16 Circulation and Access for People with Disabilities

16.1 General

Achieving equitable access requires understanding and applying all factors that can affect accessibility. The concept of Process of Access recognises the essential and sequential links between accessible information, transportation, public domains, outdoor areas, and the built environment. These guidelines define accessibility in the built environment in line with the definition found under Article 9 of the Convention on the Rights of Persons with Disabilities (CRPD), which means everyone should be able to: '*Reach all places, use and work their way around the built environment without assistance'*.

In developing countries, this means accounting for local conditions and standards. It also means using appropriate and affordable materials and practices.

Access to the buildings and facilities under the control of the University, and provisions for people with disabilities, shall comply with the requirements of the relevant building legislation, in particular the National Building Codes or Building Codes of Australia (BCA). The BCA prescribes a minimum standard of provision to be in accordance with Australian Standard AS 1428.1 2009. Where appropriate, every effort should also be made to incorporate the requirements of AS 1428.2 - 1992. In addition, some aspects of AS1428.4 noted herein and the Draft Access Code for Buildings may be required to be complied with. Should the Draft Access Code be adopted during the life of this document USP compliance will commence from the date of enactment. USP will make the final determination of the extent of non-statutory provision of facilities for people with disabilities to be provided within building projects. This decision will only be made following consultation with the University of the South Pacific (USP) Manager Disability and Resource Center (DRC) and the Manager Design, Estates and Infrastructure (E&I).

In the context of University facilities, work surfaces may mean, for example, office work desks, teaching room table accommodation, lecture theatre seating/accommodation or laboratory benching. Where work surfaces are provided for wheelchair users, dimensions shall be generally to those required under AS 1428.2 Clause 24. Refer *Section 19 Teaching Spaces.*

Following the specific guidance under the four headings provided in this section will result in a secure and accessible environment within and between buildings and in outdoor environments. This will promote opportunities for greater mobility and result in increased social and economic independence.

This guidance is grouped under four design requirement headings:

- sensory, including tactile warnings, guide ways and information
- outdoor environments, including obstructions, signage, street furniture, pathways, kerb ramps, pedestrian crossings, and parking spaces.
- horizontal access, including doors, entrance areas and lobbies, corridors, handrails and railings, bathrooms and toilets
- vertical access, including ramps, lifts and stairs.

16.2 Sensory Accessibility

This section deals with sensory accessibility design requirements. Accessible information and communications is important for everyone, including people with low vision and blindness to navigate physical spaces. This involves a consistent and continuous guiding system that includes tactile:

- warnings
- guide ways
- information.

Lighting and good signage is an important aspect in providing a safe and secure environment, particularly for people with disability.
Communication within the environment is important. Adequate lighting allows for signage to be read. It is also necessary

to enable people who use sign language or visual cues in speech to see their communication partners. Emergency communication systems must have both auditory and visual cues.

16.1 Outdoor Environment

This section deals with the design requirements of accessible outdoor environments, including outdoor areas, open spaces and recreational areas. It covers obstructions, signage, outdoor furniture, pathways, kerb ramps, pedestrian crossings, and parking spaces.

16.3.1 Obstructions

Obstacles, protruding elements and anything else obstructing the path of travel should be removed or relocated.
This includes:

- overhanging obstructions, such as electric cables, light fixtures, signs and vegetation
- fixed objects on pathway surfaces, such as bollards, garbage bins, poles, trees and other outdoor furniture
- unfixed objects on pathway surfaces, such as A-frame signs, commercial street furniture, planting boxes
- spaces below ramps and stairs.

Ideally obstructions need to be relocated from pathway surfaces and outside the path of travel in a continuous line. The recommended minimum width for a clear path of travel is 900mm, with a minimum clear height of 2m.

Guidelines to consider:
If obstructions cannot be relocated this way, they need to be clearly detectable which means they must:

- be a vertical shape rising from the pathway surface
- be placed on a 100 mm raised platform where possible
- have tactile markings on the ground around the obstacle with a minimum 30% luminance contrast to surrounding surfaces.
- overhanging obstructions should be mounted at a minimum clear height of 2m
- fixed objects should be clearly identified with contrasting durable colour marking strips
- distance between bollards should be minimum of 1 m and have a regular vertical shape without protruding elements
- spaces below ramps and stairs should be blocked completely by protective rails, raised kerbs or marked with a tactile surface.

16.3.2. Signage

Signage includes direction signs, emergency and hazard warnings, information notice boards and location signs. It must be clear, easy to read and understand, properly lit at night, visible and well located.

Guidelines to consider:

- sign surfaces should prevent glare and be of durable weather-resistant material
- colours should contrast with the surrounding surface to avoid confusing people with low vision and blindness
- colour combinations should be red and green or yellow and blue to avoid confusing people with low vision and blindness
- letters should be sized in proportion to the reading distance
- International Symbol of Access symbol should be used where appropriate (for example, in parking and toilets for people with disability).

The height of characters in signs for varying viewing distances should be determined in accordance with Table 1:

Table 1:
Height of Letters

Required Viewing Distance (m)	Minimum Height of Letters (mm)
1.5	5
1.8	6
3.0	10
3.6	12

4.5	15
6.0	20
7.5	25
15.0	50
25.0	80
35.0	110
40.0	130
50.0	160

Note: Text height is based on the lower case of the words.

- All text consisting of single words or group of words, should begin with an upper-case letter and continue with lower case letters (sentence case)
- All text must be arranged with left alignment. Signs with a single word may be centre justified.

Graphical Symbols: -

The size of graphical symbols or pictographs should be based on the intended viewing distance and determined in accordance with Table 2.

Table 2:
Sizes of Symbols

Viewing Distance (m)	Size (mm)
Up to 7.0	60 × 60
7.0 to 18.0	100 × 100
Above 18.0	200 200 to 450 × 450

Note: Dimensions above refers to the minimum size of the Symbol of Access

Arrows must be located on the side of the sign to which they are pointing, that is, arrows pointing left must be on the left and arrows pointing right must be on the right.

Colour Contrast: -

All characters and graphical symbols must: -

- be glare free
- have colours and tones that contrast with the following background:
  - within the sign and
  - with the surrounding or substrate

Note:

- To enable a sign to be located on both light and dark backgrounds or for corporate signage where the colours cannot be changed, a contrasting border should be placed around the sign.
- The sign must not have any sharp edges and if fitted into a frame, the frame must not have any sharp edges.
- Illuminated clear glass or acrylic signs with coloured etched legends are not acceptable for legibility reasons.
- Signs indicating washrooms for different sexes should have clear and simple symbols or words, preferably with colour distinctions between male and female e.g., blue for male and pink for female.

Location and Height of Signs

- Signs should be located where they are clearly visible to people who are walking, standing, or seated.
- Signs to amenities must be mounted on the wall next to the latch-side of the door at a distance of 50mm to 100mm from the door jamb to the side of the sign, as shown on *Figure (i)*. They must **NOT** be mounted on the door as the sign might not be visible when the door is open. Where there is no wall space to the latch-side of the door including double-leaf doors, signs must be placed on the nearest adjacent wall.
- The centre line of the sign must be at a height of 1500mm above the floor level where they can be read equally by a standing person, or a person with visual impairment who needs to touch and read the tactile information on the sign.

- Where signs would not be visible in a crowded situation, they should be suspended from the ceiling or projected from walls at a height of at least 2000mm above the floor level. Suspended signs should be avoided as they are not within the field of vision for some persons with visual impairments.



(a) Example of Signage at Male Toilet (b) Example of Signage at Accessible Individual Washroom

Figure (i)

Refer AS 1428.1 *Section 14 Acoustic* and *Section 18 Signage.*

16.3.3 Outdoor Furniture

This section deals with outdoor furnitures which includes bus stops, fixed benches, garbage bins, lamp posts, planter boxes, sign boards, vending machines, and water fountains.

Commercial outdoor furniture includes A-frame signs, planter boxes, stalls, tables, unfixed chairs and vendor carts that are adjacent to travel paths. This type of furniture is usually privately owned by businesses or individuals.

Guidelines to consider:

- position to allow for hazard-free passage of all people
- install at regular intervals to provide sensory cues to those with low vision and blindness
- identify location with textural changes in footpath surfaces
- mount outlets and controls, vending machines and water fountains, 850mm to 1m above the ground to enable access and ease of use
- install seating at regular intervals (100m to 200m) and at prominent public facilities, such as bus stops, and washrooms, to enable rest opportunities
- install level seating areas outside main circulation pathways, including spaces for wheelchairs
- install adequate garbage bins to minimise dumping of rubbish that can obstruct pathways and increase pollution and hygiene hazards
- allow recesses (designated refuse areas) for unfixed rubbish containers, such as skips, so they are not informally located on the path of travel
- relocate commercial outdoor furniture outside the path of travel
- include in permits issued for commercial outdoor furniture the boundaries needed for clear paths of travel, such as required circulation paths adjacent to a restaurant area.

Drinking Fountain

Refer *Section 9 Furniture and Fittings* for the dual fountain type serving able bodied and PWD users. Install a gully trap adjacent to serve the unit. A pressure reduction valve shall be fitted to allow easier push button action.

At least one Accessible chilled water drinking fountain shall be provided wherever drinking fountains are provided.

16.3.4 Pathways

Pathways include paved and unpaved footpaths. They must be safe for all users, particularly people with low vision and blindness or mobility disability. **Hazardous** pathways are those that:

- are uneven and/or unpaved
- have holes
- are of poor quality
- are not wide enough
- have many steps and/or changes in level.

