Design of an accessible and inclusive built environment

Part 2: Buildings — Code of practice
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>vi</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1 Scope</td>
<td>2</td>
</tr>
<tr>
<td>2 Normative references</td>
<td>2</td>
</tr>
<tr>
<td>3 Terms and definitions</td>
<td>4</td>
</tr>
<tr>
<td>4 Integrating inclusive design principles into the development process</td>
<td>7</td>
</tr>
<tr>
<td>4.1 Inclusive design strategy</td>
<td>8</td>
</tr>
<tr>
<td>Table 1 — Inclusive design strategy</td>
<td>9</td>
</tr>
<tr>
<td>4.2 Design and access statements</td>
<td>9</td>
</tr>
<tr>
<td>4.3 Access strategy</td>
<td>10</td>
</tr>
<tr>
<td>5 Strategic site and building layout</td>
<td>10</td>
</tr>
<tr>
<td>5.1 Site planning and position of buildings and other features</td>
<td>10</td>
</tr>
<tr>
<td>5.2 Navigation, orientation and way-finding</td>
<td>11</td>
</tr>
<tr>
<td>6 Arriving at a destination and parking</td>
<td>13</td>
</tr>
<tr>
<td>7 Access routes to and within buildings</td>
<td>13</td>
</tr>
<tr>
<td>7.1 General</td>
<td>13</td>
</tr>
<tr>
<td>7.2 Protection from hazards projecting from a building</td>
<td>13</td>
</tr>
<tr>
<td>8 Entering a building</td>
<td>13</td>
</tr>
<tr>
<td>8.1 Entrances</td>
<td>13</td>
</tr>
<tr>
<td>8.2 Entrance doors and lobbies</td>
<td>14</td>
</tr>
<tr>
<td>Figure 1 — Minimum dimensions of lobbies with single leaf doors</td>
<td>18</td>
</tr>
<tr>
<td>8.3 External and internal doors (including lobby doors)</td>
<td>19</td>
</tr>
<tr>
<td>Table 2 — Effective clear widths of doors</td>
<td>19</td>
</tr>
<tr>
<td>Figure 2 — Effective clear width through a doorway</td>
<td>20</td>
</tr>
<tr>
<td>Figure 3 — Example of door location and side clearance on the pull side</td>
<td>21</td>
</tr>
<tr>
<td>Figure 4 — Minimum zone of visibility and examples of acceptable vision panel configurations</td>
<td>23</td>
</tr>
<tr>
<td>8.4 Door fittings</td>
<td>24</td>
</tr>
<tr>
<td>Figure 5 — Location of door opening and closing furniture</td>
<td>25</td>
</tr>
<tr>
<td>Figure 6 — Examples of lever furniture showing key dimensions</td>
<td>27</td>
</tr>
<tr>
<td>8.5 Access control systems</td>
<td>29</td>
</tr>
<tr>
<td>8.6 Entrance and reception areas</td>
<td>30</td>
</tr>
<tr>
<td>Figure 7 — Minimum dimensions of an interview room</td>
<td>32</td>
</tr>
<tr>
<td>9 Horizontal movement</td>
<td>33</td>
</tr>
<tr>
<td>9.1 Corridors and passageways</td>
<td>33</td>
</tr>
<tr>
<td>Figure 8 — Dimensions and space allowances for corridors</td>
<td>34</td>
</tr>
<tr>
<td>9.2 Doors fitted with controlled door closing devices</td>
<td>36</td>
</tr>
<tr>
<td>10 Vertical movement</td>
<td>38</td>
</tr>
<tr>
<td>10.1 Steps and stairs</td>
<td>38</td>
</tr>
<tr>
<td>10.2 Ramps and slopes</td>
<td>40</td>
</tr>
<tr>
<td>Table 3 — Maximum permissible relationship between going, gradient and rise of ramps</td>
<td>42</td>
</tr>
<tr>
<td>10.3 Handrails to ramped and stepped access</td>
<td>44</td>
</tr>
<tr>
<td>10.4 Hazard protection beneath stairs and ramps</td>
<td>46</td>
</tr>
<tr>
<td>10.5 Lifting appliances</td>
<td>47</td>
</tr>
<tr>
<td>Table 4 — Minimum dimensions of a lift car with a single entrance or two opposite entrances</td>
<td>48</td>
</tr>
<tr>
<td>10.6 Escalators and moving walks</td>
<td>51</td>
</tr>
<tr>
<td>11 Surface finishes</td>
<td>52</td>
</tr>
<tr>
<td>11.1 Visual characteristics</td>
<td>52</td>
</tr>
<tr>
<td>11.2 Materials and acoustic design</td>
<td>53</td>
</tr>
</tbody>
</table>
11.3 Floor surfaces
11.4 Wall surfaces
11.5 Glazed walls and screens
12 Signs and information
  12.1 Provision of signs and information
    *Figure 9 — Standard public information symbols*
  12.2 Location and design of signs and information
  12.3 Visual signs
    *Table 5 — Text x-heights for different types of sign*
  12.4 Tactile and Braille signs and symbols
    *Figure 10 — Location of Braille messages on a tactile signboard*
  12.5 Complementary audible information
  13 Audible communication systems
  13.1 Public address and other communication systems
  13.2 Assistive listening systems
  13.3 Induction loop systems
  13.4 Infrared systems
  13.5 Radio and Wi-Fi systems
  13.6 Inductive couplers
  13.7 Alarm/alerting systems
  14 Lighting
    14.1 General principles of lighting
    14.2 Avoiding glare and shadows
    14.3 Colour rendering
    14.4 Illumination for lip reading
  15 Facilities in buildings
    15.1 Seating in general waiting areas
      *Figure 11 — Space needed to allow access by people using crutches*
      *Figure 12 — Spaces for wheelchair users in a general seating layout*
    15.2 Storage facilities
      *Figure 13 — Access to storage from the front when seated*
      *Figure 14 — Access to shelves from the side*
    15.3 ATMs and other coin and card operated devices
    15.4 User interfaces with touch screens
    15.5 Windows and window controls
    15.6 Public telephones and internet booths
      *Figure 15 — Height of telephone controls for wheelchair users*
      *Figure 16 — Key features of a telephone booth for wheelchair users*
      *Figure 17 — Tactile telephone symbol*
    15.7 Building services (outlets, switches and controls)
      *Figure 18 — Heights to the centre of outlets, switches and controls*
      *Figure 19 — Distance of outlets, switches and controls from the corner of a room*
    15.8 Assistance dog toilets/spending areas
    16 Counters and reception desks
    16.1 Location and access for visitors and customers
    16.2 Space in front of a counter or reception desk
      *Figure 20 — Access on customer side of a counter or desk*
    16.3 Counter and reception desk dimensions for visitors/customers
      *Figure 21 — Key dimensions of counters and reception desks*
      *Figure 22 — Space dimensions for counters allowing access for two wheelchair users*
16.4 Space below a counter or desk
16.5 Profile of work surface
16.6 Communication
16.7 Acoustics
16.8 Permanent or temporary control barriers for queuing
16.9 Space for secure and private transactions
17 Audience and spectator facilities
17.1 Provision of seating
   Table 6 — Provision of accessible viewing in audience seating
17.2 Provision of wheelchair spaces in audience seating
17.3 Access to audience seating
   Figure 23 — Sight lines for unfixed seating on a level floor
17.4 Raked floors
   Figure 24 — Example of locations of wheelchair spaces in a lecture theatre
17.5 Ancillary equipment
   Figure 27 — Lectern and associated equipment heights
17.6 Lecture and conference facilities
   Figure 28 — Recommended spaces between study tables/desks
18 Sanitary accommodation
18.1 General
   Figure 29 — Examples of techniques for independent transfer from a wheelchair to a WC
18.2 Shower rooms and bathrooms
   Figure 30 — En-suite shower room with corner WC for independent use
   Figure 31 — En-suite shower room for use with a ceiling-mounted full room cover tracked hoist system for assisted use
   Figure 32 — En-suite bathroom with a ceiling-mounted full room cover tracked hoist system for assisted use
   Figure 33 — Bathroom for independent use incorporating a corner WC layout
   Figure 34 — Bathroom for assisted use of a bath and peninsular WC
   Figure 35 — Grab rails where bath adjoins a wall, and transfer facilities
   Figure 36 — Bathroom allowing assisted use of the bath (and WC) using a mobile hoist operated by an assistant
18.3 Changing and shower areas
   Figure 37 — Self-contained changing area and accessories
   Figure 38 — Self-contained unisex shower room for independent use
18.4 Accessible baby changing facilities
18.5 Toilet accommodation
   Figure 39 — Unisex toilet for use by people with ambulant mobility impairments
   Figure 40 — Unisex accessible toilet with corner WC layout where other accessible toilet accommodation is available
   Figure 41 — Unisex accessible toilet with corner WC layout where only one toilet is provided within a building/unit
   Figure 42 — Heights of fixtures and fittings for toilets with corner WC layout
   Figure 43 — Location of independent mirrors, accessories and washbasins
   Figure 44 — Baby changing facilities in an enlarged unisex accessible toilet
   Figure 45 — Unisex accessible toilet with peninsular WC for assisted use
   Figure 46 — Accessible WC compartment for people with ambulant mobility impairments
18.6 Changing Places toilets

19 Individual rooms

19.1 Kitchen areas

19.2 Accessible bedrooms

19.3 Quiet spaces

20 Building types

20.1 General

20.2 Transport-related buildings

20.3 Industrial buildings

20.4 Administrative and commercial buildings

20.5 Health and welfare buildings

20.6 Refreshment buildings, including public houses, restaurants and cafes

20.7 Entertainment-related buildings

20.8 Sports-related buildings

20.9 Religious buildings and crematoria

20.10 Educational, cultural and scientific buildings

20.11 Historic buildings

20.12 Travel accommodation and venues

20.13 Shops, supermarkets and shopping malls

Table 7 — Self-service checkout facilities

Annex A (informative) Management and maintenance

Annex B (informative) Using light reflectance values (LRVs) to assess visual contrast

Annex C (informative) Slip potential characteristics of treads, ramp surfaces and floor finishes

Annex D (informative) Induction loop systems

Annex E (informative) Reach ranges
Figure E.4 — Examples of applying reach range data to common activities

Annex F (informative) Guidance on the choice of hoists, associated slings and showering/changing benches

Annex G (informative) Space allowances for wheelchair manoeuvring

Table G.1 — Space required for a sample of self-propelled wheelchairs when stationary

Table G.2 — Space required for a sample of electrically propelled wheelchairs when stationary

Table G.3 — Space required for a sample of self-propelled and electric wheelchairs when stationary

Table G.4 — Space required for a sample of attendant pushed wheelchairs when stationary

Table G.5 — Space required for a sample of electric mobility scooters when stationary

Figure G.1 — The manoeuvre and the space required for a 90° turn

Table G.6 — Space required for users of self-propelled wheelchairs to turn through 90°

Table G.7 — Space required for users of electrically propelled wheelchairs to turn through 90°

Table G.8 — Space required for users of self-propelled and electrically propelled wheelchairs to turn through 90°

Table G.9 — Space required for an attendant to turn a wheelchair through 90°

Table G.10 — Space required for users of electric mobility scooters to turn through 90°

Figure G.2 — The manoeuvre and the space required for a 180° turn

Table G.11 — Space required for users of self-propelled wheelchairs to turn through 180°

Table G.12 — Space required for users of electrically propelled wheelchairs to turn through 180°

Table G.13 — Space required for users of self-propelled and electrically propelled wheelchairs to turn through 180°

Table G.14 — Space required for an attendant to turn a wheelchair through 180°

Table G.15 — Space required for a user to turn an electric mobility scooter through 180°

Annex H (informative) Space allowances for people passing on an access route

Figure H.1 — Space allowances for people on an access route

Bibliography

Index
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;

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 8300:2.

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 9993.

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 8123-1, 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 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
BS 10621, Lock assemblies in which the operating mode can be switched between the normal 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.
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

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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/m²) 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 stailift
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.


For further information see the CABE 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.

Table 1 — Inclusive design strategy

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

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

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

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:

a) the prominence and visual relationship of the entrance with its surroundings both internally and externally;

b) the type of threshold needed to allow safe and step-free access;

c) the ease of operation of the entrance door;

d) the minimum effective clear width through the doorway;

e) the provisions for effective drainage whilst retaining level access;

f) 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 11).

**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

![Diagram of 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 1570 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

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

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*

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Door stop or edge of other door of a double doorset</td>
</tr>
<tr>
<td>2</td>
<td>Weather board if provided</td>
</tr>
<tr>
<td>3</td>
<td>Effective clear width (door stop to projecting door furniture), with door open at 90°</td>
</tr>
<tr>
<td>4</td>
<td>Door furniture</td>
</tr>
<tr>
<td>5</td>
<td>Effective clear width (door stop to projecting door furniture), with door open less than 90°</td>
</tr>
<tr>
<td>6</td>
<td>Effective clear width (door stop to door leaf), with door open beyond 90°</td>
</tr>
<tr>
<td>7</td>
<td>Minimum clearance of door furniture from face of door recess with door fully open</td>
</tr>
<tr>
<td>8</td>
<td>Effective clear width of sliding door</td>
</tr>
<tr>
<td>9</td>
<td>Any return wall to either side of the sliding door</td>
</tr>
</tbody>
</table>

### 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 1500 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.
### 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.

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

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Minimum zone of visibility between 500 mm and 1 500 mm above finished floor level, with maximum interruption of 350 mm vertically within the zone</td>
</tr>
<tr>
<td>2</td>
<td>Maximum obstruction (X + X + X) not more than 350 mm</td>
</tr>
</tbody>
</table>

Dimensions in millimetres

---
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

a) Glazed or panelled doors with narrow stiles less than 100 mm wide

b) Solid doors and doors with vision panels having side margins of 100 mm or more

NOTE 1  Figure 5 continues on the following page, with the key.
**Figure 5 (continued)**

**Key**

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

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.
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 1000 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 1000 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

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wheelchair turning space (1 500 × 1 500) mm</td>
</tr>
<tr>
<td>2</td>
<td>Effective clear width (see 8.3.1)</td>
</tr>
</tbody>
</table>
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 1800 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 1800 mm or, if less, be provided with passing places, 1800 mm wide and at least 1800 mm in length, at reasonable intervals. The surface width of a corridor should be not less than 1200 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 1200 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**

**Key**

1. Projections such as service pipes, fire hose reels and radiators should be avoided, wherever possible
2. Recess at notice board or other assembly point also serves as a passing place for wheelchairs where this creates a 1 800 mm width and extends for at least 1 800 mm
3. Hazard protection at localized obstructions (e.g. columns, ducts)
A. A surface width of 1 800 mm will allow two wheelchair users to pass each other
B. Depth of recess not less than the width of the door leaf (including outward-opening doors to sanitary accommodation)
C. Turning space of 1 800 mm diameter at a corridor junction acts as a passing place and allows a wheelchair user to turn and return in the other direction
D. 900 mm clear space where a door to a toilet opens into a corridor which is not an escape route
E. Clear width of corridor not less than 1 200 mm
F. Clear width of at least 1 000 mm where there is a localized obstruction such as a fire extinguisher or column
G. Inward-opening door (including to sanitary accommodation where space permits; see 18.1.6)
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 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).

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 1154:1997Annex A, be of a variable power type and meet the recommendations in 8.2.2.

NOTE 1 BS EN 1154:1997 Annexe 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 2000 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 amulant 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...
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.
Where the change in level within a circulation route is greater than 300 mm and accommodated by a ramp, steps should be provided in addition to the ramp. Where the change in level is less than 300 mm, steps should not be used.

10.2.2 Gradient of a ramp

A ramp should have the lowest practicable gradient within the range 1:20 to 1:12 and the maximum corresponding length between landings.

The gradient of a ramp flight in relation to its going should be not steeper than that shown in Table 3.

NOTE 1 Table 3 shows the maximum gradient and going acceptable for various rises of ramp, as follows.

- The first column indicates the rise of the ramp to be achieved, in increments of 10 mm.
- The second two columns indicate the preferred gradient and the corresponding going. For example, a gradient shown as 20 is 1:20.
- The final two columns indicate the maximum permissible gradient and the corresponding maximum permissible going for the rise shown in column 1.
- For a given rise, any going intermediate between the figures shown in columns 3 and 5 is acceptable. The gradient 1/n can then be calculated as $n = \text{going (in mm)} / \text{rise}$.

NOTE 2 Different design solutions might be needed in transport infrastructure (see Inclusive mobility – A guide to best practice on access to pedestrian and transport infrastructure [19]).

No individual flight of a ramp should have a going greater than 10 m or a rise of more than 500 mm. If a series of ramp flights rises more than 2 m, an alternative means of step-free access, such as a lifting appliance, should be provided. Where a lifting appliance is provided it should meet the recommendations in 10.5.

A cross-fall gradient to an internal ramp should be avoided. Where it is necessary to provide a cross-fall gradient to a ramp, such as in wet areas, the cross-fall gradient of a ramp should be not more than 1:50.
### Table 3 — Maximum permissible relationship between going, gradient and rise of ramps

<table>
<thead>
<tr>
<th>Rise of ramp, in increments of 10 mm</th>
<th>Preferred approach</th>
<th>Max. permissible approach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preferred gradient of ramp, 1/n</td>
<td>Going of ramp at preferred gradient</td>
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<td>500</td>
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<td>10 000</td>
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</table>

A) The formula for deriving the maximum permissible going, \( G \), and gradient, \( G_{rad} \), from the rise, \( R \), is:

\[
G = \left( (0.00004R^2) - (0.0025R) + (11R) + (125) \right); \quad \text{and} \quad G_{rad} = 1/n \quad \text{where} \quad n = G/R
\]

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10.2.3  Ramp widths

The surface width of a ramp, between walls, upstands or kerbs, should be not less than 1 500 mm. Where wider ramps are divided into separate channels, no channel should have a surface width less than 1 500 mm.

NOTE 1  It is not necessary to divide a wider ramp. A surface width of 1 800 mm is the minimum that permits two wheelchair users to pass each other.

NOTE 2  Sports facilities have their own requirements for ramp widths (see Accessible sports facilities [16]).

Widths of access routes, including ramps, for events where crowds are expected should be suitable for people to use safely and conveniently.

NOTE 3  Guidance is given in Managing crowds safely – A guide for organisers at events and venues [20] and Guidance on designing for crowds – An integrated approach [21].

10.2.4  Landings

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

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

Intermediate landings at least 1 800 mm wide × 1 800 mm long should be provided as passing places where there is no clear line of sight from one end of the ramp to the other, or where there are three or more flights.

A landing should be level, except in wet areas where a landing may have a slight cross-fall gradient, not exceeding 1:50, to help drain surface water.

10.2.5  Edge protection to ramps

A continuous upstand at least 100 mm high should be provided at any open edge of a ramp. The upstand should contrast visually with the surface of the ramp.

NOTE 1  A separate upstand is not necessary where solid guarding is provided, or where open guarding is provided that incorporates a continuous bottom rail 100 mm above the ramp surface.

NOTE 2  The upstand is intended to prevent a wheelchair user falling over the edge of the ramp and can assist with cane detection. A permanent design feature (e.g. a planting box) can give additional protection.

10.2.6  Surface materials

Surface materials should be chosen to be easy to maintain and as slip-resistant as possible, especially if surfaces are likely to become wet.

The surface of a ramp should contrast visually with the landings and the edge protection so that its presence is discernible by people who are blind or partially sighted.

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

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

NOTE 1  Advice and further references on slip resistance of surfaces are given in Annex C. More detailed recommendations for surface finishes are given in Clause 11.
Deep pile carpet should not be used for the surface of a ramp.

NOTE 2 The resistance of deep pile carpet increases the effort needed to propel a wheelchair.

Tactile warning surfaces should not be used at the top and bottom of ramps.

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

NOTE 3 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.

10.2.7 Lighting

NOTE General recommendations for lighting are given in Clause 14.

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

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

10.2.8 Temporary ramps

Temporary ramps that are fixed in place to provide a temporary solution until it is possible to provide a permanent ramp, e.g. during building works, should be designed in accordance with 10.2.1 to 10.2.7.

10.2.9 Portable ramps

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

Portable ramps should have a surface width not less than the effective clear width of the doorway served, a drainable, slip-resistant surface, and upstands at least 100 mm high to prevent wheelchair tyres veering off the edge.

NOTE 1 Attention is drawn to the minimum widths for accessible entrances given in Table 2. In existing buildings where these dimensions cannot be achieved, a portable ramp might benefit some people but this is not considered to be an accessible entrance.

Gradients of portable ramps should as far as practicable meet the recommendations in 10.2.2 and Table 3.

NOTE 2 Portable two-channel ramps are not suitable.

NOTE 3 Portable ramps can have implications for fire evacuation procedures.

10.3 Handrails to ramped and stepped access

COMMENTARY ON 10.3

Wheelchair users do not normally need to use handrails to negotiate a ramp. However, in slippery conditions on long and/or steep ramps, handrails can help wheelchair users to steady themselves.

Some people with an ambulant mobility impairment might be weaker on one side and, therefore, a handrail on each side of the flight is essential for support, for ascending and descending ramps, steps or stairs.

Many people find it easier to negotiate a flight of steps than a ramp and, for them, the presence of handrails for support is essential.
The division of wide flights of ramps or steps into separate channels allows an individual who might have less strength on one side or the other to be within easy reach of support. This is particularly important when many other people are using the ramp, steps or stairs at the same time.

10.3.1 Handrail and balustrade provision

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

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

Where appropriate guarding is available, such as a wall or a glass barrier, a second handrail should be provided in buildings used by the general public. The top surface of the second handrail should be 600 mm above the ramp surface or pitch line of a stair.

Balustrades should be designed in accordance with BS 6180:2011 Clause 5 and Clause 6, and should be strong enough to withstand inadvertent impact from an electrically powered wheelchair or electric mobility scooter. Warning signs should be placed in suitable locations, restricting vehicle speed to 4 mph on all pedestrian walkways providing access to members of the public where guarding or balustrades are required.

NOTE 2 BS 6180:2011 gives calculation methods for pedestrian and vehicle impact on barriers. For impact by mobility scooters, professional advice is likely to be needed. DfT web guidance at https://www.gov.uk/mobility‑scooters‑and‑powered‑wheelchairs‑rules/rules‑for‑class‑3‑invalid‑carriages gives additional details of maximum permitted design parameters for mobility vehicles.

10.3.2 Handrail design

COMMENTARY ON 10.3.2

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

The horizontal extension of a handrail beyond the ramp flight or the first and last steps allows an individual to steady or to brace themselves before ascending or descending. For a person who is blind or partially sighted, the change in slope of the handrail and its return into a wall signals the start or finish of the flight.

A handrail should be:

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

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

b) continuously graspable along its entire length without obstruction;

   NOTE 2 Well‑spaced handrail supports are not considered an obstruction (see 10.3.3).

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

   NOTE 3 Annex B gives guidance on how to achieve visual contrast.

d) terminated to include a minimum 300 mm long section in the horizontal plane beyond the start and finish of the ramp or the last nosing of a stair, at both top and bottom;
NOTE 4  Increasing the length of termination of the handrail at the top and bottom of a flight can be advantageous in certain situations, e.g. where large crowds are anticipated.

e) terminated in a way that reduces the risk of clothing being caught;

NOTE 5  It is preferable for this to be achieved by returning the handrail to the wall or floor. Where this is not possible, e.g. where the handrail extends beyond balustrading, the handrail may be terminated back to the nearest vertical support in such a way as to eliminate the risk of clothing being caught.

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

10.3.3 Handrail dimensions and spacings

A handrail with an oval profile should have dimensions of 50 mm wide and 39 mm deep. The profile should have rounded edges with a radius of at least 15 mm.

Any circular handrail should have a diameter of between 32 mm and 50 mm.

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

NOTE  Where a 50 mm diameter circular handrail is used, a 50 mm spacing from a wall allows the handrail to project not more than 100 mm into the width of the stair.

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

10.3.4 Handrail and balustrade fixings

Handrail and balustrade fixings should be designed to meet the loading requirements specified in BS EN 1991-1-1. Care should be taken to ensure that the strength of fixings, attachments or anchorages that secure the handrail to the substrate are adequate for the required loading, taking into account the material of the substrate, the spacing between fixings and, where the substrate is concrete, the position of the reinforcement. If there is any uncertainty as to the strength of any component in the fixing system, the design load should be increased by 50%. Reliance on the pull-out capacity of a single fixing should be avoided (see BS 6180:2011, 6.5).

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

10.4 Hazard protection beneath stairs and ramps

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

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

a) a protective guardrail and low-level cane detection; or

b) a continuous barrier.

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

COMMENTARY ON 10.5

Lifting appliances are an essential amenity for many people, including disabled and older people, people with luggage or with children in pushchairs. Lifting appliances may be conventional passenger lifts, slow speed lifts, vertical lifting platforms or wheelchair stairlifts. However, wherever practicable conventional passenger lifts are to be preferred.

Enclosed vertical lifting platforms (see 10.5.5.2) can serve a number of storeys. They are not equivalent in service to a conventional passenger lift and can only be considered as an alternative to a conventional passenger lift in an existing building. Vertical lifting platforms travel slowly between landings and therefore might not be suitable for lone users with certain impairments, e.g. people who are easily fatigued. Vertical lifting platforms are operated by continuous pressure controls, e.g. push buttons.

Non-enclosed vertical lifting platforms (see 10.5.5.3) are used mainly to transport wheelchair users or people with ambulant mobility impairments on a guarded platform vertically from one level to another.

Wheelchair stairlifts (see 10.5.6) travel up the pitch line of a stair.

10.5.1 Provision of lifting appliances

Multi-storey buildings should have at least one conventional passenger lift. All conventional passenger lifts should be of sufficient size to be accessible by wheelchair users and people with limited mobility. All floors, including any below ground level, should be served by a conventional passenger lift.

NOTE 1 For many people, a conventional passenger lift is the only practicable means of vertical movement. The provision of two lifts allows continued access in the event of the failure of one lift.

NOTE 2 Allowing space for the future installation of an additional lifting appliance will provide greater flexibility.

Lifts are the most appropriate means of evacuation for some people, and the use of either an evacuation lift or a conventional passenger lift providing the functionality of an evacuation lift should be incorporated into an evacuation strategy.

A conventional passenger lift should be the preferred solution to provide comprehensive access for all users to different levels in a building. However, in buildings where the installation of such a lift might not be possible, a slow speed lift or an enclosed vertical lifting platform should be provided.

If neither of the other types of lifting appliance can be installed, a wheelchair stairlift should be chosen as the final option for existing buildings.

NOTE 3 If no lifting appliance access can be provided in an existing building, it is necessary to ensure that essential services and facilities are provided on an accessible floor.

NOTE 4 Guidance on the selection and installation of new lifts is given in BS 5655-6.

10.5.2 Access to lifting appliances

NOTE 1 It is preferable for any conventional passenger lift to be located adjacent to the principal stair or stairs.

Signs indicating the location of accessible lifting appliances should be provided in a location that is clearly visible from the building entrance.

In a building where not every lifting appliance is accessible for wheelchair users, the accessible lifting appliance(s) should be identified by a sign incorporating a representation of the International Symbol for Access (see 12.1.4).

NOTE 2 More detailed recommendations for signs and signage are given in Clause 12.

An accessible lifting appliance should be at the same level as at least one entrance door to the building or be accessible by means of a ramp.
A clear level manoeuvring space of not less than 1 500 mm × 1 500 mm should be provided in front of the entrance to all types of lifting appliance. If the lifting appliance has a swing door, this space should be measured clear of the door swing. This landing area should be well lit artificially with an illuminance of at least 100 lux at floor level.

**NOTE 3** It is preferable for the manoeuvring space to be outside any circulation route and not directly opposite stair circulation.

### 10.5.3 Conventional passenger lifts

#### 10.5.3.1 General

Conventional passenger lifts should conform to BS EN 81-20 and BS EN 81-70.

**NOTE** Attention is drawn to the Lifts Regulations 2016 [10].

#### 10.5.3.2 Conventional passenger lift sizes

Lift sizes should be chosen to suit the anticipated intensity of use of the lifts and the requirements of disabled users.

**NOTE 1** Sports facilities have their own requirements for lift sizes (see Accessible sports facilities [16]).

The minimum dimensions of a lift car with a single entrance or two opposite entrances should be chosen according to the anticipated use as shown in Table 4.

**NOTE 2** Lifts with opposite doors (dual-entry lifts) can be used to avoid the necessity for a wheelchair user to reverse out or turn around in the lift car.

**Table 4 — Minimum dimensions of a lift car with a single entrance or two opposite entrances**

<table>
<thead>
<tr>
<th>Minimum car dimensions[^a]</th>
<th>Users accommodated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 100 mm wide × 1 400 mm deep</td>
<td>One user of a manual or electrically powered wheelchair, and one accompanying person. There is insufficient space for wheelchair users to turn conveniently.</td>
</tr>
<tr>
<td>2 000 mm wide × 1 400 mm deep</td>
<td>One user of any type of wheelchair, together with several other passengers. There is sufficient space for wheelchair users and people with walking aids to turn through 180°.</td>
</tr>
</tbody>
</table>

**NOTE** A larger lift size (2 000 mm × 1 400 mm) would more conveniently accommodate Type C outdoor electric mobility scooters.

[^a]: Dimensions are measured between the structural walls of the car, with any decorative finishes being not more than 15 mm thick.

#### 10.5.3.3 Lift call buttons and signs in the lift lobby

All visual indicators and lift call buttons should be clearly visible from within the lift lobby.

Lift call controls in the lift lobby should meet the requirements of BS EN 81-70 for landing control devices.

Lift signals in the lift lobby should meet the requirements of BS EN 81-70 for landing signals.

A sign indicating the number of the floor should be provided in each lift lobby on the wall opposite all the lift landing doors.

**NOTE 1** Such signs are not normally provided by the lift contractor.

**NOTE 2** More detailed recommendations for signs and signage are given in Clause 12.

#### 10.5.3.4 Features

A lift door should contrast visually with the adjoining wall of the lift lobby. Lift doors should have an effective clear width of at least 800 mm, but at least 900 mm for all new buildings.
The use of visually and acoustically reflective wall surfaces should be minimized within the lift car, as they can be misleading and cause confusion, particularly for people who are blind and partially sighted and people with sensory/neurological processing difficulties.

NOTE 1 Acoustic reverberation can affect the ability of people who are Deaf or hard of hearing, and people who have sensory/neurological processing difficulties, to distinguish speech and other sounds.

The floor of the lift car should be slip-resistant and have similar frictional qualities to the floor of the lift landing to decrease the risk of slips, trips and falls. The lift car floor should contrast visually with the landing.

NOTE 2 Some people can perceive a dark floor as a shaft or hole.

Areas of glass in lifts, particularly glass doors, should be easily identifiable to people who are blind or partially sighted (see 11.5). Glass floors to lifts should be avoided as they can cause discomfort.

NOTE 3 Extensive use of glass walls in lifts can also cause discomfort, and at least one solid or opaque wall or area of glass is to be preferred.

The illumination of the lift car should not cause glare, reflection, confusing shadows or pools of light and dark. Light sources should not be located immediately adjacent to the control panel.

NOTE 4 BS EN 81‑28 specifies minimum requirements of 50 lux at the landing and car sill, and 100 lux on the control devices and at 1 m above the floor at any point not less than 100 mm from any wall of the lift car.

In large lifts (2 000 mm wide x 1 400 mm deep), a duplicate set of controls should be provided on the opposite side of the lift car in accordance with BS EN 81‑70.

NOTE 5 Mounting an additional low-level control panel within the lift car at an angle will ensure that it can be seen clearly from a sitting position.

Within the lift car, there should be a visual indication and an audible announcement of the level reached. The floor indicator panel should clearly identify the accessible entrance level of the building.

Conventional passenger lifts should be fitted with an emergency communication system that conforms to BS EN 81‑28.

NOTE 6 The ability to alter the volume of the microphone and speaker of an induction loop will benefit people who wear hearing aids. BS EN 81‑28 requires a visual indicator that provides confirmation that an emergency call has been received and is being acted upon.

NOTE 7 The addition of an emergency call device at low level will enable someone who has fallen to the floor to call for help.

NOTE 8 BS EN 81‑28 deals only with entrapments and not with general emergency assistance.

10.5.4 Lifting appliances for emergency evacuation

Conventional passenger lifts that are provided to evacuate disabled people in an emergency should meet the relevant recommendations in BS 9999. Where firefighters' lifts are used for evacuation, they should conform to BS 81‑72 and BS 9999.

NOTE 1 Lifting appliances can be used to assist in the evacuation of disabled people if such appliances are encased within a fire-protected shaft and have their own independent electrical supply, control panel and other features, in accordance with BS 9999.

NOTE 2 Lifting appliances not designed for evacuation can be used for evacuation in certain circumstances, provided a fire risk assessment has evaluated that the lifting appliance is able to function as an evacuation lift (see BS 9999).

NOTE 3 Guidance on fire safety risk assessments for a variety of building types was published by the Department for Communities and Local Government (22) to (32). At the time of publication of this part of BS 8300 responsibility for fire safety has passed to the Home Office.

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10.5.5 Vertical lifting platforms

10.5.5.1 General

Vertical lifting platforms should be provided with easily accessed and clear instructions for use and fitted with an emergency alarm control device (a two-way voice communication system) in case users get into difficulty.

NOTE 1 BS EN 81-28 covers the design of alarms for conventional passenger lifts and, whilst the alarms described therein are not specifically intended for use on vertical lifting platforms, they are considered beneficial.

All users, including wheelchair users, should be able to reach and use the controls that summon and direct the lifting platform.

The lifting platform should provide audible and visual information to tell users, when waiting, that the platform has arrived at their level and, when using the platform, which floor it has reached.

Transition ramps onto vertical lifting platforms should be avoided. Where possible, the floor level and the lifting platform floor should finish level.

The lifting platform floor should contrast visually with the landing.

NOTE 2 Some people can perceive a dark floor as a shaft or hole.

10.5.5.2 Enclosed vertical lifting platforms

Enclosed vertical lifting platforms should conform to BS EN 81-41.

NOTE 1 Attention is drawn to the Supply of Machinery (Safety) Regulations 2008 [11].

NOTE 2 All enclosed vertical lifting platforms with a travel exceeding 3 m need to have a product certificate issued by a notified body.

The minimum clear dimensions of an enclosed vertical lifting platform should wherever practicable be 1 100 mm wide × 1 400 mm deep. In exceptional circumstances in existing buildings, the minimum clear dimensions may be 900 mm wide × 1 400 mm deep.

NOTE 3 A 900 mm × 1 400 mm lifting platform does not accommodate a wheelchair user and a companion.

NOTE 4 A lifting platform that does not require a wheelchair user to turn through 90° to exit is preferred.

Doors should have an effective clear width of at least 800 mm for a 900 mm wide lifting platform, and at least 900 mm for a lifting platform that is 1 100 mm wide or larger and where door openings are at 90° relative to each other. Doors should contrast visually with the adjacent surfaces, and door opening furniture should be in accordance with 8.4.1.

10.5.5.3 Non-enclosed vertical lifting platforms

Non-enclosed vertical lifting platforms should conform to BS 6440.

NOTE Non-enclosed vertical lifting platforms are used to transfer people between levels within a storey commonly where the difference in level is not more than 3 m.

The minimum clear dimensions of a non-enclosed lifting platform should be large enough to allow the user ease of movement (see recommended dimensions in 10.5.5.2).

10.5.6 Wheelchair stairlifts

Wheelchair stairlifts should not be installed in new buildings. Wheelchair stairlifts for existing buildings should be installed only where it is not possible to install a conventional passenger lift or a vertical lifting platform.

NOTE 1 Prior to the installation of a wheelchair stairlift in a public building, a risk assessment is required to ensure that means of escape are not compromised.
Wheelchair stairlifts should conform to BS EN 81-40.

Wheelchair stairlifts should be fitted with an alarm that conforms to BS EN 81-40.

The controls of a wheelchair stairlift should be designed to prevent unauthorized use (see BS EN 81-40).

For a building with a single stairway, the clear stairway width for means of escape should be maintained between the carriage rail of the wheelchair stairlift and the handrail opposite.

**NOTE 2** Recommendations for the minimum width of escape stairs are given in BS 9999.

For a building with two or more stairways between storeys, a wheelchair stairlift should only be installed on a stairway that is not intended to be used as a means of escape.

When in a parked position, a wheelchair stairlift should not obstruct the required clear width of a stairway, or cause a potential hazard for people who are blind or partially sighted using the stairway or the adjoining landings. It should not restrict access to handrails.

There should be a minimum clear width of 600 mm between the folded down platform of a wheelchair stairlift and the handrail opposite.

### 10.6 Escalators and moving walks

**COMMENTARY ON 10.6**

The use of wheelchairs on escalators and moving walks can lead to dangerous situations which cannot be mitigated by machine design. The use of conventional passenger lifts is the preferred method of vertical travel for most disabled people and in particular wheelchair users and people with assistance dogs.

Escalators and moving walks should conform to BS EN 115-1.

Wherever an escalator or moving walk is installed, a clearly signposted alternative accessible route, e.g. a conventional passenger lift, should be provided close by.

The location and direction of travel of any escalator or moving walk should be clearly indicated by signs.

A clear, well-lit unrestricted area at least 2.5 m long should be provided, where practicable, at the top and bottom of an escalator to ensure that users can board and alight safely. In all cases, the unrestricted area at the exit should conform to the minimum requirements specified in BS EN 115-1 and be unaffected by passenger flow within the building.

**NOTE 1** It is useful if the surface of the escalator contrasts visually with the approach and if audible signals or pre-recorded messages indicate the start and finish of the escalator. Such signals or recording are not normally provided by the escalator manufacturer.

Handrails should contrast visually with the surroundings.

**NOTE 2** It is useful for there to be a visible means of indicating whether the handrail is moving or stationary.

The identification of nosings should be in accordance with 10.1.4.

**NOTE 3** Further guidance on compliance with obligations arising from health and safety legislation can be found in Guidelines for the safe operation of escalators and moving walks [33].

Where an escalator or moving walk is within a pedestrian access route, guarding should be provided alongside and at each end for the safety of people who are blind or partially sighted. Any side panels to guarding should have a non-reflective finish.

**NOTE 4** Without guarding, people who are blind or partially sighted can inadvertently walk into an escalator or moving walk or be pulled over by accidental contact with moving handrails.
NOTE 5 Guidance on the selection, installation and location of escalators and moving walks is given in BS 5656-2 and in BS EN 115-1:2017, Annex A and Annex H.

11 Surface finishes

COMMENTARY ON CLAUSE 11

Floor, wall, door and ceiling surfaces can help or hinder the use of buildings. For example, people who are blind or partially sighted, people who are Deaf and hard of hearing, and people who have sensory/neurological processing difficulties might have difficulty finding their way around spaces if they cannot respond to visual cues or if they find it difficult to distinguish sounds in an acoustically reverberant environment. People with sensory/neurological processing difficulties can find shiny surfaces and some patterns difficult. The movement of wheelchair users and people with ambulant mobility impairments can be unnecessarily restricted by the choice of a high-resistance floor covering such as a deep pile carpet.

The extent to which floor, wall, door and ceiling surfaces enable people to find their bearings and maintain their independent use of a building is influenced by:

- the colour, pattern, light reflectance value (LRV) and texture of the surfaces;
- the treatment of components and finishing elements, such as doors, architraves, skirtings, handrails, etc. which define, or are contained within, these surfaces;
- the appropriate use of surfaces to clarify location and direction and to identify objects;
- the acoustic environment;
- the grip of floor surfaces, particularly at changes of level.

Photosensitive epilepsy is a type of epilepsy in which almost all seizures are triggered by flashing or flickering light. However some patterns, like stripes or checks, can also trigger seizures for some people with photosensitive epilepsy. Most people with photosensitive epilepsy are sensitive to 16 Hz to 25 Hz. Some people are sensitive to rates as low as 3 Hz and as high as 60 Hz. Designers need to take care to ensure that patterning along circulation routes does not create a flicker rate within this range.

11.1 Visual characteristics

COMMENTARY ON 11.1

Reflections and glare from shiny surfaces can be misleading and cause confusion, particularly for people who are blind and partially sighted and people with sensory/neurological processing difficulties, if those surfaces are large in area. Glare and reflections also make it more difficult for people to lip read.

The ceiling is often the least cluttered area of a space and can give partially sighted people a good impression of the size of the space that they have entered. However, as most people concentrate their vision below 1 200 mm from the floor, the contrast between the floor and the wall is critical for way-finding.

Around 5% of the population is colour-blind, particularly in the red/green region, and this needs to be taken into account when designing colour schemes. Red/green colour blindness does not mean people mix up red and green; it means they mix up all colours which have some red or green as part of the whole colour. For example, a red/green colour-blind person will confuse a blue and a purple because they cannot perceive the red element of the colour purple.

Mirrored, high gloss or very shiny surface finishes should be avoided for large areas, e.g. floor, wall, counter, worktop, door and ceiling surfaces.
Differences in LRV should be used to assess the degree of visual contrast between surfaces such as floors, walls, doors and ceilings and between key fittings/fixtures and surrounding surfaces.

**NOTE 1** Relevant LRV differentials and methods of LRV measurement are provided in Annex B.

The LRV of a wall should be 30 points different from that of the ceiling and of the floor. To avoid giving the wrong impression about the size of a room, skirtings should have the same LRV as the wall so that the junction between the skirting and the floor marks the extent of the room, except where coved skirtings are used, where the skirting should have the same LRV as the floor and should extend not more than 100 mm above finished floor level.

**NOTE 2** Colours for use in buildings can be specified using BS 4800, which gives a schedule of 100 colours for building purposes, in conjunction with BS 5254, which gives a framework for colour coordination and has available a colour matching fan. BS 8493 gives the LRV measurements of selected BS 4800 colours.

**NOTE 3** In rooms where sanitary facilities are provided and easily cleanable surfaces are essential, continuous flooring materials which provide a coved junction between the floor and the wall might be necessary.

