.2 Doors fitted with controlled door closing devices

COMMENTARY ON 9.2

If the force required to open doors is greater than wheelchair users, people who use walking aids or assistance dogs, or who have limited strength or poor standing tolerance, can manage, they will be unable to continue their journeys independently. If the closing force of the device is too great or the speed of closure is too fast, people risk being pushed off balance. It is for this reason that the action of door closing devices needs to be controlled.

9.2.1 General

Controlled door closing devices should be fitted to doors only if absolutely necessary, e.g. for reasons of fire safety, security, acoustics or energy control. Opening force limits should be in accordance with [8.4.2](#).

The choice of controlled door closing devices should take account of the efficiency of the closer, as well as the resistances from edge seals, hinge friction, latch resistance and differential air pressure, e.g. from pressurized spaces.

Push-and-go and power-assist low energy swing door operators, where used, should meet the recommendations in [8.2.2](#).

NOTE Power-operated door opening devices can be beneficial for many people who lack the upper body strength required to meet the opening force recommendations in [8.4.2](#).

9.2.2 Fire-resisting doors fitted with controlled door closing devices

COMMENTARY ON 9.2.2

The ability of fire-resisting doors to perform their designated function depends on their being fully closed at the time of fire. To ensure closure, it is necessary for them to be fitted with a controlled door closing device, irrespective of whether the door is latched or unlatched.

Self-closing fire doors are more likely to be rendered ineffective by the occupants of a building if the doors are regarded as an impediment to access.

Poorly specified controlled door closing devices can make doors virtually impassable to some people. It is important, therefore, that the controlled door closing device and any latch fitted to the door are specified to provide accessibility while maintaining an adequate level of fire safety.

Where hinged or pivoted fire-resisting doors need to be accessible, the door closing devices fitted should have controlled action conforming to [BS EN 1154:1997](#), Annex A, be of a variable power type and meet the recommendations in [8.2.2](#).

NOTE 1 [BS EN 1154:1997](#), Annex A states that controlled door closing devices of less than power size 3 are not considered suitable for use on fire/smoke door assemblies. This means that, in general, only high efficiency door closers mounted on doors with a width greater than 900 mm are likely to meet fire door requirements as well as the opening force limits described in [8.4.2](#). Controlled door closing devices of a lower power size and with relatively low efficiency, with a lower power size and/or of a width less than 900 mm, might only be suitable for non-fire-resisting doors (see [9.2.3](#)).

NOTE 2 Door-closing devices whose power is adjustable by template are not usually suitable for this application.

Where the force required to open a fire-resisting door on a circulation route exceeds the limits described in [8.4.2](#), an electrically powered hold-open device, either stand-alone or integral in the body of the closer, which conforms to [BS EN 1155](#) should be installed.

NOTE 3 A stand-alone device holds a door at a fixed position. Integral devices either allow the door to be held open from the point of engagement to the fully open position, or allow the door to swing free. The interruption of the electrical supply by one or more of the following causes the door to close positively under the power of the controlled door closing device:

- a) a smoke/fire detection signal;
- b) manual release;
- c) fail safety operation in the event of failure of component, element, system, electricity supply or wiring.

The use of swing-free controlled door closing devices should be limited to applications where doors are located for access to rooms or similar locations and not part of a circulation route. The use of delayed action controlled door closing devices should similarly be avoided in circulation areas.

NOTE 4 Where smoke seals are required, e.g. to protect refuges and lift lobbies, the force required to open the door can be reduced by installing an angle seal as an independent item in the door frame.

NOTE 5 It is important to ensure that people do not become trapped in areas of the building once any electrically powered hold-open devices have de-activated. It is essential that verification is part of standard evacuation drills.

9.2.3 Non-fire-resisting doors required to self-close

For non-fire-resisting doors which have a requirement to self-close for reasons of security, privacy, acoustics or energy control, controlled door closing devices should be selected, fitted and adjusted such that the opening forces are as low as practicable, consistent with the doors functioning as intended.

NOTE 1 It is emphasized that, for non-fire-resisting doors, door closing devices of less than power size 3 are normally acceptable. For details of controlled door closing devices, opening force limits and how to measure opening forces, see [8.2.2](#).

NOTE 2 For non-fire-resisting doors, rising butt hinges can be used to close doors where controlled door closers are not suitable.

9.2.4 Door fittings related to self-closing doors

In order to minimize hinge resistance, hinges with low friction bearings should be used on self-closing doors (see [8.4.3](#)).

NOTE Where self-closing doors are required to be latched, the installation of a modified strike plate incorporating a gravity cam, which is tripped by the projecting latchbolt as the door shuts, can reduce the latch resistance. This type of device enables closing forces to be kept to a minimum, secures the door firmly when fully closed and allows the door to be opened in the normal way, by turning the handle to withdraw the latchbolt. This type of strike plate is not suitable for use with rimlocks or on external doors.

10 Vertical movement

10.1 Steps and stairs

10.1.1 Design of steps and stairs

COMMENTARY ON 10.1.1

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 [18] 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 many people with ambulant mobility difficulties, when descending flights of stairs.