Guidelines to consider:

- clear of all obstructions
- seal or upgrade unpaved footpath surfaces, where possible, since these often become hazardous in adverse weather conditions
- construct slopes that do not exceed a gradient of 1:20
- for slopes that exceed 1:20, install ramps and allow for landings with minimum dimension of 1m x 1m every 9m, to enable rest opportunities
- use smooth, continuous, non-slip and even surfaces for all pathways
- install a guide strip comprising a tactile line in a colour that contrasts with the pavement for people with low vision and blindness
- install tactile tiling on pedestrian routes of travel, with a minimum 30% luminance contrast to adjacent surfaces
- place tactile tiling at pedestrian crossings and around obstructions that are difficult for people with low vision and blindness to detect
- avoid stepped kerbs or, if required, ensure they are between 70mm and 150mm high
- place drains, grating and manholes outside pedestrian pathways to avoid potential changes in pathway texture and height
- cover all drains, gratings and manholes for safety, ensuring covers are level with the path surface and have narrow grid patterns choose plant varieties carefully, avoiding, for example, thorny and poisonous plants and plants that drop seeds and leaves.

Footpaths should provide a continuous accessible path of travel to or within a building providing access to all facilities and should not incorporate barrier (e.g., step, stairway etc.) Footpaths shall comply with AS1428.1 – 2009 and subsequent amendments Tactile indicators should be incorporated as specified in AS1428.4.

16.3.5 Kerb Ramps

Kerb ramps can include a small ramp built into the footpath to ease passage to the street. These are especially helpful for people with disability but also for cyclists, pedestrians with baby carriages and other groups. Well-designed kerb ramps enable people to deal with the level changes between pathways and street or building entrances with minimal disruption.

Guidelines to consider:

- position out of the line of pedestrian flow
- install in accessible car parking areas, at drop-off zones at main building entrances, at pathways with high usage and at street intersections
- position away from places where water might accumulate
- allow minimum width of 1m and maximum slope of 1:10 (maximum 10mm lip where the kerb meets the lower pavement)
- choose construction material texture that distinguishes ramps from main paths
- choose construction material of a contrasting colour to guide pedestrians with low vision and blindness.

Pedestrian Crossing

Pedestrian crossings are also known as zebra crossings. They facilitate the safe and independent crossing of roads.

Guidelines to consider:

- use a colour that contrasts with the road and surrounding kerbs to avoid confusing people with low vision and blindness
- identify kerb ramps with tactile markings to alert pedestrians of potential hazards or danger in level changes and traffic
- install traffic control signals that have appropriately located push buttons, audible and visual signals and time intervals for people who cross slowly
- install guide strips leading pedestrians to traffic light push buttons, for security and guidance

- provide a coloured tactile marking strip on traffic islands
- raise crossings to the same level as the pathway so those using a wheelchair do not have to struggle with differences in height (raised crossings also act as speed bumps for approaching vehicles)
- introduce other traffic calming measures, such as speed bumps, to increase safe crossing for vulnerable groups.

16.3.7 Parking

Parking includes parking spaces and drop-off zones. Parking problems faced by people with disability include no or too few spaces, spaces that are not wide enough and/or spaces located too far from a main building entrance. Drop-off zone problems include no specified zones or poorly located zones.

Guidelines to consider in designing Parking Spaces:

- provide one disability-reserved parking space for every 50 general parking spaces, noting that some municipalities require more than this
- locate disability-reserved parking spaces no more than 50m from a main building entrance
- design parking spaces for people with disability that are a minimum width of 3.2m (preferably 3.6m) with an adjacent minimum 2.4m wide shared space for wheelchair transfers
- provide same-level access from disability-reserved parking spaces to kerb ramps and pedestrian pathways where possible.

Guidelines to consider in designing Drop-off Zones:

- design at a minimum 3.2m wide for ease of mobility and safety
- make parking spaces for people with disability wide enough to accommodate two cars
- provide at transport stops, such as bus stops
- position within 30m of accessible building entrances to reduce the need to travel long distances
- provide shelter with seating facilities for weather protection
- provide kerb ramps to negotiate changes in level from parks to footpaths
- provide clear signage to reduce potential for confusion
- provide tactile guide strips for improved security and safety
- consider installing bollards to define zones.

16.4 Horizontal Circulation

This section deals with horizontal accessibility design requirements. This covers building elements with horizontal access such as

- doors
- entrance areas and lobbies
- corridors
- handrails, and railings
- amenities.

16.4.1 Doors and Hardwares

Accessible doors include doors a person can operate in a single motion with little effort. They should **NOT**:

- be too narrow
- have incorrect hinging
- be heavy and hard to operate
- have an incorrect door swing direction.

Design Consideration (*Accessibility for the Disabled – A Design Manual for a Barrier Free Environment – United Nations Enable*)

- Power-operated doors are the best for people with disabilities. The activator system should be automatic or placed within easy reach.
- An accessible door should have the following features: a sign, a door handle, an extra pull handle, glazing and a kick plate.

Door Types:-

- Automatic doors: - Can be of the sliding or swinging type. In general sliding doors are preferable to swinging doors (fig. 1) (fig. 2).

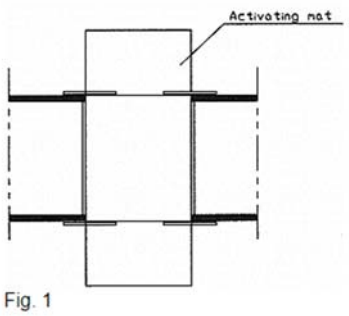
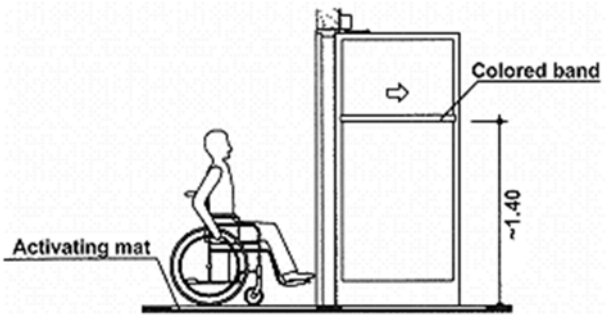
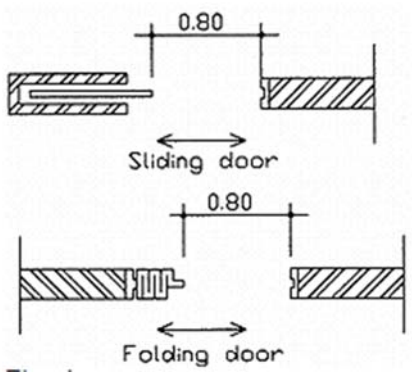


Fig. 1



- Automatic doors are useful when traffic is heavy.
- Automatic doors should have an adequate opening interval. -Guard-rails can be installed near double-swinging doors to indicate a door-opening area and to prevent people from being hit by the door.
- Pivoted doors: - Pivoted doors should swing away from the direction of travel wherever possible.
- Sliding and folding doors: - Manual sliding and folding doors are recommended for narrow spaces not heavily used by the public



Door Closers suited to the application should be adjustable to the least closing force required. Ensure that closers are adjusted to the lightest closing force necessary for satisfactory operation. Two-way swing doors may be approved where appropriate.

Kick Plates on PWD Toilet Doors:
Provide stainless steel kickplates - refer *Section 10 Doors*. Ensure door grilles are NOT provided in PWD doors.

Refer to *Section 10 – Doors, Hardware, and Locks* for details of PWD requirements for these spaces.

16.4.2 Entrance Areas and Lobbies

Entrance areas and lobbies should be accessible, easy to find, well-lit and supported with clear and consistent signage.

Guidelines to consider when designing Entrances: -

- make at least one entrance, preferably the main one, accessible by people using wheelchairs
- connect accessible pathways to accessible indoor and/or outdoor parking areas, drop-off areas, local public transit stops and public footpaths
- provide adequate covered space in front of entrances for shelter and protection from adverse weather conditions
- paint entrance doors in a colour that contrasts with surrounding surfaces
- provide lighting at entrances and along accessible pathways.

Guidelines to consider when designing Lobbies: -

- place reception desks in clear view of entrance doors
- make lobbies accessible for people using wheelchairs and provide enough space for wheelchair maneuvering
- construct counters 850mm ± 20mm high for ease of mobility and engagement with staff or communication items like telephones
- provide access to facilities such as mailboxes, public telephones and water fountains, with controls 850mm to 1.1m high
- provide public seating outside main circulation paths so people can engage socially, rest or wait
- choose furnishings of colours that contrast with the floor and surrounding walls for easy maneuverability
- provide at least 10% of seats with backs and armrests for adequate rest support.

16.4.3 Corridors: -
Corridors need to be well lit and unobstructed.

Guidelines to consider:

- make length of corridors as short as possible
- design changes of direction at 90 degrees
- allow for an unobstructed clear path of travel with a minimum width of 1.5m (preferably 1.8m), for ease of mobility and maneuverability with other pedestrians (low traffic corridors should be a minimum 1m width)
- provide appropriate resting facilities (The maximum distances people with mobility disability can walk without resting depends on factors such as slope and walking surface. Research reveals that only 20% of people with mobility disability who use mobility aids, such as walking sticks, can walk 180m without resting. It is also difficult for them to stand for more than 10 minutes at a time. Complying with the Universal design it is recommended to provide seating wherever people have to wait and along main circulation paths.)

16.4.4 Handrails and Railings: -
Handrails and railings need to be properly configured and installed at an accessible height.