### 11.2 Materials and acoustic design

**COMMENTARY ON 11.2**

Hard materials used for ceilings, walls and particularly floors, reflect sound and create a noisy environment in which a person who is Deaf or hard of hearing might have difficulty in understanding what is being said. Similarly, a person who is blind or partially sighted, relying on the character and quality of reflected sounds, might become confused because of extended reverberation times, or an echo effect. People with sensory/neurological processing difficulties can experience sensory overload within environments that are noisy and too reverberant. However, use of materials with very high absorbencies can give rise to spaces that have a muffled, lifeless character which is uncomfortable and unpleasant for some people.

Ceiling, wall and floor materials should contribute to an acoustic environment that helps orientation and enables audible information to be clearly heard. The recommendations for acoustic design given in BS 8233 should be followed in order to choose an appropriate acoustic absorbency for each surface.

### 11.3 Floor surfaces

Very shiny finishes should be avoided due to problems with glare and the fact that they are perceived as being slippery even when they have a slip-resistant surface.

Large, repeating patterns that incorporate bold contrasting colours or simulate steps should not be used for any floor surface.

**NOTE 1** People who are blind or partially sighted, and people with sensory/neurological processing difficulties, can be confused by bold patterns used in floor coverings and might read them as changes in level.

**NOTE 2** A high level of visual contrast at door thresholds or between floor surfaces can be perceived as indicating a level change, or as a void. This can lead to anxiety or hesitancy in movement, leading to falls.

Floor surfaces should offer a level of slip resistance that provides a firm foothold and good wheel grip under normal conditions of use. Adjacent floor surfaces should have similar levels of slip resistance.

**NOTE 3** Guidance on slip resistance is given in Annex C.

The ingress of soil and surface moisture to buildings, or their transfer between adjacent internal areas, should be reduced to the lowest practicable level, e.g. through the use of appropriate entrance flooring systems conforming to BS 7953 (see also 8.6.1).

Any matting should either have its surface level with the adjacent floor finish or, if surface laid, be of a type that has a rubber backing and chamfered edges. If, in exceptional circumstances, other types of
surface laid mats are used, they should be securely fixed to the floor at their edges and at any joints, to avoid the risk of tripping or slipping.

At wheelchair turning points and other heavily used areas other than at entrances where entrance flooring systems are in use, carpet should be securely fixed on a firm backing. Carpet construction, pile height and underlay type should be taken into account when assessing the suitability for wheelchair users and for people using walking sticks or frames.

Deep pile carpets and coir matting on the surface of the floor or within a mat well should not be used.

11.4 Wall surfaces

COMMENTARY ON 11.4

People who are Deaf and hard of hearing, and who lip read, might be distracted by patterned wall surfaces or screens located behind counters, reception points, speakers' rostrums and similar spaces. People who are blind or partially sighted, and people who have sensory/neurological processing difficulties, might be confused by bold patterns used in wall coverings, as they distort the perception of distance.

Large, repeating patterns that incorporate bold, contrasting colours should not be used for the wall surfaces in parts of a building where visual acuity and stress reduction are critical.

Service outlets, light switches, and other functional elements on the surface of walls should be distinguishable from the wall, using visual and textural contrast (see also 15.7).

11.5 Glazed walls and screens

COMMENTARY ON 11.5

Glazed screens, which give the illusion that there is unimpeded access at these points, can be hazardous and confusing for people who are blind or partially sighted.

Glazed walls should conform to BS 6262.

The surface of glazed walls and screens that are adjacent to doors, or form part of an enclosure, should be clearly highlighted with a manifestation which contrasts visually with the surface behind it under both natural and artificial lighting conditions, from all likely viewing directions. This manifestation should be located 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.

NOTE 1 Suitable manifestation is likely to take the form of a continuous or broken line, sign, logo or patterning on the glass that covers at least 10% of the glazing area within each zone.

Glazed screens at counters and reception points should be constructed from glass with a low light reflectance and located such that they do not affect the ability of people who are Deaf and hard of hearing to lip read through them. Glass that is silvered or highly reflective should be avoided.

NOTE 2 This is important where glazed screens are used in banks and other locations where customers might need to lip read. However, the specification of the glass in relation to security also needs to be taken into account.

Any free-standing edges of glazed screens should have a strip contrasting visually with the surroundings against which they are seen.
12 Signs and information

COMMENTARY ON CLAUSE 12

People need clear information about the purpose and layout of spaces if they are to maintain a clear sense of direction and independent use of a building. Often visual and tactile information is reinforced by audible information. As no single medium can communicate information to all those who need to receive it, some duplication is essential.

Information may take the form of visual information (e.g. signs, notice boards), audible information (e.g. public address and security systems, induction loops, telephones and infrared devices), or tactile information (e.g. signs with embossed lettering or Braille). Visual and tactile forms of information are often used in combination, complemented by audible information.

Clear signs and information are essential for people who are Deaf and hard of hearing who might be unable to ask, or feel uncomfortable about asking, for directions.

The effectiveness of information on the use of a building is determined by:

a) the location, accessibility, layout and height of signs;
b) the size and case of lettering, the size of symbols and reading distances;
c) the use of tactile letters and symbols;
d) visual contrast and lighting;
e) the finished surfaces of materials used for signs and symbols;
f) the simultaneous use of audible and visible cues;
g) integration with any other communication systems.

12.1 Provision of signs and information

COMMENTARY ON 12.1

Information to help orientation is most usefully provided at junctions of circulation routes. A plan or model may supplement written or audible instructions or signs in a large, complex building. Taped spoken messages can also help people who are blind or partially sighted comprehend a complex building.

For some people who are blind or partially sighted, tactile plans and models can also be helpful in understanding the interior layout of a public building.

Clear directions indicating the facilities on each floor of a building are essential on lift and stair landings to help ensure that people do not visit the wrong floor.

12.1.1 General

Signs should form part of an integrated communication scheme that gives clear directions, information and instructions for the use of a building. They should support a way-finding strategy that takes into account the requirements of different types of building users as well as the complexity of the building layout.

NOTE Detailed design guidance on the provision and design of signs is available in the Sign design guide [34] and the NHS wayfinding guide [25]. Guidance on signage and way-finding for people who have sensory/neurological processing difficulties is given in Building Research Technical Report 6/2005 [36].

Information and direction signs should be provided at each point where they are required, e.g. at junctions of circulation routes, at key locations such as doorways and reception points, at
facilities such as telephones and toilets, and in rooms, spaces and counters where induction loop systems are fitted.

The colour, design and typeface of signs should be consistent throughout a building.

12.1.2 Location information

All key location information, such as sign directories, orientation signs, maps and plans, should be both visual and in tactile form where low enough to be touched. Where practicable, audible information should also be provided.

Orientation ("you are here") information should be provided in accessible places. It should be clearly signposted and located alongside the main accessible route within a building, or clearly visible from the entrance to a building, so that it can be examined without restricting the access route. The orientation of maps and plans should match that of the building.

NOTE As there is no standardized way of presenting plans and maps in tactile form, people who regularly use a building might obtain more benefit than occasional visitors as they will become familiar with the tactile techniques used.

12.1.3 Directional signs

Directional signs should readily identify and easily distinguish accessible routes, including escape routes, from each other, providing a logical sequence from a starting point to a point of destination and providing a clear indication of return routes to named exits. The names of destinations should be consistent throughout the signing system.

A clear indication of the existence of steps or ramps on a route should be provided at both ends of the route.

12.1.4 Universally recognized signs and symbols

Signs to facilities specifically for disabled people should incorporate the International Symbol for Access (see Figure 9). Examples of such facilities include accessible entrances and accessible toilets.

 Universally recognized public information symbols (see Note 2) should be used to replace text, wherever possible. Any other symbols should be used in conjunction with text.

NOTE 1 Symbols are an essential aid for people who have sensory/neurological processing difficulties. In appropriate situations, Makaton and supporting graphic symbols may be used as part of a communication strategy. It is advisable to obtain specialist advice.

NOTE 2 Examples of symbols indicating the availability of services and facilities in buildings are shown in Figure 9. Further information on public information symbols can be found in BS 5499-4 and BS EN ISO 7010.

Safety signs, including fire safety and fire escape signs, should be in accordance with BS 5499-4 and BS EN ISO 7010.

A building should include spaces where announcements can be transmitted through an assistive listening system. Signs should be provided to inform people who are Deaf and hard of hearing of locations in the building where these systems are fitted, and where they can obtain the necessary equipment for assistive listening systems.

Universally accepted colour coding should be used for the background or text of warning signs, as appropriate, i.e. blue for mandatory instructions, green for safety, yellow for hazard and red for danger/emergency.
**12.1.5 Information signs and boards**

A wall-mounted information board should be provided at lift landings, at floor level landings of staircases, and at other major decision points in main circulation routes.

*NOTE* There might be occasions where notices need to be positioned at different heights to enable information to be read by sight or touch (see **12.2**).

**12.2 Location and design of signs and information**

Directional signs should indicate the route to a destination, paying particular attention to potential points of uncertainty.

Directional signs should be placed only on fixed parts of the building such as walls, posts and floors. Where such signs would not be visible in large crowds, they should be suspended from the ceiling.

The headroom of directional signs suspended from ceilings or posts, or projected from walls, should where practicable be not less than 2 300 mm.

*NOTE 1* In exceptional circumstances a lower headroom may be provided subject to a minimum of 2 100 mm.

*NOTE 2* It can be helpful to duplicate detailed signs or instructions, especially safety notices, at high and low level, so that they can be read equally by a standing person or a wheelchair user. The inclusion of tactile information, where practicable, will assist people who are blind or partially sighted.
Signs to rooms should generally not be placed on doors but on the wall to the leading edge side of
the door, as the sign might not be visible when the door is open. However, there are some situations
where a sign needs to be placed on a door, e.g. signs to toilets, pull/push signs, and hazard warnings
on plant room doors.

Signs should be positioned to avoid reflections from daylight and artificial lighting.

Signs other than universally recognized signs should include Plain English text and pictograms
together to assist people who have sensory/neurological processing difficulties.

12.3 Visual signs

12.3.1 Design and size of lettering and symbols

COMMENTARY ON 12.3.1

Short sentences are easy to understand and remember. Abbreviations, words placed closely together, and
very long words are all hard to read.

Visual signs should comprise simple words, clearly separated from one another, in short sentences.
Sentences or single word messages should begin with an upper case letter and continue with lower
case letters. Text entirely in upper case type (capitals) should not be used. Any sans serif typeface
with a relatively large x-height (lower case letter height) to capital height should be used.

NOTE 1 Typefaces that are commonly used include Helvetica, Arial, Futura and Avant Garde.

NOTE 2 Text in italics can be difficult to read for some people.

The dimensions of safety signs, including fire safety signs, and the size of any associated text, should
be in accordance with BS EN ISO 7010.

The text height for non-safety visual signs should be chosen to suit the application in accordance
with Table 5.

Table 5 — Text x-heights for different types of sign

<table>
<thead>
<tr>
<th>Viewing distance</th>
<th>Type of sign</th>
<th>x-height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long distance</td>
<td>Signs seen when approaching a building</td>
<td>150 mm min.</td>
</tr>
<tr>
<td>Medium distance</td>
<td>Directional signs</td>
<td>50 mm to 100 mm</td>
</tr>
<tr>
<td>Short distance</td>
<td>Room signs</td>
<td>15 mm to 25 mm</td>
</tr>
</tbody>
</table>

NOTE 1 Directional signs often have arrows to indicate the direction of travel.

NOTE 2 Location and identification signs are positioned at the destination.

NOTE 3 As a rule of thumb, a person who is blind or partially sighted is likely to be able to read text on a
signboard when the x-height is approximately 5.7% of the viewing distance.

Lines of text should be ranged left from a vertical line (unjustified).

NOTE 3 This is particularly important for people who are blind or partially sighted if they are to locate and
establish the extent of text.

The size of symbols or pictograms used on visual signs should be as large as the location allows,
subject to design constraints. Where space permits, symbols should be at least 100 mm in
overall height.
12.3.2 Visual contrast

For signs other than safety signs (for which there are prescribed colours), letters, symbols and pictograms should contrast visually with the signboard. Signboards should contrast visually with their backgrounds (see 11.1 and Annex B).

NOTE 1 A difference in LRV of 70 points between the letters, symbols or pictograms and the signboard, and between the signboard and the background, ensures good visual contrast.

NOTE 2 Light coloured text and symbols or pictograms on a dark background are preferred.

NOTE 3 Information on the LRV of specific colours is given in Annex B.

Where the LRV of a required signboard colour matches that of the background wall colour and neither can be changed, a visually contrasting border should be placed around the sign, equal in width to at least half the x-height of the text used for the sign.

12.4 Tactile and Braille signs and symbols

COMMENTARY ON 12.4

The use of well-contrasted tactile text and symbols can cater for both sighted and blind/partially sighted users. People who are blind or partially sighted and who do not read Braille can still identify, or be aided by, tactile information.

Directional signs, and signs identifying functions or activities within a building, should incorporate embossed letters in a sans serif typeface with a depth of 1.25 mm ± 0.25 mm, a stroke of 1.75 mm ± 0.25 mm, and the edges slightly rounded but not half round in section. 

NOTE 1 Embossed letters are easier to read than indented or engraved letters, especially if their leading edges (left and upper) are sharp and as well-defined as possible.

Graphical symbols on directional and door signs should have a raised contour of the same depth as tactile lettering. Accessible graphical symbols should be used to denote particular components of a facility, for example, sanitary or Changing Places toilets, provision of an assistive listening system, wheelchair viewing spaces and accessible seating.

NOTE 2 Further information on graphical symbols can be found in BS 8501.

Where Braille is to be provided the following recommendations apply.

- Grade 1 Braille should be used for single word or short multiple word signs (e.g. "Special Baby Care Unit").
- Grade 2 contracted Braille should be used to reduce the length of signs incorporating a paragraph of text (e.g. an interpretation sign in a museum).

Where Braille forms part of a sign, a marker (e.g. a notch or tactile shape) should be located at the left-hand edge of the sign to help locate the Braille message (see Figure 10).

NOTE 3 Further information on tactile and Braille signs, including their size and location, can be found in the Sign design guide [34].
12.5 Complementary audible information

COMMENTARY ON 12.5

A number of different wireless devices are available for transmitting information. Because these systems reduce the number of audible announcements produced, noise nuisance is reduced. Invasive audible announcements can be stressful for hearing aid users who rely on additional visual support such as lip reading to understand a message.

Tactile signs should, where practicable, be complemented by audible information for people who are blind or partially sighted.

13 Audible communication systems

COMMENTARY ON CLAUSE 13

In public buildings and in other buildings where services are provided, people who are hard of hearing can benefit from an assistive listening system (which provides sound signals transmitted directly to the person’s ear by their hearing device such as a hearing aid, cochlear implant, bone anchor hearing aid or by the use of separate headsets) or a public address system (sound which is amplified normally through loudspeakers) in those parts of the building where distance, reverberation, acoustics or background noise prevents speech/sound being understood.

13.1 Public address and other communication systems

Public address (PA) systems should be clearly audible and intelligible, and should be supplemented by visual information whenever practicable. PA systems should be in accordance with BS 6259.

PA systems for performances and announcements should include assistive listening facilities for the benefit of people who are Deaf and hard of hearing.

Where possible, systems should be tested by user trials.

**NOTE** Soundfield systems are a form of amplification system which provides an even spread of sound around a room using a number of loudspeakers distributed over the area which requires coverage. Soundfield systems are widely used in classrooms and lecture theatres.

### 13.2 Assistive listening systems

**COMMENTARY ON 13.2**

Assistive listening systems enable sound signals to be transmitted to people who are Deaf and hard of hearing, without interference from background noise or reverberation.

An assistive listening system, using induction loop, infrared or radio transmission, should be installed in rooms and spaces used for meetings, lectures, classes, performances, spectator sport or films, and at help and information points and service or reception counters where the background noise level is not low or where glazed screens are used. Induction loop systems should meet the recommendations given in BS 7594. For infrared and radio transmission systems, the need for the purchase, issue and retrieval, sanitization and maintenance of dedicated receivers and neckloops should be taken into account and planned for.

**NOTE 1** Audio description commentary can generally also be provided on infrared and radio systems.

Where a soundfield reinforcement system is fitted, this should be linked to the induction loop, infrared or radio assistive listening system so that the same microphones can be used with both systems in operation simultaneously.

The type and quality of microphones used for assistive listening systems, and their placement and proper maintenance together with the routing of any induction loop antenna cabling, should be established at an early stage in the design of the building.

**NOTE 2** If chosen correctly, microphones may be those used to feed other sound systems such as PA systems.

Rooms or spaces used for presentations should have line input sockets in accessible locations so that audio sound, or the speech dedicated channel of films, presentations or video soundtracks, can be fed into the assistive listening system.

The performance of induction loop systems should be tested for conformity to BS EN 60118-4 and, where possible, all assistive listening systems should be tested by user trials.

### 13.3 Induction loop systems

**COMMENTARY ON 13.3**

An induction loop system consists of a microphone and an amplifier with the output connected to a continuous loop of wire that produces a magnetic field in the space where users’ heads are expected to be. The system transmits the sound signal to a person’s hearing aid or telecoil-enabled personal listener. The signal can be received when the induction pick-up facility has been selected (generally by operating a switch on the hearing aid to enable a “T” programme to pick up the signal). Induction loops only benefit people whose hearing aids have induction pick-up (T-coil) or who have a listening aid with this facility. Induction loop systems are commonly referred to as hearing loop systems.

Additional guidance on induction loop systems is given in Annex D.

An induction loop system should be used (subject to specialist advice) in rooms or spaces where:

a) a relatively simple but effective system benefiting any user of a suitable hearing aid is required;

b) there is no magnetic interference from electrical equipment in or near the room or space;

c) issue/retrieval/maintenance/security of transmitters and receivers is not viable due to the function of the space or absence of on-site management.
Induction loop systems should be designed such that any spillover from one loop does not affect another loop, or compromise confidentiality.

**NOTE 1** Specialist phased array designs can limit spillover to very low levels.

Specialist advice should be obtained to specify the equipment correctly for the intended use of the space and to ensure that the hearing aid wearer receives the intended benefit.

**NOTE 2** Because induction loops are based on magnetic fields, transmissions can be picked up by other hearing aid users in adjacent rooms or spaces either side of a room, or on floors immediately above or below the space in which the induction loop is being used. This can be a problem in multi-screen cinemas and in locations where confidentiality is required, such as council chambers or courtrooms. Specialist designed phased array systems can overcome many of these issues.

**NOTE 3** The performance of an induction loop system can be affected by:

a) reduction of field strength and intelligibility (caused by reduction of higher audio frequencies) owing to large areas of metal in the building, such as steel reinforcement, metal stud partitioning, suspended ceiling systems and raised computer flooring;

b) interference from other magnetic fields, which can be picked up by the “T” coil in a hearing aid from high power cabling, electricity substations, air conditioning, refrigeration plant, lighting dimmer switches and other electrical equipment, tube screen televisions and visual display units (VDU), and some types of fluorescent lighting.

Induction loop systems should be installed in accordance with BS 7594 and should perform in accordance with BS EN 60118-4. The presence of an induction loop system should be clearly indicated for each looped area by the symbol shown in Figure 9 both at the approach to, and inside, the room or space in which the system is fitted.

The same symbol should be shown on signs or instructions associated with the system, and on any illuminated sign that is provided to show users that the system is switched on and ready for use.

Induction loop systems, particularly those that are not driven by sound feeds from other fixed PA or loudspeaker systems, should have a supplementary fixed monitor receiver in accordance with BS 7594 so that correct operation can be easily confirmed by those holding meetings or managing performances or presentations (not applicable for counter loop systems).

Care should be taken when locating electrical or electronic equipment, as a hearing aid is affected by electrical interference when switched to the “T” position (or the program equivalent).

### 13.4 Infrared Systems

**COMMENTARY ON 13.4**

Infrared systems are commonly used in multi-screen cinemas, theatres and lecture rooms where it is convenient for visitors to borrow headsets from a central source. The binaural sound can approach hi-fi quality if correctly installed and transmitted.

A person who is Deaf or hard of hearing, or someone who wishes to benefit from simultaneous voice-over, such as translation or audio description, can use an infrared system by wearing an infrared headset. Alternatively, the infrared receiver can be coupled to a person’s own hearing aid by means of a small induction loop worn around the neck. Designers need to make the building owner aware that management resources are required for the issue, retrieval, maintenance, hygiene and security of the system. The building owner also needs to provide equal numbers of headsets and neck loop receivers proportional to the seating capacity of the room. The required numbers need to be regularly monitored, but 3% to 4% of capacity of each type is a reasonable starting point. The performance of an infrared system can be compromised by line of sight between the transmitter and receiver, and also by sunlight (modern high-frequency systems are more effective in overcoming this).
Infrared systems should be used (subject to specialist advice) in rooms or spaces where:

a) required confidentiality or containment of transmitted sound cannot be achieved through phased array induction loop design;

b) more than one channel is required for audio description or translation on a second channel;

c) it is feasible to provide receivers for the number of people requiring the service;

d) local interference is likely to prevent an induction loop system being used.

Infrared systems should not operate at frequencies that are low enough to be affected by other infrared sources, such as high frequency fluorescent tubes.

NOTE 1 If excessive magnetic interference exists, this also precludes the use of neck loops by hearing instrument users.

NOTE 2 Because infrared systems are based on light and operate at different frequencies, sound cannot be picked up outside the room in which the infrared signals are generated.

The availability of infrared systems should be indicated by the symbol shown in Figure 9.

Public infrared sound aids that are not driven by sound feeds from other fixed PA or loudspeaker systems should have a supplementary sound monitor or sound-enhancing loudspeaker, so that temporary microphone faults can be readily detected by those holding meetings or managing performances or presentations.

13.5 Radio and Wi-Fi systems

COMMENTARY ON 13.5

Radio systems can be completely portable and are commonly used in schools, colleges and staff training centres where students are moving between a number of classes or lecture rooms, or in art galleries where the tour guide wears a transmitter and moves around the space describing exhibits to visitors wearing receivers. The radio signal can usually be received up to a distance of 60 m. Radio receiver assistive listening systems that allow transmitters and receivers to be switched between different channels can be used in adjacent rooms without picking up overspill sound. They can be susceptible to electromagnetic interference and radio signals from other sources on the same waveband. Designers need to make the building owner aware that management resources are required for the issue, retrieval, maintenance and security of the system.

Radio receiver assistive listening systems should be used (subject to specialist advice) in rooms or spaces where:

a) confidentiality is not an issue;

b) users carry personal receivers for use in different locations;

c) more than one channel is required for audio description or translation on a second or on several channels;

d) the number of people requiring the service can be matched by the number of receivers available.

Large lecture rooms, classrooms and training rooms that are fitted with sound amplifying or sound reinforcement loudspeakers should have microphones that provide output to radio sound aid transmitters.

NOTE New technology which can be considered (with expert advice) is Wi-Fi. The system consists of streaming an audio source connected to a Wi-Fi access point or Wi-Fi infrastructure to transmit the sound signal. The audio stream is received via a Wi-Fi enabled device (smart phone, tablet, etc.) from which the user listens to the amplified sound through their earbuds or similar receiver. The signal can be received via an app having chosen
the appropriate channel to receive the required signal. Wi-Fi can be used alongside traditional assistive listening technologies such as induction loops.

13.6 Inductive couplers

An inductive coupler meeting the performance requirements of BS EN 60118-4 and BS EN 81-70, and additional volume control to adjust amplification, should be fitted into the circuitry of all public or visitor phones, entryphones and emergency telephones in lifting appliances.

NOTE The inductive coupler is for people who wear a hearing aid that has an inductive pick-up, and the volume control is to adjust amplification for people who do not wear an aid but have a significant hearing loss.

Telephones that are suitable for use by hearing aid users should be identified by the symbol shown in Figure 9.

13.7 Alarm/alerting systems

13.7.1 Fire alarm systems

Fire alarm systems should be designed and installed in accordance with BS 5839-1.

A fire alarm should be visible as well as audible to all users; however, audible alarm sounders should not be located in such a way as to compromise the communication systems provided in refuges.

NOTE 1 This is particularly important for people who are blind or partially sighted and people who are Deaf and hard of hearing.

In areas where people are likely to be in relative isolation (e.g. toilets, bathrooms, changing rooms and isolated offices) or in noisy environments, alarm/alerting systems for people who are Deaf and hard of hearing, such as flashing beacons and vibrating devices, should be installed in conjunction with proprietary or conventional fire alarm systems.

A larger number of beacons with low output should be specified rather than a small number of beacons with high output, as these produce glare which can cause confusion and disorientation among building users. The light output of beacons should be chosen to suit the use of particular areas, particularly where individual cubicles are fully enclosed, floor to ceiling.

NOTE 2 Vibrating devices can take the form of wearable paging units.

NOTE 3 Recommendations for fire alarm systems in bedrooms are given in 19.2.10.

NOTE 4 Certain frequencies in flashing/stroboscopic light systems can cause confusion, disorientation, and in some people, epileptic seizures, migraines and nausea.

13.7.2 Emergency assistance alarm systems

An emergency assistance alarm system, where provided, should be designed such that it is not confused visually or audibly with a fire alarm.

An emergency assistance pull cord, coloured red, should be provided with two red bangles of 50 mm diameter, one set at a height between 800 mm and 1 000 mm and the other set at 100 mm above finished floor level.

NOTE 1 An additional pull cord or, preferably, a low-level alarm activator (above the skirting up to a maximum of 200 mm from finished floor level) would benefit somebody who has fallen onto the main floor area, particularly in larger rooms.

The emergency assistance alarm indicator outside the room or compartment should be located such that it is easily seen and heard by people able to give assistance and indicates where help is required.

NOTE 2 An additional alarm indicator may also be sited remotely, e.g. in a permanently staffed area of the building.
The reset control for the emergency assistance alarm should be clearly marked as such and should be reachable from a wheelchair and, where relevant, from the WC, the tip-up seat in a shower facility, or the bed in an accessible bedroom. The reset control should be easy to operate and located with its bottom edge between 800 mm and 1 000 mm above finished floor level. The marking of the reset control should be both visual and tactile.

Visual and audible feedback should be provided to indicate that, when the alarm has been operated, the emergency assistance call has been acknowledged and is being actioned.

NOTE 3 An indication that assistance is on its way can reassure those in distress.

Where alternative methods of activating the alarm system are used, they should be easily identifiable and capable of being activated and deactivated with a closed fist from a seat, the WC pan and the floor.

NOTE 4 It is important that emergency pull cords and other alarm activation devices remain accessible at all times (see Annex A).

14 Lighting

COMMENTARY ON CLAUSE 14

Good lighting is crucial in ensuring that partially sighted people and people with sensory/neurological processing difficulties are able to use buildings conveniently and safely. The illuminance on interior surfaces, the quality of the lighting, good colour rendering and the avoidance of glare are key factors to be considered.

This clause gives general recommendations for lighting. Recommendations for lighting for specific applications are given throughout the document.

14.1 General principles of lighting

COMMENTARY ON 14.1

The reflectance of walls, floors and ceilings influences the flow of light within a room or space. The flow of light affects the view of objects within the space and also the appearance of the human face. People who are Deaf and hard of hearing need to see and understand the movement of lips for lip reading, and hands when signing.

Artificial lighting systems should be designed to maintain a level of illumination that is suitable for people who are blind or partially sighted and is compatible with electronic and radio frequency installations. Where artificial lighting is provided, it should be so designed as to avoid any perception of flicker.


NOTE 2 Natural lighting or daylight has many useful properties including daily and seasonal changes; good colour rendering and daylight are also linked to health benefits. Care is required in the control of daylight to avoid glare and the risk of excessive solar heat gain. Recommendations on daylight design can be found in BS 8206.3.

14.2 Avoiding glare and shadows

COMMENTARY ON 14.2

Glare from bright patches of light within the field of view can be misleading and cause confusion, particularly for people who are blind and partially sighted and people with sensory/neurological processing difficulties. An even illuminance across a room or space is preferred.
Both natural and artificial sources of lighting should be designed to avoid creating glare, pools of bright light and strong shadows.

NOTE Activities that involve precise hand movement, e.g. keypad and entry phone controls, might require specific task lighting.

Uplighters with a light source at floor or low level should not be used as they cause glare and obscure vision.

14.3 Colour rendering

COMMENTARY ON 14.3

The effectiveness of light reflectance value differentials is reduced if artificial light sources give poor colour rendering. The colour rendering of surfaces can be enhanced by the correct choice of lamp as indicated in the SLL code for lighting [37].

Artificial lighting should give good colour rendering of all surfaces.

NOTE The prominent use of strong colours, either in light sources or on surfaces, can lead to sensory overload for some people with sensory/neurological processing difficulties.

14.4 Illumination for lip reading

Where one-to-one communication is important, e.g. between a public official and a member of the public, lighting should illuminate the face of the person speaking to make it easier for a person lip reading.

Where the communication is to an audience, the lighting should ensure that the faces of all those engaged in the communication process are illuminated.

15 Facilities in buildings

15.1 Seating in general waiting areas

COMMENTARY ON 15.1

Seating can be essential for people in terms of providing somewhere to stop and rest, but can also be a valuable tool in creating a place or space which is welcoming and inviting in which people will choose to spend time.

The provision of sufficient space to manoeuvre and the design of individual chairs or seating are important factors to consider in the design of a building, if people are to use the building independently. These factors are particularly important if the seating is used for long periods, e.g. at airports or in outpatients departments.

If a seat is too high or too low, or if there are no arm rests or side supports, a person can experience considerable discomfort as a result of poor posture. A person might also have difficulty rising from a seated position if the seat is set too low, or if it has no arm rests. Sitting on a slight slope can be very uncomfortable for wheelchair users.

This subclause applies to general waiting areas on a level floor in public and commercial buildings, including reception areas, but excludes closely seated auditoria, e.g. theatres and cinemas, which are covered in 20.7.

Space for additional facilities such as parking for push chairs and play areas for children can be advantageous. Provision of secure push chair storage might also be appropriate.

Large open-plan waiting areas can cause sensory and neurological overload for some people and quiet spaces are therefore beneficial (see 16.6 and 19.3).
It is desirable that accessible toilets are provided within easy reach of general waiting areas.

15.1.1 Types of seating

A mixture of seating options, e.g. fixed or removable, with or without arm rests, should be provided for customers or visitors to a building.

Where a significant number of seats are provided in one location, 50% of the seating, or single seats in isolation, should provide the following accessible features.

a) Where possible, a variety of seat heights should be provided: 380 mm, 480 mm and 580 mm from finished floor level. Where only one seat is provided the seat height should be between 450 mm and 480 mm from finished floor level.

NOTE A seat height of 380 mm is suitable for people of short stature; 480 mm allows for lateral transfer onto the seat by wheelchair users; and 580 mm is suitable for people who require a higher seat.

b) For some seats, back support and arm rests should be provided as some people requiring support need both.

c) To enable a wheelchair user to transfer laterally onto a bench seat, a level transfer space 1 200 mm wide should be located at one end, with an arm rest set in 500 mm to 750 mm from the transfer space. Where there is more than one bench seat, a choice of left and right transfer should be provided.

d) Arm rests should be provided to help people lower themselves onto the seat and stand up. These should be provided at a height of 200 mm from the surface of the seat, and should extend from the back support forwards to cover at least 80% of the depth of the seat. Arm rests should contrast visually with the remainder of the seat to ensure that they are easily identifiable. There should be a space between arm rests of at least 500 mm.

e) Back support should be provided at a height of at least 300 mm from seat level.

15.1.2 Provision and location of spaces for wheelchair users

Space for wheelchair users, and increased spacing between rows in seating in general waiting areas, should be provided and should reflect the type of building and its anticipated and potential use.

The floor of wheelchair spaces should be level.

Seating should be located such that it does not reduce corridor widths or circulation space when in use by a variety of people, including people with luggage or shopping, people with pushchairs, and people using mobility aids or assistance dogs, all of whom require extra space around the seating to use it.

In transport interchanges, stations and large complexes such as shopping centres, seating should be provided at intervals of not more than 50 m.

15.1.3 Access

Access to seating in general waiting areas should be direct and unobstructed.

Seating areas should be located such that they are easily identifiable by people who are blind or partially sighted.

The clear space for access to seating should be:

a) 900 mm minimum in front of a row of seats (1 200 mm where practicable), to allow access by people with crutches along a cross-aisle (see Figure 11);

b) 1 050 mm wide × 2 300 mm deep to allow for manoeuvring a wheelchair into a designated space from a circulation route at right angles (e.g. between rows of seats) (see Figure 12).
NOTE 1 The clear space may be part of the general circulation/access route.

NOTE 2 These spaces for access may either be permanently allocated, e.g. if required for means of escape from fire, or created by means of easily removable seating, when required.

NOTE 3 The clear space allowance for a wheelchair user once in a parked position is 900 mm wide × 1400 mm deep. The wheelchair spaces in Figure 12 are set out so that the person in the wheelchair and the person seated alongside are in line with each other.

Figure 11 — Space needed to allow access by people using crutches
Figure 12 — Spaces for wheelchair users in a general seating layout

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Greater leg room for people in standard seating</td>
</tr>
<tr>
<td>2</td>
<td>Unobstructed access of 900 mm min. (1 200 mm if practicable)</td>
</tr>
<tr>
<td>3</td>
<td>Space for assistance dog (with seat folded up)</td>
</tr>
<tr>
<td>4</td>
<td>2 300 mm × 1 050 mm wheelchair manoeuvring space where a wheelchair user needs to pass in front of other wheelchair users or seated people</td>
</tr>
<tr>
<td>5</td>
<td>900 mm wide × 1 400 mm deep space allowance for a wheelchair when parked</td>
</tr>
</tbody>
</table>

NOTE To achieve a more direct relationship between a wheelchair user and a person in adjacent standard seats, the seats at “A” have been moved back and seats at “B” have been moved forward. The wider access between rows provides greater leg room.

15.1.4 Seating layouts

Seating layouts should allow the option of two wheelchair users sitting next to each other, or a wheelchair user sitting next to a user of standard seating.

One space (the size of a standard seat) within or at the end of a block of seating should be provided for an assistance dog to rest.

NOTE Assistance dogs include guide dogs and hearing dogs.

A mixture of fixed and removable seats should be provided to allow flexibility.

15.1.5 Visual clarity and orientation

Seating should contrast visually with the surrounding surfaces.

Signs and public display screens in seating areas should meet the recommendations in 17.6.2 and Clause 12 for correct reading distances and text sizes.
If large rooms or spaces used as public waiting areas need to be broken down into smaller units, this should be done by an appropriate combination of physical division, lighting, furniture arrangements and floor coverings. Clear signs to the different areas or functions should be provided.

NOTE 1  This approach is particularly appropriate in, for instance, a large outpatients department in a hospital with several reception desks, or a waiting area within a transport interchange.

NOTE 2  Breaking down a large room or space into smaller units gives an opportunity to provide a quiet space (see 19.3).

15.1.6  Acoustics

In seating areas where public address systems are installed, suitable ceiling, wall and floor materials should be used in accordance with 11.2.

15.1.7  Audible communication systems

Audible information given out by a public address system should also be available in visual form.

NOTE  This is particularly important in, for example, transport termini, but it would also be of benefit in a doctor’s surgery.

Where background noise is likely to be a prominent feature of a seated waiting area, an induction loop system, in accordance with BS 7594 and 13.3, should be provided and indicated by the standard “T” switch symbol (see Figure 9).

15.2  Storage facilities

15.2.1  Access to storage facilities

Storage facilities, where provided, should be clearly indicated, and access to them should be direct and unobstructed. Wherever feasible, storage facilities should include some knee spaces. The locks and door furniture for accessible storage facilities should be between 750 mm and 1 000 mm above finished floor level.

The distance between opposing banks of storage facilities (e.g. shelving, storage units, filing cabinets or lockers) should be at least:

a)  1 200 mm if some knee spaces are provided;

b)  1 500 mm if no knee spaces are provided (see Figure 13).
15.2.2 Height of shelving or surfaces within storage units

Wherever practicable, shelving should be positioned such that it can be reached independently, taking into account the type and frequency of the activity being carried out (see Figure 13, Figure 14, and Annex E).

Where storage facilities are intended for use by a particular person, e.g. in a place of employment, they should be customized according to the individual's requirements.

**NOTE 1** Where a wheelchair user or a seated person is accessing storage from the front, shelving is best positioned:

a) not higher than 1 150 mm and not lower than 650 mm, if use is infrequent; and
b) not higher than 1 000 mm and not lower than 650 mm, if use is frequent (see Figure 13).

**NOTE 2** Where a wheelchair user or a seated person is accessing storage from the side, shelving is best positioned:

a) not higher than 1 170 mm and not lower than 630 mm, if use is infrequent; and
b) not higher than 1 060 mm and not lower than 665 mm, if use is frequent (see Figure 14).

Bookshelves or drawer pulls for use by wheelchair users should be not lower than 400 mm from the floor. Shelving for use by people who can stand but have reach difficulties and difficulties bending should be not higher than 1 500 mm and not lower than 750 mm from the floor where use is frequent and not higher than 1 625 mm and not lower than 700 mm from the floor where use is infrequent, so that stored items can be seen clearly and reached comfortably (see Figure 14 and Annex E).

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**Figure 13 — Access to storage from the front when seated**

![Diagram showing dimensions for access to storage from the front when seated]

**Key**

1. Locker/filing cabinet
2. Line of obstruction (e.g. wall or storage)
3. Shelving
4. Mobile storage unit
5. Comfortable reach range above finished floor level — 650 mm for low shelf to 1 000 mm for high shelf (1 150 mm for high shelf when use is infrequent)
6. Clear space from obstruction to front of shelf where a knee space is provided
7. Clear space in front of cabinet where there is no knee space

*a* Use of lower drawer requires access from side. Mobile storage units increase flexibility of use.
15.2.3 Fittings for storage facilities

Adjustable fixtures and fittings should be used as part of storage and shelving systems if facilities are being customized to meet the requirements of a particular disabled person.

*NOTE* The use of mobile storage units (e.g. those on castors) can assist greatly in meeting accessibility requirements.

In the interests of safety, projecting door and drawer hardware should contrast visually with its associated storage facilities and have no sharp edges.

Handles on hinged and sliding doors should be easy to grip and manipulate and should meet the recommendations in 8.4.

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

Side-hung doors of storage systems should open through 180° to avoid the risk of collision by a passer-by when open.

15.2.4 Visibility of storage facilities

The location and appearance of storage facilities should be suitable for people who are blind or partially sighted. Cupboards and shelves should contrast visually with their immediate surroundings and should not have highly reflective surfaces (see Clause 11).

Lighting should be provided within walk-in cupboards.
15.3 **ATMs and other coin and card operated devices**

COMMENTARY ON 15.3

It is important that people of varying stature, people with varying degrees of flexibility, manual dexterity and sensory perception, and wheelchair users can use, reach and interact with coin and card operated devices, such as food and drink dispensers, car park controls and automatic teller machines (ATMs).

Access to coin and card operated devices can be restricted by the inability to reach from a sitting or standing position, and by the wheels of a wheelchair and its foot rest extension.

15.3.1 **Location of devices**

Routes to coin and card operated devices should be direct and unobstructed.

The location of coin and card operated devices should be clearly signposted and easily identifiable. Card and coin operated devices, in particular ATMs, should be located in areas that are overlooked by people, and well lit at all times.

Display screens should be carefully shielded from ambient lighting, including sunlight, to prevent glare and reflection, thus ensuring that a sharp image is visible by both standing and seated users.

Signs indicating the location of coin and card operated devices should be clearly visible and meet the recommendations in Clause 12. The overall size and height of signs and the size of text and symbols should meet the recommendations in Clause 12.

Signs should be located above coin and card operated devices and be visible from the side as well as the front. Signs over coin and card operated devices should have integral illumination that is activated at night and during overcast days.

If feasible, coin and card operated devices situated on the external face of a building should be protected from the weather.

15.3.2 **Access to ATMs**

COMMENTARY ON 15.3.2

Wheelchair users and people of short stature are especially vulnerable to other people seeing keyboard operations and information on screen. A defined privacy area, within which people waiting are discouraged from standing, is an important design element that helps private transactions remain confidential.

Areas that are well lit, and also overlooked by other activities, provide a measure of protection for people using ATMs.

In all but exceptional circumstances, an ATM should be positioned clear of the adjacent circulation route, but in view of it.

NOTE Further guidance is given in Access to ATMs [38].
15.3.3 Operation of devices

COMMENTARY ON 15.3.3

For security and privacy reasons, many wheelchair users might not wish to use a device such as an ATM while reaching from the side.

Unless there are exceptional circumstances due to the particular construction of a building, a knee recess at least 500 mm deep and 700 mm high should be provided at the front of a coin or card operated device to allow any user to operate it from the front.

15.3.4 Operating instructions

Instructions for using coin or card operated devices should have a clear, large typeface. Text should be clear and easy to understand (see also Clause 12).

Universally recognized pictograms (see 12.1.4) should be used, as well as text.

15.4 User interfaces with touch screens

Touch screen interfaces are not accessible to many people, particularly people who are blind or partially sighted, people who have limited dexterity and people with sensory/neurological processing difficulties; and they should therefore not be used as the only means of accessing a service.

When controls or information are provided via the use of touch screens, the interface should give users access to a full range of options including:

a) communication and orientation via more than one sensory channel;
b) alternative colour schemes to convey information;
c) magnification and contrast;
d) audible information with user control of volume available by both headphone and speaker;
e) user preferences for sequential control and alternatives to fine motor control;
f) modes of operation for users with limited reach and strength;
g) avoidance of triggering photosensitive seizures and scotopic sensitivity;
h) a physical button to summon assistance if required.

15.5 Windows and window controls

COMMENTARY ON 15.5

Ease of access to, and use of, windows and window controls are important considerations in window design. The view through windows from a seated position is also an important consideration for wheelchair users and others who might spend much of their time sitting down.

The position of window controls and the forces needed to operate them need to be taken into account if wheelchair users and people with ambulant mobility impairments are to have easy access to windows. It is also important that furniture, both fixed and loose, does not obstruct access to the controls.

Window furniture needs to be easy to find, reach and use by people who have sight, hearing, movement and dexterity impairments.

Powered window systems eliminate the need for people to open and close windows manually. Such controls can be fitted to the following types of window:

• casement: side, top and bottom hung;
• pivoting: vertical or horizontal;
• sliding sash: vertical or horizontal;
• tilt and turn.

The use of remote activators can eliminate the need to reach windows that are inconveniently placed, such as above kitchen sinks.