When ascending stairs, people with restricted mobility and particularly those with restricted lower body movement are particularly at risk of catching 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 (e.g. metal grille-type treads), and assistance dogs might refuse to proceed. Some neurological conditions lead to difficulties stepping over open treads and in judging gaps.

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

The rise and going of each step within a flight should be uniform. Where practicable, the rise and going of each step should also be uniform between a series of flights.

Tapered risers should not be used.

Where practicable, 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.

Treads and risers should be solid and opaque. Riser profiles should be such that people who drag their feet do not trip when ascending.

There should be a minimum 30° change in the direction between flights of stairs if there are more than 40 risers in consecutive flights.

NOTE 1 For longer flights the risk and injuries in a fall are greater when flights are continuous.

NOTE 2 It is preferred that a stair comprises straight flights, with any change of direction made on a landing. Information on the safety aspects of internal steps and stairs is given in [BS 5395-1](#).

NOTE 3 Flights of stairs of helical or spiral design are not recommended as it is difficult to achieve the required dimensions to ensure that the staircase is suitable for use by people with ambulant mobility difficulties. However, they might be acceptable if they meet the requirements of particular employees in a workplace. Guidance on the design of helical and spiral stairs is given in [BS 5395-2](#).

10.1.2 Rise of a flight

Flights on a stepped access route should not contain more than 20 risers and, where practicable, 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 people who are blind or partially sighted.

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 less than 300 mm, the change should be accommodated by a ramp alone. Where the change in level exceeds 300 mm, both a stair and ramp should be provided.

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

10.1.3 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 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.

10.1.4 Identification and slip resistance of nosings

Each step nosing should incorporate a durable, permanently contrasting continuous material for the full width of the stair on both the tread and the riser to help people who are blind or partially sighted appreciate the extent of the stair and identify individual treads. The contrasting material should extend 50 mm to 65 mm in width from the front edge of the tread and 30 mm to 55 mm from the top of the riser, and should contrast visually with the remainder of the tread and riser.

NOTE 1 Particular care is needed to ensure that there is adequate contrast between nosings and landings.

NOTE 2 Nosing that wraps around the riser might assist people who are blind or partially sighted.

NOTE 3 A proprietary nosing can provide a durable solution that satisfies both visual contrast and slip resistance criteria (see BRE IP 15/03 [18]).

The whole tread or the nosing should incorporate a slip-resistant material.

NOTE 4 Guidance on slip resistance of surfaces is given in [Annex C](#).

Surface material tread and risers should be free from patterning.

NOTE 5 It is beneficial that surface material at landings and floors contrasts with surface material of stairs, subject to maintaining visual contrast at top and bottom nosings.

10.1.5 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.

10.1.6 Lighting

NOTE General recommendations for lighting are given in [Clause 14](#).

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

10.1.7 Surface materials

The surface materials used for internal steps and stairs should be chosen to be easy to maintain and as slip-resistant as possible, especially if surfaces are likely to become wet due to location or use, or if spillage occurs.

NOTE 1 Advice and further references on slip resistance of surfaces are given in [Annex C](#).

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

Deep pile carpet should not be used on stair treads.

The use of shiny, polished surface materials that cause glare should be avoided.

NOTE 2 Highly patterned surface finishes can be misleading and cause confusion, particularly for people who are blind and partially sighted and people with sensory/neurological processing difficulties.

10.1.8 Refuges

Refuges, whether within a protected stair lobby, corridor or protected room adjacent to a stairway, should be provided in accordance with [BS 9999](#).

NOTE 1 A refuge is a place of relative safety where people whose impairment might result in delayed evacuation can await assistance from building management with the next part of their movement to a place of ultimate safety.

NOTE 2 Specific recommendations for refuges are given in BS 9999:2017, Annex G.

Space provision for refuges should allow wheelchair users to manoeuvre and access the refuge independently.

The controls for emergency voice communication systems should be accessible.

10.2 Ramps and slopes

COMMENTARY ON 10.2

If a change in level along an internal circulation route is unavoidable (see [10.2.1](#)), it is necessary to provide an alternative means of access, i.e. a slope or ramp, or, if there is insufficient space for a ramp, a non-enclosed vertical lifting platform.

The key issues in the design of gently sloping or ramped circulation routes 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 use 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 descending, or of a wheelchair tipping over backwards when ascending. Control and braking are also difficult on steep gradients. Excessive cross-fall gradients present further difficulties when manoeuvring on ramps.

10.2.1 General

Buildings should be designed to avoid, as far as is practicable, the need for ramps or slopes (steeper than 1:60 and shallower than 1:20) on internal circulation routes.

Where slopes are provided, they should have landings not less than 1 500 mm long for the full width of the slope at every 500 mm rise of the route, and at the top and bottom of the slope, clear of any door swing or other obstruction.

The surface of the slope should contrast visually with the landings.

Where ramps are necessary, they should be clearly visible and in close proximity to the steps.