Guidelines to consider:

Provide handrails around all accessible balconies, galleries, hazardous areas, platforms, ramps, roofs and stairs for safety, assistance and rest opportunities install handrails at a minimum height of between 800mm and 1m check that installation arrangements are in line with safety and accessibility guidelines.

16.4.5 Amenities
Toilets & Showers
Toilets and showers include those in any form of accommodation, places of employment and public buildings.

Guidelines to consider:

- provide an accessible bathroom and/or toilet on each floor
- provide unisex-accessible bathrooms in office buildings, which can be used by people with disability and their assistant companion if of the opposite sex (in some countries this might be culturally inappropriate, however)
- provide separate facilities for males and females in schools, where feasible
- provide at least one toilet cubicle designed for wheelchair access in school ablution blocks
- install doors that are a minimum 850mm clear width and preferably open out or slide
- provide sufficient space for people using wheelchairs or other assistive devices
- install easy-to-use amenities at a convenient height
- install adequate handrails and grab bars to assist people to and from a wheelchair and assist those with reduced strength
- provide security and privacy features so users can easily close and lock bathroom or toilet doors.
- install toilets to have a minimum dimension of 1.6m x 2.4m or 2.0m x 2.7m if a shower or bath is included (assuming an in-swinging door)
- locate toilets against the wall, diagonal from the entry door
- centerline toilets 450mm to 500mm from the wall
- firmly fix a grip rail next to the toilet, 800mm high
- install accessories, such as mirrors, soap dispensers, tissue holders and towel-rails, at 900mm to 1.1m high
- firmly fix washbasins to the wall at a height of between 800mm and 850mm, with the centerline at least 450mm from an adjacent wall
- fit single-lever mixer taps
- install showers instead of baths, where possible
- firmly fix showers 800mm high, with horizontal grab rails to two walls
- attach shower heads to flexible hoses and preferably a fixed slider fitting with vertical 800mm to 1.8m high grab rail
- install a drop down or removable seat in showers
- provide female hygiene facilities that are easily accessible
- provide at least one conventional cubicle in male and female toilets to help people with ambulant disability provide cubicles for people with disability that are 900 mm wide, with grab rails on both sides of the toilet and with the door opening out.

Tap Fittings:
Provide CP Caroma Care Nordic basin mixer with 160mm extended lever option or Hansa Prado basin mixer with 160mm extended lever option or equivalent to be approved by Manager Design, E&I.

Hand Basin and Cantilever Bench:
Provide semi-recessed fitting Caroma Laser Basin with D251 heavy duty bracket with waste tie, Caroma Care Integra 500 wall basin with shroud, to provide free access space under for wheelchair as per AS1428.1.

WC Pan and Cistern:
Provide Caroma Care Pan (ref 8.02.4) OR Caroma Care Pan Concealed Trap (ref 8.02.3) with Sovereign 2000 cistern with Caroma Care Pushbutton option (Code 405067) large easy push down dual flush buttons.

Mirror:
Provide clear anodised aluminium framed upright mirror 1000 x 450mm and mounted 850 - 900mm above floor. (AS1428.1 10.4.1)

Switches:
Provide Clipsal Prestige (P2000) series type with large toggle switches in disabled access toilets.

The following requirements, including any additional to AS1428.1, shall be satisfied: Toilets and Showers. Refer *Section ` 9 Furniture and Fittings (Toilet Fixtures)* for details of PWD requirements for these spaces.

16.5 Vertical Circulation

This section deals with vertical accessibility, which covers building elements enabling people to negotiate changes in level and reach upper floors in the built environment. Vertical accessibility components that make for an accessible environment and comply with universal design principles are covered in this section, including:

- multi-level building provisions
- avoiding unnecessary level changes
- installing ramps
- installing lifts
- installing emergency stairs.

16.5.1 Multi-level Building Provisions

People with disability are entitled to non-discrimination and should be able to access all floors of a building on an equal basis to people without disability. The CRPD, Article 2 Definitions, encourages progressive implementation of accessibility and notes the issue of 'reasonable accommodation'. For existing buildings undergoing refurbishment, reasonable access to all areas and floors should be the aim, with access to ground floor and public spaces as the minimum. For new buildings, access to all services, facilities and levels should be incorporated into the design, such as the use of ramps to reach areas above ground level.

16.5.2 Avoiding unnecessary level changes

In general, avoiding unnecessary level changes is most desirable. Floors without gaps or changes in levels are the most effective and cost-efficient way to prevent vertical accessibility barriers.

Guidelines to consider:

- design or alter existing structures to avoid level changes, particularly at entrances
- avoid high thresholds that can obstruct the continuous path of travel
- minimise gaps between surfaces, such as at footpaths and transportation platforms.

16.5.3 Installing Ramps

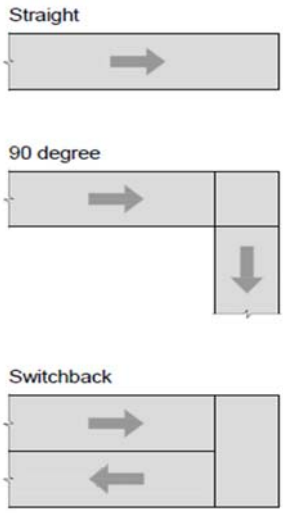
Ramps can provide barrier-free access into buildings and between floor levels. Compared with the option of installing a lift,

internal and external ramps between floors can be inexpensive. Lifts to upper floors should only be considered where maintenance funding and technical capacity are available.

Guidelines to consider:

- provide ramps when stairs obstruct the free passage of pedestrians and people with disability
- provide at least one accessible entrance to a public building, preferably the principal entrance
- locate ramps immediately adjacent to entrances, lobbies and stairs
- calculate sufficient space for ramps and landings to provide appropriate slope and include rest and passing areas
- for existing buildings where re-design or refurbishment is proposed, provide reasonable access to all ground floor services and facilities
- for designs of new single and multi-level buildings, access to all services and facilities should be addressed and incorporated into any design, which could include upper floor access by way of a ramp.

Figure ii: Three basic ramp configurations



Guidelines to consider:

- *Slope:* 1:20 is the recommended minimum for a non-assisted person in a wheelchair. The slope can be increased to 1:14 where the wheelchair user is assisted. Greater than 1:12 is considered a hazard.
- *Width:* Varies according to use, configuration, and slope, but the minimum is 1m.
- *Landings:* Provide at least every 9m, at every change of direction and at the top and bottom of every ramp. Landing width should be a minimum 1m and clear from obstructions.
- *Handrails:* Provide on both sides and along the full length of every ramp, 900mm to 1m high, returning at ends or turning down to minimise injuries. Handrails should extend for a distance of minimum 300mm at the top and bottom of ramps. For ramps wider than 3m, an intermediate rail could be installed.

Surface and tactile markings:
Surface material needs to be hard, non-slip and easy to maintain. Adequate drainage needs to be provided and ramp edges protected by a solid raised kerb. To alert people with low vision and blindness, tactile indicators at least 600mm wide should be placed at the top and bottom of ramps, with minimum 30% luminance contrast to adjacent surfaces. A colour contrasting textual marking strip, at least 600mm wide, should be placed at the top and bottom of ramps.

The maximum gradient for ramps exceeding 1200mm in length shall be 1:14. Refer Figure 1 in AS 1428.1. Tactile ground surface indicators should be installed in accordance with AS.1428.4 See summary of specifications for walkways, ramps and landings at Table C in AS1428.1 – 2009.

16.5.4 Installing Lifts

The best way to provide people who have limited mobility with access to upper floors in a multi-storey building is with an accessible standard lift. However lifts are expensive, require a reliable electricity supply, regular and relatively high-cost maintenance and can be a safety hazard when electricity supply is variable.

Guidelines to consider when installing lifts:

- ensure dimension of lift enables easy access by a person in a wheelchair
- install a handrail on at least two sides
- position the control panel so it is easily accessible and can be easily viewed
- install door re-opening activators, audio-visual signals and floor audio announcements
- install a non-skid floor
- select a door colour that contrasts with the colour of the walls, floor and the landing area in front of lift doors

- provide minimum lift floor space of 1.4m x 1.6m
- provide controls positioned 850mm to 1.2m high
- install Braille and tactile signage at the appropriate height.

Lifts where provided shall comply with AS 1735.12 and, AS 1428.2 The BCA and, USP's DS&G for Lifts. For all new buildings, Lift car is to be of a minimum size as stipulated in AS 1428.2 1992 section 6.2 'Circulation space for 180º wheelchair turn" - 2070mm × 1540mm measured in accordance with .AS1735.12 – Section 2. Refurbished lift car sizes shall be considered on a case-by-case basis by E&I, Manager Design in consultation with USP, DRC Manager, Stakeholders and Consultants.

All new lifts and lift car refurbishments are to be provided with handrails to all sides and rear wall of cars. Consult AS 1735.12 re effect of fitting handrails on floor size. Handrails are to be satin finish and are to have a 30% contrast with background to which they are affixed.

Three dimensional door sensors are to be provided where practicable.

16.5.5 Installing Stairs

Stairs should provide safe access into buildings and between levels within buildings for all users. This is particularly important for those with low vision and blindness, as well as those with mobility disability. Poor staircase design is a common problem in many buildings in developing countries and it can lead to injuries.