15.5.1 Heights of window sills and transoms

To allow wheelchair users and seated people to enjoy a reasonable view below eye level, any fixed glazing above a solid wall or opaque infill panel should start not higher than 800 mm above finished floor level and any glazing in an openable light should start as close as practicable to 800 mm (but see also Note 2).

**NOTE 1** It is important for the avoidance of eye strain for a person to be able to change the focus of their eyes to distant objects (at least 6 m away) at frequent intervals.

**NOTE 2** The height recommendations do not apply where the function of a window is purely to provide light and/or ventilation (e.g. clerestory windows). Where such windows require opening mechanisms, the recommendations in 15.5.2 apply.

For safety reasons, any glazing below 800 mm from the floor should be safety glazing and should follow the recommendations in BS 6262-4 in respect of impact resistance.

No transoms should be positioned between 800 mm and 1 200 mm above finished floor level, except in cases where guarding is required (see Note 3).

**NOTE 3** Guarding to ensure the safety of occupants takes priority over the provision of unobstructed glazing. Statutory requirements for guarding dictate the lowest level for the opening part of a window. Risk assessments might also recommend a minimum guarding height.

Where a window opens directly on to a pedestrian access route, either precautions should be taken to limit the projection to less than 100 mm, or barriers should be provided to avoid the risk of people, particularly people who are blind or partially sighted, colliding with the open window (see also 7.2).

On upper floors, top hung or horizontal pivot windows with a sill below 1 100 mm above finished floor level should be fitted with a restrictor stay, in accordance with [BS 8213-1](#), that prevents the window being opened more than 100 mm, so that people who are unsteady on their feet, or who are blind or partially sighted, are not put at risk when reaching for the handle, and children are unable to put themselves at risk by opening the window. The restrictor stay should be capable of being disengaged in an emergency or for window cleaning and maintenance.

15.5.2 Window controls

**COMMENTARY ON 15.5.2**

Controls that have to be gripped to be operated present difficulties for many people with limited dexterity.

Buildings should have easily accessible fastenings for opening and closing windows, located between 800 mm and 1 000 mm above finished floor level.

As far as is practicable, window controls should be designed so that they can be operated by someone with a closed fist or with the side of a wrist or arm. They should not require the simultaneous use of two hands.

**NOTE 1** To remain effective, window controls need to be checked, cleaned, repaired or replaced on a regular basis. Torque force characteristics also need to be monitored on a regular basis.

The type and location of controls for opening and fastening windows should be chosen to meet the reach and dexterity capabilities of potential users, without compromising security. Lever handles should be used in preference to knobs.

Horizontal sliding windows should be capable of being opened and shut using limited force.
The torque force required to operate a lever handle should not exceed:

a) 8 N·m to depress and 5.5 N·m to lift a handle with an oval cross-section;
b) 4 N·m to both depress and lift a handle with a rectangular cross-section.

**NOTE 2** Torque force (in newton metres) is the force (in newtons) exerted over a distance of 1 m.

**NOTE 3** Powered window controls eliminate the need to move towards a fixed mounted switch.

The following aspects should be taken into account if powered window controls are to be installed in a building:

1) the type of activator;
2) the location of a wall-mounted keypad;
3) the design of a remote control device;
4) the type of operation, e.g. by continuous pressure or a single press.

**NOTE 4** Further guidance on power-operated controls is given in BRE Report BR334 [29].

Window controls should contrast visually with their background for the benefit of partially sighted people.

### 15.6 Public telephones and internet booths

**COMMENTARY ON 15.6**

Despite the prevalence of personal mobile phones, public payphones are useful at transport termini, shopping centres, pick-up points, and meeting or information points. New types of interactive information technology might enhance the usefulness of information points.

#### 15.6.1 Provision and location of accessible telephones and internet booths

In buildings in which telephones or internet booths for public use are provided, at least one device mounted at a height suitable for use by a wheelchair user should be provided in an accessible location, preferably in the entrance space.

Where several accessible devices are provided, they should be positioned at different heights to suit people with ambulant mobility impairments and wheelchair users.

A fold-down seat (450 mm to 520 mm high) or a perch seat (650 mm to 800 mm high) should be provided for the convenience of people with ambulant mobility impairments. Drop-down arms should be provided for each seat.

Where practicable, devices should be located to enable wheelchair users to approach and use the device from both the front and the side.

Where it is only possible to approach a device from the front, a knee hole at least 500 mm deep and 700 mm high should be provided (see for example Figure 15).
Where acoustic hoods are provided, they should be designed and mounted in such a way that they are not a hazard, i.e. by ensuring that they are located outside the width of the access route or by means of a hazard warning (see 7.2).

NOTE 1 Items projecting into a circulation space, particularly if they have sharp edges, can cause injury.

NOTE 2 Warning of a hood projection or the presence of a shelf can be achieved by a solid plinth providing cane detection and guarding.

A shelf should be associated with all public telephones and internet points.

Directions to accessible telephones should be clearly marked by combining the International Symbol of Access (ISA) with a telephone symbol. Markings on directions should be both visual and tactile (see Clause 12).

NOTE 3 Text telephones at reception desks can assist people who are Deaf and hard of hearing.

### 15.6.2 Telephone controls

Telephone controls on accessible telephones for wheelchair users should be angled so that they can be used by people when seated or when using a perch seat.

Telephone controls should be located between 750 mm and 1 000 mm above the floor (see Figure 15).

To benefit people who are blind or partially sighted, telephones should be selected which have well-lit keypads, large embossed or raised numerals that contrast visually with their background, and a raised dot on the number 5.

Instructions for using telephones should be clear. They should be displayed in a large easy-to-read typeface (see Clause 12).

### 15.6.3 Telephone booths

A clear floor space of at least 1 850 mm × 1 200 mm should be provided within a telephone booth with accessible phones for use by wheelchair users (see Figure 16). Doors should not obstruct the clear space (i.e. outward opening doors should be installed wherever possible).
Any doorway to a telephone booth should have a minimum clear width of 800 mm (the minimum clear width should be 900 mm where practicable).

Support rails should be provided adjacent to any seating in accessible telephone booths.

Telephone booths and fittings should contrast visually with the surrounding walls (see 11.1).

A tactile telephone symbol should be placed outside an accessible telephone booth (see Figure 17).

**Figure 16 — Key features of a telephone booth for wheelchair users**

<table>
<thead>
<tr>
<th>Key</th>
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**Figure 17 — Tactile telephone symbol**

Embossed telephone symbol between 1 400 mm and 1 700 mm from the floor and within 150 mm of the door or booth opening
15.7 Building services (outlets, switches and controls)

COMMENTARY ON 15.7

Ease of operation, visibility, height and freedom from obstruction are key factors that affect the use of building services.

It is important that outlets, switches and controls are positioned consistently within a building and meet the requirements of a variety of people, e.g. wheelchair users, people who are blind or partially sighted, people with sensory/neurological processing difficulties, people who are Deaf and hard of hearing, or people who have limited dexterity or limited reach.

The height of outlets and controls may differ according to the frequency of use or the force needed to operate them.

All users need to be able to locate a control, know which setting it is on and use it without inadvertently changing its setting.

15.7.1 General

All controls should not require the simultaneous use of two hands.

All controls should contrast visually with the background against which they are seen, with information associated with them embossed to aid tactile reading (see Clause 12).

Electrical socket outlets should be switched. Switches should indicate clearly whether they are on or off and should be positioned on the outside of the socket outlet.

Individual switches on panels, including the control of multiple outlets, should be separated to allow the correct selection of the required control and avoid the inadvertent selection of an adjacent control.

NOTE The ability of people who are blind or partially sighted, and people with limited dexterity, to detect and use switches and controls is helped by the use of large touch plates.

Mains and individual circuit isolator switches should be clearly identified and their on/off status should be immediately apparent.

Red and green should not be used as indicators of “ON” and “OFF” on switches and controls without clarification by text or pictogram, as they are the most commonly confused colours for people who are partially sighted or colour-blind.

15.7.2 Location of outlets, switches, controls and meters

All outlets, switches and controls, including two-way switching, should be positioned consistently in relation to doorways and corners within a building and in a logical sequence to suit passage through the building.

NOTE 1 By using vertical strips as switches, instead of single height switches, users can operate the switch at whichever height is convenient for them.

As far as is practicable, light switches should align horizontally with door handles for ease of location when entering a room.

Electrical wall socket outlets, telephone points, and television and data sockets should be located at least 400 mm but not more than 1 000 mm above the floor. Socket outlets whose plugs are likely to be removed and replaced frequently should be located at the top of the range (see Figure 18).

NOTE 2 Switches close to the floor or skirting are difficult and dangerous because they require users to stoop or kneel to operate them. The higher the socket outlet, the easier it is to push in or pull out a plug. However, there might be circumstances in which floor sockets are required (e.g. in commercial developments for health and
safety reasons, to avoid trailing cables), in which case additional measures are needed to ensure access, such as integrating accessible sockets within fixed or movable furniture.

Switches for permanently wired appliances (e.g. fused spurs or reset switches for alarm calls) should be mounted within the range between 750 mm and 1 200 mm (see Figure 18).

Meters should be mounted between 1 200 mm and 1 400 mm from the floor so that the readings can be viewed by a person standing or sitting. Pre-pay meters should be accessible, but protected so children cannot tamper with them.

All switches and controls that require precise hand movement/dexterity, e.g. for heating installations and ventilation, should be in a zone 750 mm to 1 000 mm from the floor (see Figure 18) so that wheelchair users and people standing can operate them.

The maximum height of simple push button controls, including isolator switches and circuit breakers, that require limited dexterity should be 1 200 mm (see Figure 18).

Emergency “break glass” panels and door releases should be mounted between 1 000 mm and 1 200 mm from the floor.

Outlets, switches and controls should be at least 350 mm from room corners (see Figure 19).

**Figure 18 — Heights to the centre of outlets, switches and controls**

<table>
<thead>
<tr>
<th>Dimensions in millimetres</th>
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<tbody>
<tr>
<td>1400</td>
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<td>1200</td>
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<td>7</td>
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</tbody>
</table>

**Key**

1. Upper limit for all controls/outlets
2. Range for meter indicators
3. Range for light switches
4. Range for controls needing precise hand movement
5. Range for permanently wired switches
6. Range for socket outlets
7. Lower limit for telephone and TV sockets
15.8 Assistance dog toilets/spending areas

Assistance dog toilets or spending areas should be provided in certain locations to allow people who use assistance dogs to toilet their dogs in a safe and clean manner.

NOTE Further guidance on where to provide these facilities and how to design them can be found in the Guide Dogs for the Blind Association publication Guidance on the provision of spending facilities for guide dogs and other assistance dogs [40].

16 Counters and reception desks

COMMENTARY ON CLAUSE 16

The recommendations in this clause apply principally to customers and visitors rather than to staff. The design of the staff side of counters and reception desks is normally subject to ergonomic task analysis, and staff workstation assessments are required to accommodate an individual’s specific needs. Convenient access to counters and reception desks is essential for people to make full use of a building, whether as a visitor, customer or as a member of staff providing a service. Wheelchair users and people with ambulant mobility impairments need space to manoeuvre up to a counter, then move closer to it, e.g. to complete a form or make a booking. The design of counters and reception desks needs to take into account a wide range of factors including:

- the length of time for which customers or visitors will use the counter;
- the ergonomics of the staff work station;
- the need for security measures, passive or active such as rising screens;
- the complexity of any interaction required, for example completing complex paperwork, making a simple enquiry or using payment systems.

Disabled people often feel that the provision of a separate low level counter limits their choice and can lead to extended wait times. There might be a degree of stigma associated with such arrangements. Unless permanently staffed, such arrangements can also create operational problems regarding accountability for transactions undertaken at a given counter. Some people, particularly tall people, find wheelchair-accessible counters inappropriate.
16.1 **Location and access for visitors and customers**

Counters or reception desks should be located such that they are easily identifiable from a building entrance by people who are blind or partially sighted (see 8.6.2).

Where external noise might be a problem, reception areas should be located away from entrances.

*NOTE* People who are Deaf and hard of hearing might have difficulty understanding speech if the noise level in the reception area is too high (see also 16.7).

Signs associated with counters and reception desks that are located in busy areas such as shops and theatres should be large enough to be read at a distance and placed at a height that is convenient for wheelchair users to read. Text should be in a clear and uncomplicated typeface with a consistent thickness of stem, using upper case for the first letter and lower case for the rest of the sentence in accordance with Clause 12.

The approach to the edge of a counter or desk should be direct and unobstructed.

Where waiting and queuing is the normal pattern of use, permanent or temporary control barriers or other obstructions should allow for wheelchair users to turn towards the counter or desk, to pass behind a person already in position at another window or desk, or to turn around and leave. A place should also be provided where one wheelchair can pass another.

16.2 **Space in front of a counter or reception desk**

The clear manoeuvring space in front of a single counter or reception desk should be $1500 \text{ mm} \times 1500 \text{ mm}$ deep.

Where multiple counters or reception desks are provided and users are required to pass behind other occupied counters or reception desks, the clear manoeuvring space should be increased to $1800 \text{ mm}$ deep for the full length of the counters or desks installed (see Figure 20).

**Figure 20 — Access on customer side of a counter or desk**

![Dimensions in millimetres](image)

**Key**

1. Counter/desktop
2. Queue management system or other obstruction

16.3 **Counter and reception desk dimensions for visitors/customers**

All customer counters or reception desks should include two work surface heights to accommodate customers or visitors standing and sitting (including wheelchair users), as appropriate to the circumstance (see Figure 21).
Where space permits (e.g. reception or interview counters), a width of 1 800 mm should be provided, to allow for two wheelchair users to be positioned side by side or facing each other across the counter diagonally [see Figure 22a].

NOTE 1 This width allows space for a companion to sit beside a wheelchair user. It also allows wheelchair users on different sides of the counter to sit diagonally opposite each other when there are knee recesses.

For transactional counters (e.g. banks and ticket offices) where customers and staff are directly opposite each other, the lower level counter surface should extend for a width of at least 800 mm [see Figure 22b].

The datum level for establishing correct counter heights should be the finished floor level on the customer/visitor side of the counter or desk.

NOTE 2 To maximize accessibility, the floor level each side of the counter needs to be the same.

Where a chip and PIN device is provided, it should be usable by both seated and standing customers.

Figure 21 — Key dimensions of counters and reception desks

NOTE 1 The dimensions allow a visitor in a wheelchair to bring the arms of their wheelchair to the edge of the counter in order to read and sign a paper.

NOTE 2 Profiling the space below a counter will allow a number of structural support solutions.

Key
1 Upper writing surface for standing visitors/customers at 950 mm to 1 100 mm above the floor
2 Height of knee recess 700 mm min. above the floor
3 Counter top between 760 mm and 860 mm above the floor
4 Depth of knee recess 300 mm min. where rising security screens are required or for brief transactions, and 500 mm min. for longer transactions (or 400 mm for counters that are designed for customers and staff to be directly opposite each other)
Figure 22 — Space dimensions for counters allowing access for two wheelchair users

The clear height from the floor surface to the underside of the counter or its support rail should be at least 800 mm, in circumstances where the activity can be carried out without the need for the arm rest of a wheelchair to be under the work surface, or where a person is likely to have a wheelchair with desk arms (see Annex E).
The profile of the space beneath a counter or reception desk should be as shown in Figure 21 to accommodate foot rests and knees and, where appropriate, arm rests of wheelchairs (see also Annex E).

For counters that are designed for customers and staff to be directly opposite each other, the depth of the knee recess should be a minimum of 300 mm where it is necessary to accommodate large security devices (such as rising screens). Where there are no security devices a depth of 400 mm should be provided. The clear space beneath the counter top and support rails should be maintained for a width of at least 1 400 mm to allow for the angled positioning of a wheelchair.

Reception desks that are designed for visitors to be positioned diagonally across from staff should provide a 500 mm deep knee recess maintained for a minimum width of 700 mm.

16.5 Profile of work surface
Where tickets or coins are involved in transactions, an upward sloping leading edge should be provided at the front of a counter to help people with limited dexterity to grip coins.

16.6 Communication
Where a glazed security screen is used above a counter or reception desk, an induction loop system, in accordance with BS 7594 and the recommendations in 13.3, should be provided in addition to a speech transfer system. It should be clearly indicated with the standard “T” switch symbol (see Figure 9).

Where background noise is excessive, alternative communication aids (such as headsets and VDUs) should be made available.

To facilitate lip reading, lighting design should ensure that both the receptionist’s and the customer’s faces are evenly lit. Security screens should be designed to ensure that reflections are avoided.

16.7 Acoustics
Acoustics within reception areas should be conducive to clear verbal communication.

**NOTE** Sound attenuation can help deaden reverberating noise and allow staff and customers to concentrate on a transaction.

Where public address systems are installed near counters or reception desks, suitable ceiling, wall and floor materials should be used in accordance with 11.2.

16.8 Permanent or temporary control barriers for queuing
The spacing of control barriers used for waiting and queuing should allow wheelchair users to manoeuvre to the reception point, turn to face the receptionist, and leave, without excessive changes of direction. Such barriers should contrast visually with the background against which they are seen.

**NOTE 1** Excessive changes of direction can be reduced by use of removable sections of barrier to permit users to bypass lengths of queuing space when user numbers are low.

The width between control barriers for waiting and queuing should be not less than 1 200 mm clear with a minimum dimension of 1 500 mm at every change of direction. The entry point should be clearly identifiable.

The space between any queuing barriers and any obstruction, wall, reception or serving point should be at least 1 800 mm wide. This width would be suitable in front of a reception point or serving point where a knee recess is incorporated into the reception or serving point; where such a knee recess is not incorporated, a width of 2 200 mm should be provided, to allow a wheelchair user to pass behind another wheelchair user who is being served.
Wherever possible, barriers with rigid rails top and bottom should be provided, the top one ensuring stability for people who need to lean or rest on a barrier when queuing, and the lower one being usable as a tapping rail with its underside not higher than 150 mm above finished floor level. The feet or base of temporary or permanent barriers should not project into the minimum clear width of any access route.

If retractable belt barriers are unavoidable for operational reasons, the belt element should be provided top and bottom, with the lower belt being not higher than 150 mm above finished floor level.

Seating should also be provided close to any barred queuing area to accommodate people who are unable to stand for extended periods.

NOTE 2 For management information on temporary control barriers, see Annex A.

16.9 Space for secure and private transactions

If a room or space adjacent to counters is provided for the purposes of privacy and security, it should be in accordance with B.6.4.

17 Audience and spectator facilities

COMMENTARY ON CLAUSE 17

This clause applies to audience seating in a wide range of applications, including lecture theatres and conference facilities, on either flat or raked floors. It also includes small teaching spaces such as seminar rooms. It does not include recommendations on audience seating in closely seated auditoria, such as theatres, which is covered in 20.7.

Good sight lines and lighting are especially important for people who are Deaf and hard of hearing to lip read or to interpret sign language adequately within a group setting, or for people who rely on performance captioning.

The acoustic and visual environment, accessibility and disposition of seating areas and related facilities are of critical importance for the effective interaction of teachers, trainers and performers with students and audiences.

Complete acoustic privacy in a self-contained booth would also be of benefit to some people with speech, language, communication and sensory/neurological processing difficulties.

17.1 Provision of seating

Within audience facilities, seating suitable for people with varying access requirements should be provided (see 15.1.1).

NOTE It is desirable for such seating to be, as far as possible, available on request and released for use if not specifically required for an event.

For people who prefer to transfer from their wheelchairs, secure storage space for wheelchairs should be provided within a reasonable distance.

The minimum provision of wheelchair spaces and accessible seating for audience and spectator use should be as shown in Table 6.

Some seating should be provided with arm rests to both sides of the seat in order to provide additional support. Where arm rests are provided, it should be possible to move them out of the way by either raising or removing them.

The seating should be provided with sufficient depth in front of the seat for assistance dogs or mobility aids.
The route from accessible seating to toilets should itself be accessible.

### Table 6 — Provision of accessible viewing in audience seating

<table>
<thead>
<tr>
<th>Seating capacity</th>
<th>Provision of wheelchair spaces</th>
<th>Provision of accessible seating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Permanent</td>
<td>Removable</td>
</tr>
<tr>
<td>Up to 600</td>
<td>2% of total seating capacity</td>
<td>A further 1% of total seating capacity</td>
</tr>
<tr>
<td>Over 600 but less than 10 000</td>
<td>2% of total seating capacity</td>
<td>A further 1% of total seating capacity</td>
</tr>
</tbody>
</table>

**NOTE** Percentages need to be rounded up to determine the recommended number of spaces. For seating capacities of 10 000 or more, guidance is given in Accessible stadia: a good practice guide to the design of facilities to meet the needs of disabled spectators and other users [41]. Specific guidance for sports facilities is given in Accessible sports facilities [16].

### 17.2 Provision of wheelchair spaces in audience seating

**COMMENTARY ON 17.2**

The provision of wheelchair spaces reflects the ability to use removable seating to increase the provision in response to changes in demand.

The provision of wheelchair spaces in audience seating should be as shown in Table 6.

The arrangement of wheelchair spaces and removable seating should permit a wheelchair user to sit alongside another wheelchair user or a seated companion.

**NOTE** In fixed seating layouts, loose chairs may be used in these spaces when not occupied by wheelchairs, subject to means of escape requirements.

Wheelchair spaces should be located in different parts of the auditorium to provide a range of vantage points, provided that the view is unobstructed.

### 17.3 Access to audience seating

Seating allocated to disabled people should be on an accessible route, free from obstructions and conveniently located. Seating should contrast visually with the surrounding surfaces in accordance with the recommendations in Clause 11.

Seating for disabled people should not obstruct participants, or other members of the audience.

Sight lines should allow people to view projection screens and high-level electronic text devices, as well as people providing sign language interpretation.

The space for access to seating, including manoeuvring space for wheelchair users and people with ambulant mobility impairments, should meet the recommendations in 15.1.3.

The provision of adequate sight lines for people in unfixed seating on a level floor should be in accordance with Figure 23.

**NOTE 1** In rooms with level floors that are used for entertainment, lectures or meetings, people who rely on lip reading or sign language are disadvantaged if they cannot see either the person who is addressing the audience, or the face and hands of a sign interpreter. A person of small stature, or a wheelchair user, might also be disadvantaged if they are not allocated spaces with clear views.

**NOTE 2** For reading sign language, the viewer is best positioned in front of and within 45° either side of the direction the person is signing.

**NOTE 3** For lip reading, the most effective distance between the speaker and the reader is between 900 mm and 1 800 mm.
Figure 23 — Sight lines for unfixed seating on a level floor

a) Sight lines for people standing and sitting

NOTE Staggered seating offers more opportunity for positions with better sight lines. Seats marked “F” offer more leg room for tall people or those with restricted leg movements. (These seats could also be higher and wider.)

b) Part plan of seating

Key
1 Row with wider access
2 Side aisle
3 Seats removed
A Person standing
B Small person seated or a wheelchair user – in this position their view is likely to be restricted
C Person seated
D Seating in the front row is convenient for wheelchair users and people who rely on lip reading
E Sign language interpreter – face and hands should be clearly illuminated

17.4 Raked floors

Where practicable, in a room with a raked floor, a choice of spaces for wheelchair users (or seating with extra space for people with limited mobility) should be provided. It should be ensured that disabled people are not segregated into different or special areas.

NOTE 1 An example of a lecture theatre layout is shown in Figure 24.
With fixed but removable seating layouts, spaces for wheelchair users should either be permanently kept clear, or created by removing seats when required.

**NOTE 2** If retractable seating is used, it might be feasible only to provide accessible spaces on the lowest or highest tier. The provision of space on the lower tier is preferred in case people who are Deaf and hard of hearing need to lip read.

**NOTE 3** Seating layouts using loose seating give greater flexibility in accommodating spaces for wheelchair users, people of large stature, or people with restricted leg movements.

**NOTE 4** Where permanent access needs to be maintained along all cross-aisles, and between rows of seats in fixed seating, it might not be possible for a wheelchair user to sit in line with a person in the adjacent standard seat.

In lecture theatres and similar auditoria with raked floors, wheelchair spaces should have a handrail and toeboard located at any change of level where no barrier is provided by other means, such as other seating (see Figure 25).

Intermittent handrails at a height of 800 mm should be provided on stepped approaches within raked seating.

Access routes on raked floors should have fixed handrails on adjacent walls.

The floor where wheelchair spaces are located should be level, as sitting on a slight slope can be very uncomfortable for wheelchair users.
Figure 25 — Guarding to wheelchair spaces at changes of level on a raked floor

Key
1 Wheelchair space allowance 1 400 mm × 900 mm
2 Wall or balustrading
3 Handrail and crash bar at change of level
4 Steps
5 Handrail
6 Toeboard at 150 mm above wheelchair floor level

NOTE The details shown relate to the plan arrangement in Figure 24.

a) 1 200 mm preferred.
Where amphitheatre-style seating in excess of three tiers is used, steps should be provided to give access to the seats.

The recommendations for raked seating areas given in this subclause may be used as a principle on which to base the design of amphitheatre-style seating, but the precise details should be determined on a case-by-case basis.

The provision of adequate sight lines for people in fixed seating on a raked floor should be as shown in Figure 26.

**Figure 26 — Maintaining sight lines with seating on a raked floor**

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<td>B</td>
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A) 1 200 mm provides crutch users with easier access (see 15.1).

### 17.5 Ancillary equipment

Lecterns should have a stable base, and should be designed such that the height of the reading surface is adjustable to enable participation by a wheelchair user or a person standing (see Figure 27).

A local light should be provided to illuminate the lectern’s reading surface. Where appropriate, the speaker’s face should be lit for the benefit of lip readers in the audience.

When the lights in lecture and conference facilities are low, any sign language interpreter should be separately lit.
The height of the top surface of an overhead projector, or the height of a keyboard when a computer is used for image projection, should be not higher than 800 mm above the floor (see Figure 27).

Power sockets should be available to enable audience members to recharge mobility devices, assistive technology devices and laptops (often used for assisted technology purposes).

Where a podium is provided, and at a height that is not accessible by ramped and/or stepped access, a vertical lifting platform, visually and acoustically screened, should be installed.

**Figure 27 — Lectern and associated equipment heights**

![Dimensions in millimetres]

Key
1 Angle of lectern surface
2 OHP surface or computer keyboard to be not higher than 800 mm
3 Lectern to be adjustable across the range 800 mm to 1 100 mm

17.6 Lecture and conference facilities

17.6.1 Study spaces

The minimum space between rows of desks to accommodate wheelchair users should be as shown in Figure 28.

The height of a fixed desk surface should be between 730 mm and 750 mm, with the clear height under the desk of at least 700 mm. Where feasible, adjustable height desks should be provided.
Power sockets should be available to enable students to recharge mobility devices, and assistive technology devices such as laptops and tablets.

**Figure 28 — Recommended spaces between study tables/desks**

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17.6.2 Reading distance and size of lettering

Seating areas in lecture and conference facilities, and their relationship to signs, should meet the recommendations in **Clause 12** with regard to reading distances and text sizes.
Where projected images are used in lecture and conference facilities, seating layouts should be flexible enough to allow people who are partially sighted to sit close to the screen.

17.6.3 Visual clarity and orientation

Seating in lecture and conference facilities should contrast visually with the surrounding surfaces in accordance with the recommendations in Clause 11.

17.6.4 Acoustics

Acoustics within lecture and conference facilities should be conducive to clear verbal communication. Where public address systems are installed in the seating areas of lecture and conference facilities, materials for the ceiling, wall and floor should be chosen having regard to their sound absorption characteristics (see 11.2).

18 Sanitary accommodation

COMMENTARY ON CLAUSE 18

Accessible sanitary accommodation ought to be no less pleasant and convenient to use than equivalent non-accessible facilities. It needs to contain all of the amenities that would be provided elsewhere, e.g. mirrors and hairdryers, but without compromising the functionality of the spaces.

Good inclusive design provides choice for a multitude of users: for example, single user gender-neutral sanitary accommodation can be helpful for transgender people and also useful for parents with young children, people who need assistance, etc.

Frequently, accessible sanitary accommodation is misused for other purposes such as baby feeding because no alternatives are available, when this is by no means appropriate or suitable. It might be desirable to provide a dedicated hygienic space with a washbasin such as for those who might need to express milk or for parents who wish to be private.

Many people require facilities such as convenient shelves to hold their personal equipment, so it is necessary to ensure that adequate provision is made. Location of such shelves is indicated on some of the diagrams in Clause 18; such indication is sometimes omitted because of the amount of detail that needs to be shown in a relatively small space on the page, but the provision is nonetheless still necessary. Care needs to be taken to ensure that access to and use of the essential features shown on the diagrams is not compromised by the location of shelves.

Detailed recommendations for sanitary accommodation are given in BS 6465. The design and specification of sanitary accommodation respecting religious and faith sensitivities is also outside the scope. It is necessary to obtain specialist advice for such facilities.

18.1 General

COMMENTARY ON 18.1

Within bathrooms, showers, changing areas and toilet accommodation, including Changing Places toilets, there are a number of common features that contribute to the accessibility of these spaces to disabled people. To avoid repetition, details of these are described in this subclause.
18.1.1 Accessible routes and minimum room spaces
Sanitary accommodation for disabled people should be located on accessible routes that are direct and obstruction-free. The minimum room spaces shown in the figures associated with sanitary accommodation should not be encroached upon by building services and service ducts.

NOTE Room spaces greater than the recommended minimum dimensions will increase flexibility in use.

18.1.2 Provision
Where only one bathroom, shower room, changing room or toilet can be provided, it should be a unisex type, preferably designed for right-hand transfer (see examples in 18.5.3.1). Where more than one unisex facility can be accommodated, a choice of left-hand and right-hand transfer layouts should be provided.

NOTE 1 Examples of techniques for independent transfer are shown in Figure 29.

Figure 29 — Examples of techniques for independent transfer from a wheelchair to a WC

a) Frontal transfer, using grab rails to move from wheelchair to WC
b) Oblique transfer, using grab rails and/or leaning on WC
c) Lateral transfer, using grab rails and/or leaning on WC, with one wheel backed up to rear wall and the wheelchair at an angle to WC
d) Lateral transfer, using grab rails and/or leaning on WC, with both wheels backed up to rear wall and the wheelchair roughly parallel to WC

Key
1 Right-handed
2 Left-handed

NOTE The diagrams are intended to show alternative positions for oblique, right-hand and left-hand transfer in a corner layout WC. They are not to be interpreted as recommending a peninsular layout WC.

NOTE 2 For more detail on the provision and location of toilet accommodation, see 18.5.1.

The fittings and amenities described in 18.1.3 to 18.1.10 should be provided in sanitary accommodation where indicated in 18.2 to 18.5 and the associated figures.

18.1.3 Washbasins, taps and hot water supply
Large washbasins should not have a pedestal and should be of a size that allows washing and rinsing of hair. Semi-pedestal basins may be used provided that they do not restrict wheelchair access beneath.

NOTE 1 Such a size is suitable for a person to use from a wheelchair.

NOTE 2 A height-adjustable washbasin allows more flexible use.
Taps should either be mixer taps with a single lever action to control water flow, or individual, clearly marked, hot and cold lever-operated taps with not more than a quarter turn from off to full flow. The markings on taps, shower controls, etc. should be logical and clear to people who are blind or partially sighted.

NOTE 3 A disabled person with a poor grip can operate a single lever action mixer tap or an individual lever action tap by using the flat of the hand or the wrist. A water supply activated automatically by placing hands under the tap is an acceptable alternative solution.

NOTE 4 A single lever action mixer tap and sensor taps can cause confusion for some people with particular neurological requirements (such as people living with dementia) compared with a more familiar cross-head tap. Provision of more familiar tap options as an alternative option alongside other tap variants would therefore be beneficial.

Hot water from individual bath and basin taps should be thermostatically controlled so that it does not exceed 43 °C at the outlet. Hot water pipes and wastes should not be exposed, in order to avoid the possibility of injuries caused by hot surfaces. If they are boxed in, the boxing should not impinge upon the recommended reach and circulation spaces.

NOTE 5 The temperature of water circulating in the pipework needs to be at least 60 °C to avoid the risk of Legionella.

NOTE 6 The temperature of hot water supply at an outlet can be controlled by use of an appropriate in-line blending valve or other temperature control device in accordance with either BS EN 1111 or BS EN 1287.

Access to the washbasin should not be restricted by mixer valves and waste pipes.

NOTE 7 It might be necessary for pipework to be concealed behind panelling, provided that it does not impinge upon the minimum room dimensions.

18.1.4 Fixed grab rails and drop-down support rails

Fixed grab rails, whether vertical or horizontal, should be 32 mm to 35 mm in diameter, with a clearance between the bar and the wall of 50 mm to 60 mm. They should have a surface that provides a good grip when wet.

Drop-down support rails should hold securely when in an upright position. They should also be capable of being released easily when required in a horizontal position. Where possible, drop-down support rails should not be fitted with support struts as they can impede access. If support struts are used, they should be set back from the front edge of the rail by at least half its projection from the wall so as not to impede wheelchair access.

The wall construction and the fixings used to support drop-down support rails and fixed grab rails should be capable of resisting the vertical and horizontal loads exerted by users when they raise or lower themselves or when they pull themselves to a standing position.

NOTE 1 The Good loo design guide [42] recommends that drop-down rails be capable of supporting a load of 171 kg applied both vertically and at 45°.

The wall construction should allow a secure fixing of grab rails in any position on the wall if it is necessary to change their original position to suit the changing needs or the specific requirements of an individual.

NOTE 2 Suitable fixings need to be chosen carefully, in conjunction with the specialist grab rail supplier and fixings manufacturer, according to the nature of the background wall construction.

NOTE 3 For details of support rails and grab rails associated with WCs, see 18.5.3.5.

18.1.5 Clothes hooks, towel rails and shelves

Clothes hooks should be located at a height of 1 400 mm and 1 050 mm to allow use by people with ambulant mobility impairments and wheelchair users respectively.
Where a non-heated towel rail is required, a grab rail should be used for the purpose so that it can also be used for support. If a towel rail is heated, its surface should be kept at a temperature not exceeding 43 °C.

Shelves should be provided in accessible sanitary accommodation, but care should be taken to ensure that their size and location do not compromise access to and use of the sanitary facilities, fixtures and fittings, and associated manoeuvring spaces.

**NOTE** Dimensions of 250 mm wide × 150 mm deep, at a height of 950 mm above finished floor level, are considered suitable for a colostomy bag changing shelf over a high or low level or reduced flush cistern. Where a cistern is close-coupled, the same function may be provided by its top surface, provided that it is flat. Dimensions of 400 mm wide × 200 mm deep, at a height of 760 mm above finished floor level, are considered suitable for a shelf for general use.

### 18.1.6 Doors to sanitary accommodation

**COMMENTARY ON 18.1.6**

An outward-opening door is particularly useful for people with limited mobility or impaired balance. Also, a person in distress or someone who has collapsed against the door within the compartment can more easily and quickly receive assistance if the door opens outwards.

**Rising butt hinges** can assist wheelchair users to close the door behind them as they enter the compartment.

**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 toilets and bathrooms. From a 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.**

**Sliding doors** are an alternative where it is not possible for a side-hung door to swing either in or out or for a reduced-swing doorset to be used.

For doors leading into corridors, see 9.1.5.

The effective clear width of doorways to sanitary accommodation should meet the recommendations in 8.3 and Table 2, except for doors to WC cubicles accessible by people with ambulant mobility impairments, which should provide a minimum clear width of 700 mm (see 18.5.3.3).

Door handles and other hardware should meet the recommendations in 8.4.

To help people close the door when inside a room or compartment, outward-opening doors to sanitary accommodation should have a horizontal pull rail fixed to the closing, or interior, face where no door closing device is fitted. The door should be of a robust construction to which such door furniture can be securely fixed.

Any door that opens towards a frequently used corridor should be located in a recess at least as deep as the width of the door leaf.

**NOTE 1** If a reduced-swing doorset is used, the depth of the recess can be minimized.

If an inward opening door is the only solution for a cubicle that is accessible to a wheelchair user, a clear minimum space (on plan) of 800 mm × 1 400 mm should be provided between the door swing and any fittings (including drop-down rails when in the down position) to enable a wheelchair user to enter and close the door behind them.

Any door to sanitary accommodation, whether opening inwards or outwards, should be capable of being opened in an emergency if a person inside has fallen against it and is unable to move.

**NOTE 2** The use of pivot hinges, in conjunction with an emergency release door stop and bathroom lock openable from the outside, can provide this facility.
A door fitted with a privacy lock should have an emergency release openable from the outside and, if not sliding or opening outwards, should have an alternative means of gaining access in an emergency.

A means of indicating whether or not a compartment is in use should be provided, preferably with the words “vacant” or “occupied” clearly visible and with a change in the colour of the indicator.

*NOTE 3 This provision can be usefully combined with an emergency release mechanism.*

Doors to accessible WCs should be labelled with a sign incorporating the International Symbol for Access (see 12.1.4).

18.1.7 Surface finishes

To help people who are blind or partially sighted identify key objects within sanitary accommodation, support rails and grab rails should contrast visually with the wall; the WC seat and cover should contrast visually with the WC pan and cistern; and sanitary fittings and accessories should contrast visually with the background against which they are seen.

Large areas of shiny floor and wall surface should not be used as they can produce reflections and glare that confuse partially sighted people.

Floors should be slip-resistant, especially when wet.

*NOTE Information and guidance on slip resistance is given in Annex C.*

18.1.8 Emergency assistance alarm systems

Emergency assistance alarm systems should be in accordance with 13.7.2.

A pull cord should be reachable from changing or shower seats, from the WC and from the floor. A reset control should be provided for use if the alarm is activated by mistake. An alarm reset control should be positioned on the wall adjacent to the WC or the shower seat or changing seat. The mounting height of a reset control and its location relative to a corner WC should be in accordance with 18.5.3.1. Pull cords and reset switches should be provided near to all seating where a transfer procedure might be carried out, and the pull cord should be not more than 50 mm from the adjacent wall.

18.1.9 Heat emitters

A radiator or similar heating device should not be sited in a position that reduces the wheelchair manoeuvring space or the space needed to transfer to the shower seat, changing seat or WC pan. Such a heating device should not impinge on the minimum dimensions of the room or area.

Exposed surfaces of heating equipment should either be screened to protect users of sanitary accommodation from burns, maintained at a temperature below 43 °C, or located at high level out of reach.

18.1.10 Lighting

*NOTE 1 General recommendations for lighting are given in Clause 14.*

Where lighting can be individually controlled within a sanitary compartment, a pull cord, if provided instead of a wall switch, should be set between 900 mm and 1 000 mm above the floor, and located within 150 mm of the leading edge of the door and the surface of the adjacent wall. The pull cord and the pull cord end should contrast visually with the wall, but should not be red as this colour is reserved for emergency assistance alarms.

*NOTE 2 See also 18.5.7 in respect of motion sensors in toilet accommodation.*
18.2 **Shower rooms and bathrooms**

**COMMENTARY ON 18.2**

The correct relationship of a shower and/or bath to a wheelchair manoeuvring space, and to other sanitary fittings, is critical in allowing disabled people to wash or bathe either independently or with assistance from others, when necessary.

Where mobile or fixed hoists operated by an assistant are used for transfer, additional floor area within the bathroom is needed.

There is no single design/layout that will suit all disabled people, but the requirements of many disabled people will be met if a building can offer a choice of shower room and bathroom layout, with an integral WC, allowing for alternative transfer directions.

The recommendations given in this subclause apply to buildings that require bathing facilities, such as hotels, motels, nursing, residential and care homes, hostels, halls of residence, day centres, hospitals (relatives’ accommodation), and sports buildings where baths are provided as an alternative or a supplement to showers.

Further guidance on hoists is given in the Inclusive Hotels Network publication [43].

**Changing Places toilets** (see 18.6) offer a specialist facility for use by people with complex and multiple impairments who require the help of up to two assistants, for whom the general recommendations given in this subclause might not be suitable.

18.2.1 **En-suite shower room with a corner WC for independent use**

The minimum overall dimensions, as well as the location of sanitary and other fittings, for a shower area that incorporates a corner WC layout for independent use should be as shown in Figure 30.

When more than one shower area incorporating a corner WC layout for wheelchair users is planned, a choice of left-hand and right-hand transfer layouts should be provided. However, where only one such shower area is provided, it should be designed, preferably, for right-hand transfer as shown in Figure 30.
Figure 30 — En-suite shower room with corner WC for independent use

Key
1. Drop-down support rail
2. Shower curtain
3. Floor drain
4. Alarm pull cord
5. Vertical and horizontal grab rails
6. Tip-up shower seat
7. Optional tip-up seat for use when drying (mainly for ambulant users)
8. Fall to floor drain not steeper than 1:50
9. Towel rail
10. Wheelchair turning space (1 500 × 1 500) mm
11. Horizontal pull rail to help close the door from a wheelchair
12. See Figure 33 for details of WC, basin and associated fittings
13. Shelf

NOTE 1 Example shown is for right-hand transfer to shower seat and WC.
NOTE 2 For details of plan arrangement of fittings associated with the shower, see Figure 38.
NOTE 3 The vertical arrangement of fittings, alarm cords and reset buttons is similar to that for toilets (see Figure 42).
NOTE 4 The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.
18.2.2 En-suite shower room or bathroom with a ceiling-mounted full room cover tracked hoist system

COMMENTARY ON 18.2.2

A full room cover tracked hoist system gives the greatest flexibility of use. It makes the best use of the available space, and improves a person’s privacy and independence by allowing transfers to be made totally within the shower room, if required. It is used in conjunction with slings of which there are a number of types. Guidance on the choice of hoists and slings is given in Annex F. Other systems are also acceptable, provided they give similar access to all sanitary fittings.

Wherever full room cover tracked hoist systems are installed, care needs to be taken to ensure that the type of system (e.g. manual or powered) is appropriate for the intended use.

If a ceiling-mounted tracked hoist is fitted in an existing building, the implications of the additional loading need to be checked.

The minimum overall dimensions, as well as the location of sanitary and other fittings, for an en-suite shower area for use with a ceiling-mounted full room cover tracked hoist system for assisted use should be as shown in Figure 31. The tracked hoist system should be compatible with the hoist system in any adjacent room where hoist provision is required.

NOTE In the case of solo use hoist rooms, it is advantageous for the emergency alarm to be voice-activated, in addition to a pull cord or other mechanism.