Staircase design complying with universal design
Steps

- All steps in one flight should be uniform.
- Steps should be 150mm to 180mm high and not less than 280mm deep.
- Open riser staircases should not be used as they pose a risk.
- Angled risers are preferred to nosing, but if nosings are used they should be rounded and not project more than 40mm.
- Nosing should have permanent colour contrasts to facilitate ease of use for people with low vision and blindness.
- Stair covering should be slip-resistant, firmly fixed and easy to maintain.
- Landings should be provided at least every 15 steps to assist people who cannot manage long staircases.
- Each landing should be at least 1.2m long.
- Clear width of stairways should be at least 1m, preferably 1.5m allowing for easy two-way traffic.
- Handrails should be provided on both sides of a flight of stairs and on each side of landings.
- With wider stairs, intermediate handrails should be installed.
- Handrails should be positioned between 800mm and 1m above floor finish.
- Handrails must extend a minimum of 300mm beyond top and bottom steps, turning to the wall.
- Handrails should be supported on brackets that do not obstruct continuous hand contact with the handrail. Tactile marking
- Tactile warning strips should be provided at the top and bottom of stairs and at intermediate landings, to alert
- People with low vision and blindness to the location of the stairs.
- A textural marking strip is essential and should be at least 600 mm deep, extending over the full width of the stairs.
- To provide orientation for people with low vision, the marking strip should be in a colour that contrasts with the surrounding surface. Lighting
- Staircases should be well lit during the day and at night when in use, with a preferred level of lighting between 150 Lux and 200 Lux.

16.5.6 Emergency Stairs

Most people with disability are unable to access stairs in an emergency when lifts are not operating. Universal design helps practitioners address this important need.

Guidelines to consider:

- consult local and fire control authorities, Disabled People's Organisations, and people with a range of disability to determine emergency needs
- provide a rescue assistance area or standby space with direct access to an Emergency Exit where people can temporarily and safely await further instructions or assistance during emergency evacuation
- provide a rescue assistance area or standby space at each floor landing of Emergency Exit stairs or balconies in case of external stairs.

16.6 Teaching Facilities

16.6.1 Flexible Teaching and Learning Classrooms

A flexible classroom arrangement provides a wide range of opportunities for teachers and students to respond to class requirements. This supports a positive learning environment, noting that implementation of good design layout and universal design principles does not need to cost a lot of money.

Guidelines to consider:

- provide chairs of various heights, to match desk heights
- provide sufficient space for opportunities to arrange or re-arrange furniture and for people to move around the classroom, including those using wheelchairs
- design square or near square rooms, which are more functional and flexible than rectangular rooms and which reduce distances between users
- install blackboards and/or whiteboards, which are excellent teaching aids and give good contrast
- fix storage furniture and shelves along walls as a safety precaution
- install a lockable cupboard in which to keep materials and specialised learning equipment
- provide at least two exit doors if capacity in teaching and assembly spaces is above 50 people, for safety and evacuation
- avoid fully glazed doors which are hazardous, especially for students with low vision and blindness

16.6.2 Lecture Theatres, Lecture Rooms, Seminar/Tutorial Rooms and Computer Laboratories:-

Adjustable height, non-fixed seat workstations to be provided at a ratio as proscribed in the Draft Access Code for Buildings - Clause D3.9. Also refer *Section 19 Teaching Spaces.*

Minimum workstation size - nominally 1200mm by 800mm. Workstation are to be easily recognisable with "height adjustable" signage in the room. Refer *Section 19 Teaching Spaces.*

16.6.3 Science Laboratories:

- Each new science laboratory is to be provided with a minimum of one adjustable height workbench, complete with a full complement of services provided to ambulant workbenches in the proposed laboratory.
- Where sinks and wash hand basins are provided at least one is to be accessible to wheelchairs.
- Where safety showers and eyewash stations are provided at least one is to be accessible to wheelchairs.
- Where fume cupboards, biohazard/laminar flow cabinets or other specialty equipment are provided in new laboratory fit outs at least one of each is to be made accessible, or as agreed with the Manager DRC.

Refer to *Section 20 Special requirements for Laboratories*.

16.7 Audio Visual Facilities

Hearing Augmentation - Listening Systems

All new projects in which rooms are fitted with amplified Public Address systems, an approved hearing augmentation system shall be included. Such rooms shall include teaching spaces, computer and science laboratories. Student centres and other major faculty reception areas should be fitted with an approved hearing augmentation system

The standard hearing augmentation system for use at USP is the Williams WIR TX75 PRO infrared emitter, to be used in conjunction with Williams WIR RX22-4N infrared receiver and neck loop, or equivalent approved model.

Signage indicating the presence of hearing systems should be displayed in the prescribed manner.

Refer AS1428.2. (Clause 21) See *Section 23 AV Standards for Classrooms and Lecture Theatres*. Also refer Draft Access Code for Buildings Clause D3.7

16.8 Furniture Design and Selection

Furniture should be well-designed and well-built, so it is appropriate for all students, including those with disability.

Guidelines to consider:

- design and construct furniture to fit the user and maximise physical comfort

- construct all furniture so it is strong and stable to prevent easy tilting
- select furniture with rounded edges to prevent injuries
- provide at least one station with a top at suitable height for working while seated in multipurpose rooms, science rooms, other specialty rooms and workshops
- provide a few adjustable tables or tables of various heights suited to those in a wheelchair, which can be easily moved to teaching spaces

16.8.1 Kitchens

All kitchen facilities including tea preparation areas provided for student use shall be accessible. Accessible sink and work surfaces in staff kitchen facilities shall be considered on a case-by-case basis. Sinks and surfaces must comply with AS4299:1995.

Where tables are provided in public, student or staff common dining areas, at least one-off accessible height is to be provided.

16.8.2 Reception Counters

The design of reception counters must be considered from an access point of view and designs must be approved by USP Manager Design of E&I and Manager DRC.

16.9 Lighting

Visual comfort is essential for quality learning. It is especially important for people with hearing disability and intellectual disability, as well as those with low vision and blindness. Proper lighting makes it easier for students to read blackboards and see other teaching aids. It also enables them to see teachers' faces and lips and the faces of other students.

Visual comfort involves balancing natural and artificial lighting, paying attention to colour schemes, and installing light points and ceiling fans in the correct position, for maximum benefit. It also involves positioning signage so it can be easily seen.

Guidelines to consider:

- ensure adequate natural light can enter classrooms and other essential rooms, particularly where power is not available
- provide a uniform light level, avoiding high contrasts and shadow areas
- locate light points over working benches and position to prevent children from working in their own shadow, especially at work benches installed along walls
- paint internal walls and ceilings a light shade, such as beige, to reflect light uniformly around the room
- avoid dark floor finishes, which means using lighter colours and finishes to make it easier to observe changes in floor surfaces and avoid obstacles
- use matt finishes to avoid glare on blackboards and working surfaces
- install electric lights on the ceiling in a uniform pattern
- recess electric lights and cover with a protection mesh to prevent accidental breakages
- use diffusers, shields or hoods on lights to prevent breakage and avoid bright spots in the vision field
- install low-consumption compact fluorescent lamps with reflectors
- select colour schemes carefully with a preference for pastel shades, which provide visual comfort
- follow manufacturer specifications with artificial lights to achieve the best distribution of light and light levels, noting that the recommended light level for educational activities is a minimum 540 lux55
- install on external pathways and in internal corridors uniform lighting, at a minimum light level of 200 lux

Illumination levels should be uniform and comply with the requirements for illumination as set out in:

- AS 1680.1:2006 Interior and workplace lighting
- AS 1680.0:1998 - Interior lighting - Safe movement
- AS 1680.2.3 - 1994 - Educational and Training Facilities,
- And other relevant sections

The Standard does not seek to provide specific recommendation for levels of illumination suitable for people with disabilities. Particular consideration should be given to ensure that lighting meets the requirements for uniformity, task area illumination, colour, glare, contrast and unwanted reflections. The use of downlights and spotlights may present difficulties for people with vision impairment.

Any lighting controls connected to the USP data network are required to be connected to a light control LAN approved by ITS. Any variation to the approved LAN will need approval from the USP, Director IT Services.

16.10 Glass in Buildings

Glazing in buildings where the BCA requires access for people with disabilities, should be marked in accordance with AS 1428.1.7.5

See also AS 1228 - 2006 Glass in buildings - selection and installation *Section 5.19 Making Glass Visible (Manifestation)*

Manifestation is a treatment that can be applied to glass windows, doors, partitions and any other large expanses of clear glass, in order to make the glass visible, preventing injury through collisions. It can also help enhance privacy and can be decorative. Manifestation is typically created from a frosted film applied at specified locations on clear glass to make it more easy to detect.

Building regulations requirement: Manifestation of glazing, states that:
Transparent glazing with which people are likely to come into contact while moving around in or about the building, shall incorporate features which make it apparent.

Approved document for Protection from falling, collision and impact, suggests that this requirement will be satisfied by including permanent means of indicating the presence of large uninterrupted areas of transparent glazing, and provides further details, requiring that either:

They are clearly defined with **glass manifestation** on the glass at two levels; between 850-1,000 mm and 1,400-1,600 mm above the floor, contrasting visually with the background seen through the glass (both inside and out) in all lighting conditions. Manifestation takes the form of logo or sign at least 150 mm high (repeated if on a glazed screen), or a decorative feature such as broken lines or continuous bands, at least 50 mm high.

STANDARDS
NEW ZEALAND
Paerewa Aotearoa

NZS 4121:2001

New Zealand Standard

Design for Access and Mobility – Buildings and Associated Facilities

Superseding NZS 4121:1985 and NZMP 4122:1989

NZS 4121:2001



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This Standard was prepared by the Access 2000 committee (P 4121) for the Standards Council established under the Standards Act 1988.