A shower room with a tracked hoist system should be an additional provision to the basic self-contained shower room for independent use from a wheelchair.

The minimum overall dimensions, as well as the location of sanitary and other fittings, of an en-suite bathroom provided with a ceiling-mounted full room cover tracked hoist system for assisted use should be as shown in Figure 32. The tracked hoist system should be compatible with the hoist system in any adjacent room where hoist provision is required.
Figure 31 — En-suite shower room for use with a ceiling-mounted full room cover tracked hoist system for assisted use

Key
1 Peninsular WC with close coupled cistern
2 Fall to floor drain not steeper than 1:50
3 Towel rail
4 Alarm pull cord
5 Vertical and horizontal grab rails
6 Full room cover tracked hoist system (or similar system), ensuring that access to sanitary fittings, alarms and other facilities is not compromised
7 Shower curtain
8 Tip up shower seat
9 Floor drain

NOTE 1 Example shown is for right-hand transfer to shower seat.
NOTE 2 For details of fittings associated with the shower, see Figure 38, and with the peninsular WC, see Figure 45.
NOTE 3 The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.
Figure 32 — En-suite bathroom with a ceiling-mounted full room cover tracked hoist system for assisted use

Dimensions in millimetres

Key
1  Sliding doors
2  Alternative washbasin position
3  Vertical grab rails
4  Peninsular WC with close coupled cistern
5  Alarm pull cord
6  Full room cover tracked hoist system (or alternative system giving similar access to all sanitary fittings)
7  Towel rail

NOTE 1  Example shown is for left-hand transfer to bath.
NOTE 2  For details of accessories associated with the bath, see Figure 35, and with the peninsular WC, see Figure 45.
NOTE 3  The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.
18.2.3  Bathroom for independent use incorporating a corner WC

The minimum overall dimensions, as well as the location of sanitary and other fittings, for a bathroom intended principally for independent use incorporating a corner WC and a large washbasin (not a hand rinse basin) should be as shown in Figure 33.

NOTE  The washbasin in a bathroom is usually large enough for hair washing or full body washing, although it can also be used for hand rinsing. The position of the basin in relation to the WC is the same as for the unisex corner WC compartment (see 18.5.3.1). With a large basin, it is likely that users will fill the basin with water before sitting on the WC pan, as the taps might be out of reach.

In bathrooms with a WC that are intended for independent use, the direction of transfer to both bath and WC should be consistent.

When more than one bathroom for independent use incorporating a corner WC is planned, a choice of left-hand and right-hand transfer layouts should be provided.

18.2.4  Bathroom allowing assisted use of a bath (without hoist) and a peninsular WC

The minimum overall dimensions, as well as the location of sanitary and other fittings, for a bathroom for assisted use of a bath and a peninsular WC should be as shown in Figure 34 and Figure 35.

NOTE  Recommendations for peninsular WCs are given in 18.5.3.2.

When more than one bathroom allowing assisted use of a bath and a peninsular WC is planned, a choice of left-hand and right-hand bath transfer layouts should be provided.

A bathroom that incorporates a peninsular WC should not be the only type of bathroom in a building. Where, in addition to a shower room, there is only one accessible bathroom in a building, a bathroom with a corner WC, which can be used either independently or with assistance, should be provided (see Figure 33).
Figure 33 — Bathroom for independent use incorporating a corner WC layout

Dimensions in millimetres

Key
1  Horizontal pull rail to help close the door from a wheelchair
2  Two clothes hooks, one at 1 050 mm and the other at 1 400 mm above the floor
3  Sanitary dispenser
4  Disposal bin
5  Towel rail
6  Shelf
7  Bath seat
8  Alarm pull cord
9  See Figure 41 for details of fittings on this wall
10 Vertical grab rails
11 Large washbasin with depth (front to back) not greater than 450 mm
12 Wheelchair turning space (1 500 × 1 500) mm
13 Sanitary disposal unit
14 Bath mixer tap
15 Drop-down support rail
16 Rail with padded back rest, where cistern is not close-coupled
17 Colostomy bag changing shelf for standing users at 950 mm above finished floor level
18 Horizontal grab rail mounted on cranked wall

NOTE 1  Example shown is for right-hand transfer to bath and WC.
NOTE 2  The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.
**Figure 34** — *Bathroom for assisted use of a bath and peninsular WC*

**Key**

1. Two clothes hooks, one at 1 050 mm and the other at 1 400 mm above the floor
2. Bath seat
3. Towel rail
4. See Figure 42a for details of fittings associated with this large washbasin
5. See Figure 35 for details of the bath and its associated grab rails
6. Wheelchair turning space (1 500 × 1 500) mm
7. Alarm pull cord
8. See Figure 44 for details of fittings associated with the peninsular WC

**NOTE 1** Example shown is for right-hand transfer to bath.

**NOTE 2** The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.
Figure 35 — Grab rails where bath adjoins a wall, and transfer facilities

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Key
1. Vertical grab rail
2. Horizontal grab rail
3. Bath rim may be higher if solely for assisted use
4. Gap for hoist feet
5. Gap clear of bath supports
6. Clearance 50 mm to 60 mm
7. Bath seat for sitting to dress or placing items within reach
8. Potential seat/shelf for a person to rest on and/or place items on
9. Bath length
10. Depth of transfer seat 400 mm min

A) To meet these recommendations, a shallower than normal bath might be necessary.
18.2.5 Bathroom allowing assisted use of a peninsular bath (with hoist) and a peninsular WC

COMMENTARY ON 18.2.5

Because of the specialized nature of this type of use, this layout is used mainly in registered nursing, residential and care homes or other specific building types.

The minimum overall dimensions, as well as the location of sanitary and other fittings, for a bathroom that allows assisted use of the bath and WC, with space for a mobile hoist operated by an assistant, should be as shown in Figure 36.

A vertical gap 150 mm high should be provided at the base of the bath panel to accommodate the chassis of a mobile hoist, as shown in Figure 35. The bath should be chosen and fixed to ensure that the 150 mm gap can be achieved.

NOTE 1 A shallower bath might be needed (see Figure 35).

NOTE 2 For the benefit of assistants’ manual handling, it might be useful for the bath to have its rim at 560 mm above the floor. However, this height is too high for independent transfer from a wheelchair.
Figure 36 — Bathroom allowing assisted use of the bath (and WC) using a mobile hoist operated by an assistant

Dimensions in millimetres

Key
1 Shelf
2 Sanitary dispenser
3 Two clothes hooks, one at 1 050 mm and the other at 1 400 mm above the floor
4 Access, 700 mm wide, around peninsular bath for an assistant
5 Disposal bin
6 2 300 mm turning space of mobile hoist
7 See Figure 42a) for details of fittings associated with this large washbasin
8 Mixer tap
9 Alarm pull cord
10 Towel rail
11 See Figure 44 for details of peninsular WC and associated fittings
12 Extra space for an assistant to help on other side of peninsular bath

NOTE The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.
18.2.6 Bath and taps

The bath in an accessible bathroom should be either 1600 mm or 1700 mm long × 700 mm wide with a slip-resistant, flat base.

Taps should be located such that they are easily reached from a wheelchair but do not impede access to the bath. Taps mounted on the wall side of the bath are difficult to reach and should be avoided.

NOTE Some proprietary types of plug (e.g. spring-loaded) avoid a chain or a pop-up waste and are more suitable for people with limited hand dexterity.

18.2.7 Bath rim height

COMMENTARY ON 18.2.7

A bath rim at the same height as the majority of wheelchair seats can aid a disabled person’s independent transfer from wheelchair to bath via a transfer seat.

The rim of a bath for independent use should be 480 mm above finished floor level at the transfer end (see Figure 35). Any grab rails fitted to the rim should not project above this height.

18.2.8 Bath seat

Where space is available, a securely fixed bath seat or shelf, which can assist a person to sit and rest and get dressed or place items within reach, should be provided. It should be the same width as the bath and extend beyond the head of the bath by at least 400 mm, with the top surface set at bath rim height, as shown in Figure 35.

NOTE The preferred option is for the room to be large enough to have a distance of 800 mm between the bath and the wall to allow a wheelchair to be positioned within the room.

18.2.9 Size and location of bath grab rails

Bath grab rails should be sized in accordance with 18.1.4 and located as shown in Figure 35.

18.2.10 Type and location of other sanitary fittings and accessories

WCs, mirrors and other associated toilet accessories used in a bathroom should be chosen and located in accordance with 18.5.

Medicine cabinets and similar storage items should be located in accordance with 15.2.

18.2.11 Lighting and lighting accessories

NOTE General recommendations for lighting are given in Clause 14. Additional guidance is given in the SLL Code for lighting [37].

The maintained illuminance (or general lighting level) of a bathroom should be between 200 lux and 300 lux.

18.3 Changing and shower areas

COMMENTARY ON 18.3

All buildings are more accessible and convenient for disabled people if they provide different relationships between changing areas and shower areas, while offering a choice between private and communal changing and showering.

The requirements of many people will be met if a building offers a choice of shower layout (e.g. for both right- and left-hand transfer) and includes a shower with a WC, as well as one without a WC (if a WC facility is provided elsewhere).
Many people are prepared to use open changing areas, but some require the privacy of a self-contained cubicle or compartment. Recommendations on changing cubicles (fitting rooms) in retail premises are given in 21.13.7.

The recommendations given in this subclause apply to buildings that require changing and shower facilities, such as hotels, motels, nursing, residential and care homes, and relatives’ accommodation in hospitals.

Changing Places toilets (see 18.6) offer a specialist facility for use by people with complex and multiple impairments who require the help of up to two assistants, for whom the general recommendations given in this subclause might not be suitable.

18.3.1 Provision of changing and shower areas

The provision of changing and shower areas, whether self-contained unisex or communal, designated as suitable for use by disabled people, should reflect the numbers of disabled people likely to require such facilities.

NOTE Sports facilities have their own requirements for team changing and showering (see Accessible sports facilities [16]). The guidance in Accessible sports facilities also provides for the needs of people requiring high levels of assistance, including Changing Places toilets.

18.3.2 Self-contained unisex changing areas

Self-contained unisex changing facilities with space for a companion or assistant of either sex to help should always be provided, with communal separate-sex changing facilities as an additional provision.

The minimum overall dimensions, as well as the location of sanitary and other fittings, for a self-contained changing area accessible to a wheelchair user should be as shown in Figure 37.

NOTE 1 Wheelchair users need sufficient space for dressing and undressing while seated or lying down. Space might also be required for one or two assistants and/or for a shower chair to transfer into before showering or entering a swimming pool.

Vertical support struts from the seat to the floor should not be installed. A padded tip-up seat should be securely fixed to the wall, as shown in Figure 37.

NOTE 2 Struts fitted at the front of the seat impede wheelchair access.

Drop-down support rails and grab rails for a self-contained changing area should be located as shown in Figure 37.

NOTE 3 Drop-down support rails at right angles to each other can help prevent a disabled person falling forward or sideways.
Figure 37 — Self-contained changing area and accessories

Dimensions in millimetres

Key
1 Minimum unobstructed room height
2 Vertical grab rail
3 Back rest
4 Two clothes hooks, one at 1050 mm and the other at 1400 mm above the floor
5 Towel rail
6 Tip-up seat
7 Drop-down support rails on side and far wall
8 Alarm reset button (located immediately above backplate of horizontal grab rail)
9 Horizontal grab rail
10 Alarm pull cord

NOTE 1 Example shown is for left-hand transfer to changing seat.
NOTE 2 The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.
18.3.3 Communal changing areas

Where changing facilities suitable for disabled people are provided communally, each changing subdivision should have the same configuration of space, seat, drop-down support rails and grab rails as for a self-contained unisex changing area.

18.3.4 Lockers for self-contained or communal changing areas

Lockers suitable for wheelchair users should be at least 300 mm wide, not more than 600 mm deep, and with their bases set between 400 mm and 800 mm above finished floor level.

Lockers that are intended to store crutches, callipers, or artificial limbs should be at least 1 200 mm high. Lockers that are intended to store walking frames should be 800 mm × 600 mm in plan.

Locks for lockers should be located not higher than 1 150 mm and should be easy to use, one-handed, by a person with poor dexterity or limited strength in the hand or arm.

Lockers should be securely constructed and fixed, and located in a dry place, preferably outside the changing area.

Wheelchair manoeuvring space in front of a locker should be in accordance with 15.2.

18.3.5 Self-contained unisex shower areas, controls and accessories

The minimum overall dimensions, as well as the location of sanitary and other fittings, for a self-contained unisex shower area accessible for independent use by a wheelchair user should be as shown in Figure 38.

NOTE 1 There is often a need for two tip-up seats, one “wet” and the other “dry”.

Floors should be slip-resistant, and as level as possible subject to the minimum fall for draining water to a floor drain that is located away from the circulation area (1:50).

NOTE 2 If the outlet grating is recessed, a weir effect will be created and water flow increased.

The shower head should be mounted on a vertical rod so that its height can be adjustable between high and low level (see Figure 38).

A shower fitting should be controlled by a lever operated, thermostatic mixer that delivers water at a temperature not exceeding 43 °C. The markings on the shower control should be logical and clear to people who are blind or partially sighted.

NOTE 3 The temperature of water circulating in the pipework needs to be at least 60 °C to avoid the risk of Legionella.

NOTE 4 The temperature of hot water supply at an outlet can be controlled by use of an appropriate in-line blending valve or other temperature control device in accordance with either BS EN 1114 or BS EN 1287.

A tip-up plastic shower seat with a slip-resistant finish should be provided as shown in Figure 38.

NOTE 5 An adjustable height padded shower seat with back rest and a central hole can be beneficial to people with a wide range of impairments. Folding arm rests or safety rails attached either side of the shower seat can help to prevent somebody sliding off a wet slippery seat.
Figure 38 — Self-contained unisex shower room for independent use

Dimensions in millimetres

Key

1  Vertical rod to carry a detachable shower head, adjustable within a range 1 050 mm to 1 850 mm above the floor
2  Soap tray
3  Back rest
4  Height range for shower controls 750 mm to 1 000 mm above the floor
5  Drop-down support rails on side and rear walls
6  Tip-up shower seat
7  Alarm reset button
8  Towel rail
9  Alarm pull cord
10  Horizontal grab rail
11  Floor drain
12  Vertical grab rail
13  Fall to floor drain not steeper than 1:50
14  Shower curtain
15  Tall mirror
16  Two clothes hooks, one at 1 400 mm and the other at 1 050 mm above the floor
17  Additional optional tip-up seat for users when drying (mainly for ambulant users) (see e.g. Figure 30)

a) Elevation (for clarity excluding fixed grab rails on rear wall with shower fitting)

b) Plan

NOTE 1  Figure 38 continues on the following page.
Drop-down support rails and grab rails for a self-contained shower area should be located as shown in Figure 38.

NOTE 6 Drop-down support rails that are at right angles to each other help prevent a disabled person from falling forward.

A shower curtain, operated from a shower seat, should enclose the seat and the rails when they are in a horizontal position.

NOTE 7 After a wheelchair user transfers from the wheelchair to a shower seat, the wheelchair can only be pushed away within arm’s reach for subsequent retrieval. A shower curtain can help prevent the chair getting wet during showering.

### 18.3.6 Communal shower areas, controls and accessories

Where shower facilities suitable for disabled people are provided communally, each shower subdivision should have the same configuration of space, seat, drop-down support rails and grab rails as for a self-contained unisex shower area.

### 18.3.7 Sanitary fittings and accessories

The type of WC pan and washbasin, and the range of associated accessories, should be chosen and, where appropriate, located in accordance with 18.5.

A shelf should be provided for toiletries in a position that can be reached by a person sitting on the shower seat or from a wheelchair before or after transfer.

### 18.3.8 Doors

Where doors are provided in self-contained unisex or communal changing and shower areas, door furniture and door opening directions should be in accordance with 18.1.6.
18.3.9 Lighting and lighting accessories

NOTE 1 General recommendations for lighting are given in Clause 14.

The maintained illuminance (or general lighting level) of a changing area or shower area should be in the range 100 lux to 300 lux at floor level.

NOTE 2 In nursing, residential and care homes, or similar health care buildings, the lighting level needs can vary as follows:

a) between 100 lux and 150 lux for changing areas;

b) between 100 lux and 300 lux for shower areas.

The location and appearance of lighting pull cords should be in accordance with 18.1.10.

18.4 Accessible baby changing facilities

Where baby changing facilities are provided, they should be accessible.

An accessible baby changing facility should not usually (see Note 1) be incorporated in a unisex accessible toilet but should be provided in a separate room, in order to ensure that the toilet is available for users who need it. The facility should meet the relevant recommendations in 18.1.

NOTE 1 The exception to this is described in Note 7 to 18.5.3.1.

NOTE 2 It is desirable for an accessible baby changing facility to incorporate a WC. Further guidance on provision of baby changing facilities, including family toilets, is given in BS 6465-2.

The room should be at least 2 m × 2 m in size and should include the following items:

a) a wall-mounted baby changing table, either permanently fixed at 750 mm above finished floor level or adjustable in height, allowing a minimum 700 mm of clear space above finished floor level for a wheelchair user to access and use the table (see Note 3);

b) a washbasin, with its rim at 720 mm to 740 mm above finished floor level;

c) a soap dispenser and an automatic hand dryer, with their undersides set between 800 mm and 1 000 mm above finished floor level;

d) a full length mirror, with its lower edge located at 600 mm above finished floor level;

e) a nappy vending machine, with the controls not higher than 1 000 mm above finished floor level;

f) a sanitary disposal bin, preferably recessed into the wall;

g) a chair, if a fixed-height changing table is installed.

NOTE 3 The correct use of a height-adjustable changing table allows the surface to be set at the optimal height, thus reducing strain on the user’s back.

18.5 Toilet accommodation

COMMENTARY ON 18.5

Disabled people ought to be able to find and use suitable toilet accommodation no less easily than non-disabled people. The space requirements for suitable toilet accommodation are generally driven by the requirements of wheelchair users, although the facilities might also be used by people with other access requirements.

The recommendations for toilet accommodation given in this subclause are based on the extent to which wheelchair users and people with ambulant mobility impairments are able to approach, transfer to and use sanitary facilities. Toilet accommodation normally takes the form of a unisex accessible toilet or an enlarged cubicle in a separate-sex toilet washroom.
Within wheelchair-accessible toilets, the correct relationship of WC to basin and other accessories, and to the space required for manoeuvring, is critical in enabling disabled people to adopt various transfer techniques that allow independent or assisted use of sanitary facilities. These transfer techniques, which are illustrated in Figure 29, include:

- lateral transfer to WC using grab rails, with one or both rear wheels of the wheelchair backed up to the rear wall;
- oblique transfer using grab rails and leaning on the WC, or just leaning on the WC for full support;
- frontal transfer using grab rails that enable some people to pivot round and others to slide forward on to the WC from their wheelchair and use the WC in a forward facing position;
  
  NOTE This might or might not involve standing as part of the transfer process. With this transfer technique, the WC can be used as a urinal.

Within separate-sex toilets, a WC compartment can be provided specifically for people with ambulant mobility impairments, which takes pressure off wheelchair-accessible provision.

It is advantageous to provide some unisex self-contained toilets for use by all. Such facilities, where the washbasin is within a cubicle or compartment, can provide gender-neutral facilities as well as potential benefits where the balance of male and female users fluctuates.

The recommendations in this subclause apply to all buildings used by the general public.

Changing Places toilets (see 18.6) offer a specialist facility for use by people with complex and multiple impairments who require the help of up to two assistants, for whom the general recommendations given in this subclause might not be suitable.

### 18.5.1 Provision and location of toilet accommodation

**COMMENTARY ON 18.5.1**

A unisex wheelchair-accessible facility is intended for independent use. Changing Places (CP) toilets are intended for assisted use and provide the most appropriate solution for people who require high levels of assistance; recommendations for CP toilets are given in 18.6.

Where space is limited, e.g. in small business premises, the provision of a single wheelchair-accessible toilet compartment of unisex design instead of separate-sex facilities caters for all needs with less demand on space.

Wheelchair-accessible unisex compartments are more easily identified than single-sex compartments and are more likely to be available when needed. Some disabled people need to use a toilet more frequently than other users, making it desirable that, generally, accessible toilets are not made available to the general public.

The time taken to reach a toilet is an essential element to be taken into account in siting toilet accommodation.

At least one unisex wheelchair-accessible toilet (see 18.5.3.1) should be provided at each location where toilet accommodation is provided for the use of customers, employees or visitors. In buildings such as hotels and hostels, where no toilet accommodation is provided other than that within bedrooms, at least one unisex accessible toilet should be provided for visitors at entrance level.

**NOTE 1** Sports facilities have their own requirements for unisex and other accessible toilet accommodation (see Accessible sports facilities [16]).

Where there is only one toilet available in a building, or self-contained unit within a building, it should be of unisex wheelchair-accessible corner design, but enlarged to accommodate a
standing-user height washbasin, with its rim 780 mm to 800 mm above the floor, in addition to the hand rinse basin. An enlarged unisex accessible toilet should also be provided where full washing facilities are required.

When more than one unisex wheelchair-accessible toilet with corner WC is planned, a choice of layouts suitable for left-hand and right-hand transfer should be provided, preferably with the handing indicated by a touch-legible pictogram.

NOTE 2 For multi-storey buildings, an accessible toilet with corner WC design provides a choice of transfer options if the layout is handed on alternate floors.

Where separate-sex cubicle arrangements are provided, at least one cubicle suitable for use by people with ambulant mobility impairments (see 18.5.3.3) should be provided and identified within each range of WC cubicles in separate-sex toilet washrooms, irrespective of whether a wheelchair-accessible cubicle has been provided in the same range. Where separate-sex cubicles are the preferred approach, at least one unisex self-contained toilet should be provided in accordance with Figure 39.

Where unisex self-contained cubicles or compartments are provided, at least one cubicle suitable for use by people with ambulant mobility impairments should be provided and identified within each range of facilities (see Figure 39).

Figure 39 — Unisex toilet for use by people with ambulant mobility impairments

NOTE 3 In existing buildings, space and structural constraints might make it impracticable to provide a unisex accessible toilet. Where this is the case, separate-sex toilets may contain a wheelchair-accessible WC cubicle.

A unisex accessible toilet should be located as close as possible to the entrance and/or waiting area of a building.
Unisex accessible toilet accommodation should be provided near to bedrooms designed for wheelchair users if the general sanitary arrangement for standard bedrooms in a hotel or motel is not en suite.

The location of toilet accommodation in a multi-storey building should wherever practicable be in a similar place on each floor.

18.5.2 Accessible routes

Doors from toilet accommodation, when open, should not obstruct emergency escape routes.

A disabled employee should not have to travel more than 40 m on the same floor from their workstation to an accessible toilet, or more than 40 m combined horizontal travel distance where accessible toilet accommodation is accessed by conventional passenger lift on another floor of the building.

NOTE Where vertical travel is by means of a vertical lifting platform, allowance needs to be made in the travel distance limitation for the much slower rate of travel of the lifting platform.

18.5.3 WC compartments

18.5.3.1 Unisex wheelchair-accessible toilet with corner WC

Minimum room dimensions, as well as the location of sanitary and other fittings, for the standard unisex wheelchair-accessible toilet with corner WC should be as shown in Figure 40. The layout of the enlarged unisex toilet should be as shown in Figure 41. The location of fixtures and fittings should be as shown in Figure 42, and the location of independent mirrors, accessories and washbasins should be as shown in Figure 43.

NOTE 1 Examples of transfer techniques are shown in Figure 29.

NOTE 2 A unisex accessible toilet with corner WC is equipped so that it is also suitable for use by people with ambulant mobility impairments.

For outward opening doors, the combination of door width and selected ironmongery should be not less than the effective clear width shown in Table 2.

NOTE 3 The minimum clear overall dimensions of a unisex accessible toilet with corner WC allow the hand rinse basin to be used both from a wheelchair and while a person is seated on the WC, and allow space for somebody to assist a disabled person.

The tap to the basin should be positioned on the side nearest to the WC pan.

NOTE 4 It is important for reasons of personal hygiene that a person seated on the WC can reach the basin, tap and soap dispenser to rinse their hands before adjusting their clothing.

The hand rinse basin within a unisex accessible toilet should be set with the rim height at 720 mm to 740 mm above the floor (Figure 42) to allow use for hand washing by people standing as well as seated.

NOTE 5 The hand rinse basin next to the WC can be at a lower level for use from the WC, provided there is a separate washbasin for people with ambulant mobility impairments to use (see Figure 43).

NOTE 6 The use of adjustable height washbasins can accommodate a greater range of people.

The unisex accessible toilet shown in Figure 40 should not incorporate baby changing facilities.

Where there is only one toilet in a building or self-contained unit within a building, an enlarged unisex accessible toilet containing baby changing facilities, as shown in Figure 44, should be provided.

NOTE 7 Combining an accessible toilet and baby changing facility is acceptable only in the smallest of buildings or self-contained units within a building with low levels of demand where it is not feasible to provide more than one toilet. Combining use can lead to extended wait times for all users and is therefore to be avoided.
Figure 40 — Unisex accessible toilet with corner WC layout where other accessible toilet accommodation is available

Key

1. Sanitary dispenser
2. Alternative door position
3. Disposal bin
4. Shelf, 760 mm above finished floor level
5. Wheelchair turning space (1 500 × 1 500) mm
6. Long mirror
7. Wall A (see Figure 42)
8. Hand rinse basin projecting not further than 250 mm
9. Vertical grab rails
10. Tap on side of basin nearest to WC
11. Two clothes hooks, one at 1 050 mm and the other at 1 400 mm above the floor
12. Alarm pull cord
13. Horizontal grab rail
14. Sanitary disposal unit
15. Drop-down support rail
16. Vertical grab rail
17. Flush mechanism on this side of WC pan
18. Flat-topped close-coupled cistern providing a back rest and a colostomy bag changing surface for standing users\(^\text{a)}\)
19. Horizontal pull rail

NOTE  Examples shown are for right-hand transfer to WC.

\(^{a)}\) Where high or low level or reduced flush cisterns are used, a rail with a padded back rest and a separate colostomy bag changing shelf at 950 mm above finished floor level should be provided.
**Figure 41** — *Unisex accessible toilet with corner WC layout where only one toilet is provided within a building/unit*

Key

1. Two clothes hooks, one at 1050 mm and the other at 1400 mm above the floor
2. Wheelchair turning space (1500 × 1500) mm
3. Large washbasin with its rim at 780 mm to 800 mm above finished floor level, with a mirror above and a paper towel dispenser and a soap dispenser alongside
4. See Figure 40 for details of fittings on this side of the room

**NOTE 1** Examples shown are for right-hand transfer to WC.

**NOTE 2** Figure 42 shows the location of appliances, fixtures and fittings. For the location of the mirror and associated fittings, see Figure 43. Figure 29 gives further details of transfer techniques. For door widths, see Table 2.

**NOTE 3** The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.
Figure 42 — Heights of fixtures and fittings for toilets with corner WC layout

Dimensions in millimetres

Height of drop-down support rails to be the same as the other horizontal grab rails.

Key

1. Wall A (see Figure 40)
2. Alarm pull cord with two red bangles
3. Vertical grab rails (those above the hand rise basin should be set 500 mm to 700 mm apart centred on the basin)
4. Colostomy bag changing shelf at 950 mm above finished floor level, where a high or low level or reduced flush cistern is used
5. Sanitary dispenser, on wall adjacent to door, with coin slot between 750 mm and 1 000 mm above the floor
6. Automatic hand dryer
7. Soap dispenser
8. Paper towel dispenser
9. Toilet paper dispenser
10. Alarm reset button
11. Centre line of vertical grab rails
12. Horizontal grab rail
13. Shelf
14. Hand rinse basin with tap on side of basin close to the WC pan
15. Flat-topped close-coupled cistern providing a back rest and a colostomy bag changing surface for standing users

NOTE Examples shown are for right-hand transfer to WC.

A) Where high or low level or reduced flush cisterns are used, a rail with a padded back rest should be provided in addition to a colostomy bag changing shelf (item 4).
Figure 43 — Location of independent mirrors, accessories and washbasins

Dimensions in millimetres

a) In bathrooms and shower rooms

Location of washbasin, mirror and grab rails (not associated with a corner WC), for wheelchair users and people with ambulant mobility impairments

Key
1 Automatic hand dryer
2 Shaver point (where relevant)
3 600 mm vertical grab rail each side of mirror
4 Centre line of vertical grab rail
5 Mirror above basin, with base corresponding with top of washbasin
6 Tall mirror
A For people with ambulant mobility impairments only
B For both people with ambulant mobility impairments and wheelchair users

b) In a unisex accessible toilet

Long mirror located away from washbasin suitable for wheelchair users and people with ambulant mobility impairments (mirror and associated fittings used within a unisex accessible toilet compartment or within a separate sex facility serving a range of compartments)
Figure 44 — Baby changing facilities in an enlarged unisex accessible toilet

Key
1  Nappy disposal bin
2  Wheelchair turning space (1 500 × 1 500) mm
3  Fold-down baby changing table
4  Two clothes hooks, one at 1 050 mm and the other at 1 400 mm above the floor
5  See Figure 40 for details of fittings on this side of the room
6  Mirror (see Figure 43, key item 6)

NOTE 1 Examples shown are for right-hand transfer to WC.

NOTE 2 This configuration is acceptable only in small buildings or self-contained units within buildings where it is not feasible to provide more than one toilet.

18.5.3.2 Unisex wheelchair-accessible toilet with peninsular WC for assisted use

COMMENTARY ON 18.5.3.2

Unisex accessible toilets with peninsular WC for assisted use are intended for use by people who require assistance but do not need a changing bench and/or hoist, and are likely to be beneficial only in a limited number of circumstances.

The minimum clear overall dimensions, as well as the location of sanitary and other fittings, of a unisex accessible toilet with peninsular WC for assisted use should be as shown in Figure 45.

NOTE 1 Examples of transfer techniques are shown in Figure 29.
Figure 45 — Unisex accessible toilet with peninsular WC for assisted use

Dimensions in millimetres

Key
1. This door may be in any position along the wall but the leading edge should be not less than 300 mm from a return wall
2. Towel rail
3. Sanitary dispenser
4. Shelf
5. Disposal bin
6. Large washbasin with vertical grab rails either side and mirror over (see Figure 43)
7. Two clothes hooks, one at 1 050 mm and the other at 1 400 mm above the floor
8. Wheelchair turning space (1 500 × 1 500) mm
9. Independent tall mirror
10. Alarm pull cord
11. Drop-down support rails, one with a toilet paper dispenser
12. Vertical grab rail
13. Sanitary disposal unit
14. Flat-topped close-coupled cistern providing a back rest and a colostomy bag changing surface for standing users A)

NOTE The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.

A) Where high or low level or reduced flush cisterns are used, a rail with a padded back rest and a separate colostomy bag changing shelf at 950 mm above finished floor level should be provided.
NOTE 2  A peninsular WC layout is appropriate only when an assistant is available, because drop-down support rails are not considered to give sufficient support for independent transfer and it is not possible to rinse hands when seated on the WC. Furthermore, the absence of a side wall can give rise to feelings of insecurity.

A single unisex accessible toilet with a peninsular WC layout for assisted use should not be provided as a substitute for separate unisex accessible toilets with handed corner layouts, or for a Changing Places toilet (see 18.6). If provided, it should be as an additional facility.

18.5.3.3 WC compartments or cubicles accessible by people with ambulant mobility impairments

The minimum clear overall dimensions of a WC compartment accessible by people with ambulant mobility impairments, as well as the location of sanitary and other fittings, should be as shown in Figure 46.

Where unisex self-contained compartments or cubicles are provided, at least one should be suitable for use by people with ambulant mobility impairments in accordance with 18.5.1.

Where the compartment has an inward-opening door, it should be fitted with a double action pivot set and an emergency release mechanism operated from the outside. Inward-opening compartment doors should be used only in existing buildings where there is no alternative.

All WC cubicle doors should provide a minimum clear width of 700 mm. Where toilet compartments are isolated, door widths should be in accordance with Table 2.

Figure 46 — Accessible WC compartment for people with ambulant mobility impairments

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NOTE 1  The overall dimensions shown exclude such items as heat emitters and boxing in of pipework, and adjustments in room size will be needed to accommodate these items.

NOTE 2  For cubicle widths greater than 1 000 mm, see the WC and grab rail arrangement in Figure 39.

A) Where high or low level or reduced flush cisterns are used, a rail with a padded back rest and a separate colostomy bag changing shelf at surface 950 mm above finished floor level should be provided.
18.5.3.4 WC pan and cistern

The flush should be operated manually by a spatula type lever located between 800 mm and 1 000 mm above finished floor level and, for a corner arrangement, positioned on the open or transfer side of the pan for ease of access.

NOTE 1 This applies irrespective of whether the cistern is external or located within a duct. Care is needed in the selection of a cistern, as not all cisterns are dual-handed.

The top surface of a WC seat (neither the cover nor the sanitary ware) should be set at a height of 480 mm above finished floor level (see Figure 42).

NOTE 2 A height of 480 mm is the same as the seat height of the majority of wheelchairs.

The WC seat in an accessible unisex toilet should be designed for heavy duty use and securely fixed with metal (preferably stainless steel) fittings from the top into the rim of the WC, as a wheelchair user transferring from a wheelchair imposes high lateral stresses on the seat and seat fixings.

NOTE 3 Retaining buffers (lugs that hold the sides of the seat in place on the pan) can offer greater lateral stability for the seat.

Seat covers should not be used as they impede transfer when raised.

Gap-front seats should not be used.

18.5.3.5 Size and location of support rails and grab rails around a WC

The height of all horizontal, fixed grab rails or drop-down support rails should be set at 680 mm above the floor (see Figure 42).

The lateral position of horizontal support rails and grab rails should be set as follows (see Figure 40 and Figure 45).

a) A hinged drop-down support rail, located on the open side (Figure 40) or on both sides (Figure 45), should be fixed with its centre line 320 mm from the centre line of the WC and should extend 50 mm to 100 mm beyond the front of the WC.

b) A fixed horizontal grab rail should be located on the side wall (Figure 40 and Figure 43) with a 50 mm to 60 mm clearance between the rail and the wall.

c) A fixed horizontal rail, with a padded backrest, should be located behind, and centred on, the WC pan when the cistern is in a duct, when there is sufficient space below a low-level cistern (not close-coupled) or when the cistern is at high level, provided the rail’s projection allows the seat to tilt beyond the vertical and remain raised so that the WC is comfortable and safe to use and can be used as a urinal.

NOTE 1 The satisfactory performance of grab/support rails is dependent on the provision of a suitable supporting structure and fixings.

NOTE 2 A fixed horizontal grab rail behind the WC pan cannot be accommodated in conjunction with a close-coupled cistern. In this circumstance, a close-coupled cistern with a screw-down cover designed to give support provides an alternative solution.

The operation of drop-down support rails, and the nature of supporting walls and fixings, should meet the recommendations in 18.1.4.

Vertical grab rails, at least 600 mm in length, should be fixed where possible with their centre line set at 1 100 mm above the floor (see Figure 43).

The lateral position of vertical grab rails should be set 470 mm from the centre line of the WC (see Figure 40 and Figure 45).

Grab rails should contrast visually with the background against which they are seen.
18.5.4 Urinals accessible to wheelchair users and people with ambulant mobility impairments

COMMENTARY ON 18.5.4

Wheelchair users might be able to pull themselves to a standing position to use a urinal, or they might be able to use a urinal from their wheelchair. The lower urinal position shown in Figure 47 is also beneficial to a person of restricted stature or a child.

The wheelchair space in front of a urinal should be level (see Figure 47).

Vertical grab rails for the benefit of a disabled person who is standing should be provided on each side of a urinal where stall privacy dividers are not fitted.

The rim height of a urinal should be 500 mm above finished floor level for a standing person and 380 mm above finished floor level for a wheelchair user. In both instances, the urinal rim should project at least 360 mm from the wall face (see Figure 47).

NOTE A tapering urinal, possibly extending more than 360 mm from the wall, allows closer access, without the wheelchair touching the wall or any pipework.

An unobstructed space of at least 900 mm wide × 1400 mm deep should be provided in front of a urinal to allow access by a wheelchair user (see Figure 47).

Urinals should contrast visually with the wall to which they are attached.

Where a urinal suitable for a wheelchair user is situated in a wheelchair-accessible male washroom, one washbasin with its rim between 680 mm and 700 mm should also be provided.
**Figure 47 — Urinals accessible to wheelchair users and people with ambulant mobility impairments**

![Diagram of urinals with dimensions in millimetres]

Dimensions in millimetres

a) Elevation

Key

1. Line of top fixing for vertical grab rails
2. 600 mm long grab rail for standing users
3. 900 mm long grab rail for wheelchair users
4. Wall space kept free of pipework to 200 mm above floor unless urinal projects more than the minimum 360 mm from the wall
5. 900 mm wide × 1400 mm deep wheelchair access space

A Suitable for people with ambulant mobility impairments
B Suitable for wheelchair users

18.5.5 Washbasins

18.5.5.1 Hand rinse basin and tap

A wall-mounted hand rinse basin should be provided in a unisex WC cubicle to allow closer access for wheelchair users and to enable feet and foot rests to move under the washbasin when the wheelchair is turned. The height of the washbasin rim should be as shown in Figure 43. The projection should be as shown in Figure 44.

The hand rinse basin should have a mixer tap fitted to the side of the basin nearest to the WC to allow easy reach from the WC.

**NOTE** Some proprietary types of plug (e.g. spring-loaded or flip-over) avoid a chain or a pop-up waste and are more suitable for people with limited hand dexterity.
18.5.5.2  Washbasins accessible to people with ambulant mobility impairments

The unobstructed space provided at washbasins for people with ambulant mobility impairments should be 800 mm wide × 1100 mm deep.

A basin rim should be set between 780 mm and 800 mm above finished floor level as shown in Figure 43.

Where possible, vertical support bars at least 600 mm long should be fixed each side of the washbasin, with their mid-point at 1100 mm above the floor (see Figure 43).

18.5.6  Toilet accessories

18.5.6.1  General

Toilet accessories, such as dispensers for soap, toilet paper and paper towels, should be suitable for single-handed use and for use by people with weak arm movements. They should be readily accessible to a person in a wheelchair or seated on the WC, and to a person when standing (see Figure 42).

NOTE 1  Single-sheet toilet paper dispensers are more suitable for single-handed use than most toilet roll holders.

Electric hand dryers with an automatic timed duration should be provided in addition to a paper towel dispenser, and should be located on the door side of the washbasin so as not to obstruct access to the WC. They should be operated either by a movement sensor or by an easily operated push button. Hand dryers that require the user to insert their hands in the top of the dryer should not be installed.

NOTE 2  Noise from electric hand dryers can cause difficulties for people with sensory/neurological processing difficulties or with heightened sensitivity to noise.

If a shaver point is provided, it should be located at the side of a mirror, between 800 mm and 1000 mm above the floor (see Figure 43).

Sanitary towel and incontinence pad dispensers, and sealed containers for their disposal, as well as disposal bins for other items, should be incorporated into the design of the WC compartment in such a way that they do not obstruct transfer from a wheelchair to the WC pan. They should not be placed within the manoeuvring area for wheelchairs.

NOTE 3  In areas of high usage, it might be preferable to install built-in macerator units.

Shelves should be provided in accordance with 18.1.5, Figure 40 and Figure 42.

Wall-mounted vending machines, where used, should not reduce the clear width of door openings.

18.5.6.2  Mirrors

Mirrors should be positioned as shown in Figure 43.

When a mirror is located away from a washbasin, e.g. within an individual unisex accessible toilet, or when it is serving a range of compartments or other sanitary facilities, it should be at least 1000 mm tall and have its bottom edge set at 600 mm above the floor (see Figure 43).

NOTE 1  A mirror fixed between these heights and located away from a washbasin is suitable for use by people with ambulant mobility impairments and wheelchair users.

Any mirror that is located above a large washbasin (not the hand rinse basin associated with a corner unisex WC layout) should be fixed as closely as possible to the top of the basin and extend to at least 1600 mm above the floor, as shown in Figure 43. Mirrors that cannot be extended down
to the upper edge of the washbasin, e.g. because of the presence of a soap dispenser, should be tilted forward.

NOTE 2 A tilting mirror is suitable for use by most people and can enable a smaller size of mirror to be used. Large expanses of mirror in a compartment should be avoided as they can cause difficulties for people who are blind or partially sighted.

18.5.7 Lighting and lighting accessories

NOTE General recommendations for lighting are given in Clause 14.

The maintained illuminance (or general lighting level) of toilet accommodation should be not less than 100 lux at floor level.

Where automatic lighting is used, the sensor(s) should be so located and sufficiently sensitive to detect the presence of a person anywhere within the space.

18.5.8 Emergency assistance

Emergency assistance alarm systems in toilet accommodation should be in accordance with 13.7.2 and 18.1.8.

The emergency assistance pull cord should be sited so that it can be operated from the WC and from an adjacent floor area.

18.5.9 Heat emitters

In a unisex accessible toilet, heat emitters should not be located in the following positions:

a) on the same wall as the WC or adjacent to it;

b) on the wall directly opposite the washbasin, unless the width of the room is increased to accommodate it;

c) underneath, or immediately adjacent to, the washbasin or hand dryer.

18.6 Changing Places toilets

COMMENTARY ON 18.6

A Changing Places (CP) toilet is a room with a WC, hoist, basin, adult-sized changing bench and optional shower, for use by people with complex and multiple impairments who require the help of up to two assistants. The space needs to be fitted with a fixed tracked-hoist system so that assistants can fit the user's slings to the hoist and move the person to the various items in the facility.

Any building where the public have access in numbers would benefit from provision of a CP toilet. Such facilities are particularly important in buildings that might offer the only suitable sanitary accommodation within a locality (e.g. transport interchanges), buildings where visitors might be expected to spend long periods of time (e.g. leisure and sport complexes), or buildings where public services are provided (e.g. those operated by local authorities). Commercial facilities such as large retail and leisure premises would be suitable as they provide longer opening hours and are likely to have a regular cleaning regime.

CP toilets require extended space to accommodate disabled people, often with large complex wheelchairs with elevated leg rests, a reclining facility or integral oxygen cylinders, and space to fit slings for use with the hoist. It also needs to be possible for a wheelchair to be parked within the facility when not in use without compromising the safe access and use of the equipment.

As CP toilets are not designed for the use of independent wheelchair users, or to be used as baby changing facilities, it is desirable for facility providers to indicate the location of the nearest unisex accessible toilet and the nearest baby changing facility.
Further advice on the design and installation of CP toilets, particularly in existing premises, including a suitable logo to identify such facilities, can be obtained by contacting the Changing Places Consortium. The Changing Places Consortium website provides an interactive map which indicates the locations of all CP toilets throughout the UK. It would be of benefit to the Changing Places Consortium to receive notification of any new CP toilets being built to allow them to be incorporated into the map.

A CP toilet is not suitable for bariatric use, as the turning space and load-bearing capabilities are considerably more onerous. It is necessary to obtain specialist advice for such use.

CP toilets should be provided in buildings and complexes such as:

a) major transport termini or interchanges, e.g. large railway stations and airports;
b) motorway services;
c) sport and leisure facilities, including large hotels;
d) cultural centres, e.g. museums, concert halls and art galleries, and faith centres;
e) stadia and large auditoria;
f) large commercial retail premises and shopping centres;
g) key buildings within town centres, e.g. town halls, civic centres and main public libraries;
h) educational establishments;
i) health facilities, such as hospitals, health centres and community practices;
j) other visitor attractions, such as theme parks, monitored beaches and parks.

NOTE 1 Care is needed to ensure that CP toilets are located to provide maximum access for users, taking into account factors such as security and payment barriers. In some cases this might require duplication of facilities.

Where possible, a CP toilet should be located close to other managed facilities in a development. If remote from the reception/management point, the facility should have controlled access.

The CP toilet should be in addition to, not instead of, the provision of standard and accessible toilets. A sign should be provided at the entrance to the CP toilet indicating the location of the nearest unisex accessible toilet and any baby changing facilities.

The CP toilet should be at least 3 m wide and 4 m long, with a ceiling height of 2.4 m.

NOTE 2 Additional guidance, particularly for existing buildings, can be sought from the Changing Places Consortium.

The doorway should have a minimum effective clear width of 1 000 mm, with a level threshold. Where practicable, recessed single-leaf single-swing doors should open out and be fitted with a horizontal pull rail on the interior face of the door. Where they need to open inwards, the door position should not restrict access. A turning space of 1 800 mm should be provided to enable someone to enter safely before the door is closed.

CP facilities should have a full room cover overhead tracked hoist system (either ceiling- or wall-mounted) conforming to BS EN ISO 10535. The room structure and the track should be capable of supporting a safe working load of 200 kg. All ceiling fittings and fixtures should be flush, recessed or shallow fittings to allow free movement of the moving rail of the tracked hoist. Manufacturers’ instructions should be clearly displayed.

NOTE 3 The use of a mobile hoist might restrict the flexibility and long-term use of the facility. A full room cover system provides greater flexibility by being able to reach all areas of the room. Written instructions on the use of equipment need to be displayed beside each item (see Annex F). It is expected that the premises management will
provide information to prospective users on the type of sling connector and the types of sling that are compatible with their installed hoist and track.

**NOTE 4** The loop type of connector is preferred by the vast majority of private users, whereas the clip type is more common in healthcare buildings. More information on slings is available in Annex F.

The room should have a mobile or wall-mounted changing bench, in each case height-adjustable, capable of operating at a safe working load of 200 kg. The covering of the bench should be suitable for use when a person is showering as well as changing, and should be easy to clean/dry.

**NOTE 5** Mobile changing benches offer greater flexibility in use. Wall-mounted changing benches can be beneficial where there are safety or security concerns.

**NOTE 6** It can be beneficial to use a shower seat in conjunction with a moveable changing bench. A mobile changing bench has the advantage that assistants can give support from both sides when the bench is moved away from the wall (see Annex F). Attention is drawn to the Lifting Operations and Lifting Equipment Regulations 1998 [44]. Useful guidance is also available in Guide to the handling of people [45].

Large sanitary disposal bins and waste disposal bins should, where practicable, be recessed into the wall to avoid being an obstacle to assistants moving alongside the WC. Sanitary disposal bins should be large enough to accommodate adult-sized pads.

A power-operated, height-adjustable washbasin should be provided to accommodate use by both wheelchair users and assistants.

A peninsular WC layout should be provided, with drop-down support rails either side.

**NOTE 7** It is an advantage if the support rails are height-adjustable.

A retractable privacy screen (not ceiling-mounted) should be provided to allow the disabled person to maintain their dignity when using the WC, as an assistant will always be present.

**NOTE 8** The screen will also benefit assistants who require to use the WC without leaving the disabled person unattended.

Ventilation extract fans should be as quiet as possible in operation as their noise can cause distress to some people and can be a barrier to communication.

The CP toilet should be heated, as users might be undressed and in the facility for a long period.

**NOTE 9** Under-floor heating is preferred as this can aid in drying out the room after a shower is used, and it does not impact on space.

The illuminance in the room should be maintained at 300 lux at changing bench level. Timed lighting should not be used as, if the lighting switches off, the assistant has to leave the disabled person unattended to re-activate the lighting.

**NOTE 10** It is not appropriate to install ultra-violet light in this type of facility, as it reduces the ability of people who are blind or partially sighted to appreciate visual contrast and might trigger seizures in people with epilepsy.

A CP toilet should contain, as a minimum, the fittings and accessories shown in the example layout in Figure 48. Clear instructions and notices should be displayed with any weight limits and a reminder, where appropriate, to return the hoist to the charging point.
Figure 48 — Example of fittings and accessories in a Changing Places toilet

Dimensions in millimetres

Key

1 Paper towel dispenser
2 Full length mirror
3 Large sanitary disposal bin, if possible recessed into the wall
4 Alarm reset button
5 Full room cover tracked hoist system
6 Vertical grab rail
7 Drop-down support rails with toilet paper dispensers
8 Flat-topped close-coupled cistern providing a back rest and a colostomy bag changing surface for standing users
9 Peninsular WC (see Figure 45 for the location of associated fittings)
10 Large power-assisted height-adjustable washbasin
11 Waste disposal bin
12 Manually-operated low-noise hand dryer (see Note 2 to 18.5.6.1)
13 Retractable privacy curtain/screen
14 Alarm pull cord
15 Height-adjustable showering/changing bench, min. 1800 mm long
16 Floor drain
17 Optional shower unit with hose long enough to reach the centre of the bench, for personal hygiene purposes
18 Wide paper roll dispenser for use on the changing bench
19 Sanitary towel dispenser
20 Two clothes hooks, one at 1050 mm and the other at 1400 mm above the floor

NOTE 1 Details of common features of sanitary accommodation are described in 18.1 and accessories related to toilets in 18.5.6. Advice on particular products is available from the Changing Places Consortium (see Commentary on 18.6).

NOTE 2 Provision of a wash/dry type WC can enable greater independence and dignity for users.

NOTE 3 Provision of a shelf can be beneficial for users.

A) Where high or low level or reduced flush cisterns are used, a rail with a padded back rest and a separate colostomy bag changing shelf at 950 mm above finished floor level should be provided.
19 Individual rooms

19.1 Kitchen areas

COMMENTARY ON 19.1

Bringing food preparation, cooking areas and appliances within the reach of most people with restricted movement is the key factor to consider in the arrangement of kitchen areas and their fittings.

It is particularly difficult to cater for users with a wide range of requirements in kitchen areas. Compromise and care in the choice and design of facilities are crucial. If appropriate, two sets of facilities, e.g. two adjacent sinks, at heights suitable for wheelchair users and people with ambulant mobility impairments, provide maximum versatility.

As the height, depth and extent of the clear space below a work surface affect reach, they have a major impact on how easily a wheelchair user can use a kitchen. The clear space below a work surface also influences how much unobstructed main floor space is needed for wheelchair users to move easily from one task area to another.

Carefully chosen lighting and finishes, as well as kitchen fittings and appliances chosen to contrast visually with their backgrounds, not only create a safe environment for partially sighted people but also one that is attractive for all users.

The recommendations given in this subclause apply to self-catering kitchen facilities in non-residential buildings (such as shared refreshment facilities in commercial buildings or offices, community buildings and community centres, self-catering accommodation or hospital accommodation for relatives of in-patients, premises for hire and day centres), and to catering facilities in buildings such as university and college halls of residence, and nursing, residential and care homes. The recommendations also apply to existing buildings where practicable.

The recommendations do not apply to commercial kitchens.

19.1.1 Accessible routes

Where a kitchen area suitable for wheelchair users and people with ambulant mobility impairments is provided in a building, it should be located on an accessible route that is direct and obstruction-free.

19.1.2 Floor space and knee recesses for wheelchair users

A kitchen area should have an unobstructed floor space of at least 1 500 mm × 1 500 mm between facing floor units or between floor units and a wall.

Where possible, an unobstructed space or knee recess, at least 800 mm wide, should be provided to one side of kitchen appliances such as refrigerators, washing machines, freezers or ovens.

A knee recess the depth of the work surface and at least 800 mm wide should be provided below or adjacent to each key task area, such as hobs, sinks and preparation spaces, as shown in Figure 49 and Figure 50. Where a knee recess is provided under a hob or a kitchen sink bowl, its underside should be insulated to avoid harm to a person who has little or no feeling in their legs.

NOTE The extent to which knee recesses can be provided depends on the amount of floor-mounted cupboard space required. The side on which a knee recess is located is determined by the handing of the appliance doors and controls.
Figure 49 — Kitchen and work surface layout in a kitchen for shared use (with dual height work surfaces)

Key
1  Work space suitable for ambulant people:
   900 mm height work surface with cupboard units below and wall units over
2  Work space suitable for wheelchair users:
   760 mm or adjustable height work surface with clear space below (wall units optional)
3  Change of level
4  Knee recess with 800 mm min. width to be used between floor mounted cupboards (hobs and kitchen sink bowls to be insulated within this recess)
5  Hob
6  Alternative hob arrangement reduces reach needed, and allows safer pan removal
7  Mobile storage unit
8  Separate refrigerator and freezer, both on plinths
9  Oven
10  Microwave oven
11  1 050 mm min. for wheelchair user to manoeuvre into position
12  Serving hatch to a separate dining room
13  Table
14  Obstruction (e.g. wall, kitchen unit or appliance)
15  800 mm min. for a person with an ambulant mobility impairment to be able to sit at a table
**Figure 50 — Work surfaces and accessories**

Key

1. Power sockets on side wall 150 mm max. back from the front of worktop
2. Isolating switches controlling sockets on rear wall above knee recess
3. Switched socket outlets 150 mm above work surface on side wall
4. Cabinet with deep pan drawers
5. Pull-out shelf above floor-mounted cupboard unit
6. Max. height reachable by people with ambulant mobility impairments
7. Standard location of wall cupboards
8. Maximum shelf height to allow reach from a wheelchair
9. Height of work surface specifically for wheelchair users (760 mm or adjustable height)
10. Height of work surface for a shared refreshment facility (850 mm or adjustable height)
11. Clear height 700 mm min. for knee recess

*NOTE* The drawing shows the use of a wheelchair with desk arms.
19.1.3 Work surfaces

19.1.3.1 Work surface layout and work sequence

COMMENTARY ON 19.1.3.1

A logical work sequence and efficient use of space are important considerations for people with restricted movement, as they prevent fatigue caused by unnecessary travel between areas for food storage and preparation, cooking, and utensil cleaning.

A work surface should be continuous where possible, and designed so that travel is minimized, for wheelchair users in particular, between the sink, hob/oven, refrigerator and other appliances or task areas. There should be a smooth transition between the work surface, hob and drainer so that wheelchair users or anyone with a poor grip can slide rather than carry objects from one task area to another.

NOTE An L or U shaped worktop layout allows for a more compact working sequence than an in-line (galley) or parallel worktop layout.

19.1.3.2 Dual height work surfaces for a self-catering kitchen used by wheelchair users and people standing

Where space is available, and the kitchen is intended for use by wheelchair users and people with ambulant mobility impairments who occupy the same accommodation and cater for themselves, work surfaces, sinks and, if possible, hobs should be provided at different levels, as follows:

a) 900 mm for people standing;

b) 760 mm for wheelchair users (see Figure 49 and Figure 50).

NOTE The use of an adjustable height work surface gives greater flexibility and is therefore to be preferred.

19.1.3.3 Single height work surface for a tea point

Where a facility is provided for making refreshments and heating pre-cooked meals only, and a dual facility cannot be accommodated, a single work surface of 850 mm or adjustable height, which allows for the widest range of users, should be provided (see Figure 50 and Figure 51).

NOTE 1 The use of an adjustable height work surface gives greater flexibility and is therefore to be preferred.

NOTE 2 In multi-storey buildings, it is preferable for the layout of such facilities to be handed on alternate floors.
Figure 51 — Layout of shared refreshment facility

Key
1  Clear space under worktop (structural support will be required for sink and worktop but should not impede access for wheelchair users)
2  150 mm deep sink bowl (insulated)
3  Water heater (may be freestanding subject to safety requirements)
4  Floor unit
5  Microwave oven
6  Wheelchair turning space (1 500 × 1 500) mm
7  Refrigerator under worktop
8  Work surface 850 mm above finished floor level or adjustable height

19.1.3.4 Variable height work surfaces for self-contained self-catering accommodation designated for disabled people

For self-contained self-catering accommodation (e.g. hostels or chalets in leisure parks), which is designated for people with ambulant mobility impairments and wheelchair users, and where occupancy changes on a regular basis, work surfaces should be provided at heights of between 750 mm and 900 mm. This can be achieved in various ways, including:

a)  designing a range of different work surface heights across the stock of designated accommodation;
Where a range of different heights of work surface is provided, it is the responsibility of management to match users to the most appropriate accommodation.

b) using a system of easily adjustable work surfaces to accommodate the specific requirements of a disabled person.

NOTE 2 Work surfaces can be readily adjusted electrically or manually or changed without excessive disruption between tenancies or ownership.

Storage units and services to sinks should also be adjustable, with storage units provided as mobile units.

19.1.3.5 Work surface depth

**COMMENTARY ON 19.1.3.5**

A wheelchair user’s knees and feet are accommodated when the space below the work surface is kept clear of floor-mounted cupboard units, equipment, support brackets, legs and front fascia.

A work surface should be not more than 600 mm deep as shown in Figure 50, with occasional knee recesses with reduced work surface depth to allow wheelchair users to reach as far as possible over the work surface in the preparation area and to reach switched socket outlets on the back wall. The front edge of the work surface should have a rounded profile.

19.1.3.6 Work surface accessories

**COMMENTARY ON 19.1.3.6**

Where circulation space and floor-mounted cupboard space is at a premium, and an accessible work surface for all kitchen tasks is not possible, pull-out shelves provide supplementary accessible work surfaces for wheelchair users. Pull-out boards may be usefully located adjacent to a hob, oven or refrigerator.

If pull-out shelves are required when floor-mounted cupboard units restrict access for wheelchair users over the work surface, they should be fitted immediately below the work surface (see Figure 50).

If fitted, at least one pull-out shelf should be provided with a circular cut-out, finished with rubber beading, so that people with poor grip or coordination can secure an object, such as a mixing bowl, that normally requires steadying with one hand.

A pull-out shelf should be accessible by a person with limited grip, and should contrast visually with the background against which it is seen to ensure that it can be seen by a person who is blind or partially sighted if it is left in the “out” position.

19.1.4 Storage units accessible to wheelchair users

A number of floor-mounted cupboard units, with banks of drawers, should be provided as they enable side access for wheelchair users if a kitchen area is limited and base units are required to maintain storage at an acceptable volume.

**NOTE 1** Full height, tall units with lateral pull-out horizontal shelving set at different heights might assist wheelchair users, in addition to pull-down baskets in wall units.

**NOTE 2** A floor-mounted cupboard unit used at a corner return may be fitted with a carousel mechanism for gaining easy access to items stored out of reach.

**NOTE 3** Where space is limited, a moveable trolley consisting of drawers or open containers can be useful for wheelchair users, providing flexible and accessible storage in place of a fixed floor-mounted cupboard unit. A moveable trolley provides supplementary storage space accessible from all sides from a seated position. When not in use, it can be stored under a work surface. When access to the work surface is required, the trolley is temporarily wheeled aside.
19.1.5 Cupboard unit door and drawer hardware

Cupboard unit door and drawer handles should be easy to grip.

NOTE 1 In a shared kitchen facility, it is an advantage if door pulls of high-level wall cupboards are positioned towards the bottom of the door.

Sliding doors and drawers should be capable of being operated with limited force when operated from the front or side.

Cupboard unit doors should swing open through 180°.

NOTE 2 A cupboard door with a 90° opening is a hazard, especially for people who are blind or partially sighted. A door with a 180° opening is not a hazard, and does not restrict access in front of it.

19.1.6 Kitchen sink and taps

COMMENTARY ON 19.1.6

A person with a poor grip can operate a lever tap by using the flat of the hand, a closed fist or the wrist. A swivel neck allows the outlet to be located over an adjacent work surface or drainer that supports pans and kettles while filling. It is difficult for many wheelchair users to operate a mixer tap safely if it is located centrally behind the sink bowl.

A sink bowl to be used by a wheelchair user should where possible be 150 mm deep to enable easy reach of immersed items.

NOTE 1 When used in conjunction with a work surface shared by people with ambulant mobility impairments and wheelchair users, the shallow sink provides clearance for a wheelchair user’s knees.

The underside of an exposed sink bowl and any exposed hot water pipes and wastes should be heat-insulated to avoid the possibility of knee and leg injuries caused by hot surfaces.

Taps should have clear markings to indicate hot and cold settings, and should have a lever operation. They should be fitted to the sink within easy reach of wheelchair users, if necessary at the side of the sink bowl.

In a kitchen where water can be emitted at a temperature greater than 43 °C, a warning notice should be displayed clearly.

Where particular care is needed for people who are insensitive to temperature and who are therefore at risk of being scalded, a control mechanism should be provided to limit water temperature to 43 °C.

NOTE 2 The temperature of water circulating in the pipework needs to be at least 60 °C to avoid the risk of Legionella.

NOTE 3 The temperature of hot water supply at an outlet can be controlled by use of an appropriate in-line blending valve or other temperature control device in accordance with either BS EN 1111 or BS EN 1287.

19.1.7 Kitchen appliances

19.1.7.1 Hobs and individual cooking rings

A hob should:

a) be located near the oven, with a preparation area between it and the oven;

b) have a heat-resistant work surface on at least one side, but preferably both sides, to provide a support surface for pans;

c) be insulated on the underside if located above a knee recess;
d) have a means of indicating (if electric) that the rings are hot;
e) have controls that are either at the front of the burners, or mounted in a deep fascia at the front edge of the work surface.

A hob's controls should be easy to locate and the settings should be easy to identify and operate.

Where necessary to cater for people with severely restricted reach, an alternative arrangement of individual cooking rings, with the furthest edge of the cooking ring not more than 400 mm from the front edge of the work surface, should be provided, as shown in Figure 49.

NOTE Cooking rings that are located behind others are of limited use to people with restricted reach.

Where gas rings are used, they should be self-igniting.

19.1.7.2 Oven units

COMMENTARY ON 19.1.7.2

A side-hung or slideaway oven door and a pull-out shelf underneath assist the transfer of items from the oven to a trolley or the work surface.

Oven units with telescopic, locking shelves and a pull-out robust shelf below the oven, set at a height suitable for a wheelchair user to get underneath, can also assist ambulant users.

Oven units in a kitchen to be used by wheelchair users and people with ambulant mobility impairments should be chosen to facilitate easy transfer of cooking vessels from the oven to an adjacent work surface.

If an oven unit has side-hung doors, they should open to 180°. The swing of an oven door should not impede access by wheelchair users (see Note 2 to 19.1.5). The door should open away from the adjacent work surface to enable hot dishes to be easily transferred.

Oven units intended for use by wheelchair users should either have adjustable-height housing or be located such that the surface of the pull-out shelf below the oven is at 760 mm above finished floor level. Oven units intended for use by people with ambulant mobility impairments should be installed with the base of the oven interior not lower than 850 mm.

Controls for an oven and grill intended for use by wheelchair users should be not higher than 1 050 mm and not lower than 700 mm above finished floor level, with display panels not higher than 1 200 mm above finished floor level.

The markings of the controls should be clear and easy to understand and their design should enable them to be operated by people with limited dexterity.

Microwave ovens should either be located on a work surface or mounted such that the base of the oven is not higher than 850 mm from the floor and its controls not higher than 1 150 mm from the floor.

19.1.7.3 Other kitchen and laundry appliances

Where a refrigerator and/or freezer (excluding chest freezers) are intended for use by wheelchair users, they should be fitted as separate units on a plinth approximately 200 mm high. The swing of a side-hung door should not impede access by wheelchair users (see Note 2 to 19.1.5).

NOTE The highest and lowest shelves of a standard floor-standing combination fridge-freezer are not accessible for most wheelchair users.

Where a front-loading washing machine and front-loading tumble dryer are intended for use by wheelchair users, they should be installed on a plinth with their bases set at 200 mm above finished floor level.
If a dishwasher is intended for use by wheelchair users, it should be installed on a plinth with its base set at approximately 200 mm above finished floor level.

A water heater should, wherever possible, be installed as a free-standing unit with controls not higher than 1 200 mm from the floor. If installation of a water heater above a work surface is unavoidable, it should be located such that the controls are not higher than 1 150 mm from the floor.

If ironing facilities are intended for use by wheelchair users, a folding wall-mounted ironing board, with height adjustment, should be provided in conjunction with an adjacent socket outlet.

19.1.8 Switches, sockets and controls

COMMENTARY ON 19.1.8

Switches can be arranged to operate moveable appliances plugged into sockets located at the back edge of a work surface, and to operate fixed appliances such as washing machines, ovens and cooker hoods.

Where a clear space has been provided beneath a work surface, switched socket outlets should be positioned on the wall at the back of the worktop, with their centre line not higher than 1 050 mm from finished floor level. This maximum height relates to the maximum height standard work surface of 900 mm and should be proportionally lower for a lower work surface.

Where no space has been provided beneath a work surface, switched socket outlets should be positioned on a return wall at the end of the work surface at 150 mm above the work surface and not more than 150 mm back from the front edge of the work surface. Isolating switches controlling socket outlets should be positioned on a fascia, as shown in Figure 50. Only switches should be located on a front fascia.

Switches and controls in kitchens, where mounted on a wall without an intervening work surface or counter, should be accessible to wheelchair users and be mounted with their centre lines between 750 mm and 1 200 mm from finished floor level.

Work surface light switches should be located on a wall remote from the light fittings for easy access by those with limited reach, e.g. adjacent to the main light switch.

Controls for general kitchen appliances, excluding ovens but including cooker hood extract units, should be not higher than 1 200 mm, or 1 150 mm if it is necessary to reach across a work surface to operate them.

19.1.9 Heat emitters

Heat emitters should not restrict the recommended circulation spaces in a kitchen (see 19.1.2).

Surfaces of heat emitters should either be screened to prevent burns, or kept at a temperature not exceeding 43 °C.

19.1.10 Alarm systems

The signal emitted by a fire alarm should be both visual and audible to warn people who are blind or partially sighted, and people who are Deaf and hard of hearing.

Where an emergency assistance alarm system is installed in a kitchen, it should meet the recommendations in 13.7.2.
19.1.11  Refreshment and dining areas — Dining spaces for wheelchair users

COMMENTARY ON 19.1.11

Wheelchair users need easy access to take their cooked meals from the kitchen area to a shared dining area.

Priority seating should be provided for disabled people in all refreshment and dining areas in buildings visited by the general public. In large dining areas, the table layouts should provide for more than one accessible location to give people choice. Routes to collect food and dispose of waste should also be accessible.

Wheelchair access should be provided to the full length of self-service counters and till areas. Fixed seating at tables and table supports should allow access to the table by one or more wheelchair users without the need to remove foot rests.

The provision of dining spaces associated with kitchens should be as follows.

a) When a dining area is designed to be part of a kitchen, it should accommodate all potential users.

b) When a dining area is designed to be separate from a kitchen, space should be provided for two people to eat together informally in the kitchen from a table whose surface is not higher than 760 mm and whose vertical knee hole space is not less than 700 mm.

c) A serving hatch should be provided at the rear of a wheelchair work surface, and level with the work surface, to link directly with any separate dining area.

19.1.12  Finishes for kitchen and dining space surfaces

Cupboard units and work surfaces should contrast visually with background finishes to help people who are blind or partially sighted identify the differences between them.

Flooring should be slip-resistant and contrast visually with wall surfaces.

NOTE  Guidance on the slip resistance of different floor finishes is available in Annex C.

Shiny floor and wall surfaces should be avoided as they can produce reflections and glare that confuse people who are blind or partially sighted.

Bold patterns should not be used on floors and walls, as they are confusing for people who are blind or partially sighted.

19.1.13  Lighting of kitchens

NOTE  General recommendations for lighting are given in Clause 14.

The maintained illuminance (or general lighting level) of a kitchen should be in the range 200 lux to 300 lux, at work surface level, without giving rise to glare, reflections, or shadows on the work surfaces and sink.

Room lighting and task lighting should be designed to provide a clear definition between work surfaces and manoeuvring spaces, with task lighting at work surfaces having a higher illuminance than the ambient room lighting.

When designing daylit kitchen areas, appliances should be located such as to avoid reflections due to bright sunlight from polished stainless steel sinks, drainers, splashbacks and cookers.

Fluorescent lights with electronic ballasts should be used on low ceilings and on walls, as inductive chokes can cause interference to hearing aids. Electronic ballasts should be high frequency to avoid any perception of flicker.
19.2 Accessible bedrooms

COMMENTARY ON 19.2

Many disabled people find it more convenient to dress and undress on a bed. Some disabled people might also have continence problems and therefore need to be close to sanitary facilities.

A ceiling track hoist system, for transfers between a wheelchair, bed, chair, shower or bath and WC, can provide the required support to assist a person to move between different locations and potentially reduce transfers.

Disabled people, particularly wheelchair users, need sufficient space to be able to move around a bedroom with ease and to use the facilities available. Disabled users might also need to bring assistance dogs into the room.

Whilst there might be increased circulation space, disabled people can still find it difficult to reach certain fixtures and fittings from a seated position and/or due to limited reach range. The type and location of fixtures and fittings therefore need to be selected carefully in order to ensure ease of use by a range of people.

Carefully chosen lighting, fixtures and finishes, in addition to windows which provide a view, can create a safe and welcoming environment which can assist people who have difficulty adapting to unfamiliar environments.

Adequate provision of electric socket outlets will assist with the charging of medical equipment, electric wheelchairs, etc.

The recommendations given in this subclause apply to all building types that require permanent sleeping accommodation for disabled people, including hotels, motels, nursing, residential and care homes, university and college halls of residence, and relatives’ accommodation in hospitals.

19.2.1 Provision of accessible bedrooms

19.2.1.1 General

An accessible bedroom should cater for as wide a range of disabilities as possible (see 3.3).

Accessible bedrooms should always be provided with en-suite sanitary facilities if the general sanitary arrangement in the building adopts an en-suite approach for any other standard bedrooms. En-suite facilities should be the preferred solution where there is no such approach as disabled people might have difficulty moving from one compartment to another. If such a solution is not possible, the sanitary facility and the bedroom should provide separately the same degree of accessibility and be located close to one another.

NOTE It can be advantageous for some accessible bedrooms to have a connecting door to an adjoining room for use by an assistant or family member.

19.2.1.2 Hotel bedrooms

Accessible bedrooms should always be provided with en-suite accessible sanitary facilities, including a WC, basin and shower (or bath) if en-suite facilities are provided for any other bedrooms.

The minimum provision of accessible bedrooms as a percentage of the total number of bedrooms should be:

- one room or 5%, whichever is the greater, with a wheelchair-accessible en-suite shower room for independent use (see examples in Figure 30 and Figure 52);
- a further one room or 1%, whichever is the greater, with a tracked hoist system (see examples in Figure 31 and Figure 32), and a connecting door to an adjoining (standard) bedroom for use by an assistant or companion;
• one room or 5%, whichever is the greater, with an en-suite shower room to meet the requirements of people with ambulant mobility impairments (see Figure 53).

A further number of bedrooms to make up a total provision of 15% of all bedrooms should be large enough for easy adaptation to accessible bedroom standards (with en-suite facilities) if required in future, i.e. incorporate all the correct dimensions and sanitary layouts in Figure 33 and Figure 52, and be structurally capable of having grab rails installed quickly and easily.

**Figure 52 — Example of an accessible bedroom with en-suite sanitary facilities**

![Diagram of an accessible bedroom](image)

**Key**

1. Television
2. Refrigerator
3. Luggage rack
4. Drawer unit and clear space under
5. 800 mm min. unobstructed knee recess in wardrobe, with no plinth
6. Effective clear width (see Table 2); position of door depends on layout of room
7. See Figure 30 for details of a shower room with corner WC for independent use, Figure 32 for details of a bathroom with a tracked hoist system and Figure 34 for details of a bathroom with a peninsular WC for assisted use

A (1 500 × 1 500) mm min. allows front facing or 45° oblique transfer by wheelchair user

B (2 250 × 2 100) mm min. allows transfer methods used in A and also space for a mobile hoist to be turned through 180°

C 700 mm min. allows an assistant to help with the transfer from the other side of a bed

**NOTE 1** The example shown is for right-hand transfer to the shower seat and WC.

**NOTE 2** The example shown is for twin beds but would accommodate a double bed.
If only three accessible bedrooms are provided at completion, the en-suite sanitary facility for independent use should be a shower room rather than a bathroom, since many disabled people can only use a shower. If practicable, it should have a right-hand transfer layout (see Figure 30). The en-suite sanitary facility for assisted use should be a bathroom with an over-bath shower and with a fixed or demountable over-bath stretcher available within the room.

If more than one accessible bedroom for independent use is provided, a choice of shower or bath and a choice of left-hand or right-hand transfer to the WC and shower or bath should be provided. A choice of sanitary facilities for independent and assisted use should be made available.

NOTE 1 Right-hand transfer is taken to mean the action of a person moving from being seated in their wheelchair to the WC pan on their right.

NOTE 2 The preferred solution for an en-suite sanitary facility for independent use is a level-access shower, with a shower chair/tip-up seat.

19.2.1.3 Student accommodation bedrooms

COMMENTARY ON 19.2.1.3

Student accommodation differs from hotel accommodation as students book or reserve accommodation in advance, meaning a longer lead-in time than would be received with a hotel booking.

For this reason a greater level of flexibility and adaptability can be applied, as there will be time to ensure that any accessible accommodation is arranged and that the correct equipment and facilities have been installed to suit an individual disabled student.

19.2.1.3.1 Accessible student accommodation design

Accessible bedrooms or self-contained flats should meet the general recommendations in 19.2.1.1.

Some fully equipped accessible student accommodation should be provided on completion of the building, to ensure that a room or self-contained flat which is accessible is available for people to view and assess how their requirements can best be met in the space, including storage space and arrangements.
Given the long lead-in time for residents coming into student accommodation and the fact that they are likely to stay for between 8 months and a year, easily adaptable accommodation should also be provided.

NOTE  Easily adaptable accommodation incorporates the correct space requirements, power socket locations and sanitary ware positions, and reinforced wall panels to accommodate grab rails, but does not need to incorporate all of the grab rails and other kitchen and dining fixtures, fittings and furniture on completion; these could be installed at a later date if required to suit an individual disabled person. If it is not required these rooms could form part of the general student accommodation offer.

Where kitchen facilities are provided in association with student accommodation, the kitchen should meet the recommendations in 19.1.

19.2.1.3.2 Accessible student bedroom provision

In student accommodation, the minimum provision of accessible bedrooms as a percentage of the total number of bedrooms should be:

- one room or 4%, whichever is the greater, wheelchair-accessible in accordance with Figure 52 and Figure 54;
- one room or 1%, whichever is the greater, with a tracked hoist system (see examples in Figure 31 and Figure 32), and a connecting door to an adjoining (standard) bedroom for use by an assistant or companion;
- 5% easily adaptable wheelchair-accessible rooms for independent use.

Easily adaptable rooms should provide the space allowances and design features recommended in 19.2.7 and Figure 30 on completion, but not the grab rails, shower seat or alarm pull cords shown in Figure 30. In the case of easily adaptable assisted use wheelchair access rooms, the structural and ceiling height needs should be met on completion but the hoist can be fitted when required.

All fittings should be easy to install when required.

If only one accessible bedroom is provided, it should include an accessible shower room, rather than a bathroom. If practicable, it should have a right-hand transfer layout (see Figure 30). If more than one en-suite accessible bedroom is provided, a choice of shower or bath and a choice of left-hand or right-hand transfer to the WC and shower or bath should be provided.

All sanitary facilities in accessible bedrooms should contain a WC.

NOTE 1  Right-hand transfer is taken to mean transfer to the right when a person is seated in their wheelchair.

NOTE 2  The preferred solution is a level-access shower, with a shower chair/tip-up seat being provided, if required.
Figure 54 — Examples of accessible bed layouts

**Dimensions in millimetres**

a) Double bedroom (with space for an assistant beside the bed)

b) Single bedroom (with space for an assistant beside the bed)

c) Single bedroom (without space for an assistant)

**Key**

1. Bathroom or shower room
2. (1 500 × 1 500) mm min. (see Figure 52)
3. (2 250 × 2 100) mm min. (see Figure 52)
4. 700 mm min. (see Figure 52)

### 19.2.2 Location of accessible bedrooms

Accessible bedrooms should be located on accessible routes that are direct and obstruction-free. Suitable means of escape should be provided in accordance with BS 9999.

Accessible bedrooms should be situated such that they have equal access to views enjoyed from standard bedrooms, as well as access to all available amenities of the building. Those accessible
bedrooms located on upper floors should be located close to lifting appliances; those on the ground floor should be located close to the reception area.

NOTE Provided that accessible routes and suitable means of escape are available, accessible bedrooms do not need to be located on the ground floor, where views might be limited.

19.2.3 Space around beds

19.2.3.1 Space for independent transfer at the side of a bed

The clear minimum space to allow a wheelchair user to gain access to one side of a bed and to turn should not be less than $1500 \times 1500$ mm (see Figure 52 and Figure 54).

NOTE 1 The $1500 \times 1500$ mm square space allows a $45^\circ$ (oblique) transfer, or front facing transfer, from wheelchair to bed, with a wheelchair user needing to reverse at some point during the manoeuvre.

NOTE 2 The use of beds with toe/foot rest space beneath them maximizes manoeuvring space.

The clear space to allow wheelchair users access to one side of a bed and also to turn through $180^\circ$ should be at least $2100 \times 2250$ mm deep (see Figure 52 and Figure 54).

The bed and bedside table should not be fixed to the wall so that they can be moved to suit a person’s preferred mode of transfer to the bed.

19.2.3.2 Space at the side of a bed for an assistant

A clear space should be provided on one side and at the foot of a bed, to allow a person to assist with transfer. This space should be at least 700 mm wide (see Figure 52 and Figure 54).

19.2.3.3 Space at the side of a bed for an assistant to operate a mobile hoist

COMMENTARY ON 19.2.3.3

An assistant-operated mobile hoist is useful in hostels, hotels, holiday facilities, residential, nursing and care homes, hospitals and medical centres.

A clear space should be provided to allow transfer with the aid of an assistant-operated mobile hoist turning through $180^\circ$. This space should be at least $2250 \times 2100$ mm deep (see Figure 52 and Figure 54).

NOTE The space needed to accommodate a mobile hoist in a bedroom is likely to be greater than that of an accessible en-suite bedroom with a fixed hoist system installed.

19.2.4 Doors

19.2.4.1 Clear widths of door openings

The effective clear width of door openings to all bedrooms should meet the recommendations in 8.3.1.

NOTE 1 External doors to bedrooms that are not designed as accessible bedrooms need to have the same effective clear width, so that wheelchair users can visit guests in those rooms. However, door openings, spaces and facilities within such rooms do not need to be fully accessible.

Doors of wardrobes and other storage systems should swing open through $180^\circ$.

NOTE 2 A door that has a restricted swing presents a hazard, especially for people who are blind or partially sighted. A door that swings through $180^\circ$ presents no such hazard, nor does it restrict access in front of it. The approach to storage facilities is also made easier for wheelchair users.
19.2.4.2 Door fittings

Door handles on hinged and sliding doors in accessible bedrooms should be easy to grip and operate by a wheelchair user or a person with an ambulant mobility impairment (see 8.4.1), and should contrast visually with the door.

Handles fixed to hinged and sliding doors of furniture and fittings in bedrooms should be easy to grip and manipulate. They should meet the recommendations in 8.4 for dimensions and location, and the minimum force required to manipulate them.

Electronic door entry systems should be in accordance with 8.5.1.

A wide angle viewer should be provided in doors to accessible bedrooms at two heights, 1 050 mm and 1 500 mm above finished floor level, to allow viewing by a person from a seated position and a person standing.

19.2.5 Balconies

COMMENTARY ON 19.2.5

Access to a balcony is as important as the space on the balcony itself.

Where an adjoining balcony to a bedroom is provided, wheelchair users should have access to it, preferably with space for a companion, as shown in Figure 55.

The external threshold should meet the recommendations in 8.1.4.

Balcony doors should meet the recommendations in 8.3 and 8.4.

The heights of centre rails and transoms incorporated into balcony access doors should not obstruct the view of a wheelchair user or a seated person with an ambulant mobility impairment (see 15.5).

The balcony balustrade and/or guarding should contrast visually with the background against which they are seen and should meet the recommendations in BS 6180. Balconies should not have glazed or see-through flooring.
Figure 55 — Examples of wheelchair access to balconies

Dimensions in millimetres

Key
1 Minimum 900 mm wide circulation zone from a wheelchair space to any obstruction
2 Doors to swing back to wall where, if open at 90°, they would impinge into the minimum circulation zone
3 900 mm wide × 1 400 mm deep wheelchair space
4 Guarding
5 Level threshold
6 Line beyond which there should be no obstructions
7 Minimum transfer zone at the side of a bed (see A in Figure 52)

19.2.6 Windows

COMMENTARY ON 19.2.6

Views from windows uninterrupted by sills and transoms and easy use of window controls are important considerations in the design of accessible bedrooms for wheelchair users and people with ambulant mobility impairments.

Window design in accessible bedrooms should meet the recommendations in 15.5.

19.2.7 Room furniture and fittings

19.2.7.1 Beds

The top surface of a bed mattress should be between 480 mm and 540 mm from finished floor level. The mattress should be firm enough to support a disabled person transferring from a wheelchair.

A clearance under the bed of at least 200 mm should be provided to accommodate the supports of a mobile hoist. Beds in accessible bedrooms should not have extra legs midway between the corner legs as they prevent use of a mobile hoist.
19.2.7.2 Wardrobes and storage systems

Where possible, the design of a wardrobe should incorporate open-fronted access for ease of access for wheelchair users.

NOTE 1 An open-fronted space provides a disabled person with the option of a front approach. The open-fronted space may be formed by the omission of shelving or drawers below a height of 725 mm from finished floor level. However, this might result in the loss of some storage space.

NOTE 2 If the space in front of the open-fronted access to the wardrobe forms part of the wheelchair-to-bed transfer space, the room area is more economically utilized.

The clear space for a wheelchair user in front of a wardrobe with an open front should be at least 1100 mm.

Wherever possible, adjustable fixtures and fittings should be used as part of the shelving and hanging system within a wardrobe. Alternatively, one low and one high rail should be provided at heights that meet the height recommendations for clothes hooks (see 18.1.5).

Where possible, stored items at the rear of the highest shelf in a storage system should be visible to wheelchair users and people with ambulant mobility impairments, so that such items can be grasped safely and securely when viewed (see 15.2).

19.2.7.3 Other furniture and fittings

A table or desk used for writing should meet the recommendations in Clause 16.

The height of coat hooks should meet the recommendations in 18.1.5.

19.2.8 Switches, sockets and controls

Switches, sockets and controls for heating/cooling, lighting, radio and television should be safe and accessible to wheelchair users and to people with limited dexterity, people who are blind or partially sighted, and people who are Deaf and hard of hearing (see 15.7).

Wherever possible, safe and accessible controls for opening and closing curtains/blinds/shutters automatically or by other means of remote control should be provided for use by disabled people.

NOTE Rods or pull cords for manually opening and closing curtains are acceptable.

Main lights, bedside lights and telephones (and, where practicable, heating/cooling controls) should be easily operated from a prone position on both sides of a double bed, or from both beds if twin beds are provided, and should also be reachable from a wheelchair.

A telephone with volume control that can be used by a person who is Deaf or hard of hearing should be available in all bedrooms, and should be reachable from a wheelchair and from the bed (see 15.6) in accessible bedrooms.

19.2.9 Heat emitters

Heat emitters should be located such that they do not restrict the recommended circulation space in an accessible bedroom (see Figure 54).

Exposed surfaces of heat emitters should either be screened or kept at a temperature not exceeding 43 °C.

NOTE This is particularly important for people with little or no feeling in their limbs or torso, who would initially be unaware of burns.
19.2.10  Alarm systems

A fire alarm, which emits a visual and audible signal to warn people who are blind or partially sighted, and people who are Deaf or hard of hearing, should be provided in accordance with 13.7.1.

NOTE 1  Individual under-pillow vibrating units or vibrating under-mattress pads that plug into the fire alarm system are designed to wake people who are Deaf or hard of hearing from sleep in an emergency. In addition to the provision of physical devices to alert people with sensory impairments in the event of an emergency, it is management's responsibility to ensure that staff are fully aware of the hazards that people with disabilities might face in such situations, and are trained to react appropriately [see Annex A, a)2)].

NOTE 2  Information on the management of a building, in particular emergency escape procedures, can be made available in audio form via radio and/or television.

An emergency assistance alarm in accordance with 13.7.2 should be provided in an accessible bedroom and activated by a pull cord sited such that it can be operated both from the bed and from an adjacent floor area.

The reset control for the emergency assistance alarm should be reachable from both a wheelchair and the bed.

19.2.11  Lighting and lighting accessories

NOTE  General recommendations for lighting are given in Clause 14.

The maintained illuminance (or general lighting level) for an accessible bedroom should be not less than 100 lux at floor level.

Lighting controls should be accessible from the bed (see 19.2.8).