The committee consisted of representatives of the following:

Building Industry Authority
Building Officials Institute of New Zealand
DPA NZ (Inc)
New Zealand Association of Occupational Therapists
New Zealand Institute of Architects
Property Council of New Zealand

Working in close co-operation with:

Association for Blind Citizens
Barrier Free New Zealand Trust
National Foundation for the Deaf
Royal New Zealand Foundation for the Blind

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RELATED DOCUMENTS

Reference is made in this Standard to the following:

NEW ZEALAND STANDARDS

NZS 4223:- - - -	Code of practice for glazing in buildings
Part 3:1999	Human impact safety requirements
NZS 4241:1999	Public toilets
NZS 4332:1997	Non-domestic passenger and goods lifts
NZS 4512:1997	Fire alarm systems in buildings
NZS 6703:1984	Code of practice for interior lighting design
NZS/AS 1428:- - - -	Design for access and mobility
Part 4:1992	Tactile ground surface indicators for the orientation of people with vision impairment
NZMP 6004: 1999	Safer electrical installations in homes – For children, the elderly and people with disabilities

JOINT AUSTRALIAN/NEW ZEALAND STANDARDS

AS/NZS 1680:- - - -	Interior lighting
Part 0:1998	Safe movement
Part 2.4:1997	Industrial tasks and processes
Part 2.5:1997	Hospital and medical tasks
AS/NZS 1730:1996	Washbasins
AS/NZS 2107:2000	Acoustics – Recommended design sound levels and reverberation times for building interiors
AS/NZS 3661:- - - -	Slip resistance of pedestrian surfaces
Part 1:1993	Requirements
Part 2:1994	Guide to the reduction of slip hazards
AS/NZS 3856:- - - -	Hoists and ramps for people with disabilities – Vehicle-mounted
Part 1:1998	Product requirements
AS/NZS 4586:1999	Slip resistance classification of new pedestrian surface materials

AUSTRALIAN STANDARDS

AS 1088:- - - -	Hearing aids
Part 4:1987	Magnetic field strength in audio-frequency induction loops for hearing aid purposes
AS 1428:- - - -	Design for access and mobility
Part 2:1992	Enhanced and additional requirements – Buildings and facilities
Part 3:1992	Requirements for children and adolescents with physical disabilities
Part 4:1992	Tactile ground surface indicators for the orientation of people with vision impairment
AS 1735:- - - -	Lifts, escalators and moving walks
Part 6(Int):1996	Moving walks
AS 2107:1987	Acoustics – Recommended design sound levels and reverberation times for building interiors
AS 2890:- - - -	Parking facilities
Part 1:1993	Off-street car parking

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BRITISH STANDARDS

BS 5252:1976	Framework for colour co-ordination for building purposes
BS 5776:1996	Powered stairlifts
BS 6440:1999	Powered lifting platforms for use by disabled persons
BS EN 115:1995	Safety rules for the construction and installation of escalators and passenger conveyors
BS EN 1154:1997	Building hardware. Controlled door closing devices. Requirements and test methods

NEW ZEALAND ACTS AND REGULATIONS

Building Act 1991
Building Regulations 1992 (includes the Building Code)
Fire Safety (Evacuation of Buildings) Regulation 1992
Fire Service Act 1975
Human Rights Act 1993
Local Government Act 1974
Resource Management Act 1991

OTHER PUBLICATIONS

Land Transport Safety Authority – Road and traffic guidelines
RTS Guideline No. 14. 1997. Guidelines for installing pedestrian facilities for people with visual impairment.

The users of this Standard should ensure that their copies of the above-mentioned New Zealand Standards or of overseas Standards approved as suitable for use in New Zealand are the latest revisions or include the latest amendments. Such amendments are listed in the annual Standards New Zealand *Catalogue* which is supplemented by lists contained in the monthly magazine *Standards* issued free of charge to committee and subscribing members of Standards New Zealand.

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FOREWORD

The Building Act 1991 integrated the requirements for access and facilities for people with disabilities, previously covered by the Disabled People Community Welfare Act 1975, into the general building law and the provision of these facilities is enforceable under this Act.

NZS 4121 is cited in subsection (3) of section 47A of the Building Act 1991, as providing a means of compliance with the Building Code.

The access requirement in the Building Act applies in effect to all new buildings and existing buildings, other than private residential buildings, when they are altered, or there is a change in use. The access requirement also applies to driveways, accessways and passages within and between complexes and developments and associated landscaping (if any) that are intended to be used for, or associated with, one or more of the buildings to which the access requirement applies.

The purpose of the Standard is to provide guidance for those who are responsible for making buildings and facilities accessible to and fully usable by people who have disabilities. This is to be done in accordance with the access requirement that reasonable and adequate provision is made for people with disabilities who may be expected to visit or work in buildings and to enter and carry out normal activities and processes in those buildings. It should be noted that this requirement is considered from the view of the user and not the building owner.

In practice a building must be designed to enable people with disabilities to use the building with the same convenience as those who do not have disabilities.

This Standard provides a universal basis for the necessary dimensions and space needed to ensure that the structure and layout of both public and private accommodation and their other elements, facilities and features are accessible to and usable by people with disabilities. The requirements for public and private accommodation can of course be usefully used in the design of private dwellings.

The Building Act 1991 recognizes that people with disabilities are part of the community, and that any barrier which prevents them from participating in the social and economic life of that community must be eliminated. Architectural barriers cause the most difficulty in respect of access, not only for people with disabilities, but also for many other people, particularly the very young and the elderly.

Public building types such as shopping malls, supermarkets, department stores and airline terminals have been made more accessible, not only in consideration of people with disabilities, but because better access for the public at large improves these buildings, and makes them more attractive and usable for a wider cross-section of the population. When a building design is carried out with access as a primary element of the brief, access is provided much more cost-effectively than if it is treated in a secondary manner or as an afterthought.

Accessibility not only means access for people with disabilities, but it also ensures efficiency, comfort and convenience for everyone else. It is a practical matter, and not an emotional issue. In this Standard an endeavour has been made to relate the design rules to the practical experience which has been gained in implementing the access provisions since they came into force in New Zealand in 1977. This Standard is not

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the only means of complying with the statutory provisions relating to access, and because of the diversity of building types the Standard does not attempt to cover all circumstances. What amounts to "reasonable and adequate provision" in respect of access is a matter to be decided in the design of each particular building having regard to the need to assist and encourage people with disabilities to become socially and financially independent.

Above all there is the absolute requirement to enhance their human rights, which are now protected by the Human Rights Act 1993, which prohibits discrimination on the grounds of disability.

The New Zealand Health Survey 1992-93 by the Ministry of Health confirms the need for access and facilities (especially lifts designed for use by all users). This survey showed that a quarter of the entire adult population has a mobility limitation.

The design requirements in the concepts of approachability, accessibility and usability are meant to ensure that accessible facilities are melded into the design of a building as a whole (including landscaping) so that the occupants of the building happily use these facilities without being conscious of their underlying purpose.

It will be recognized that 'accessible' routes for people with disabilities extend far past those on the building sites and within buildings, see definition of the accessible route, 1.5.1. Local and central government are required, through the Local Government Act 1974, the Resource Management Act 1991 and the Human Rights Act 1993 to provide clear access along pavements and to provide road crossings etc. for people with disabilities to use. This consideration automatically extends to the siting of street furniture, bollards and the like and the siting and design of public transport bus or train stops etc.

Access for people with disabilities should not be seen as "special", but as part of a safe and convenient environment for everyone.

People with disabilities, their families and companions form a growing segment of the travelling public on business or holidays. Some commercial tour operators now actively promote and organise holidays within New Zealand and overseas operators are continually seeking suitable accommodation for tourists with disabilities who travel alone or with a group.

Accessible hotel and motel rooms should be decorated and furnished to the same standard as the other rooms in the premises.

The principle in design is that "good design for people with disabilities is good design for everyone". It certainly does not mean that hospital style rooms should be built or that all guestrooms be specially designed.

People with disabilities also travel unaccompanied so they should be able to "use" hotels and motels with the same convenience as the non-disabled traveller. Having to call for assistance to do simple tasks is embarrassing for both staff and guest. This standard does not spell out all the aspects and elements for the complete design of accessible accommodation and common sense must prevail.

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NEW ZEALAND STANDARD

DESIGN FOR ACCESS AND MOBILITY – BUILDINGS AND ASSOCIATED FACILITIES

1 GENERAL

1.1 Scope

1.1.1

This Standard sets out requirements for the design of buildings, facilities within buildings, driveways, car parks, passages and any associated landscaping and accessways for use by people with disabilities as required by the Building Act 1991 and the Local Government Act 1974.

It is written to cater for the majority of access and usage needs of people with disabilities, however, everyone benefits from accessible buildings in a variety of ways.

1.1.2 Types of buildings

This Standard shall apply to, but shall not be limited to, buildings, and parts of buildings, (including driveways, accessways, car parks and passages within and between complexes and developments, and associated landscaping, if any) that are defined in the Building Act Section 47A(4), refer to Appendix A, A3.1.

The Standard covers access provisions for the following types of buildings, refer also to Appendix A.