19.2.12  Finishes

Furniture and fittings should contrast visually with their surroundings to help partially sighted people locate them.

19.3  Quiet spaces

COMMENTARY ON 19.3

It might be appropriate to provide a dedicated room or space for calm, tranquillity, prayer or contemplation.

In environments where stress and sensory overload are likely to be especially intense for some people, the provision of quiet spaces can be particularly beneficial.

Within public buildings and workplace environments (see Clause 20), the local population and the requirements of the building users should be taken into account. Where possible, a room or space should be provided that can be used as a quiet space where individuals might find peace and calm in order to manage sensory/neurological processing needs or spend time in contemplation or prayer.

Where such a room or space is provided, it should have the following features:

- a space that is calm, quiet and neutral in both visual and acoustic terms;
- either two rooms, or a room that can be divided into two areas with two entrances to accommodate separate single sex users;
- facilities for washing, either within the room itself or within an adjacent room located as close as practicable;
- an "engaged" sign to indicate when the room is in use;
- some enclosed storage (such as a cupboard/shelves with doors).
20 Building types

20.1 General

For each of the specific building types listed in this clause, parking and the approaches to buildings should meet the recommendations in BS 8300-1.

Accessible internal spaces, services and equipment common to most buildings should meet the general recommendations in Clause 8 to Clause 19.

20.2 Transport-related buildings

COMMENTARY ON 20.2

Journeys on public transport involve passengers transferring between different modes of public transport, as well as being set down or collected by another means of transport, e.g. a car.

The accessibility of the spaces and information systems that form the interchange facilities is a fundamental consideration in the location and planning of a transport building.

As information systems play a crucial role in any transport-related building, it is important that people are able to distinguish these systems quickly and effectively and, wherever possible, use the facilities independently, i.e. without depending on others for assistance.

This subclause deals with access issues that apply to a range of transport-related buildings, including:

- railway, bus and coach stations;
- underground railway and rapid transit stations;
- airports and terminals;
- ferry terminals and ports;
- motorway services.

NOTE Further guidance on accessible transport-related buildings is given in Inclusive mobility [19] and Train and station services for disabled passengers [46].

20.2.1 Location and accessible routes

Resting places should be provided for people with limited mobility. The distance on level ground between resting places should be not more than 50 m.

Wherever possible, accessible routes between different transport services should be under cover.

A designated setting-down point, wherever possible protected from the elements, should be provided close to a transport building entrance for the benefit of disabled passengers. Where security restrictions prevent it being close to the building entrance, a route protected from the weather should be provided from the setting-down point to the building entrance. Short- and long-term parking close to the building entrance should be provided for disabled motorists. Short-term parking should also be provided adjacent to setting-down points for use by a person helping a disabled person to or from their vehicle or by a disabled driver waiting for passengers (see BS 8300-1).

At least one clearly signed route within the site boundary, accessible for wheelchair users, should link transport stops, setting-down points, parking, passenger boarding points and public pavements to the transport building they serve, preferably coinciding with the route for the general public. Signs indicating the accessible route should meet the recommendations in Clause 12.
20.2.2  Ticket sales and information points

Ticket sales and information points should be fitted with an assistive listening system (induction loop, see Annex D). Where security screens are in place, a speech transfer intercom system should be used in conjunction with the induction loop, and at least one position should be fitted with a system to assist hearing aid users. When more than one position has an induction loop system, they should be spaced apart sufficiently such that there is no spill-over between positions (see Clause 13).

Furthermore, one of the positions fitted with an induction loop system should also be suitable for wheelchair users.

*NOTE*  It might not be possible for an induction loop system to be fitted to adjacent positions without spillover and therefore loss of privacy.

Glass screens should be non-reflective and any walls behind the ticket salesperson finished in a solid colour to aid lip reading (see also 11.5).

At least one ticket sales and information point should be suitable for wheelchair users (see Clause 16). Where there is only one ticket sales and information point, the counter should be at a height that is suitable for both wheelchair users and people standing.

Queuing lanes to ticket sales and information points defined by barriers should always be wide enough for a wheelchair user to turn (see Annex G). Wherever possible, they should include a zone where one wheelchair user can pass another.

20.2.3  Location and operating space for ticket machines

The location and operating space for ticket machines should be accessible to people with limited mobility and should meet the recommendations in 15.3.

20.2.4  Obstructions

Free-standing litter bins and isolated barriers such as bollards should be sited outside the main pedestrian access routes and contrast visually with the surroundings (see 7.2).

Telephones, vending machines, ticket machines and seating areas should be located such that people using them do not obstruct the main pedestrian flow.

20.2.5  Waiting areas and seating

Seating should be provided at all key waiting points in a transport-related building (see 15.1).

One space within or at the end of a block of seating should be provided for an assistance dog to rest. This space should be underneath or at the side of the allocated seat and clear of pedestrian routes. Labelling that indicates priority use of strategically placed seats for people with limited mobility should be clearly visible.

*NOTE*  Assistance dogs include guide dogs and hearing dogs.

Waiting areas for long-distance coach and rail services should be located close to information points, toilets and refreshment facilities.

Any waiting areas that are segregated from coach or rail boarding areas, to give protection from noise and/or fumes, should have visual and audible information regarding boarding.

20.2.6  Ticket barriers and gates

At least one permanently available passing gate should be provided as a means of access to wheelchair users, people with assistance dogs, and others with limited mobility.
20.2.7 Boarding points and platforms

The layout and location of bus, coach and tram boarding points, railway platforms, and concourses, should be designed so that passengers can quickly identify the service they want.

In bus, coach and tram stations, passengers should not have to cross the paths of other moving vehicles.

Where trains are not provided with on-board ramps, portable ramps should be available on station platforms to allow a wheelchair user access between platform and train, with staff assistance.

The surface of rail, bus, coach and tram platforms should be even, non-slip and with a drainage slope not exceeding 1:50 from the front edge. Parts of a platform where drainage is not essential, e.g. at the rear, should be level to assist people travelling along its length.

NOTE Examples of convenient access to buses and coaches, and further guidance on rail platform design, are given in Inclusive mobility [19] and Train and station services for disabled passengers [46]. Guidance on tactile paving, which is needed on railway platforms, is given in Guidance on the use of tactile paving surfaces [47].

Pedestrian passenger access at ferry terminals and in ports should be accessible.

20.2.8 Toilet accommodation

COMMENTARY ON 20.2.8

Many disabled people are unable to use on-board toilets on coaches, trains, ships and aircraft.

Wheelchair-accessible unisex toilet accommodation should be provided as near as possible to departure and arrival points, i.e. in a location in which it can be used as late as possible before departure from the building and immediately on arrival at the destination. Toilet accommodation should meet the recommendations in 18.5.

At major transport terminals, a mix of differently handed unisex WC designs (left-hand and right-hand transfer) should be provided to accommodate as wide a range as possible of assisted and independent disabled users.

Toilets should be provided with repeater speakers from the public address system so that people using WC facilities do not miss important information.

NOTE If a transport terminal is large enough, it can be beneficial to provide a Changing Places (CP) toilet with a peninsular WC layout. Such a facility includes a changing bench for the benefit of people with complex or multiple impairments and their assistants. CP toilets are not considered to be suitable for independent use by wheelchair users (see 18.6).

20.2.9 Escalators and moving walks

Any escalator or moving walk in a transport building should meet the recommendations in 10.6.

NOTE Escalators and moving walks are unsuitable for many disabled people, particularly wheelchair users and other people with limited mobility.

20.3 Industrial buildings

COMMENTARY ON 20.3

This subclause deals with access issues that apply to a range of industrial buildings, including factories, warehouses and processing plants. This subclause does not cover certain specialist areas such as access to plant and machinery.
20.3.1 Access routes in industrial buildings
Access routes for wheelchair users and people with ambulant mobility impairments between equipment and machinery should not be reduced in width by safety guarding or by people performing their work.

Access routes used by vehicles inside an industrial building should be clearly marked on the floor using colours that provide visual contrast. Pedestrian and vehicle tracks should be separated with their markings contrasting visually to assist people who are blind or partially sighted (see 11.1).

20.3.2 Sanitary accommodation
Sanitary accommodation in industrial buildings should be in accordance with Clause 18.

20.3.3 Storage of hazardous materials in industrial buildings
Hazardous materials should be identified in a way that ensures that they can be easily seen from a seated position, e.g. from a wheelchair.

20.3.4 Equipment in industrial buildings
Wherever possible, equipment in industrial buildings should be accessible and usable by disabled people (see 15.7).

20.4 Administrative and commercial buildings

COMMENTARY ON 20.4
Disabled people need access to all spaces and fittings in administrative and commercial buildings, whether as members of the public or as members of staff. Access to all public and private areas in office and retail spaces is also necessary if disabled people are to function independently in the building. Where access is on a regular basis, it is necessary to design to meet their requirements.

This subclause deals with access issues that apply to a range of administrative and commercial buildings, including:

- central and local government administrative offices;
- employment offices;
- other offices providing a service to the public, such as banks and post offices;
- private offices;
- shopping centres, supermarkets, department stores and other retail environments;
- specialist shops and showrooms;
- crown, magistrates' and coroners' courts;
- public service buildings such as police stations.

20.4.1 Offices and commercial buildings
Disabled people should have access to offices and commercial buildings so that they can carry out their work independently.

NOTE 1 Detailed information is available in Accessible offices [48] and Designing for accessibility [49].

A combination of general and task lighting should be provided in offices and commercial buildings.

NOTE 2 Guidance is given in the SLL Code for lighting [37] and the SLL lighting guide LG7 [50].

Toilet accommodation should be provided in accordance with 18.5.
20.4.2 Law courts, tribunal buildings, police stations and prisons

Accessible toilets and facilities should be available for a person being interviewed or being held in custody, as well as in all areas used by employees and members of the public.

Where cells are on a level which is inaccessible or cell doors are narrow, an accessible secure room should be provided.

Audible communication systems should be provided in accordance with Clause 13.

Seating should be provided in accordance with 15.1.

20.5 Health and welfare buildings

COMMENTARY ON 20.5

This subclause deals with access issues that apply to a range of health and welfare buildings, including:

- hospitals;
- health centres;
- doctors’ and dentists’ surgeries;
- opticians;
- older persons’ day centres;
- residential, nursing and care homes.

Health and welfare buildings should be accessible.

NOTE Detailed guidance on design issues is given in the NHS wayfinding guide [35], Doubly disabled – Equality for disabled people in the new NHS [51] and the NHS access audit template [52]. General information is given in Disabled people using hospitals – A charter and guidelines [53]. Requirements for nursing homes are covered in the Registered Homes Act 1984 [54], and the Registered Homes (Amendment) Act 1991 [55].

Accommodation for relatives staying overnight in hospitals should include facilities for disabled people (see Clause 18 and 19.2).

20.6 Refreshment buildings, including public houses, restaurants and cafes

COMMENTARY ON 20.6

Background noise can cause difficulties for people who are Deaf and hard of hearing, people with sensory/neurological processing difficulties and people with heightened sensitivity to noise. In facilities where background music is played, it is advantageous if a quieter area can be provided.

Refreshment buildings should be accessible.

All refreshment areas in the same storey should be on the same level, wherever possible. Any split levels should be linked by ramps (see 10.2).

A self-service area should have a continuous counter at a height of 850 mm to allow a disabled person to manoeuvre a tray, and a suitable table should be provided within close proximity of the till.

A range of table heights should be available, with the clear space to the underside of the tables between 700 mm and 800 mm.

NOTE 1 Some tables provided solely for drinks and for use by children may be of a lower height.

The minimum space between tables to accommodate wheelchair users should be the same as that for desks as shown in Figure 28.

Chairs should be freely moveable. At least some chairs should have arm rests.

NOTE 2 If tables and chairs are bolted to the floor, many people are unable to use them.
20.7 Entertainment-related buildings

COMMENTARY ON 20.7

In entertainment-related buildings, it is vital that the concourse provides clear directions to all facilities within the building.

This subclause deals with access issues that apply to theatres, cinemas, and concert halls where the seating is more closely packed than otherwise would be the case in order to provide an intimate atmosphere.

Recommendations on audience seating in lecture theatres, conference facilities and teaching spaces, on either flat or raked floors, are given in 17.1. Recommendations for refreshment areas are given in 20.6.

Further detailed guidance is available from the Association of British Theatre Technicians, 47 Bermondsey Street, London SE1 3XT, telephone 0207 403 3778.

20.7.1 Accessibility in entertainment-related buildings

20.7.1.1 Access for members of the audience

COMMENTARY ON 20.7.1.1

Full use by disabled people of an entertainment space is limited by raked floors and lack of removable seating. Also, some people might need to sit in a particular location in order to see or hear in comfort.

Accessible seating should be provided for wheelchair users. It should provide wheelchair users with the option of being able to sit next to a disabled or non-disabled companion. Accessible seating for disabled people should be provided in a range of vantage points in the building, where this is provided for non-disabled members of an audience. Fire safety arrangements, including means of escape, should be in accordance with BS 9999.

NOTE 1 Fire safety arrangements specific to theatres, cinemas and similar venues are given in BS 9999:2017, Annex D.

The viewing distance in theatres and similar venues should be minimized by carefully designing the access routes and access to spaces for wheelchair users.

NOTE 2 Spaces for wheelchairs are best accommodated in relation to either a cross-aisle (usually the means of escape at the front or rear of the auditorium) or a seatway, which gives local access to a row of seats from one side only. Examples are shown in Figure 56 and Figure 57.

Space adjacent to some seats should be provided, large enough for an assistance dog to rest away from the main circulation route.

Seating in entertainment buildings designated for wheelchair users should meet the recommendations in 17.1 and 17.2.

NOTE 3 It is desirable for some aisle seats to be double seats, with retractable central and outboard arm rests.

Horizontal sightlines should be designed such that the view for wheelchair users is not impeded by structural columns or technical equipment.

Vertical sightlines should be designed such that users of higher wheelchairs fitted with head restraints do not unreasonably restrict the view for those seated behind.

There should be a space at the front of the hall or room where a sign language interpreter can be easily seen. There should be separate dimmable directional lighting so that the face and hands of the signer are clearly visible independently of changing lighting conditions during the performance.

A sufficient number of designated accessible seats for Deaf and hard of hearing people should be provided, to enable a simultaneous clear view of the performance and the sign language interpreter.
A suitable captioning screen point should be provided, with designated seating for Deaf and hard of hearing people to enable a simultaneous clear view of the performance and the captioning screen.

**Figure 56 — Location of wheelchair spaces in front of a rear aisle**

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Steps</td>
</tr>
<tr>
<td>2</td>
<td>Aisle</td>
</tr>
<tr>
<td>3</td>
<td>(1400 × 900) mm nominal wheelchair spaces</td>
</tr>
<tr>
<td>4</td>
<td>More seats can be removed if necessary to create more wheelchair spaces</td>
</tr>
<tr>
<td>5</td>
<td>Rear wall</td>
</tr>
</tbody>
</table>

Dimensions in millimetres
**20.7.1.2 Access for performers**

A level or accessible route should be provided to the main foyer entrance, the performers’ entrance, the auditorium and the backstage area. If there is a direct route between the auditorium and the backstage area, it should be accessible.

A level or accessible route should be provided between the backstage area and dressing rooms, storage areas, toilets and showers.

Office accommodation (including sound control/editing rooms, etc.), where provided, should be accessible.

Dressing rooms should be accessible to disabled performers, including combined visual and audible communication systems and performance call alerts.

**20.7.2 Toilet accommodation**

Each wheelchair seating area should have access to an accessible unisex toilet.
The provision of accessible unisex toilets should accommodate use by a number of people during a performance interval (see 18.5).

Gender-neutral toilets should be provided separately from wheelchair-accessible toilets.

**20.7.3 Box office counters**

Box office counters should be accessible and should meet the recommendations in Clause 16.

**20.7.4 Assistive listening systems**

Systems for assistive listening systems should be installed in entertainment buildings and should meet the recommendations in Clause 16.

Electric cables carrying current in which the waveform has been modified (dimmed) should be routed to avoid, as far as is practicable, any interference to hearing aids.

*NOTE 1 Cables generate large magnetic fields that cause a loud hum in hearing aids.*

Equipment that uses fans, such as computers or slide projectors, should be carefully sited to reduce background noise for people who are Deaf or hard of hearing. Fluorescent fittings should be selected to ensure that they do not cause interference to hearing technology, such as hearing aids, bone anchor hearing aids and cochlear implants.

An acoustic booth for the provision of audio description should be provided with full view of the stage or screen in theatres and cinemas.

Wherever possible, the acoustic booth should be wheelchair-accessible, as the audio describer might be a wheelchair user.

*NOTE 2 People who are blind or partially sighted benefit from a description of live or recorded performances being relayed to them through audio description, for example, what is happening on stage, discreetly describing the action, scenery, facial expressions and costumes of the actors. Infrared systems and radio often have more than one channel, which can be used to provide assistive listening for hearing aid users as well as for audio description (see 13.2).*

**20.8 Sports-related buildings**

*COMMENTARY ON 20.8*

Disabled people, including disabled children, need to be able to access and use sports-related buildings, whether large or small, as spectators, participants, coaches, officials or part of a management team.

Wheelchair users often transfer into their sports wheelchairs at the vehicle setting-down point when they arrive at a sports-related building in order to take part in sporting activities. Whilst in competition mode, wheelchair athletes often change into their day chair between matches. Other disabled people borrow sports wheelchairs from the sports building management. Additional circulation and storage space is needed for sports wheelchairs because of their large wheel camber.

Swimming is an important activity for many disabled people and provides a high degree of independence and freedom. However, disabled swimmers might feel more self-conscious in a pool setting; as they are without their aids, they are physically exposed and they might require assistance into and out of the pool. Disabled swimmers are often at their highest risk when they are making their way to the pool or back to the changing area/room.

Sports-related buildings become more accessible and attractive for disabled people if a choice of changing and showering facilities, i.e. unisex facilities, and cubicle or accessible facilities within a separate-sex communal changing arrangement, is provided. If these facilities are not properly designed, they can become a significant barrier to use and active participation in sport by disabled people of all ages.
This subclause deals with access issues that apply to a range of sports-related buildings, including:

- stadia;
- sports centres including tennis centres, indoor bowls halls, gymnastic centres, etc.;
- sports club houses and pavilions;
- swimming pools;
- fitness suites and exercise studios.

Further guidance is given in Accessible sports facilities [16], Guide to safety in sports grounds [56], Accessible stadia [41] and the Inclusive Fitness Initiative 8.

20.8.1 Access for disabled spectators

Disabled spectators should be provided with a choice of vantage points, distributed around the sports-related building, where this is provided for non-disabled spectators. Horizontal sightlines should be designed such that the view for wheelchair users is not impeded by structural columns or technical equipment.

Vertical sightlines should be designed so that users of higher wheelchairs fitted with head supports/restraints do not unreasonably restrict the view for those seated behind.

Wheelchair users should be provided with wheelchair seating areas in all sports buildings where recreational activities require the provision of spectator facilities.

NOTE 1 Detailed guidance on spectator provision is available from the Guide to safety in sports grounds [56] and Accessible stadia [41]. For guidance on provision in smaller scale facilities, see Clause 17.

Any wheelchair seating area should be designed such that spectators in wheelchairs can still see the event when located behind standing accommodation or where people in front might stand up.

NOTE 2 Foldable arm rests on aisle seats are helpful to many people with mobility impairments and chronic pain conditions. It is desirable for some aisle seats to be double seats, with retractable central and outboard arm rests.

Each wheelchair seating area should have access to an accessible unisex toilet.

The provision of accessible unisex toilets should accommodate use by a number of disabled people during a performance interval (see 18.5).

Seating should allow freedom of choice for a person accompanied by an assistance dog and/or a companion to sit anywhere within the stadium.

NOTE 3 The front row of a block on any tier of seats usually provides more space and comfort for an assistance dog.

All routes in and out of the stadium should be accessible for people using assistance dogs, without obstructions such as turn-stiles.

NOTE 4 A guide dog is extremely adaptable and can utilize limited space to the best advantage. Guidance is available in the Guide Dogs for the Blind Association publication Access to sports stadia [57].

Audio descriptive commentary should be provided where practicable for spectators who are blind or partially sighted.

NOTE 5 Audio-description is a continuous and live commentary of the action, provided by a commentator specifically trained in describing events for those unable to see them clearly.

A means of assistive listening should be provided for people who are Deaf and hard of hearing in designated areas of a stadium. Assistive listening systems should meet the recommendations in Clause 13.

NOTE 6 Infrared systems are unlikely to be suitable in open stadia as they are affected if the user faces direct sunshine or floodlights. Detailed recommendations on the use of different hearing enhancement systems are given in Clause 13.

20.8.2 Access for disabled people who are participants or competitors in sports events

Facilities should be provided for disabled people to participate in all the sports available at a sports venue and at all levels of competition. All circulation routes should be designed to accommodate sports wheelchairs so that disabled people can gain access to all associated facilities, e.g. refreshment and social areas. As sports wheelchairs are generally longer and wider than conventional wheelchairs, circulation routes, doorways, lift lobbies and lifting appliances should be larger than the minimum recommendations in Clause 9 and Clause 10, e.g. tennis sports wheelchairs require a doorway with an effective clear width of 1.200 mm for convenient access.

NOTE Guidance on the specific requirements for sports buildings is given in Accessible sports facilities [16].

Where disabled people participate in competitive sports, secure and convenient storage areas should be provided for mobility aids, artificial limbs or sports wheelchairs, which are generally not collapsible. Space for double pushchairs should also be provided, ideally separately.

All sports facilities should provide unisex accessible changing and showering facilities. Unisex or gender-neutral changing facilities should be provided in addition to the accessible provision.

In all but the smallest sports facility, these should be supplemented with accessible communal and private changing/showering facilities. Changing facilities should have visual and audible communication systems and call alerts for announcements, including evacuation instructions.

20.8.3 Swimming pools

COMMENTARY ON 20.8.3

Swimming is a very important activity for many disabled people and once in the water they can feel comfortable and independent, often free of any mobility aids as they gain support in the water from their buoyancy. It is essential that their experience of accessing, using and leaving the facility is a positive and easy one, otherwise a poor experience can act as a significant barrier for their return. Appropriate changing facilities are essential, as is the location and design of safe and secure day chair and pool chair storage.

Step-free access should be provided from changing areas to pool areas. A number of access options should be provided to a pool in a variety of locations so that the different requirements of different users can be met.

NOTE 1 Examples of access options are:

- user-controlled submersible lifting devices;
- a hoist, which allows a wheelchair user to transfer from wheelchair to pool or jacuzzi, or between the two;
- a leisure pool in which the water is level with a surrounding wall at wheelchair transfer height, which enables a person to transfer to the wall, then directly to the pool;
- ramped “beach” entry or easy going steps, which can offer many people independent and comfortable pool access (including people with ambulant mobility impairments, older people and people with young children).

NOTE 2 Detailed guidance on the selection of appropriate access options and the design of swimming pools for disabled people is given in Accessible sports facilities [16].

NOTE 3 Increasing the size of lettering on direction and information signs in swimming pools can benefit users whose vision might be poor due to their inability to wear their normal glasses (see Clause 12). Tactile information
such as embossed numbers on lockers is helpful. The swimming pool depth scale needs to be in an easy read format with a symbol or image so that the deep end of the pool is readily evident to everyone.

Unisex changing facilities should be designed to allow for assisted changing and for a wheelchair user to transfer to a shower chair in accordance with 18.3. Accessible changing facilities should be located as close to the pool area and the position of any fixed pool access devices as practicable.

NOTE 4 It is desirable to allow space for mobile shower chairs and wheelchairs for swimmers moving between changing facilities and poolside.

20.8.4 Fitness and exercise areas

Disabled people should have the same access to all fitness and exercise areas, and types of equipment, as non-disabled people.

To assist people who are Deaf and hard of hearing, exercise studios and fitness and exercise areas should be provided with a sound enhancement system so that these people can receive instructions and any music related to the exercise activity. Assistive listening systems should meet the recommendations in 13.2.

NOTE Further detailed guidance on the design of fitness suites and exercise studios is given in Accessible sports facilities [16].

20.9 Religious buildings and crematoria

COMMENTARY ON 20.9

Irrespective of their religious faith, or their reason for visiting a religious building or crematorium, disabled people require the same degree of access as non-disabled people.

This subclause deals with access issues that apply to a range of religious buildings and associated spaces, including:

- places of worship and meeting rooms;
- church halls;
- crematoria;
- cemetery chapels.

Further detailed guidance on access to, and the use of, religious buildings is available in the Roofbreaker guides [58] and in Widening the eye of the needle [59].

20.9.1 Places of worship

Removable seating should be provided at various locations in places of worship so that wheelchair users can be accommodated amongst the general congregation (see also 15.1.3 and 15.1.5).

An assistive listening system, meeting the recommendations in 13.2, should be provided for people who are Deaf and hard of hearing.

20.9.2 Crematoria and cemetery chapels

A covered assembly area should be provided at crematoria.

Both entry to, and exit from, the crematorium should be accessible to disabled people, whether they are officials, family members or friends.

A crematorium should be provided with at least one accessible unisex toilet (see 18.5).
Wheelchair users who are visitors (and who are not family members) should have a choice of seating positions inside the building.

*NOTE* Wheelchair users are often placed inappropriately at the front of the building close to the coffin, even when they are not family members.

An assistive listening system, meeting the recommendations in 13.2, should be provided for people who are Deaf and hard of hearing.

## 20.10 Educational, cultural and scientific buildings

### COMMENTARY ON 20.10

This subclause deals with access issues that apply to a range of educational and scientific buildings, including:

- universities, colleges and schools;
- zoos;
- public libraries, university, college and company libraries, scientific and research libraries;
- laboratories;
- museums and art galleries;
- exhibition centres;
- research, scientific and professional institutes.

*NOTE* Recommendations on the design of schools for disabled children are given in Building Bulletin 102 [1].

Guidance on achieving a satisfactory hearing environment for students who are Deaf and hard of hearing is given in Building Bulletin 93 [60].

### 20.10.1 Accessible routes and spaces

All display areas in museums, art galleries, exhibition and visitor centres should be accessible to wheelchair users and people with ambulant mobility impairments.

Restaurants, bars, shops and similar public amenities in museums, art galleries, exhibition and visitor centres should be accessible.

Common rooms, refreshment rooms, recreation rooms and offices associated with educational and scientific buildings should be accessible.

Archive materials held by museums, galleries, libraries, and institutes should be accessible to disabled users who are members of staff or the general public.

*NOTE* The use of electronic archive retrieval could enhance the convenience of the facility.

### 20.10.2 Display cases

#### COMMENTARY ON 20.10.2

A matt surface eliminates glare and reflected images, which are particularly distracting for partially sighted people. Labels positioned horizontally inside display cases are difficult to read from a seated position.

Glass with a reflective surface should not be used to enclose exhibits.

Tactile and interactive displays should be within the zone of operation of both seated and standing users (see Annex E).
Labels on display cases should be set at 45°, preferably at the eye level of a seated person, and located at the front of the case.

NOTE 1  The provision of an additional label at a higher level and in a larger text size will benefit people who are blind or partially sighted.

Labelling should contrast visually with the immediate surroundings (see Clause 12).

NOTE 2  The Sign design guide [34] gives recommendations for information and signage.

20.10.3  Reading and studying in libraries

Where reading carrels are provided in libraries, at least one should be large enough to accommodate a wheelchair user (see Annex G). Either desks in libraries should meet the recommendations in Clause 16, or adjustable desks or tables should be provided.

NOTE  Tables whose height can be altered with raisers are suitable.

20.10.4  Seating

Fixed seating should be provided throughout display spaces, for resting, viewing exhibits and reading guidebooks. Seating should be easy to find and located in a prominent position, but it should not be located within main access routes or escape routes.

Seating should be provided in accordance with 15.1.

NOTE  Resting rails/perch seats can augment seating provision where their installation is practicable.

Some seating, with wheelchair spaces alongside, should be provided in external courtyards or gardens.

20.10.5  Obstructions and way-finding

COMMENTARY ON 20.10.5

Locating exhibits away from internal corners of viewing areas avoids congestion and provides a more attractive and usable space for all.

Overhanging barriers on display cases and low rails, intended to prevent too close access to paintings, present hazards for people who are blind or partially sighted and should be protected in accordance with the recommendations in 7.2.

A minimum clear passageway should be maintained adjacent to people viewing objects in cases or on walls (see 9.1).

Floor textures should be used to indicate the location of individual exhibits or the route to follow.

NOTE  They can also be used to reflect the nature of the exhibits and so add to the overall experience of the objects and spaces.

20.10.6  Audible communication

An assistive listening system, meeting the recommendations of 13.2, should be provided (see 20.7.4).

20.11  Historic buildings

COMMENTARY ON 20.11

Historic buildings exist for the enjoyment and appreciation of everybody. Good quality access can enhance understanding of the historic environment and ensure its sustainability into the future. With the right kind of thought and discussion, barriers to access and inclusion can be removed.

The Historic England guide Easy access to historic buildings [61] provides advice on all aspects of making historic buildings accessible including establishing an access strategy, overcoming barriers, and making access a reality through practical examples and case studies.
Before any work is undertaken to improve access to a historic building, an inclusive design strategy should be produced, in addition to and in conjunction with the conservation assessment/statement. The inclusive design strategy should highlight that the requirements of visitors and users are clearly understood, as well as the significance of the setting. Proposals should:

a) demonstrate an understanding of the existing context, which includes the historic building or features of local distinctiveness or importance;

b) demonstrate an understanding of the values which are attached to the existing building that need to be considered;

   NOTE 1 This could include values such as visual appearance, communal understanding and association, and historical. From a heritage perspective this includes the significance of heritage assets; why they are important in terms of archaeological, architectural, artistic or historic interest.

c) identify the challenges that need to be addressed, e.g. a balanced approach between conserving the historic building and improving access; and

d) identify the optimum (design and inclusive design) solution which addresses the issues identified within the context being delivered.

   NOTE 2 Further guidance on inclusive design strategies is given in Clause 4.

Specialist advice from heritage/conservation officers/consultants, and access officers/consultants should be sought when dealing with historic or listed buildings.

When considering reuse or refurbishment of heritage assets, historic or listed buildings, opportunities should be explored to identify potential modifications to improve levels of inclusion and access for disabled people.

20.12 Travel accommodation and venues

COMMENTARY ON 20.12

It is critical that disabled people have the same opportunities as non-disabled people to stay away from home, such as on business or holiday. However, due to the limited availability and difficulty finding suitable accessible accommodation, opportunities can be reduced. This problem can also be exacerbated where there are a greater number of disabled people who require a higher number of accessible rooms in one location, such as for a conference or event.

Access issues apply to facilities such as:

- hotels, motels, hostels and clubs;
- bed and breakfast guest accommodation;
- self-catering holiday accommodation;
- accommodation providing holiday care.

Travel accommodation and venues should be accessible.

Conference facilities should be in accordance with 17.6.

Accessible bedrooms should be in accordance with 19.2.

20.13 Shops, supermarkets and shopping malls

COMMENTARY ON 20.13

Many of the recommendations in this standard are applicable to a retail environment. It is however recognized that retail environments present some retail-specific challenges for some people. This
subclause aims to provide design guidance on these challenges, which is to be used in addition to rather than in isolation from the rest of this standard.

Good signage is essential to assist in orientation, in locating goods and services within shops, and in way-finding to exits and car parks when inside larger shops and malls.

Recommendations for permanent or temporary control barriers for queuing are given in 16.8.

20.13.1 General

COMMENTARY ON 20.13.1

When assessing the accessibility of a retail establishment, the requirements of a range of potential users need to be taken into account. Some disabled and older people with ambulant mobility difficulties or limited walking distances can be assisted in their retail experience by the provision of an electric mobility scooter which may be borrowed or hired for the duration of their time on that site. When assessing the suitability of such a facility, the scale of the retail development needs to be taken into account: it might not be reasonable to require such a facility to provide access to an individual shop, but would be useful in a larger shopping centre or development incorporating multiple retailers.

The location of any electric mobility scooter borrowing facility should be carefully assessed and it should be positioned to be within easy reach for people arriving by public transport as well as private car. It should be easy to find and close to a principal entrance point to allow ease of use.

NOTE 1 Good signage is essential to assist in orientation, in locating goods and services within shops, and in way-finding to exits and car parks when inside larger shops and malls.

Shops, supermarkets and shopping malls should be accessible to disabled shoppers and provision should be made for disabled staff to be employed in all areas. Fire safety arrangements, including means of escape, should be in accordance with BS 9999.

NOTE 2 Fire safety arrangements specific to shopping complexes are given in BS 9999:2017, Annex E.

20.13.2 Arrival

Setting-down points should be provided close to the entrance(s) for buses, minibuses and taxis. A setting-down bay should have a dropped kerb and bay width in accordance with BS 8300-1. An area of raised kerb should be provided alongside the bay for passengers to use a ramp to board a taxi or bus, or to climb the steps into a high-floor minibus.

Designated parking spaces should be provided for disabled motorists close to all shops and shopping mall entrances and to the lifting appliances and walkways from adjoining multi-storey car parks in accordance with BS 8300-1.

NOTE Specific recommendations for parking provision are given in BS 8300-1:2018, Clause 7.

20.13.3 Counters, checkouts and service points

All counters, checkouts and service points should be accessible. A clear space should be provided in front of them, and writing surfaces for seated and standing customers should be provided in accordance with Clause 16. Where feasible, induction loop systems should be fitted in accordance with Clause 13 and 16.7 (see also Annex D).

Self-service checkout facilities should be positioned such that they can be reached independently, taking into account the type and frequency of the activity being carried out (see Table 7 and Annex E).
Table 7 — Self-service checkout facilities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Reach range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing bags or picking bags up</td>
<td>Comfortable reach range</td>
</tr>
<tr>
<td>Scanning items</td>
<td>Extended reach range</td>
</tr>
<tr>
<td>Paying for items by card or contactless</td>
<td>Extended reach range</td>
</tr>
<tr>
<td>Paying for items by cash</td>
<td>Comfortable reach range</td>
</tr>
</tbody>
</table>

20.13.4 Clear width between checkouts

The minimum effective clear width between checkouts should be 1 200 mm with space to turn or pass at either end of the checkout structure.

20.13.5 Aisle clear widths and circulation space

Aisles should provide a minimum effective clear width of 1 500 mm to allow wheelchair users to turn, or in larger stores 1 800 mm as this allows two users to pass each other comfortably.

NOTE 1 A width of 1 500 mm might not be suitable for people using larger wheelchairs or electric mobility scooters to turn (see Annex G), so it is good practice to widen this wherever possible.

Displays of goods or merchandising displays should be planned to allow easy of circulation around them, taking into account people stopping to look at items on them. Where clear routes between displays form an aisle they should achieve the minimum effective clear widths above.

NOTE 2 The width between displays can be narrowed to 1 200 mm if suitable passing places either side of the display are incorporated which do achieve a width of 1 800 mm for a length of 1 800 mm. Further information is provided in Annex H.

20.13.6 Displays of goods

Where items are placed on a stand to display them, the stand or its mechanisms for hanging items or hanging rails (or the items on it) should not intrude out beyond the base of the stand. They may taper towards the top but should not taper towards the ground, to allow people who are blind or partially sighted to detect at ground level the extent of the display above.

Where mannequins are used to display goods they should be placed on a plinth, at least 150 mm above ground level, which provides a solid vertical surface for people who are blind or partially sighted using a white cane to tap against and ascertain the location and extent of the display above. Mannequins should not extend beyond the extent of the plinth.

The ends of hanging rails should be smooth or rounded to minimize the risk of damage on impact. Items on display should be positioned such that they can be reached independently (see Annex E).

20.13.7 Fitting rooms

At least one unisex accessible cubicle, suitable for a person with an ambulant mobility impairment or a wheelchair user and an assistant, should be provided for each fitting room or suite of fitting cubicles.

The unisex accessible cubicle should contain/incorporate:

a) a mirror in the centre of one wall at least 1 200 mm tall whose bottom edge is 600 mm above the floor;

b) a fixed or tip-up seat at a height of 480 mm in a corner with fixed grab rails, in accordance with Figure 37, beside it;

c) clothes hooks at 1 050 mm and 1 400 mm above the floor;

d) a call bell to request staff advice, positioned not higher than 1 200 mm above the floor;
e) an outward opening door or curtain near the corner diagonally opposite the fixed seat;
f) minimum dimensions of 2 000 mm deep × 2 200 mm wide;
g) a minimum clear space inside, clear of the fixed seat or the fixed part of the tip-up seat, of 1 500 mm × 1 500 mm.

Where fewer than five fitting rooms are provided in one location, the unisex accessible cubicle may be formed from two adaptable standard cubicles, which can be used as two separate cubicles when not required by a disabled person. When the two adaptable cubicles are combined into one (e.g. by drawing a curtain or folding back a moveable wall), the combined single cubicle should meet all of the recommendations for a standard unisex accessible cubicle.
Annex A (informative)
Management and maintenance

The following lists give a summary of important factors in ensuring that a building is easily accessed and used:

a) management issues:

1) ensuring that wheelchair spaces are available in seating areas;
2) ensuring that staff understand the management issues relating to disabled people, including emergency procedures;
3) ensuring that staff are fully aware and trained on the use of accessible facilities/features available within the building;
4) ensuring that wheelchairs are not used on escalators or moving walks;
5) ensuring that side-hung doors accompanying revolving doors are not kept locked;
6) ensuring that storage, planters, bins, fixed and unfixed furniture, etc. do not obstruct clear widths in circulation spaces or accessible toilets, or accessible control equipment (e.g. lifting appliance call buttons);
7) ensuring that accessible counters are kept clear of unnecessary material;
8) ensuring that cleaning and polishing does not produce a slippery surface;
9) ensuring that trip hazards such as at junctions between floor surfaces are removed;
10) ensuring access between moveable tables in refreshment areas;
11) ensuring that a RADAR National Key Scheme (NKS) key to sanitary accommodation is available to lend to disabled people when such locks are installed;
12) ensuring, in Changing Places (CP) toilets, that written instructions on the use of equipment are displayed beside each item;
13) ensuring, in CP toilets, that information is available on the type of sling connector and the types of sling that are compatible with their installed hoist and track;
14) ensuring that a procedure is set up to respond to alarm calls from sanitary accommodation;
15) ensuring that waterproof mattress covers can be made available for use in accessible bedrooms;
16) ensuring that, where floor sockets are provided (e.g. in meeting rooms), access to sockets is also available at desk level;
17) ensuring that assistance is made available to carry trays where needed in refreshment areas;
18) ensuring that suitable arrangements are made for assistance dogs while their owners are using leisure facilities;
19) ensuring that all furniture and equipment, whether loose or fixed, does not impede the 300 mm leading edge of doors as indicated in Figure 3.
20) ensuring that accessible facilities signage or way-finding is not obscured or hidden by furniture or fittings;
b) maintenance issues:

1) maintaining doors, door closers and building hardware, including checking that the opening forces of self-closing doors are within acceptable limits;

2) maintaining access control systems;

3) checking floor surfaces, matting, surface-mounted carpets, etc., re-fixing to the floor where necessary, and replacing where damaged or worn (particularly at entrances to buildings);

4) maintaining assistive listening systems, including retention of information pertaining to the layout and operation of such systems;

5) maintaining sanitary fittings, including checking that toilet seats are securely fixed, cleaning tap nozzles to ensure correct water flow, emptying and cleaning bins, and keeping equipment clean;

6) ensuring that adjustable shower heads are lowered to be ready for the next user;

7) ensuring that emergency assistance pull cords are kept fully extended and in working order at all times;

8) checking the mountings of all grab rails, and the mechanism of drop-down rails, re-fixing or replacing where necessary;

9) servicing of all types of lifting appliances and hoists;

10) ensuring that facilities, such as lifting appliances, hoists, etc., are in working order between servicing schedules, and providing alternative arrangements in case of facilities being out of order;

11) maintaining ventilation and heating equipment;

12) replacing defunct light bulbs and flickering fluorescent tubes quickly;

13) keeping windows, lamps and blinds clean to maximize lighting;

**NOTE** Attention is drawn to the Provision and Use of Work Equipment Regulations 1992 [62], which requires work equipment to be maintained and inspected, and to the Lifting Operations and Lifting Equipment Regulations 1998 [44], which furthermore requires lifting equipment to be periodically thoroughly examined.

c) communication issues:

1) providing clear and accurate pre-visit information via websites, literature, social media, telecommunications that is easy to access and understand and available in alternative formats, including details of modes of transport, parking, drop-off and what level of accessibility to expect on arrival;

2) providing information on strobe lighting prior to entry;

3) removing and/or changing signage as necessary, e.g. when departments relocate, when the building is used for different activities (such as a school hall being used after hours for community activities), or for temporary events;

4) providing accurate information on facilities prior to arrival (including user guides where appropriate);

5) providing audio description services;

6) providing all relevant literature, and reviewing/revising it when necessary;

7) ensuring that a permanently manned position is available for the emergency lift telephone communications;

8) updating maps of buildings following changes;
9) replacing signs correctly after decoration;
10) displaying signs and information regarding the availability of translation or communication support services;

d) policy issues:
1) allocating and reviewing parking spaces;
2) changing signs when departments move;
3) reviewing the number of disabled people attending and needing facilities;
4) monitoring the demand for accessible storage units, taking into account the importance of storage to the user, frequency of use, number of people with access requirements using the storage, and availability of assistance;
5) establishing and running user groups to provide feedback;
6) reviewing the number of instruments supporting infrared systems;
7) adopting a signage policy;
8) providing portable ramps;
9) arranging access audits of journeys made by visitors;
10) instructing access audits;
11) ensuring that services are provided when facilities such as lifting appliances break down;
12) ensuring that responsibilities are defined within the organization;
13) ensuring that access improvements are picked up whenever possible during maintenance and refurbishment work;
14) reviewing and improving evacuation procedures;
15) training of staff;
16) reviewing all policies, procedures and practices;
17) reviewing the provision of auxiliary aids;
18) considering the impact of background noise (e.g. music) on people who are Deaf and hard of hearing, particularly in reception areas;

e) fire safety issues (see BS 9999).

Guidance on various aspects of facilities management is given in BS 8536, BS 8572 and BS 8587.