"(a) Land, sea, and air passenger transport terminals and facilities and interchanges, whether wholly on land or otherwise;

"(b) Public toilets wherever situated;

"(c) Banks;

"(d) Childcare centres and kindergartens;

"(e) Day-care centres and facilities;

"(f) Commercial buildings and facilities for business and professional purposes, including computer centres;

"(g) Central, regional, and local government offices and facilities;

"(h) Courthouses;

"(i) Police stations;

"(j) Hotels, motels, hostels, halls of residence, holiday cabins, groups of pensioner flats, boarding-houses, guest houses, and other premises providing accommodation for the public;

"(k) Hospitals, whether public or private, nursing homes, and old people's homes;

"(l) Medical and dental surgeries, and medical and paramedical and other primary health care centres;

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"(m) Educational institutions, including public and private primary, intermediate, and secondary schools, universities, polytechnics, and other tertiary institutions;

"(n) Libraries, museums, art galleries, and other cultural institutions;

"(o) Churches, chapels, and other places of public worship;

"(p) Places of assembly, including auditoriums, theatres, cinemas, halls, sports stadiums, conference facilities, clubrooms, recreation centres, and swimming baths;

"(q) Shops, shopping centres, and shopping malls;

"(r) Restaurants, bars, cafeterias, and catering facilities;

"(s) Showrooms and auction rooms;

"(t) Public laundries;

"(u) Petrol and service stations;

"(v) Funeral parlours;

"(w) Television and radio stations;

"(x) Car parks, parking buildings, and parking facilities;

"(y) Factories and industrial buildings where more than ten persons are employed;

"(z) Other buildings, premises, or facilities to which the public are to be admitted, whether on payment or otherwise."

1.1.3 Structure of standard

The Standard is divided into 14 sections plus appendices:

Section 1	General information
Section 2	Performance requirements
Sections 3 – 14	Design rules for access and mobility including: – Accessible outdoor public areas – Accessible accommodation
Appendices	

1.1.4 Children with disabilities

This Standard is primarily written for adult people with disabilities. Reference may be made from time to time to provisions for children. The design of buildings and facilities to accommodate children e.g. childcare centres is covered in AS 1428.3, which deals specifically with requirements for children and adolescents with physical disabilities.

1.2 Objective

The purpose of the Standard is to provide workable solutions, which meet and integrate the performance criteria for access and facilities of the New Zealand Building Code (NZBC) into the overall design of buildings to which these requirements relate. Some of the requirements of this standard may exceed some of the requirements currently given in the Building Code and Approved Documents, and is expected to complement the Building Code. This is to be done by applying the principles of approachability, accessibility and usability to the overall design of buildings to ensure that people with disabilities are able to enter and carry out normal activities and processes in buildings and parts of buildings. These principles are

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to be applied to driveways, car parks and passageways within and between complexes and developments and associated landscaping, if any.

The purpose of the Standard is also to provide workable solutions for the creation of accessways in urban areas that facilitate the movement of people between buildings, along pavements and across roads and streets.

Section 47A(3) of the Building Act states that this Standard is a means of establishing compliance with the Building Code (which is the first Schedule to the Building Regulations 1992) in respect of the provision of access and facilities for people with disabilities.

1.3 Application

1.3.1 Users

The Standard is intended for use by people with disabilities, occupational therapists, government departments, architects, designers, drafters, building owners, builders, local authorities, town planners, building officials and people with day-to-day control over the arrangement of facilities on a building site or within a building.

1.4 Statutory provisions

C1.4
Appendix A is an informative Appendix entitled 'Statutory obligations relating to access and building' and outlines the obligations imposed on designers, building owners and territorial councils by New Zealand law that provides for people with disabilities.

1.4.1 Building Act 1991

The Building Act has a number of sections relating to access and facilities for people with disabilities in buildings. The relevant sections are 6(2)(e), 34(7), 38, 46 and 47A. These are discussed in Appendix A.

1.4.2 NZS 4121

Under section 47A (3) of the Building Act, NZS 4121:2001, being a standard specification that is in substitution for NZS 4121:1985, is deemed to be one of the documents establishing compliance with the New Zealand Building Code, refer to Appendix A, A3.1 (3).

1.4.3 Local Government Act 1974

C1.4.3
See section 331 of the Local Government Act, or refer to Appendix A, A4.1.

The Local Government Act requires Councils to provide safe and easy passage for people with disabilities from kerb to kerb of any road.

1.4.4 Resource Management Act 1991

The Resource Management Act provides for the inclusion of any matter relating to the management of any actual or potential effects of any use, development or protection described in its schedules on the community or any group within the community including minorities, children and disabled people, refer to Appendix A, A5.

1.4.5 Regulations

1.4.5.1 New Zealand Building Code

The Building Code in the First Schedule to the Building Regulations 1992 sets out the objectives, functional and performance requirements for buildings. The requirements in respect of people with disabilities are to be found in the following clauses (refer also to Appendix B):

Clause D1	Access Routes
Clause D2	Mechanical Installations for Access
Clause F8	Signs

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Clause G1 Personal Hygiene
Clause G2 Laundering
Clause G3 Food Preparation and Prevention of Contamination
Clause G5 Interior Environment
Clause G9 Electricity
Clause G12 Water Supplies

1.4.5.2 Fire Safety (Evacuation of Buildings) Regulation 1992

The Fire Safety (Evacuation of Buildings) Regulations require that access for people with disabilities shall not be denied on the grounds that there are problems with fire safety and evacuation from a building, refer to Appendix A, A6.

1.5 Definitions and interpretation

1.5.1 Definitions

For the purpose of this Standard the following definitions shall apply:

ACCESSIBLE means having features that permit use by people with disabilities.

ACCESSIBLE ROUTE means a route that is usable by people with disabilities. It shall be a continuous route that can be negotiated unaided by a wheelchair user, walking device or by a person with a guide dog. The route shall extend from the street boundary and car parking area to those spaces within the building required to be accessible to enable people with disabilities to carry out normal activities and processes within the building.

ACCESSIBLE STAIRWAY means a stairway having features for use by people with disabilities. Buildings required to be accessible shall have at least one accessible stairway leading off an accessible route whether or not a lift is provided.

ACCESSWAY means a continuous accessible path of travel to buildings and between buildings, along pavements or across roads or streets, which provides access to all the facilities. This may include footpaths, ramps, and stairs.

ALL-GENDER means no distinction or restriction on access or use made on the basis of gender.

BUILDING means 'Building' as defined by section 3 of the Building Act, refer Appendix A of this Standard.

CIRCULATION SPACE means the net unobstructed area for a minimum height of 2000 mm above the finished floor or ground surface (unless otherwise specified in this Standard), which is that space surrounding built elements, landscape elements, and fixtures and fittings required for movement into and within buildings.

CONSTANT CONTACT TECHNIQUE means a white cane technique in which the person with a visual impairment keeps the cane tip on the ground, and sweeps from side to side in front of them, using an arc to cover the body width.

COUNCIL means a territorial local authority within the meaning of the Local Government Act 1974.

CUE sometimes also referred to as clues. An element within the environment which can be felt, heard, seen or smelt, and which assists a person with visual impairment to establish their location or direction of

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travel. Some important cues such as changes in angle of a floor surface are sensed within the body [proprioceptively] rather than at the extremities [touch].

GOING
- of a step is the horizontal distance from the nosing of one tread to the nosing of the next tread;
- of a stair is the total horizontal distance travelled of a stair;
- of a ramp is the horizontal distance travelled of a ramp

GRAB RAIL means a rail used to steady, stabilize, or support the full weight of a person who is changing position.

GROSS FLOOR AREA means the superficial area on the plan of a floor of a building measured over its outside dimensions including walls.

HANDRAIL means a rail used in circulation areas such as corridors, passageways, ramps and stairways to assist in continuous movement.

INTERNATIONAL SYMBOL OF ACCESS (ISA) – Refer to Appendix E.

KERB means a side barrier to a trafficable surface.

KERB RAMP means a short ramp, length not greater than 1520 mm and a gradient not steeper than 1 in 8, cutting through a kerb or built up to the kerb.

LANDING means a flat or crowned surface with a gradient not steeper than 1 in 50, e.g. a rest area on a ramp, stairway or walkway.

LANDMARK means any cue that is easily recognizable and that has a known and exact location in the environment.

MAIN ENTRANCE means the principal entrance that is used as a matter of course by people visiting or working in the building.

MOBILITY means the act of movement within the physical environment.

NOSING means the rounded projecting edge to a stair tread.

ORIENTATION means the process involved in monitoring one's position in space, through the use of the senses and in relation to the known patterns of environment, to facilitate purposeful movement.

PEOPLE WITH DISABILITIES means people whose ability to be freely mobile or to access and use buildings is affected by mental, physical, hearing or sight impairment, such as:

(a) An inability to walk;
(b) Walking difficulties;
(c) Reliance on walking aids;
(d) Partial sightedness or total blindness;
(e) Hearing disabilities;
(f) Lack of co-ordination;
(g) Reaching disabilities;
(h) Manipulation disabilities;
(i) Lack of stamina;
(j) Difficulties in interpreting and reacting to sensory information;
(k) Extremes of physical size;
(l) Learning difficulties.

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PEOPLE WITH VISUAL IMPAIRMENT includes: people who are totally blind [around 5 %], those who are blind but have some light perception, and people who have low vision whose sight may be affected in one or more of a wide variety of ways.

PLACES OF ASSEMBLY means in addition to theatre, cinema, or public hall, a building or part thereof used or intended to be used as a place of assembly for 250 or more people, seated or unseated.

RAMP means an inclined accessible route with a gradient steeper than 1 in 20 but not steeper than 1 in 12. 1 in 14 is preferred as many people have difficulty negotiating a steeper ramp.

SHORELINE means a continuous tactile cue that runs parallel to the desired direction of travel for a person with a visual impairment. For example a wall or edge of a grass perm bordering a footpath.

SLIP RESISTANT means a walking surface that has a coefficient of friction (Φ) under all conditions of normal use, of no less than $\Phi = 0.4 + 0.0125$ S, where S is the slope of the walking surface as a percentage.