Annex B (informative)
Using light reflectance values (LRVs) to assess visual contrast

B.1 LRVs and visual contrast

For people with good vision, differences in hue (the nature of the colour) or chroma (the intensity of the colour) provide adequate visual contrast. Unfortunately, this is not the case for all people who are blind or partially sighted. The main feature of a surface, which appears to be strongly correlated with
the ability of people who are blind or partially sighted to identify differences in colour, is the amount of light the surface reflects, or its light reflectance value (LRV).

The LRV scale runs from 0, which is a perfectly absorbing surface that could be assumed to be totally black, up to 100, which is a perfectly reflective surface that could be considered to be the perfect white. Because of practical influences in any application, black is always greater than 0 and white never equals 100. For a definition of light reflectance value, see 3.10.

The evidence-based research available to date allows a degree of variability concerning the minimum LRV difference that is required to provide adequate visual contrast for people who are blind or partially sighted (see Project Rainbow, a research project to provide colour and contrast design guidance for internal built environments [63]). That variability is shown in Figure B.1. With the axes representing the LRV of two adjacent surfaces, the zones on the graph give an indication of where visual contrast is likely to be good, acceptable or poor. Whilst there is considerable confidence in recommending a difference in LRV of 30 points or more (the good zone), there is also some evidence to suggest that a difference of around 20 points might still be acceptable, provided the illuminance on the surfaces is 200 lux or more. Differences less than about 20 points might not give adequate contrast, even with an illuminance of 200 lux on the surfaces.

In the case of door opening furniture, the ease with which people who are blind or partially sighted are able to distinguish furniture against its background is influenced by its 3-D form (giving light and shade) and the shiny nature of the finish, whether metallic or non-metallic. For such products, it is considered that a difference in LRV between the product and its background of at least 15 points is acceptable.

NOTE For flat surfaces, it is thought that LRV differences are less important between two large areas, e.g. between wall and floor, than between a small object on a larger background surface, e.g. a light switch on a wall.

Additional information on the provision of colour and contrast can be found in The colour, light and contrast manual – Designing and managing inclusive built environments [64].

Figure B.1 — Zones of good, acceptable and poor visual contrast in relation to the LRV of two adjacent surfaces
B.2 Methods of measuring LRVs

B.2.1 The BS 8493 test method

A test method for measuring the LRV of flat surfaces with opaque paint systems or coverings, flat opaque materials, including those coated with non-opaque coatings, or coverings and multi-coloured surfaces, is described in BS 8493.

NOTE This test method is suitable for manufacturers, researchers and those requiring accurate standard measurements.

The method is suitable to determine the LRVs of products for which visual contrast is an issue, including paints and coatings, carpets, veneered doors and finished metals.

As a guide for designers, the LRVs of the 100 colours in the BS 4800 range have been determined in accordance with BS 8493 and are set out in Table B.1. It is emphasized, however, that the LRVs of any colour range can be determined using the BS 8493 test method. It is expected, therefore, that product manufacturers will use the standard to prepare LRV data for their own particular colour ranges.

The LRVs determined using BS 8493 are applicable to surfaces of products or materials as they leave the factory gate. There is no inference or specification within BS 8493 to take account of the ageing effects of wear and tear, maintenance, cleaning or any other events which might affect the nature of the surface. It is recognized that further research is required into these factors before authoritative guidance can be provided on the effect of ageing on LRVs.

Table B.1 — Light reflectance values associated with the BS 4800 range of colours

<table>
<thead>
<tr>
<th>Code from BS 4800</th>
<th>LRV</th>
<th>Code from BS 4800</th>
<th>LRV</th>
</tr>
</thead>
<tbody>
<tr>
<td>00A01</td>
<td>66</td>
<td>10D43</td>
<td>39</td>
</tr>
<tr>
<td>00A05</td>
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<td>00A09</td>
<td>23</td>
<td>10E49</td>
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<td>00A13</td>
<td>10</td>
<td>10E50</td>
<td>65</td>
</tr>
<tr>
<td>02C33</td>
<td>59</td>
<td>10E53</td>
<td>57</td>
</tr>
<tr>
<td>02C37</td>
<td>22</td>
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<td>77</td>
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<tr>
<td>02C39</td>
<td>10</td>
<td>12B17</td>
<td>58</td>
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<tr>
<td>02C40</td>
<td>7</td>
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<td>32</td>
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<td>04B15</td>
<td>75</td>
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<td>12B29</td>
<td>7</td>
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<tr>
<td>04B41</td>
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<td>12C33</td>
<td>58</td>
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<td>04C33</td>
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<td>9</td>
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<td>29</td>
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<td>12D45</td>
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</tr>
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</tr>
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</tr>
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<tr>
<td>06C37</td>
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</tr>
<tr>
<td>06C39</td>
<td>10</td>
<td>14E53</td>
<td>22</td>
</tr>
</tbody>
</table>

* BS 4800 comprises a schedule of 100 colours for paints, and their available surface finishes. It includes, within a folder, an explanatory text, and a mask for use in conjunction with BS 5252 which illustrates the colours specified in BS 4800. BS 4800 is to be read in conjunction with BS 5252.
### Table B.1 (continued)

<table>
<thead>
<tr>
<th>Code from BS 4800</th>
<th>LRV</th>
<th>Code from BS 4800</th>
<th>LRV</th>
</tr>
</thead>
<tbody>
<tr>
<td>06D43</td>
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<td>16C33</td>
<td>58</td>
</tr>
<tr>
<td>06D45</td>
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<td>16C37</td>
<td>22</td>
</tr>
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<td>18B21</td>
<td>33</td>
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<tr>
<td>08B17</td>
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<td>18B25</td>
<td>16</td>
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<tr>
<td>08B25</td>
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<td>18C31</td>
<td>81</td>
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<td>08B29</td>
<td>7</td>
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<td>18D43</td>
<td>22</td>
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<td>18E53</td>
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<td>10B25</td>
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<tr>
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<td>6</td>
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<tr>
<td>10C31</td>
<td>76</td>
<td>22D45</td>
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</tr>
<tr>
<td>10C39</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE** The LRV has been determined in accordance with BS 8493.

A) BS 4800 comprises a schedule of 100 colours for paints, and their available surface finishes. It includes, within a folder, an explanatory text, and a mask for use in conjunction with BS 5252 which illustrates the colours specified in BS 4800. BS 4800 is to be read in conjunction with BS 5252.

### B.2.2 Hand-held colorimeter

The LRV of a surface can also be determined using a hand-held colorimeter or reflectometer of 0°/45° geometry. Two methods are possible. In the first method, the hand-held colorimeter is used in conjunction with a white, high reflectance standard surface. Since the reflectance of the white standard surface is known, it is possible to calculate the reflectance of the surface of interest by measuring the luminance of both surfaces under the same lighting conditions, where luminance is amount of light emitted from a surface. This is commonly termed the brightness of the surface. The LRVs measured in this way are dependent on the ambient lighting, which needs to be quoted in relation to any measurements taken.

In the second method, the hand-held colorimeter is placed on the surface and configured to read CIE Y, x y or a reflectometer calibrated to a colour reference sample with a known LRV.
Neither of these methods are suitable for curved or metallic surfaces, nor are they suitable for glossy surfaces. Whilst the LRVs determined by this method are useful, they are not as accurate as those obtained by using the test method in BS 8493.

**NOTE** This method of measurement is suitable for on-site measurements where an approximation of LRV is sufficient.

### B.2.3 Approximate method using colour swatches

The LRV of a surface can be approximated by reference to colour swatches or panels of colour samples. The LRV of the various colours can be obtained from the manufacturer of the colour swatches or samples, who is able to determine the LRV of each colour using the method described in BS 8493. In some cases, the colour notation on the sample includes the LRV. By placing the colour swatch against the coloured surface of interest, a reasonable match can be identified. The LRV of the nearest colour match from the swatch can then be assumed to be the LRV of the surface of interest.

**NOTE** This very approximate method can be used for the initial selection of colours for design purposes and for preliminary site assessments.

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### Annex C (informative)

**Slip potential characteristics of treads, ramp surfaces and floor finishes**

**COMMENTARY ON ANNEX C**

Many products used for tread and floor finishes will change significantly, merely on installation. Wear, anticipated usage, potential contamination, cleaning and maintenance regimes, will all have an impact on the performance of a tread or floor finish over its lifetime.

Further guidance can be obtained from the following publications.

- **Information to assist in assessment of the slip resistance of floor surfaces is given in HSE information sheet Assessing the slip resistance of flooring** [65].
- **Comprehensive advice on reducing the risk of slipping on surfaces is given in CIRIA publication C652** [66].
- **General advice on floor finishes as they relate to inclusive design, including slip resistance, can be found in the CAE specifiers’ handbook on internal floor finishes** [67].

### C.1 Background

Floor surfaces need to be selected to ensure, as far as is possible, that traction beneath the foot can be maintained under normal conditions of use. This entails specifying materials that have an appropriate coefficient of friction, offering a surface that reduces the potential for slips whilst also allowing passage without undue effort due to levels of friction being too great.

Excessive levels of traction can themselves be a barrier to use, particularly where the foot remains in contact with the surface during walking. Very rough surfaces or materials such as deep pile carpets...
or brush matting need to be avoided where possible. This helps to ensure that passage along such surfaces is more comfortable and requires less effort and control.

Sudden changes in the frictional characteristics of a floor surface can cause a person to stumble and fall or otherwise lose control. Where there is a change in the characteristics of materials on a circulation route, such as from a tile to carpet finish, transition needs to be level and to offer similar frictional characteristics. Where this is not practical, differing surfaces need to contrast visually to identify the change in material and reduce the potential for an incident.

### C.2 Slip resistance

The following indices are used to indicate the slipperiness of surfaces:

a) pendulum test values (PTVs) obtained using a pendulum tester in line with BS 7976-2

b) surface micro-roughness (Rz) measurements using a stylus instrument in accordance with BS 1134.

Detailed information on assessing slip resistance, together with a table illustrating common surface materials and their dry and wet slip resistance values (SRV), also known as pendulum test values (PTV), can be found in BS 5395-1:2010, Clause 7.

**NOTE** Depending on the precise nature of the wearing surface, seemingly similar products made from the same material can be totally different in terms of their slip potential characteristics.

### C.3 Ramps and sloping surfaces

On a sloping surface, the lateral component of the force in contact with the surface increases as the gradient of that surface increases. To compensate for this, a sloping surface needs to have a higher coefficient of friction than an equivalent level surface to maintain the same degree of traction.

The additional slip resistance can be approximated for the gradients recommended for ramps by expressing the gradient as a percentage and adding this to the SRV for an equivalent level surface. For example, for a 1:20 slope, the gradient is 5% and the required SRV is increased by 5. For a 1:12 slope, the gradient is 8.3% and the SRV needs to be increased by 8.3.

Where a ramp is likely to become wet, the recommended wet PTVs for ramps of different gradients are, therefore, increased from 40 to 45 for shallow ramps of 1:20 and to 49 for the steepest recommended gradient of 1:12.

Materials that are likely to achieve such wet PTVs include floated concrete, acid-etched ceramic tiles and some epoxy coatings with granular aggregate.

### C.4 Step nosings

Where slip resistance is required for nosings and treads, the slip resistance needs to be equivalent to that expected for level surfaces. A PTV greater than 36 is considered to be suitable, as pushing and turning are unlikely on stairs. On existing nosings, the slip resistance of step nosings are generally expressed by their Rz roughness value as PTV is difficult to measure. In such cases a roughness Rz value of 20 μm is considered to be suitable.
Annex D (informative)
Induction loop systems

D.1 General
Induction loop systems (commonly referred to as hearing loop systems) are normally installed to help people who use a hearing aid or cochlear implant to hear and understand the spoken word or an audio sound source. Speech may be picked up by one or more microphones or may come from other sources such as televisions or public address systems.

It is essential to understand what activities will take place in the area being covered and how the room will be used so that the microphone(s) can be located to pick up speech whilst not picking up unwanted background noise.

Induction loops are covered in BS 7594, BS EN 60118-4 and BS EN 62489-1.

D.2 Why install an assistive listening system?
Deaf and hard of hearing people need to be able to go about their daily lives and participate fully, whether that be going to church, going to a bank or pharmacy, attending a conference or a meeting, in fact anywhere which involves communication or listening.

To obtain the full benefit of attending public performances or taking part in discussions, a Deaf or hard of hearing person needs to receive a signal that has a high signal-to-noise ratio. The three technologies commonly used to provide this enhanced level of sound are induction loop (AFILS), infrared and radio.

D.3 How does an induction loop system work?

D.3.1 General
Where a hearing aid or cochlear implant user is more than approximately 2 m from a person talking, and particularly in a reverberant acoustic environment, the direct sound from the talker becomes mixed with the reverberant sound and other background noises in the room (collectively known as the “acoustic gap”), and the signal-to-noise ratio experienced by the listener is significantly degraded.

With an induction loop system, audio from a microphone(s) or other sources is fed into an induction loop amplifier which, in turn, feeds the signal to a loop of wire in the area being covered. The current flowing in the loop follows the audio signal and creates a magnetic field that also follows the audio signal. Hearing aids or cochlear implants that are fitted with a telecoil detect this magnetic field and convert it back to a signal that can be heard by the user.

In a properly designed and maintained system, this has the benefit of cutting out the acoustic gap so that the user has the best possible chance of understanding and gaining benefit from the transmitted audio.

D.3.2 Microphones
When microphones are used, it is important to place them close to the talker so that the desired sounds are picked up but undesired reverberation and sounds are not. This means that the way the room is to be used needs to be specified so that the best possible microphone design can be achieved.
On small area (counter) loops, microphones need to be placed in a position that picks up the member of staff’s voice clearly.

D.3.3 Other audio sources

Induction loops often have more than one input and may be connected to a PA system or to other sources such as televisions, help points and self-service tills. Some televisions only have digital audio outputs and so a converter might be needed.

D.3.4 Amplifiers

Induction loop amplifiers are normally located near to the loop for installation convenience. The size of amplifier needed can be determined by calculation or reference to manufacturers’ information and, for all but the smallest induction loops, can be confirmed by temporary trial installations.

D.3.5 Loops

The size and design of the loop(s) depends on several factors:

- the class of induction loop system (see D.4);
- the coverage needed, which is not necessarily the whole of a room but generally includes all places where a hearing aid or cochlear implant user would expect to receive induction loop signals;
- the need to minimize overspill of the magnetic field to avoid interference with other nearby induction loop systems;
- the need to minimize overspill of the magnetic field to maintain confidentiality (overspill can be overcome by using phased array designed systems);
- the need to compensate for signal losses due to large amounts of metal, for example in the building structure;
- the physical limitations of the building;
- the presence of magnetic fields that might be caused by faulty or incorrectly installed electrical wiring or areas close to high power supply cabling or equipment. The user will quite often experience this as an uncomfortable hum or buzz and assume the loop is at fault. It is advisable to carry out a survey prior to any installation to ensure any magnetic interference is minimal.

D.3.6 Hearing instrument (hearing aid or cochlear implant)

The hearing instrument (or special receiver) needs to have a “T” coil to pick up the magnetic signal from the loop system (worn by the user).

In the UK, national health hearing aids are provided with a “T” coil as standard but it has to be activated by an audiologist.

D.4 Classes of induction loop systems

BS 7594 lists seven classes of system, of which four are relevant to buildings:

- **A2**: small area (counter) systems for use in one to one applications, where the user is in a fixed position and use is transitory, e.g. counter systems, reception desks or till points;
- **A3**: perimeter (large area) loop for coverage of a single volume where other induction loops (AFILS) are not present in the vicinity and where security, overspill or overcoming significant metal losses are of no importance, e.g. church/stone building remote from other buildings containing induction loops (AFILS);
• **A4:** phased array (large area) systems, specifically designed to control the horizontal and vertical field components for induction loops (AFILS) installed in close proximity and/or to overcome significant metal content, e.g. classrooms or cinemas with multiple induction loops (AFILS), an auditorium with a box office AFILS in the same building, reinforced concrete construction, or an office space with a raised steel computer floor. The techniques involved depend entirely on the individual application: from as simple as a figure 8 loop, to the use of two separate arrays of loops in conjunction with a phase shifter or similar device;

• **A7:** specialist (integrated) loops, which fall into none of the above categories, such as systems for lifting appliances (see BS EN 81-70, aids for communication), intercoms, emergency voice communication systems (EVCS) and help points.

### D.5 Signs

Clear signage is always required, giving accurate guidance as to the location of the induction loop system.

### D.6 Staff training

It is important for customer-facing staff to be made aware of the presence of the induction loop, the limits of its coverage and how to respond to enquiries or complaints from users. In particular, staff need to know how to escalate problems to responsible management.

Technical staff need to be trained in the operation and maintenance of induction loop systems, and to know how to enlist technical support from the supplier/manufacturer or from independent technical experts if necessary.

### D.7 Routine testing

On a weekly basis, the responsible person needs to ensure the satisfactory operation of the induction loop by use of a test signal and either a fixed loop monitor receiver or a portable field strength meter. It is essential to supplement this with a listening test using real speech into the microphone(s), to ensure that the microphone(s) are working correctly and that amplifier control settings have not been inappropriately changed.

These routine tests and any user complaints need to be recorded in the system log book.

### D.8 Inspection and servicing

It is essential that the system is subject to periodic inspection and servicing so that faults are identified, preventive measures can be taken to ensure the continued reliability of the system, and that the user is made aware of any changes to the building that affect the performance afforded by the system.

Periodic inspection and servicing at intervals not exceeding 12 months needs to be carried out by a competent person with specialist knowledge of induction loop systems, adequate access to spares and sufficient information regarding the system.

### D.9 Examples of where induction loop systems are used

Induction loop systems are used in many locations including the following.

*NOTE* More detailed guidance is given in Table D.1.
• Places of worship. A large area loop system is connected to the public-address system.

• Hospitals. Departmental reception desks have a fixed counter loop; meeting rooms and waiting areas are equipped with large area loop systems.

• Transport terminals such as railway and bus stations, airport check-in desks and border control points. Ticket offices have a fixed counter loop (if a glazed screen is in place then a speech enhancement intercom system can also be fitted). Larger area loop systems can be used for PA announcements (for example rail platforms) and fitted in an area that is clearly signed.

• Banks. Counters have a fixed counter loop (where a glazed screen is in place then a speech enhancement intercom system may also be fitted). Reception and interview desks have fixed counter loop systems.

• Retail. Service tills, checkouts and customer service desk have fixed counter loop systems.

• Public buildings. Reception desks have fixed counter loops; meeting rooms and council chambers have large area loop systems.

• Hotels. Hotel reception counters have fixed counter loops; conference, banqueting and function rooms have large area induction loop systems.

• Nursing, residential and care homes. Lounges have a large area induction loop connected to the television; if there is an activity area that is used then this can also have an induction loop system. Induction loop systems designed for listening to the television in individual rooms are also available.

Table D.1 — Examples of where induction loop systems are used

<table>
<thead>
<tr>
<th>Application/location</th>
<th>Typical sound source</th>
<th>Type of loop/assistance listening system</th>
<th>Appropriate level of provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank counter</td>
<td>Staff voice a)</td>
<td>Counter loop</td>
<td>Ideally every counter provides a loop</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If a glazed screen is present then a speech transfer system is needed in addition to the loop</td>
</tr>
<tr>
<td>Supermarket checkout</td>
<td>Staff voice a)</td>
<td>Counter loop</td>
<td>Ideally every checkout provides a loop</td>
</tr>
<tr>
<td>Reception desks</td>
<td>Staff voice a)</td>
<td>Counter loop</td>
<td></td>
</tr>
<tr>
<td>Customer service tills</td>
<td>Staff voice a)</td>
<td>Counter loop</td>
<td></td>
</tr>
<tr>
<td>Retail point of sale</td>
<td>Staff voice a)</td>
<td>Counter loop</td>
<td>Minimum of every other counter provides a counter loop</td>
</tr>
<tr>
<td>Check in desks</td>
<td>Staff voice a)</td>
<td>Counter loop</td>
<td>All check in desks</td>
</tr>
<tr>
<td>Payment window</td>
<td>Staff voice a)</td>
<td>Counter loop and speech transfer system</td>
<td>All payment windows</td>
</tr>
<tr>
<td>Ticket window</td>
<td>Staff voice a)</td>
<td>Counter loop and speech transfer system</td>
<td>All ticket windows such as transport, theatre, etc.</td>
</tr>
<tr>
<td>Retail point of sale (self service)</td>
<td>Audio from self-service unit</td>
<td>Integrated loop</td>
<td>All units</td>
</tr>
<tr>
<td>Help point or information point (that provides audio)</td>
<td>Audio from help point</td>
<td>Integrated loop</td>
<td>All help points</td>
</tr>
<tr>
<td>Refuge point</td>
<td>Audio from refuge point</td>
<td>Integrated loop</td>
<td>All refuge points</td>
</tr>
<tr>
<td>Door entry systems (entrance panel)</td>
<td>Audio from door entry panel</td>
<td>Integrated loop</td>
<td>All door entry panels</td>
</tr>
</tbody>
</table>

a) Via a microphone.
b) In phased array configuration.
### Table D.1 (continued)

<table>
<thead>
<tr>
<th>Application/ location</th>
<th>Typical sound source</th>
<th>Type of loop/ assistive listening system</th>
<th>Appropriate level of provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lift emergency intercom</td>
<td>Audio from intercom</td>
<td>Integrated loop</td>
<td>All emergency intercom</td>
</tr>
<tr>
<td>TV listening (home)</td>
<td>TV</td>
<td>TV loop system</td>
<td></td>
</tr>
<tr>
<td>TV listening (communal areas)</td>
<td>TV</td>
<td>Large area loop</td>
<td></td>
</tr>
<tr>
<td>Announcements (airports, train stations)</td>
<td>PA announcement system</td>
<td>Large area loop or a loop that covers a designated area (which will require clear signage)</td>
<td>A designated area (zone) is identified that relates to the announcement and gives maximum coverage (attention is needed to ensure specific zoned areas are looped accordingly)</td>
</tr>
<tr>
<td>Conference rooms</td>
<td>Presenter’s voice/ AV system</td>
<td>Large area loop</td>
<td></td>
</tr>
<tr>
<td>Meeting rooms</td>
<td>Attendees’ voices $^a$ / AV system</td>
<td>Large area loop</td>
<td>Microphone type and coverage needs to be specified correctly</td>
</tr>
<tr>
<td>Boardroom</td>
<td>Attendees’ voices $^a$ / AV system</td>
<td>Large area loop</td>
<td>Microphone type and coverage needs to be specified correctly</td>
</tr>
<tr>
<td>School classrooms</td>
<td>Teacher’s voice $^a$ / AV system</td>
<td>Large area loop</td>
<td>Could be used in conjunction with a soundfield system</td>
</tr>
<tr>
<td>Lecture theatres</td>
<td>Tutor’s voice $^a$ / AV system</td>
<td>Large area loop</td>
<td>Could be used in conjunction with a soundfield system</td>
</tr>
<tr>
<td>Places of worship</td>
<td>PA system</td>
<td>Large area loop</td>
<td>Ideally the whole area of the congregation is covered, if this is unachievable a minimum of 50% is attained and clearly signed where the loop is operational</td>
</tr>
<tr>
<td>Entertainment venue</td>
<td>Venue sound/ AV system</td>
<td>Large area loop $^b$</td>
<td>Where the acoustic environment is benign, and the consultant and patient are within 2 m of each other an induction loop might be unnecessary</td>
</tr>
<tr>
<td>Consultation rooms</td>
<td>Consultant’s voice $^a$ / AV system</td>
<td>Counter loop/small area loop</td>
<td></td>
</tr>
<tr>
<td>Communal rooms</td>
<td>Presenter’s voice / AV system</td>
<td>Large area loop $^b$</td>
<td>Nursing, residential and care homes, day centres, community centre</td>
</tr>
</tbody>
</table>

$^a$ Via a microphone.

$^b$ In phased array configuration.

### Annex E (informative)

#### Reach ranges

*NOTE* The measurements given in this annex are based on ergonomic research trials commissioned by the Department of the Environment, Transport and the Regions (DETR) in 1999. This research was used to establish ranges of dimensions that can be applied to common activities. These dimensions affect the accessibility of such facilities as telephones, reception desks, tables and kitchen work surfaces.
E.1 Key dimensions relating to wheelchair users

Table E.1 gives the following key dimensions, the definitions of which are illustrated in Figure E.1:

a) arm rest height (an unoccupied dimension), which is a measurement of the wheelchair only;

b) knee height (an occupied dimension), measured from the floor to the top of the knee;

c) foot rest depth (an occupied dimension), which includes a person’s feet and is measured from the front of the wheelchair seat to the front of the toes.

NOTE Figure E.1 shows a wheelchair with a desk arm rest, which is fitted in place of standard arm rests by some wheelchair users when in an office or similar work environment.

Table E.1 — Range of wheelchair-related dimensions

<table>
<thead>
<tr>
<th>Percentage of wheelchair users accommodated</th>
<th>Arm rest height</th>
<th>Knee height</th>
<th>Foot rest depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>713 mm</td>
<td>661 mm</td>
<td>445 mm</td>
</tr>
<tr>
<td>90%</td>
<td>751 mm</td>
<td>674 mm</td>
<td>473 mm</td>
</tr>
<tr>
<td>95%</td>
<td>794 mm</td>
<td>691 mm</td>
<td>490 mm</td>
</tr>
</tbody>
</table>

Figure E.1 — Definitions of key wheelchair dimensions

Based on these data, a kneehole profile can be determined which will satisfy the vast majority of wheelchairs and wheelchair users. This profile is shown in Figure E.2, which shows a typical standard wheelchair arm rest.
E.2 Reach ranges

The research team obtained results for the following two reach ranges, which are intended to relate to the physical demands of an activity or action in terms of its precision or how often it is normally carried out.

a) Comfortable reach range. This range is determined by the capability of a person to reach in a comfortable and relaxed manner without stretching or bending from the waist and is appropriate for an activity that requires precision in its execution and is frequently performed.

b) Extended reach range. This range is determined by the capability of a person to reach when stretching and/or bending the body and is appropriate for an activity that does not require precision and is infrequently performed.

Table E.2 gives the data from the research trials for comfortable and extended reach for wheelchair users and people with ambulant mobility impairments at different angles above and below the horizontal plane. The dimensions, which are for reach at right angles to the vertical reference plane, are for height and the associated depth from the horizontal reference plane (see Figure E.3). The dimensions shown in the table represent the reach capabilities of 90% of the sample of wheelchair users and people with ambulant mobility impairments who took part in the trials.

In practice, some actions or activities are normally performed outside the range of angles used for the research, e.g. reaching down to switch a low-level socket outlet, or reaching into the back or bottom of a drawer in a kitchen. Recommendations in this British Standard on these reach dimensions are based on a separate research study.

**Figure E.2 — Minimum dimensions of kneehole profile**

Dimensions in millimetres

Key

1 Vertical reference plane for reach data

*NOTE* The wheelchair shown has standard arm rests.
### Table E.2 — Dimensions associated with comfortable and extended reach ranges

<table>
<thead>
<tr>
<th>Person</th>
<th>Access</th>
<th>Reach angle</th>
<th>Height (H)</th>
<th>Depth (D)</th>
<th>Comfortable mm</th>
<th>Extended mm</th>
<th>Comfortable mm</th>
<th>Extended mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheelchair user</td>
<td>Front</td>
<td>+70°</td>
<td>1 000</td>
<td>90</td>
<td>1 150</td>
<td>1 170</td>
<td>90</td>
<td>1 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>horizontal</td>
<td>(750)</td>
<td></td>
<td>(750)</td>
<td>(750)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>~24°</td>
<td>650</td>
<td></td>
<td>650</td>
<td>630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side</td>
<td>Front</td>
<td>+70°</td>
<td>1 060</td>
<td>100</td>
<td>1 170</td>
<td>1 200</td>
<td>100</td>
<td>1 300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>horizontal</td>
<td>(750)</td>
<td></td>
<td>(750)</td>
<td>(750)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>~24°</td>
<td>665</td>
<td></td>
<td>630</td>
<td>615</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambulant</td>
<td>Front</td>
<td>+70°</td>
<td>1 500</td>
<td>200</td>
<td>1 625</td>
<td>1 700</td>
<td>200</td>
<td>2 500</td>
</tr>
<tr>
<td>disabled</td>
<td></td>
<td>horizontal</td>
<td>(850)</td>
<td></td>
<td>(850)</td>
<td>(850)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>~24°</td>
<td>750</td>
<td></td>
<td>700</td>
<td>680</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE 1**  Dimensions have been rounded to the nearest 5 mm.

**NOTE 2**  Dimensions in brackets are for the horizontal reference plane.

**NOTE 3**  It is assumed that any kneehole allows full reach capabilities.

**NOTE 4**  Maximum heights are measured from the 70° line; minimum heights from the −24° line (see Figure E.3).

**NOTE 5**  For some activities, the recommended dimensions in the standard are extended beyond those resulting from the research trials on the basis of accepted practice.
**Figure E.3 — Reference planes, reach angles and definition of height/depth**

Dimensions in millimetres

Key
1. Reach angles
2. Vertical reference plane (from front of seat)
3. Horizontal reference plane
4. Vertical reference plane (from toes)
5. Front access
6. Vertical reference plane (from wheel)
7. Side access

**NOTE 1**  Horizontal and vertical dimensions are measured from where the fist passes through each reach angle.

**NOTE 2**  Maximum heights in Table E.2 are measured from the 70° line; minimum heights, from the −24° line.
### E.3 Activities and associated reach ranges

Table E.3 lists commonly encountered actions or activities and gives guidance on which reach ranges are appropriate when designing facilities within buildings.

**Table E.3 — Reach ranges associated with common activities**

<table>
<thead>
<tr>
<th>Type of action or activity</th>
<th>Reach range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating light switches, heating controls</td>
<td>✓</td>
</tr>
<tr>
<td>Using shower controls</td>
<td>✓</td>
</tr>
<tr>
<td>Holding onto support rails</td>
<td>✓</td>
</tr>
<tr>
<td>Operating sink/basin taps</td>
<td>✓</td>
</tr>
<tr>
<td>Preparing food/using kitchen equipment</td>
<td>✓</td>
</tr>
<tr>
<td>Removing and replacing items from shelving</td>
<td>✓ A)</td>
</tr>
<tr>
<td>Lifting telephone receiver and operating key pad</td>
<td>✓</td>
</tr>
<tr>
<td>Operating window controls</td>
<td>✓</td>
</tr>
<tr>
<td>Operating wall-mounted alarm buttons</td>
<td>✓</td>
</tr>
<tr>
<td>Operating lift call buttons</td>
<td>✓</td>
</tr>
<tr>
<td>Operating computer keyboard/mouse</td>
<td>✓</td>
</tr>
<tr>
<td>Touching interactive screens/displays</td>
<td>✓</td>
</tr>
<tr>
<td>Dispensed items, e.g. toilet paper/towels/soap</td>
<td>✓ B)</td>
</tr>
<tr>
<td>Buying items/tickets from counter</td>
<td>✓</td>
</tr>
<tr>
<td>Filling out forms/signing documents</td>
<td>✓</td>
</tr>
<tr>
<td>Operating cash/ticket machines:</td>
<td></td>
</tr>
<tr>
<td>Insertion/withdrawal of plastic card into slot</td>
<td>✓</td>
</tr>
<tr>
<td>Ticket/cash withdrawal</td>
<td>✓</td>
</tr>
<tr>
<td>Pressing control buttons</td>
<td>✓</td>
</tr>
<tr>
<td>Coin insertion into slot</td>
<td>✓</td>
</tr>
<tr>
<td>Envelope insertion/withdrawal</td>
<td>✓</td>
</tr>
<tr>
<td>Using lecture facilities (lecterns/projectors)</td>
<td>✓ B)</td>
</tr>
</tbody>
</table>

A) Depends on the use of the building.

B) The design of the equipment or fittings will affect the need for precision in operation.

**Figure E.4** shows examples of how the reach contours for comfortable and extended reach relate to different activities associated with access to counters and shelving for both wheelchair users and people with ambulant mobility impairments. The dimensions of the top two examples differ because of the use of desk arms in the right-hand example.
**Figure E.4 — Examples of applying reach range data to common activities**

**Key**
- **1** Knee space for a wheelchair without desk arms
- **2** Knee space for a wheelchair with desk arms
- **A)** Heights above finished floor level
- **C** Comfortable reach (broken line contour)
- **E** Extended reach (solid contour)

Dimensions in millimetres

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Annex F (informative)
Guidance on the choice of hoists, associated slings and showering/changing benches

F.1 Provision of personal hoisting equipment

Apart from healthcare buildings or adaptation of facilities to suit an individual, the use of personal hoisting equipment is generally associated with accessible sanitary accommodation (particularly Changing Places toilets) and accessible sleeping accommodation, e.g. in hotels and nursing, residential and care homes. It is in these areas that provision of a hoist offers the greatest benefit, extending the range of people that a facility can accommodate.

The provision of hoists within accessible accommodation can greatly improve the safe and dignified use of facilities by disabled people with more complex and/or multiple impairments. It is an advantage if the design and structure of a building allows the simple installation of hoisting equipment at a later date.

Where a means of lifting is provided, there are four components essential to safe and comfortable use of that equipment:

a) there needs to be sufficient space for efficient use;

b) assistants need to be familiar both with the moving and handling requirements of the person in their care and with the operation of equipment in question. To assist in this, written instructions need to be provided with the equipment;

c) personal equipment (such as slings) or supplied equipment (shower chairs, stretchers) needs to be compatible with the hoisting equipment;

d) any equipment provided needs to be properly maintained.

F.2 Types of hoist system

There are three types of hoist system in general use.

a) An overhead full room cover tracked hoist allows transfers to be carried out in any part of the room and use of all the equipment/facilities. Due to its travelling track, it provides flexibility in the use of the space and can be ceiling-fixed or wall-supported, which is an advantage if retrofitting.

b) A single overhead tracked hoist is a common, lower-cost installation which enables use of identified facilities on a fixed route. It requires a robust ceiling structure for mounting and is not as flexible as a full room cover system in terms of flexibility of use or accommodating changes to the future use of a space.

c) A mobile hoist is intended for use only with assistance, and requires the assistant to move both the hoist and the person around the room. Additional space is needed within the facility for manoeuvring the hoist. It can become a trip hazard and, not being a fixture, might not be available when needed (e.g. it might have been removed). However, it does allow flexibility of use in a managed environment, where adequate space is provided.
F.3 Slings

There are many different types of hoists, manufactured to provide for a range of weights and heights of people and use situations. Similarly, there is more than one system for connecting personal equipment, such as slings, to such devices.

In the majority of hoisting situations, a personal sling is used to allow transfer of a person via a hoist. There are two main methods of attaching the sling to the hoist: loop attachments, which potentially provide the greatest compatibility, and clip attachments, which can only be used with a limited number of specific sling types.

It is important to ensure that the correct sling is used. The assistant needs to carry out an assessment before the hoist and sling are used to ensure that they have sufficient knowledge and experience of the equipment in order to use it safely. It is expected that each disabled person will have been risk assessed and their assistant(s) trained in the use of their specific sling for use at home.

Slings are intended to be used by one person only and then washed, to avoid risk of cross-infection. Additionally, on account of the difficulty ensuring appropriate sizing of slings for each individual, it is suggested that slings are not provided by the management of the facility.

Users are expected to bring their own slings to enable them to use the hoists. It is expected that the type of hoist facility offered will be advertised by the management, and that information will be made available to potential users to help ensure that the type of sling brought is compatible with the installed hoist.

Manufacturers commonly recommend using their own slings. However, hoist manufacturers are expected to provide guidelines and instructions on the compatibility of their equipment with different slings. The type of hoist installed is expected to provide the widest choice of compatibility of different types and makes of slings. For this reason, it is advisable to seek specialist advice, e.g. from occupational therapists or the Changing Places Consortium, regarding the type of hoist to be installed.

The provider is expected to ensure that the overhead track hoist has instructions for use displayed within the facility, is safe to operate and is in good working order.

Assistants have a responsibility to read, understand and follow the instructions. If the equipment is not working properly, or assistants are unfamiliar with the equipment, they have a responsibility to alert the management of the facility, and to ensure that the hoist is not used.

F.4 Height-adjustable changing benches

Wall-mounted height-adjustable benches fold against the wall when not in use and therefore provide for flexibility in the use of space. They are fixed in place for security.

Mobile height-adjustable benches can be moved to provide access by an assistant on either side, but can be removed.
Annex G (informative)
Space allowances for wheelchair manoeuvring

**NOTE** The measurements given in this annex are based on ergonomic research commissioned by the Department of the Environment, Transport and the Regions (DETR) in 1999. This research, which involved user trials and computer-aided design (CAD) analysis, was used to establish ranges of dimensions that can be applied to common activities for users of wheelchairs and electric mobility scooters, such as turning and manoeuvring in corridors, in access routes. This part of BS 8300 gives the results that are applicable in buildings. BS 8300-1 gives the results that are applicable to the external environment.

G.1 User trials on space requirements

During the trials, the research team first measured the space required when occupied and unoccupied wheelchairs were stationary, then they measured the space required when wheelchair users turned their wheelchairs through 90° and 180°.

The results are tabulated for each type of wheelchair and each type of movement as follows:

a) in a stationary position (see Table G.1, Table G.2, Table G.3, Table G.4 and Table G.5);

b) when turning through 90° (see Table G.6, Table G.7, Table G.8, Table G.9 and Table G.10);

c) when turning through 180° (see Table G.11, Table G.12, Table G.13, Table G.14 and Table G.15);

d) manoeuvring at the side of vehicles (see BS 8300-1:2018, Table C.1 and Table C.2).

**NOTE** CAD and trials data were also used to determine the space required for wheelchair users to manoeuvre at the side of vehicles. Results from these are given in BS 8300-1.

G.2 Wheelchairs in a stationary position

For Table G.1, Table G.2, Table G.3, Table G.4 and Table G.5, the differences in occupied and unoccupied length reflect the projection of the feet beyond the foot rests, and bags or other items hanging from the back of the wheelchair.

The differences in occupied and unoccupied width reflect the projection of the upper limbs, sometimes with bulky clothing, beyond the arm rests or wheels.

**Table G.1** — Space required for a sample of self-propelled wheelchairs when stationary

<table>
<thead>
<tr>
<th>Percentage of self-propelled wheelchair users accommodated</th>
<th>Occupied</th>
<th>Unoccupied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>80%</td>
<td>1 150</td>
<td>696</td>
</tr>
<tr>
<td>90%</td>
<td>1 190</td>
<td>720</td>
</tr>
<tr>
<td>Complete range</td>
<td>860 to 1 250</td>
<td>560 to 800</td>
</tr>
</tbody>
</table>

A) Sample size = 54.
Table G.2 — Space required for a sample of electrically propelled wheelchairs when stationary A)

<table>
<thead>
<tr>
<th>Percentage of electric wheelchair users accommodated</th>
<th>Occupied</th>
<th>Unoccupied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>80%</td>
<td>1 292</td>
<td>750</td>
</tr>
<tr>
<td>90%</td>
<td>1 384</td>
<td>760</td>
</tr>
<tr>
<td>Complete range</td>
<td>860 to 1 520</td>
<td>560 to 800</td>
</tr>
</tbody>
</table>

A) Sample size = 27.

Table G.3 — Space required for a sample of self-propelled and electric wheelchairs when stationary A)

<table>
<thead>
<tr>
<th>Percentage of wheelchair users accommodated</th>
<th>Occupied</th>
<th>Unoccupied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>80%</td>
<td>1 200</td>
<td>720</td>
</tr>
<tr>
<td>90%</td>
<td>1 250</td>
<td>750</td>
</tr>
<tr>
<td>Complete range</td>
<td>860 to 1 520</td>
<td>560 to 800</td>
</tr>
</tbody>
</table>

A) Sample size = 81.

Table G.4 — Space required for a sample of attendant pushed wheelchairs when stationary A)

<table>
<thead>
<tr>
<th>Percentage of attendant pushed wheelchair users accommodated</th>
<th>Occupied</th>
<th>Unoccupied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Complete range</td>
<td>1 200 to 1 570</td>
<td>580 to 700</td>
</tr>
</tbody>
</table>

NOTE The measurements were taken with the attendant standing behind the occupied wheelchair.

A) Sample size = 6.

Table G.5 — Space required for a sample of electric mobility scooters when stationary A)

<table>
<thead>
<tr>
<th>Percentage of scooter users accommodated</th>
<th>Occupied</th>
<th>Unoccupied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Complete range</td>
<td>1 170 to 1 600</td>
<td>630 to 700</td>
</tr>
</tbody>
</table>

A) Sample size = 5.

G.3 Wheelchair users performing a 90° turn

The dimensions of length and width in Table G.6, Table G.7, Table G.8, Table G.9 and Table G.10 relate to the manoeuvre within a rectangle defined in Figure G.1.
Figure G.1 — The manoeuvre and the space required for a 90° turn

![Diagram showing a 90° turn manoeuvre with annotations for length, starting position, width, and final position.]

**Key**

1 Length
2 Starting position
3 Width
4 Final position

*NOTE* The manoeuvre involved reversing back then turning through 90°.

<table>
<thead>
<tr>
<th>Percentage of self-propelled wheelchair users accommodated</th>
<th>Turning space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (mm)</td>
</tr>
<tr>
<td>80%</td>
<td>1300</td>
</tr>
<tr>
<td>85%</td>
<td>1300</td>
</tr>
<tr>
<td>90%</td>
<td>1345</td>
</tr>
</tbody>
</table>

A) Sample size = 54.

Table G.6 — Space required for users of self-propelled wheelchairs to turn through 90°

<table>
<thead>
<tr>
<th>Percentage of electric wheelchair users accommodated</th>
<th>Turning space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (mm)</td>
</tr>
<tr>
<td>80%</td>
<td>1430</td>
</tr>
<tr>
<td>85%</td>
<td>1500</td>
</tr>
<tr>
<td>90%</td>
<td>1600</td>
</tr>
</tbody>
</table>

A) Sample size = 27.

Table G.7 — Space required for users of electrically propelled wheelchairs to turn through 90°
Table G.8 — *Space required for users of self-propelled and electrically propelled wheelchairs to turn through 90°* A)

<table>
<thead>
<tr>
<th>Percentage of self-propelled and electric wheelchair users accommodated</th>
<th>Turning space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (mm)</td>
</tr>
<tr>
<td>80%</td>
<td>1420</td>
</tr>
<tr>
<td>85%</td>
<td>1500</td>
</tr>
<tr>
<td>90%</td>
<td>1550</td>
</tr>
</tbody>
</table>

A) Sample size = 81.

Table G.9 — *Space required for an attendant to turn a wheelchair through 90°* A)

<table>
<thead>
<tr>
<th>Percentage of attendant pushed wheelchair users accommodated</th>
<th>Turning space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (mm)</td>
</tr>
<tr>
<td>Complete range</td>
<td>1200 to 1800</td>
</tr>
</tbody>
</table>

A) Sample size = 6.

Table G.10 — *Space required for users of electric mobility scooters to turn through 90°* A)

<table>
<thead>
<tr>
<th>Percentage of scooter users accommodated</th>
<th>Turning space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (mm)</td>
</tr>
<tr>
<td>Complete range</td>
<td>1400 to 2500</td>
</tr>
</tbody>
</table>

A) Sample size = 5.

G.4 *Wheelchair users performing an 180° turn*

The dimensions of length and width in Table G.11, Table G.12, Table G.13, Table G.14 and Table G.15 relate to the manoeuvre within a rectangle defined in Figure G.2.

*NOTE* The manoeuvre involved either a single 180° turn or a three-point turn.
**Figure G.2 — The manoeuvre and the space required for a 180° turn**

Dimensions in millimetres

**Key**
1. Length
2. Starting position
3. Width
4. Final position

---

**Table G.11 — Space required for users of self-propelled wheelchairs to turn through 180°**

<table>
<thead>
<tr>
<th>Percentage of self-propelled wheelchair users accommodated</th>
<th>Turning space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (mm)</td>
</tr>
<tr>
<td>80%</td>
<td>1 800</td>
</tr>
<tr>
<td>85%</td>
<td>1 910</td>
</tr>
<tr>
<td>90%</td>
<td>1 950</td>
</tr>
</tbody>
</table>

* A) Sample size = 54.

---

**Table G.12 — Space required for users of electrically propelled wheelchairs to turn through 180°**

<table>
<thead>
<tr>
<th>Percentage of electric wheelchair users accommodated</th>
<th>Turning space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (mm)</td>
</tr>
<tr>
<td>80%</td>
<td>2 190</td>
</tr>
<tr>
<td>85%</td>
<td>2 213</td>
</tr>
<tr>
<td>90%</td>
<td>2 275</td>
</tr>
</tbody>
</table>

* A) Sample size = 27.
Table G.13 — Space required for users of self-propelled and electrically propelled wheelchairs to turn through 180°

<table>
<thead>
<tr>
<th>Percentage of self-propelled and electric wheelchair users accommodated</th>
<th>Turning space</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>80%</td>
<td>2 000</td>
<td>1 500</td>
</tr>
<tr>
<td>85%</td>
<td>2 000</td>
<td>1 550</td>
</tr>
<tr>
<td>90%</td>
<td>2 150</td>
<td>1 600</td>
</tr>
</tbody>
</table>

A) Sample size = 81.

Table G.14 — Space required for an attendant to turn a wheelchair through 180°

<table>
<thead>
<tr>
<th>Percentage of attendant pushed wheelchair users accommodated</th>
<th>Turning space</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Complete range</td>
<td>1 600 to 2 000</td>
<td>1 500 to 1 800</td>
</tr>
</tbody>
</table>

A) Sample size = 6.

Table G.15 — Space required for a user to turn an electric mobility scooter through 180°

<table>
<thead>
<tr>
<th>Percentage of scooter users accommodated</th>
<th>Turning space</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Complete range</td>
<td>2 000 to 2 800</td>
<td>1 300 to 2 200</td>
</tr>
</tbody>
</table>

A) Sample size = 5.
Annex H (informative)
Space allowances for people passing on an access route

Figure H.1 shows the recommended space allowances for people passing on an access route.

**Figure H.1 — Space allowances for people on an access route**

- **a)** Two wheelchair users
- **b)** A wheelchair user and an ambulant person
- **c)** Blind or partially sighted person with cane
- **d)** Person on crutches
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Index

The suffix "Comm" indicates that the reference is contained within the Commentary section of the specified clause or subclause.

access, definition, 3.1
access control systems, 8.5
access routes, Clause 7
  horizontal movement, Clause 9
  industrial buildings, 20.3.1
  passing places, 9.1 Comm, Annex H
  projections into, 7.2, 15.5.1
  to buildings, 5.2.2, 7.1
  transport-related buildings, 20.2.1
  vertical movement, Clause 10
  within buildings, 5.2.2, 7.1, Clause 9, Clause 10
access strategy, 4.3
accessible, definition, 3.2
accessible bedrooms
  alarm systems, 19.2.10
  balconies, 19.2.5, Fig. 55
  beds, 19.2.7.1
  definition, 3.3
  doors, 19.2.4
  entry systems, 19.2.4.2
  furniture and fittings, 19.2 Comm, 19.2.7
  heat emitters, 19.2.9
  hoist systems, 19.2.3.3, F.1
  hotels, 19.2.1.2
  layout and space requirements, 19.2.3, Fig. 52, Fig. 54
  lighting, 19.2.11
  location, 19.2.2
  provision, 19.2.1
  sanitary accommodation, 19.2.1.1, 19.2.1.2, Fig. 53
  student accommodation, 19.2.1.3
  surface finishes, 19.2.12
  switches, sockets and controls, 19.2.8
  wardrobes and storage systems, 19.2.4.1, 19.2.7.2
  windows, 19.2.6
accessible routes
  definition, 3.4
  see also access routes
acoustic design, 11.2, 15.1.6, 16.7, 17.6.4
administrative and commercial buildings, 20.4
airports see transport-related buildings
alarm/alerting systems, 13.7
  see also emergency assistance alarms; fire alarm systems
arriving at destination, Clause 6
art galleries see educational, cultural and scientific buildings
assistance dogs
  seating layouts and, 15.1.4, 17.1, 20.2.5, 20.7.1.1
  sports-related buildings, 20.8.1
toilets/spending areas, 15.8
assistive listening systems, Clause 13 Comm, 13.2
  educational, cultural and scientific buildings, 20.10.6
  entertainment-related buildings, 20.7.4
induction loop systems see induction loop systems
infrared systems, 13.2, 13.4, 20.8.1
  Note 6
interview rooms, 8.6.4
PA systems and, 13.1
radio receiver systems, 13.2, 13.5
  reasons for installation, D.2
signs, 12.1.4, 13.3, 13.4, D.5
  sports-related buildings, 20.8.1, 20.8.4
transport-related buildings, 20.2.2
Wi-Fi systems, 13.5
ATMs, 15.3
  access, 15.3.2
  location, 15.3.1
  operation, 15.3.3
see also coin and card operated devices

audible communication systems, Clause 13

educational, cultural and scientific buildings, 20.10.6

law courts, tribunals, police stations and prisons, 20.4.2

waiting areas, 15.1.7

see also assistive listening systems; public address systems

audience facilities, Clause 17

access to seating, 17.3

accessible seating provision, 17.1, 17.2, Table 6

ancillary equipment, 17.5, Fig. 27

raked floor design, 17.4, Fig. 24, Fig. 25

sight lines, 17.3, Fig. 23, Fig. 26

wheelchair spaces, 17.1, 17.2, 17.4, Fig. 24

see also entertainment-related buildings; lecture and conference facilities

audio description facilities, 20.7.4, 20.8.1

automated teller machines see ATMs

baby changing facilities, 18.4, 18.5.3.1, Fig. 44

balconies, 19.2.5, Fig. 55

balustrades

fixings, 10.3.4

provision and design, 10.3.1

see also handrails

basins see hand rinse basins; washbasins

bathrooms, 18.2

assisted use, 18.2.2, 18.2.4, 18.2.5, Fig. 32, Fig. 34, Fig. 36

baths see baths

with corner WCs, 18.2.3, Fig. 33

en-suite, 18.2.2, Fig. 32

fittings and accessories, 18.2.10

hoist systems, 18.2 Comm, 18.2.2, 18.2.5, Fig. 32, Fig. 36

independent use, 18.2.3, Fig. 33

lighting, 18.2.11

with peninsular baths, 18.2.5, Fig. 36

with peninsular WCs, 18.2.4, 18.2.5, Fig. 32, Fig. 34, Fig. 36

see also general recommendations under sanitary accommodation

baths, 18.2.6

bath seats, 18.2.8

grab rails, 18.2.9, Fig. 35

rim height, 18.2.7, Fig. 35

bedrooms see accessible bedrooms

Braille information, 12.4, Fig. 10

building management and maintenance issues, Annex A

building positioning, 5.1

building services see outlets, switches and controls

cafés, 20.6

car parking, Clause 6

shopping, recreation and leisure facilities, 20.13.2

transport-related buildings, 20.2.1

changing areas, 18.3

communal, 18.3.3

doors, 18.3.8

fittings and accessories, 18.3.7

lighting, 18.3.9

lockers, 18.3.4

provision, 18.3.1

self-contained, 18.3.2, Fig. 37

sports-related buildings, 18.3.1 Note, 20.8 Comm, 20.8.2

swimming pools, 20.8.3

see also general recommendations under sanitary accommodation

Changing Places (CP) toilets, 18.2 Comm, 18.3 Comm, 18.5 Comm, 18.5.1 Comm, 18.6, Fig. 48

in transport-related buildings, 20.2.8 Note

cinemas see entertainment-related buildings

coin and card operated devices, 15.3

access, 15.3.2
instructions, 15.3.4  
location, 15.3.1  
operation, 15.3.3  
colour schemes, 11.1  
Note, 14.3  
colour-blindness, 11.1 Comm, 15.7.1  
comfortable reach range, E.2, Table E.2  
commercial buildings, 20.4  
communication systems, Clause 13  
see also assistive listening systems; public address systems  
complementary audible information, 12.5  
concert halls see entertainment-related buildings  
conference facilities see lecture and conference facilities  
control barriers  
reception areas, 16.1, 16.8  
transport-related buildings, 20.2.2, 20.2.6  
controlled door closing devices, 8.4.2, 9.2  
definition, 3.5  
doors leading into corridors, 9.1.5 Note 4  
entrance doors, 8.2.2  
fire-resisting doors, 9.2.2  
controls see outlets, switches and controls  
conventional passenger lifts, 10.5 Comm, 10.5.3  
controls, 10.5.3.3, 10.5.3.4  
definition, 3.9.1  
dimensions, 10.5.3.2, Table 4  
doors, 10.5.3.4  
emergency communication systems, 10.5.3.4  
 glazed elements, 10.5.3.4  
lighting, 10.5.3.4  
lobby signs, 10.5.3.3  
provision, 10.5.1  
surface finishes, 10.5.3.4  
cookers see hobs and cooking rings; oven units  
corridors and passageways, 9.1  
dimensions, 9.1.2, Fig. 8  
doors across, 9.1.6  
doors leading into, 9.1.5  
floors, 9.1.3  
lighting, 9.1.4  
projections into, 9.1.1  
counters, checkouts and service points, Clause 16, 20.13.3  
access, 16.1  
acoustic design and, 16.7  
box-offices, 20.7.3  
communication, 16.6  
control barriers, 16.1, 16.8  
dimensions, 16.3  
 glazed screens, 11.5  
location, 16.1  
profile of work surface, 16.5  
secure/private spaces, 16.9  
space below, 16.4  
space in front, 16.2, Fig. 20  
width between checkouts, 20.13.4  
see also reception desks/points  
crematoria and cemetery chapels, 20.9  
cultural buildings see educational, cultural and scientific buildings  
cycle parking, Clause 6  
day centres see health and welfare buildings  
dentists’ surgeries see health and welfare buildings  
design and access statements, 4.2  
digital locks, 8.5.1  
dining areas, 19.1.11, 19.1.12  
directional signs, 12.1.3  
location, 12.2  
tactile information, 12.4  
dishwashers, 19.1.7.3  
doctors’ surgeries see health and welfare buildings  
doors closing devices see controlled door closing devices
access control systems, 8.5  
accessible bedrooms, 19.2.4  
across corridors, 9.1.6  
bolts, 8.4.5  
changing and shower areas, 18.3.8  
controlled door closing devices, 3.5, 8.2.2, 8.4.2, 9.1.5  
Note 4, 9.2, 9.2.2  
conventional passenger lifts, 10.5.3.4  
CP toilets, 18.6  
entrance, 8.2, 8.3.5  
entry systems, 8.5.1, 19.2.4.2  
fire-resisting, 9.1.6, 9.2.2  
fittings, 8.4, 19.2.4.2  
glass, 8.3.6, 9.1.6  
hinges, 8.4.3  
leading into corridors, 9.1.5  
location, 8.3.2, Fig. 3  
locks and latches, 8.4.4, 8.5.1  
manual opening and closing furniture, 8.3.4, 8.4.1, Fig. 5, Fig. 6  
opening and closing forces, 8.2.2 Comm, 8.4.2, 9.2 Comm, 9.2.2  
panic and emergency exit devices, 3.6.1, 3.6.2, 8.4.6  
power-operated, 8.2.3  
reduced-swing, 9.1.5 Note 2, 18.1.6 Comm  
with requirement to self-close, 9.2.3  
revolving, 8.2.4  
sanitary accommodation, 18.1.6  
self-closing see self-closing doors  
side clearance, 8.3.2, Fig. 3  
sliding, 8.3.1 Note 1, 8.3.3, 18.1.6 Comm  
television booths, 15.6.3  
thresholds, 8.1.4  
Toilet accommodation, 9.1.5 Note 1, 18.5.2, 18.5.3.1, 18.5.3.3  
vertical lifting platforms, 10.5.5.2  
vision panels, 8.2.5.2, 8.3.5, 9.1.6, Fig. 4  
visual contrast, 8.3.4, 9.1.5, 9.1.6  
width, 8.3.1, Fig. 2, Table 2  
drop-down support rails, 18.1.4  
changing areas, 18.3.2  
shower areas, 18.3.5  
toilet accommodation, 18.5.3.5  
educational, cultural and scientific buildings, 20.10  
accessible routes and spaces, 20.10.1  
audible communications, 20.10.6  
display cases, 20.10.2  
obstructions and wayfinding, 20.10.5  
seating, 20.10.4  
electric mobility scooters  
shopping facilities, 20.13.1  
space allowances, Annex G  
electrical sockets see outlets, switches and controls  
electronic door entry systems, 8.5.1, 19.2.4.2  
emergency assistance alarms, 13.7.2  
ablessible bedrooms, 19.2.10  
kitchen areas, 19.1.10  
sanitary accommodation, 18.1.8, 18.5.8  
solo use hoist rooms, 18.2.2 Note 2  
vertical lift platforms, 10.5.5.1  
emergency communication systems  
conventional passenger lifts, 10.5.3.4  
refuges, 10.1.8  
emergency exit devices, 3.6.1, 8.4.6.2  
enclosed vertical lift platforms, 3.9.5, 10.5 Comm, 10.5.5.2  
entertainment-related buildings, 20.7  
assistive listening systems, 20.7.4  
audience access, 20.7.1.1  
box-office counters, 20.7.3  
performer access, 20.7.1.2  
provisions for Deaf and hard of hearing people, 20.7.1.1  
seating, 20.7.1.1, Fig. 56, Fig. 57  

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toilet accommodation, 20.7.2
entrance areas, 8.6
flooring, 8.6.1, 11.3
entrance doors, 8.2, 8.3.5
entrance lobbies, 8.2.5
   dimensions, 8.2.5.2, Fig. 1
glazing, 8.2.5.3
   projections into, 8.2.5.2, 8.2.5.4
entrances to buildings, 8.1
   thresholds, 8.1.4
   visual clarity, 8.1.2
   weather protection, 8.1.3
entryphones, 8.5.2, 13.6
epilepsy, Clause 11 Comm, 13.7.1 Note 4
escalators, 10.6, 20.2.9
evacuation lifts, 3.9.2, 10.5.1, 10.5.4
extended reach range, E.2, Table E.2

ferry terminals see transport-related buildings
fire alarm systems, 13.7.1
   accessible bedrooms, 19.2.10
   kitchen areas, 19.1.10
fire escape routes, 9.1.7
fire-resisting doors, 9.1.6, 9.2.2
firefighters lifts, 3.9.3, 10.5.4
fitness and exercise areas, 20.8.4
fitting rooms, 20.13.7
floors and flooring
   acoustic design, 11.2
   conventional passenger lifts, 10.5.3.4
   corridors, 9.1.3
   educational and cultural buildings, 20.10.5
   entrance areas, 8.6.1, 11.3
   kitchen areas, 19.1.12
   patterns, 9.1.3, 11.3, 19.1.12
   reception areas, 8.6.2
   sanitary accommodation, 18.1.7
shower areas, 18.3.5
slip resistance, 11.3, Annex C
surface finishes, 11.3
visual characteristics, 11.1
garages, Clause 6
gender-neutral sanitary accommodation,
Clause 18 Comm, 18.5 Comm, 20.7.2, 20.8.2
glass doors, 8.3.6, 9.1.6
   glazed elements
      conventional passenger lifts, 10.5.3.4
      entrance lobbies, 8.2.5.3
      screens, 11.5, 16.6, 20.2.2
      walls, 8.3.6, 11.5
      see also glass doors; vision panels; windows
grab rails, 18.1.4, 18.1.5
baths, 18.2.9, Fig. 35
changing areas, 18.3.2
shower areas, 18.3.5
   toilet accommodation, 18.5.3.5
hand dryers, 18.5.6.1
hand rinse basins, 18.5.1, 18.5.3.1, 18.5.5.1
      see also washbasins
handrails
   definition, 3.13.3
   escalators and moving walks, 10.6
   raked floors, 17.4
   ramped and stepped access, 10.3
   design, 10.3.2
   dimensions and spacings, 10.3.3
   fixings, 10.3.4
   provision, 10.3.1
hazardous material storage, 20.3.3
health and welfare buildings, 20.5
hearing instruments, D.3.6
      see also assistive listening systems


heat emitters
accessible bedrooms, 19.2.9
kitchen areas, 19.1.9
sanitary accommodation, 18.1.9, 18.5.9
height-adjustable changing benches, 18.4
historic buildings, 20.11
hobs and cooking rings, 19.1.7.1
hoist systems
full room cover tracked hoists, 19.2 Comm, F.2
bathrooms and shower rooms, 18.2 Comm, 18.2.2, Fig. 31, Fig. 32
CP toilets, 18.6
guidance on choice, Annex F
mobile hoists, F.2
accessible bedrooms, 19.2.3.3
bathrooms and shower rooms, 18.2 Comm, 18.2.5, Fig. 36
overhead tracked hoists, F.2
hotel bedrooms, 19.2.1.2
student accommodation, 19.2.1.3.2
provision, F.1
horizontal movement, Clause 9
hospitals see health and welfare buildings
hot water supplies
kitchen areas, 19.1.6, 19.1.7.3
sanitary accommodation, 18.1.3
shower areas, 18.3.5
hotels
accessible bedrooms, 19.2.1.2
toilet accommodation, 18.5.1
see also travel accommodation and venues

illuminance
definition, 3.7
see also lighting
inclusive design
definition, 3.8

principles, Clause 4 Comm
strategy, 4.1, Table 1
inclusive environments, Clause 4 Comm
induction loop systems, 13.3, Annex D
classes, D.4
conventional passenger lifts, 10.5.3.4
entryphones, 8.5.2 Note 2
functioning and components, D.3
inspection and service, D.8
locations, D.9, Table D.1
reception desks/points, 8.6.3, 16.6
signs and signage, 8.6.3
staff training, D.6
testing, 13.2, D.7
transport-related buildings, 20.2.2
waiting areas, 15.1.7
see also assistive listening systems
inductive couplers, 13.6
industrial buildings, 20.3
access routes, 20.3.1
equipment, 20.3.4
hazardous material storage, 20.3.3
sanitary accommodation, 20.3.2
information provision, Clause 12
complementary audible information, 12.5
pre-arrival and on arrival, 5.2.4 Note 4
signs and boards, 12.1.5
transport-related buildings, 20.2.2
see also signs and signage
infrared assistive listening systems, 13.2, 13.4, 20.8.1 Note 6
International Symbol for Access, 12.1.4, Fig. 9
internet booths, 15.6
interview rooms, 8.6.4, Fig. 7
ironing facilities, 19.1.7.3

kitchen areas, 19.1
alarm systems, 19.1.10
appliances, 19.1.7
cupboard/drawer hardware, 19.1.5
dining spaces, 19.1.11
floor space and layout, 19.1.2, Fig. 49
heat emitters, 19.1.9
knee recesses, 19.1.2
lighting, 19.1.13
location, 19.1.1
pull-out shelves, 19.1.3.6
self-catering kitchens, 19.1.3.2, 19.1.3.4
shared use, 19.1.3.2, 19.1.3.3, Fig. 49, Fig. 51
sinks and taps, 19.1.6
storage units, 19.1.3.4, 19.1.4
student accommodation, 19.2.1.3.1
surface finishes, 19.1.12
switches, sockets and controls, 19.1.8
teapoints, 19.1.3.3, Fig. 51
work surfaces see work surfaces
kneehole profiles, Fig. E.2

laboratories see educational, cultural and scientific buildings

landings
definition, 3.1.3.4
ramps and slopes, 10.2.1, 10.2.4
steps and stairs, 10.1.5

laundry appliances, 19.1.7.3

law courts, 20.4.2

see also administrative and commercial buildings

lecture and conference facilities, 17.6

acoustic design, 17.6.4
lighting, 17.5
reading distances, 17.6.2
seating, 17.4, 17.6.2
visual clarity, 17.6.3
wheelchair spaces, 17.4, Fig. 24

see also audience facilities
legibility of space, 5.2.2
libraries, 20.10.3
lifting appliances, 10.5
access, 10.5.2
conventional passenger lifts see conventional passenger lifts
definitions, 3.9
emergency evacuation, 10.5.1, 10.5.4
evacuation lifts, 3.9.2, 10.5.1, 10.5.4
firefighters lifts, 3.9.3, 10.5.4
provision, 10.5.1
slow speed lifts, 3.9.7, 10.5 Comm. 10.5.1
stairlifts see wheelchair stairlifts
vertical lifting platforms see vertical lifting platforms
where no provision, 10.5.1 Note 3
lifss see conventional passenger lifts; evacuation lifts; firefighters lifts; lifting appliances; slow speed lifts
light reflectance value (LRV)
definition, 3.10
measuring, B.2
visual contrast and, B.1, Fig. B.1
walls, ceilings and floors, 11.1
light switches see outlets, switches and controls

lighting, Clause 14
accessible bedrooms, 19.2.11
bathrooms, 18.2.11
changing and shower areas, 18.3.9
colour rendering, 14.3
conventional passenger lifts, 10.5.3.4
corridors, 9.1.4
CP toilets, 18.6
general principles, 14.1
glare and shadows, 14.2
kitchen areas, 19.1.13
lecture and conference facilities, 17.5
lip reading and, 14.4, 16.6
natural light/daylight, 14.1 Note 2
offices and commercial buildings, 20.4.1
ramps, 10.2.7
reception desks/counters, 16.6
sanitary accommodation, 18.1.10
steps and stairs, 10.1.6
storage facilities, 15.2.4
toilet accommodation, 18.5.7
way-finding, 5.2.4
lip reading
audience facilities, 17.3 Note 1, 17.3 Note 3, 17.4 Note 2, 17.5
glazed elements, 11.5
illumination for, 14.4, 16.6, 17.5
patterns and, 11.4 Comm
reception desks/points, 8.6.3, 11.5
lockers, 18.3.4
locks and latches, 8.4.4
accessible bedrooms, 19.2.4.2
digital locks, 8.5.1
lockers, 18.3.4
sanitary accommodation, 18.1.6
low energy swing doors, 8.2.3 Note 6, 9.2.1
maintenance issues, Annex A
management issues, Annex A
manifestation
definition, 3.11
glass doors, 8.3.6
glazed walls and screens, 11.5
lobby glazing, 8.2.5.3
materials see surface finishes and materials
meters, 15.7.2
microphones, 13.2, 13.5, D.3.2
microwave ovens, 19.1.7.2
mirrors, 18.2.10, 18.5.6.2, Fig. 43
motorway services see transport-related buildings
moving walks, 10.6, 20.2.9
multi-storey buildings
lifting appliances, 10.5.1
tea points, 19.1.3.3 Note 2
toilet accommodation, 18.5.1
museums see educational, cultural and scientific buildings
natural light/daylight, 14.1 Note 2
navigation, 5.2
non-enclosed vertical lifting platforms, 3.9.6, 10.5 Comm, 10.5.5.3
offices see administrative and commercial buildings
opticians see health and welfare buildings
orientation, 5.2
outlets, switches and controls, 15.7
accessible bedrooms, 19.2.8
kitchen areas, 19.1.8
location, 15.7.2, Fig. 18, Fig. 19
visual and tactile contrast, 11.4
oven units, 19.1.7.2
panic exit devices, 3.6.2, 8.4.6.1
parking see car parking; garages
passageways
definition, 3.12
see also corridors and passageways
passenger lifts see conventional passenger lifts
peninsular WCs, 18.2.4, 18.2.5, 18.5.3.2, Fig. 31, Fig. 32, Fig. 34, Fig. 36, Fig. 45
picking-up points, Clause 6
places of worship, 20.9.1
police stations, 20.4.2
see also administrative and commercial buildings
portable ramps, 10.2.9, 20.2.7
power-operated doors, 8.2.3
principle of two senses, 5.2.3
prisons, 20.4.2
public address systems, Clause 13 Comm, 13.1
acoustic design and, 15.1.6, 16.7, 17.6.4
transport-related buildings, 20.2.8
public houses, 20.6
public telephones, 15.6
accessible bedrooms, 19.2.8
controls, 15.6.2
height, 15.6.1, Fig. 15
inductive couplers and, 13.6
provision and location, 15.6.1
signs, 13.6, 15.6.1, 15.6.2, 15.6.3, Fig. 17
television booths, 15.6.3, Fig. 16
public transport see transport-related buildings
quiet spaces, 15.1 Comm, 15.1.5 Note 2, 19.3
radiators see heat emitters
radio receiver assistive listening systems, 13.2, 13.5
railway stations see transport-related buildings
raked floors
design, 17.4
sight lines, 17.4, Fig. 26
wheelchair spaces, 17.4, Fig. 24, Fig. 25
ramps, 10.2
component definitions, 3.13
edge protection, 10.2.5
gradient, 10.2.2, 10.2.9 Table 3
handrails, 10.3
hazard protection beneath, 10.4
landings, 10.2.1, 10.2.4
lighting, 10.2.7
portable, 10.2.9, 20.2.7
power-operated doors and, 8.2.3 Note 2
signs and signage, 12.1.3
slip resistance, 10.2.6, C.3
surface materials, 10.2.6

temporary, 10.2.8
width, 10.2.3
reach ranges, Annex E
activities and, E.3, Fig. E.4, Table E.3
dimensions, Fig. E.3
reception areas, 8.6, 8.6.2
acoustic design, 16.7
location, 16.1
seating, 8.6.3
reception desks/points, 8.6.3, Clause 16
access, 16.1
acoustic design, 16.7
communication, 16.6
control barriers, 16.1, 16.8
dimensions, 16.3, Fig. 21, Fig. 22
induction loops, 8.6.3
location, 16.1
profile of work surface, 16.5
secure/private spaces, 16.9
space below, 16.4
space in front, 16.2, Fig. 20
reduced-swing doorsets, 9.1.5 Note 2, 18.1.6 Comm
refreshment areas
dining spaces, 19.1.11, 19.1.12
tea points, 19.1.3.3, Fig. 51
refreshment buildings, 20.6
refuges, 3.14, 10.1.8
religious buildings, 20.9
residential, nursing and care homes see health and welfare buildings
restaurants, 20.6, 20.10.1
resting places
transport-related buildings, 20.2.1
see also seating
revolving doors, 8.2.4
room signs, 12.2
safety signs, 12.1.4, 12.3.1
sanitary accommodation, Clause 18
accessible bedrooms, 19.2.1.1, Fig. 52, Fig. 53
clothes hooks, 18.1.5
CP toilets see Changing Places (CP) toilets
doors, 18.1.6
drop-down support rails, 18.1.4
emergency assistance alarms, 18.1.8, 18.5.8
fixed grab rails, 18.1.4, 18.1.5
heat emitters, 18.1.9
hoist systems, Annex F
hot water supplies, 18.1.3
hotel bedrooms, 19.2.1.2
industrial buildings, 20.3.2
lighting, 18.1.10
location, 18.1.1
locks, 18.1.6
minimum room space, 18.1.1
provision, 18.1.2
shelves, Clause 18 Comm, 18.1.5
student accommodation, 19.2.1.3.2
surface finishes, 18.1.7
swimming pools, 20.8.3
taps, 18.1.3
towel rails, 18.1.5
washbasins, 18.1.3
see also bathrooms; changing areas; shower areas/rooms; toilet accommodation
scientific buildings see educational, cultural and scientific buildings
seating
access to, 15.1.3, Fig. 11
acoustic design and, 15.1.6
amphitheatre-style, 17.4
audience facilities, 17.1, 17.2, Table 6
educational, cultural and scientific buildings, 20.10.4
entertainment-related buildings, 20.7.1.1, Fig. 56, Fig. 57
law courts, tribunals, police stations and prisons, 20.4.2
layout, 15.1.4
lecture and conference facilities, 17.4, 17.6.2
raked floors, 17.4, Fig. 24, Fig. 25, Fig. 26
reception areas, 8.6.3
sight lines, 17.3, 17.4, Fig. 23, Fig. 26
sports-related buildings, 20.8.1
transport-related buildings, 20.2.5
types, 15.1.1
visual clarity and orientation, 15.1.5
waiting areas, 15.1
wheelchair spaces, 15.1.2, 17.1, 17.2, 17.4, Fig. 12, Fig. 24, Fig. 25, Fig. 56, Fig. 57, Table 6
security pass gates, 8.5.3
self-closing doors
doors fittings, 9.2.4
fire-resisting, 9.2.2
non-fire-resisting, 9.2.3
swing doors, 8.2.2, 9.1.6
sensory information, 5.2.3, 5.2.4 Note 3
setting-down points, Clause 6
shopping facilities, 20.13.2
transport-related buildings, 20.2.1
weather protection, 8.1.3 Note
shaver points, 18.5.6.1
shelving
access, Fig. 14
kitchen areas, 19.1.3.6, 19.1.4
public telephones and internet booths, 15.6.1
sanitary accommodation, Clause 18 Comm, 18.1.5
showers/changing areas, 18.3.7
storage areas, 15.2.2
toilet accommodation, 18.5.6.1
shopping facilities, 20.13
aisle clear widths, 20.13.5

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arrival, \textit{20.13.2}

circulation space, \textit{20.13.5}

counters, checkouts and service points, \textit{20.13.3, 20.13.4}

displays of goods, \textit{20.13.5, 20.13.6}

in educational and cultural buildings, \textit{20.10.1}

fitting rooms, \textit{20.13.7}

parking, \textit{20.13.2}

self-service checkout facilities, \textit{20.13.3, Table 7}

see also \textit{administrative and commercial buildings}

shower areas/rooms, \textit{18.2, 18.3}

accessible bedrooms, \textit{Fig. 53}

ambulant mobility impaired people, \textit{Fig. 53}

assisted use, \textit{18.2.2, Fig. 31}

communal, \textit{18.3.6}

with corner WC, \textit{18.2.1, Fig. 30}

doors, \textit{18.3.8}

en-suite, \textit{18.2.1, 18.2.2, Fig. 30, Fig. 31}

fittings and accessories, \textit{18.3.7}

hoist systems, \textit{18.2 Comm, 18.2.2, Fig. 31}

independent use, \textit{18.2.1, Fig. 30, Fig. 38}

lighting, \textit{18.3.9}

provision, \textit{18.3.1}

self-contained, \textit{18.3.5, Fig. 38}

sports-related buildings, \textit{18.3.1 Note, 20.8 Comm, 20.8.2}

see also \textit{general recommendations under sanitary accommodation}

sight lines

audience seating, \textit{17.3, 17.4, Fig. 23, Fig. 26}

entertainment-related buildings, \textit{20.7.1.1}

raked floors, \textit{17.4, Fig. 26}

sports-related buildings, \textit{20.8.1}

sign language, audience facilities, \textit{17.3, 17.5, 20.7.1.1}

signs and signage, \textit{Clause 12}

accessible routes, \textit{12.1.3}

accessible WCs, \textit{18.1.6}

assistive listening systems, \textit{12.1.4, 13.3, 13.4, D.5}

Braille information, \textit{12.4, Fig. 10}

coin and card operated systems, \textit{15.3.1, 15.3.4}

colour coding, \textit{12.1.4}

counters, \textit{16.1}

CP toilets, \textit{18.6}

design, \textit{12.1.1, 12.3.1}

directional signs see directional signs

entertainment-related buildings, \textit{20.7 Comm}

entrance areas, \textit{8.6 Comm}

escalators, \textit{10.6}

induction loop systems, \textit{8.6.3}

information signs and boards, \textit{12.1.5}

lecture and conference facilities, \textit{17.6.2}

lifting appliances, \textit{10.5.2, 10.5.3.3}

location, \textit{12.1.1, 12.2}

moving walks, \textit{10.6}

orientation information, \textit{12.1.2}

power-operated doors, \textit{8.2.3}

provision, \textit{12.1}

public telephones, \textit{13.6, 15.6.1, 15.6.2, 15.6.3, Fig. 17}

ramps, \textit{12.1.3}

reception areas, \textit{8.6.2, 8.6.3}

reception desks/points, \textit{8.6.3, 16.1}

room signs, \textit{12.2}

safety signs, \textit{12.1.4, 12.3.1}

seating areas, \textit{15.1.5}

shopping facilities, \textit{20.13 Comm}

standard signs and symbols, \textit{12.1.4, Fig. 9}

steps and stairs, \textit{12.1.3}

swimming pools, \textit{20.8.3 Note 3}

tactile signs and symbols, \textit{12.4, 12.5, Fig. 10}

telephones, \textit{13.6, 15.6.1, 15.6.2, 15.6.3, Fig. 17}

text heights, \textit{12.3.1, Table 5}

transport-related buildings, \textit{20.2.1}

typeface, \textit{12.1.1, 12.3.1}

universally recognized, \textit{12.1.4}

visual contrast, \textit{12.3.2}
visual signs, 12.3
way-finding and, 5.2.4
sinks and taps
kitchen areas, 19.1.6
see also taps; washbasins
site planning, 5.1
sliding doors, B.3.1 Note 1, B.3.3, 18.1.6 Comm
slings, F.3
see also hoist systems
slip potential characteristics, Annex C
slopes, 3.13.10, 10.2
see also ramps
slow speed lifts, 3.9.7, 10.5 Comm, 10.5.1
soundfield systems, 13.1 Note, 13.2
space allowances, wheelchair manoeuvring, Annex G
spectator facilities, Clause 17
sports-related buildings, 20.8.1
see also audience facilities
spillover, 3.15, 13.3
sports-related buildings, 20.8
assistive listening systems, 20.8.1, 20.8.4
changing and shower areas, 18.3.1 Note, 20.8 Comm, 20.8.2
door widths, Table 2 Note 4
fitness and exercise areas, 20.8.4
lifting appliances, 10.5.3.2 Note 1
participant/competitor access, 20.8.2
ramps, 10.2.3 Note 2
spectator access, 20.8.1
swimming pools, 20.8 Comm, 20.8.3
toilet accommodation, 18.5.1 Note 1, 20.8.1
stairlifts see wheelchair stairlifts
steps and stairs, 10.1
component definitions, 3.13
design, 10.1.1
handrails, 10.3
hazard protection beneath, 10.4
identification of step nosing, 10.1.4
landings, 10.1.5
lighting, 10.1.6
patterns, 10.1.4, 10.1.7 Note 2
rise of flight, 10.1.2
signs, 12.1.3
single steps, 10.1.2
slip resistance, 10.1.4, C.4
stair width, 10.1.3
stairlift installation, 10.5.6
surface materials, 10.1.4, 10.1.7, C.4
visual contrast, 10.1.4
storage facilities, 15.2
access, 15.2.1, Fig. 13
accessible bedrooms, 19.2.4.1, 19.2.7.2
fittings, 15.2.3
height of shelving and surfaces, 15.2.2
industrial buildings, 20.3.3
kitchen areas, 19.1.3.4, 19.1.4
lighting, 15.2.4
sports-related buildings, 20.8.2
visibility, 15.2.4
student accommodation
bedrooms, 19.2.1.3
design, 19.2.1.3.1
easily adaptable rooms, 19.2.1.3.1, 19.2.1.3.2
provision, 19.2.1.3.2
study spaces, 17.6.1, 20.10.3, Fig. 28
supermarkets see shopping facilities
surface finishes and materials, Clause 11
accessible bedrooms, 19.2.12
acoustic design and, 11.2, 15.1.6, 16.7
colours, 11.1 Comm, 11.1 Note 2
conventional passenger lifts, 10.5.3.4
floors, 8.6.1, 11.3
kitchen and dining areas, 19.1.12
ramps, 10.2.6, C.3
sanitary accommodation, 18.1.7
slip potential characteristics, Annex C
steps and stairs, 10.1.4, 10.1.7, C.4
transport platforms, 20.2.7
visual characteristics, 11.1
walls, 11.4
swimming pools, 20.8 Comm, 20.8.3
swing doors, 8.2.2, 9.1.6
switches see outlets, switches and controls
tactile signs and symbols, 12.4, 12.5, Fig. 10
taps
baths, 18.2.6
telephones see public telephones
temporary ramps, 10.2.8
text telephones, 8.5.2 Note 3, 15.6.1 Note 3
theatres see entertainment-related buildings
thresholds, 8.1.4
ticket machines, transport-related buildings, 20.2.3
toilet accommodation, 18.5
toilet accommodation and venues, 20.12
transport accommodation and venues, 20.12
see also hotels
tribunal buildings, 20.4.2
turnstiles, 8.5.3
two senses, principle of, 5.2.3
unisex, definition, 3.16
urinals, 18.5.4, Fig. 47
vertical lifting platforms, 10.5 Comm, 10.5.5
vertical lifting platforms, 10.5 Comm, 10.5.5
controls, 10.5.5.1
definitions, 3.9.5–3.9.6
dimensions, 10.5.5.2
enclosed, 3.9.5, 10.5 Comm, 10.5.5.2
 provision, 18.5.1
sports-related buildings, 18.5.1 Note 1, 20.8.1
transport-related buildings, 20.2.8
urinals, 18.5.4, Fig. 47
washbasins, 18.5.5, Fig. 43
WC compartments see WC compartments
see also Changing Places (CP) toilets and general recommendations under sanitary accommodation
touch screen interfaces, 15.4
transport-related buildings, 20.2
accessible routes, 20.2.1
arriving at, Clause 6
assistive listening systems, 20.2.2
boarding points and platforms, 20.2.7
escalators and moving walks, 20.2.9
location, 20.2.1
obstructions, 20.2.4
parking, 20.2.1
ticket barriers and gates, 20.2.6
ticket machines, 20.2.3
ticket sales and information points, 20.2.2
toilet accommodation, 20.2.8
waiting areas and seating, 20.2.5
travel accommodation and venues, 20.12
see also hotels
non‑enclosed, 3.9.6, 10.5 Comm, 10.5.5.3
provision, 10.5.1
vertical movement, Clause 10
video entryphones, 8.5.2 Note 1
vision panels
doors across corridors, 9.1.6
entrance doors, 8.3.5
example configurations, Fig. 4
lobby doors, 8.2.5.2, 8.3.5
see also glazed elements
visual contrast, definition, 3.17

waiting areas
acoustic design, 15.1.6
audible communication systems, 15.1.7
seating, 15.1
transport‑related buildings, 20.2.5
wheelchair spaces, 15.1.2, Fig. 12
walls
acoustic design and, 11.2
functional elements on, 11.4
see also outlets, switches and controls
glazed, 8.3.6, 11.5
patterns, 8.6.3, 11.4, 19.1.12
surface finishes, 11.4
visual characteristics, 11.1
visual contrast, 8.3.4
washbasins
ambulant mobility impaired people, 18.5.5.2
bathrooms, 18.2.3 Note
CP toilets, 18.6
hand rinse basins, 18.5.1, 18.5.3.1, 18.5.5.1
sanitary accommodation, 18.1.3, Fig. 43
toilet accommodation, 18.5.5
way‑finding
definition, 3.18, 5.2.1 Note
planning and strategy, 5.2.1
spatial, physical and environmental clues, 5.2.4
WC compartments, 18.5.3
ambulant mobility impaired people, 18.5 Comm,
18.5.1, 18.5.3.1 Note 2, 18.5.3.3, Fig. 39, Fig. 46
assisted use, 18.5.3.2, Fig. 45
corner layout, 18.5.3.1, Fig. 40, Fig. 41, Fig. 42
fixtures and fittings, 18.5.3.1, Fig. 42, Fig. 43
peninsular layout, 18.5.3.2, Fig. 45
self‑contained, 18.5 Comm
signs and signage, 18.1.6
support and grab rails, 18.5.3.5
transfer techniques, 18.5 Comm, Fig. 29
WC pans and cisterns, 18.5.3.4
see also urinals
weather protection
coin and card operated systems, 15.3.1
entrances to buildings, 8.1.3
transport‑related buildings, 20.2.1
wheelchair stairlifts, 3.9.4, 10.5 Comm, 10.5.6
definition, 3.9.4
provision, 10.5.1
wheelchair users
key dimensions, E.1, Fig. E.1, Fig. E.2, Table E.1
reach ranges, Annex E
space allowances, Annex G
Wi‑Fi assistive listening systems, 13.5
windows, 15.5
accessible bedrooms, 19.2.6
controls, 15.5 Comm, 15.5.2
powered systems, 15.5 Comm, 15.5.2
sill and transom height, 15.5.1
work surfaces, 19.1.3
depth, 19.1.3.5
dual height, 19.1.3.2
layout, 19.1.3.1, Fig. 49, Fig. 50, Fig. 51
pull‑out shelves, 19.1.3.6
single height, 19.1.3.3
variable height, \textit{19.1.3.4}  

zoos see educational, cultural and scientific buildings