SQUARING OFF the act of aligning and positioning one's body in relation to an object for the purpose of establishing a definite position and orientation in the environment and subsequently an accurate line of travel. Used commonly by people with a visual impairment prior to crossing open spaces.

STEP RAMP means a short ramp with a length not greater than 1520 mm and a gradient not steeper than 1 in 8, replacing a step or located in a step other than a kerb. Refer kerb ramp.

SUPPORT RAIL means a rail used to provide steadying or stabilizing assistance.

TOILET UNIT means a self contained fully enclosed space or room within a toilet facility containing a water closet or privy, a hand basin and possibly other toilet features.

TOUCH TECHNIQUE means a white cane technique in which the person with a visual impairment touches the cane on the ground where they will place their foot next.

WALKWAY means any accessway with a gradient not steeper than 1 in 20.

1.5.2 Interpretation

For the purposes of this Standard the word "shall" refers to practices that are mandatory for compliance with this Standard, while the word "should" refers to practices which are advised or recommended.

Clauses prefixed by "C" and printed in italic type are intended as comments on the corresponding mandatory clauses. They are not to be taken as the only or complete interpretation of the corresponding clause, nor should they be used for determining in any way the mandatory requirements of compliance within this Standard. The Standard can be complied with if the comment is ignored.

The terms "Normative" and "Informative" have been used in this Standard to define the application of the Appendix to which they apply. A "Normative" Appendix is an integral part of a Standard whereas an "Informative" Appendix is only for information and guidance. Informative provisions do not form part of the mandatory requirements of the Standard.

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2 PERFORMANCE REQUIREMENTS

2.1 Scope

This section of the Standard identifies the requirements for access and facilities for people with disabilities.

2.2 Function and context of use

2.2.1 Function

The function of design specifically for people with disabilities is to provide suitable access and facilities to and within buildings for any type of disability.

2.2.2 Context of use

A disability may be temporary or permanent. A disability may affect mobility to the extent that a wheelchair is necessary, may affect use of the arms and hands or the flexibility or balance of the body, or it may affect sight or hearing partially or totally. At any one time at least 20 % of the population have some kind of disabling condition.

People with disabilities still have a need to visit or to work in buildings. The Building Code, through its objectives and functional and performance requirements, establishes access requirements and facilities within buildings which are intended for use by all people regardless of any degree of disability.

However, the building owner and designer still have to give special recognition in building design to the needs of people who have a disability. This Standard, based on a long practical experience, is produced to provide the designer with methods, techniques and solutions that will meet their needs.

Through section 47A of the Building Act this Standard is accepted as deemed to be one of the documents establishing compliance with the Building Code (NZBC). As such it is only one way of meeting the performance requirements of the NZBC. Designers may use 'alternative solutions' provided they can show the alternative meets the performance requirements.

2.3 Performance requirements

2.3.1 The Building Code (NZBC)

The performance requirements for design for access and mobility are those given in the relevant clauses of the NZBC noted in 1.4.5 and Appendix B of this Standard.

2.3.2 This Standard

Sections 3 to 14 of this Standard identify and use many 'criteria' that are based on current experience with current equipment, or on parameters such as an average person's size or reach. The Standard identifies minimum requirements, (particularly for dimensions), which will comply with the minimum performance requirements of the NZBC. However, it may also recommend more useful or best practice criteria, which would then be in excess of the minimum requirements of the NZBC.

2.3.3 Listening systems

The performance requirements for listening systems suitable for use in public places are to be found in Appendix H.

Hearing augmentation – listening systems shall be:

(a) Usable by people who do not have hearing aids;

(b) Suitable for a range of severity of hearing impairment;

(c) Safe and easy to use/control;

(d) Suitable for intended use;

(e) Maintained regularly.

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3 DESIGN FOR ACCESS AND MOBILITY

3.1 Scope

3.1.1 New buildings

This section of the Standard provides guidance for the design of new buildings and facilities to enable people with disabilities, to get to, enter and use a building or facility unaided.

The particular buildings and facilities or parts of buildings and facilities are those which section 47A of the Building Act refers, refer to 1.1.2 and Appendix A.

3.1.2 Alterations to existing buildings

C3.1.2

Refer to Appendix A4.2 which covers section 38 of the Building Act, dealing with alterations to existing buildings.

Alterations to existing buildings can pose difficult design challenges for compliance with this Standard. In Appendix C design solutions for common alteration problems are suggested. These are acceptable only when there is no other way of bringing the building into compliance with the Building Code. These alternatives are allowed at a cost to people with disabilities and shall not be used in new building construction.

3.2 General

3.2.1 Approachability, accessibility and usability

Design shall be carried out by applying the principles of approachability, accessibility and usability to the overall design to ensure that people with disabilities, visitors and workers are able to enter and carry out normal activities and processes in buildings and parts of buildings. These principles which are illustrated in figure 1, are also applied to driveways, accessways and passages within and between complexes and developments and associated landscaping.

3.3 Design

3.3.1 Minimum provisions

In addition to the maximum requirements of this Standard, notes are given below to extra provisions necessary for certain types of building.

(a) Transport terminals

Accessible routes shall serve all parts of a terminal. This access provision shall apply to floors above or below ground level, and shall include access to such facilities as cash machines, booking / ticketing, luggage delivery, restaurants, bars, cafes, canteens, shops, banks and post offices.

(b) Educational institutions etc.

(i) Buildings. In educational institutions the teaching, social, recreational and administration buildings, used by both students and staff, shall be connected by an accessible route.

(ii) Libraries, laboratories, resource rooms and facilities providing for other similar specialist activity shall be located on an accessible route, except where they are duplicated and then at least one shall be on an accessible route.

(iii) Showers. Where showers are provided, at least one shower for each gender (or one all gender shower) shall be accessible in accordance with 10.5.11. ➤

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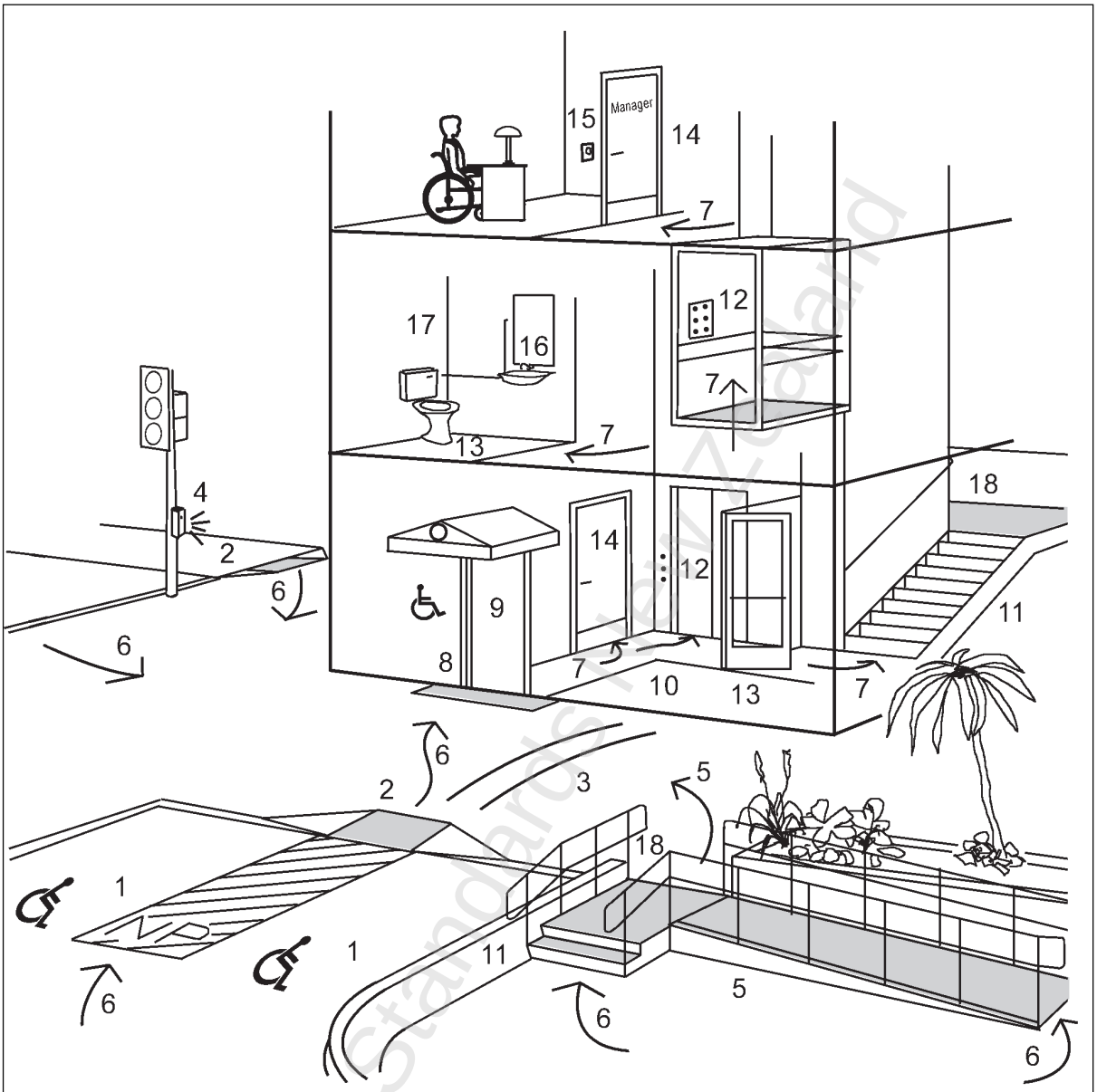


Figure 1 – Approachability, accessibility and usability

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(iv) Toilets. In the case of primary schools the height of toilet pans and other facilities in toilet compartments may be varied from that shown in this Standard to meet the special needs of young people with disabilities.

(c) Industry
The provisions of this Standard are not required to be applied to factories unless the number of people employed is more than ten. Where the number of people employed is more than ten, accessible facilities shall be in accordance with this Standard.

3.3.2 Bilateral provision

Whenever possible, when two or more facilities are to be provided, the designer shall provide right and left-handed arrangements of fixtures and fittings.

C3.4
Greater flexibility and ease of use of the space or facility is often achieved by increasing these dimensions, as well as extending the opportunities to design for greater comfort and convenience.

3.4 Minimum dimensions

The floor space and door opening dimensions in this Standard are shown as minimum measurements.

The space requirements for people with disabilities using various aids, or with the support of another person are to be found in Appendix D.

3.5 Wheelchairs

The basic dimensions of currently used wheelchairs upon which this Standard is based and the space and reach requirements of the wheelchair user are to be found in Appendix D.

3.6 Symbol of access and symbol for deafness

Section 47A of the Building Act requires that the International Symbol of Access be displayed on buildings which are, or have been made accessible, refer to Appendix A, A3.1 (5).

It is essential that both the International Symbol of Access and the International Symbol for Deafness, see Appendix E, are displayed within accessible buildings to show the location of accessible facilities.

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4 ACCESSIBLE ROUTES

4.1 Scope

This section covers a description of an accessible route and the features that are necessary for people with disabilities to effectively use the route.

4.2 Accessible route

4.2.1

An accessible route or routes shall be provided that connects from the point of arrival on site to those rooms and spaces required to be accessible to enable people with disabilities to visit and work and "carry out normal activities and processes" in the buildings and facilities, refer Appendix A, A3.

4.2.2

There will be situations where the local topography will not allow an accessible route requirement to be fully provided. Other solutions that provide reasonable and adequate access may be approved provided that the principles of accessibility are maximized in the alternative designs.

4.2.3

The accessible route includes paths, car parks, ramps, at least one public entrance, corridors, stairs, doorways and lifts within the building. For non-ambulatory people, the accessible route shall not incorporate any step, stairway, turnstile, revolving door, escalator or other impediment that would prevent it from being safely negotiated.

C4.2

Accessible routes are not required to such places as plant rooms, pumping station shafts etc.

4.3 General

In order to achieve the objective of 4.1, people with disabilities shall be able to:

(a) Park their cars in accessible car parks;

(b) Approach the accessible main entrance (or entrances) to the building or facility by footpath on an accessible route;

(c) Enter the building or facility at an entrance, which has a level threshold, or which is approached via an incline or ramp with an appropriate gradient;

(d) Move freely inside and to use the facilities within the building or facility, except as provided for in this part of the Standard;

(e) Operate electronic access mechanisms and systems.

4.4 Kerb ramps

Kerb ramps shall be provided and designed according to 13.4.

4.5 Hazards and obstructions

4.5.1 General

The accessible route shall have the required height and width clearance and shall be free from hazards and obstructions at all times.

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4.5.2 Height clearance

For accessible routes of unlimited length the height clearance shall be 2100 mm. For landings, stairways and corridors less than 2000 mm in length the height clearance shall be 2000 mm. These height clearances are illustrated in figure 2.

C4.5.3

People working in certain types of buildings such as supermarkets and other retail outlets, libraries, restaurants and cafes often erect or reorganize display stands or move furniture such that the accessible route is blocked or encroached upon.

4.5.3 Clear route

An accessible route shall be designated as a clear route and maintained with a minimum width of 1200 mm, at all times, see 4.5.4.

4.5.4 Turnstiles and trolley traps

4.5.4.1 Access

Whenever the accessible route into a building passes through turnstiles or trolley traps these shall allow unimpeded passage to a person with mobility aids including guide dogs.

C4.5.4.2

The provisions of the Fire Service Act apply.

4.5.4.2 Egress

The nominated 'means of escape' route shall be clearly indicated at the turnstile or trolley trap so that people with disabilities do not attempt to use the turnstile or trolley trap in an emergency.

4.5.5 Signs, lights and awnings

The requirements for hanging signs, lights and awnings and permanent and temporary obstructions are given in 13.2.

4.5.6 Projections

Minor, major and dangerous projections are covered by the requirements of Approved Document D1/AS1 of the NZBC.

4.6 Surface finishes

Ground, floor, ramp and stair tread surfaces shall be stable, firm and slip resistant under all normal environmental conditions.

C4.6.1

Factors which affect slip resistance are:

(a) Approved Document D1/AS1 refers to AS/NZS 3661.1 and AS/NZS 3661.2. AS/NZS 3661.1 has been superseded by AS/NZS 4586;

(b) Floor surfaces should be slip resistant when dry and should not be highly polished;

(c) Paving bricks with bevelled edges or chamfered arises, and heavily textured and figured surfaces such as raked joint pavers are considered not traversable by a wheelchair;

(d) Carpet and underlay need to be securely laid to prevent wave-like stretching. Carpet should be short-piled; i.e. not too long or soft, so as to impede wheelchair movement. Exposed junctions between carpet and other floor surfaces should be securely trimmed.

4.6.1 Slip resistance

The requirements for slip resistance of accessible routes, ramps and stairs as specified in Approved Document D1/AS1 of the NZBC shall apply.

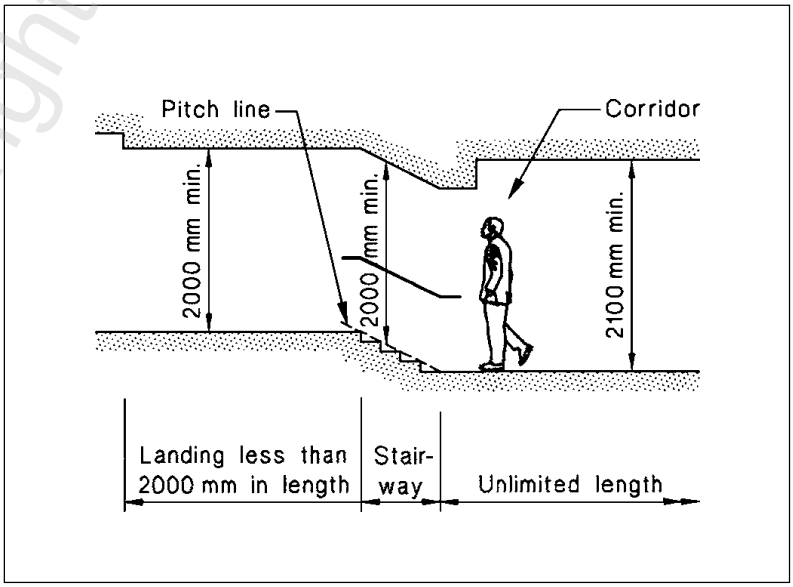


Figure 2 – Height clearance on accessible routes

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Most floor surfaces are reasonably slip-resistant when dry. All surfaces, except textiles, tend to become more slippery when they are on a slope, when they are wet or when they are covered with grit or mud. Particular attention should be given to floors in entrance lobbies, which can become slippery in wet weather.

The following finishes are some of those considered satisfactory, subject to the surface texture being traversable by wheelchair:

Dry locations:

(a) All materials suitable for wet locations;

(b) Short-piled carpet i.e. having less than 6 mm pile height;

(c) Smooth flooring materials, which should not have a high-gloss, slippery finish, or which have been suitably treated to provide slip-resistance.

Wet locations:

(a) Concrete with abrasive or textured finish;

(b) Concrete with exposed aggregate finish;

(c) Bituminous concrete;

(d) Natural stone with rough finish;

(e) Paving bricks with special abrasive finish;

(f) Slip-resistant tiles;

(g) Profile decking timber;

(h) Broom finish concrete.

4.7 Direction indicators

Direction indicators shall be installed on accessible routes in accordance with this Standard.

C4.7

Direction indicators use a wide range of materials and principles, (sight, sound, touch). The most obvious indicator is the tactile tile set into the floor. Another tactile indicator is raised lettering or Braille. Changes in material in the accessible route e.g. from concrete to timber to rubber, produce different sounds and are good aural indicators. Designers should aim for reinforcement of cues and provide more than one cue.

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4.8 Signs

4.8.1 General

Every building and support facility designed in accordance with this Standard shall have and maintain signs, both inside and outside the building.

C4.8.1

It is important for people who visit a building (and the staff who use it) to be aware of the facilities which have been provided for people with disabilities. The display of appropriate signs both inside and outside a building is important to increase a person's degree of independence and to avoid having to ask for directions. Signs are particularly helpful to people with hearing impairment.

4.8.2 Signs

Signs have three functions:

(a) Informative – advising about availability of facility or service;

(b) Directional – directing to specific facility;

(c) Locational – identifying the place where the facility is provided.

4.8.2.1 Usage

Signs shall identify:

(a) Accessible car parks;

(b) Accessible entrances;

(c) Services available in the building;

(d) Accessible routes through buildings;

(e) Accessible stairs or lifts;

(f) Location of accessible toilet facilities;

(g) Locations of rooms with listening systems.

4.8.2.2 Standard format

Signs shall indicate the direction and name or symbol of an accessible facility and shall incorporate the symbol of access in accordance with figure 3.

4.8.2.3 Position

Signs shall be positioned and located in a consistent manner. A sign shall be fixed on a wall at between 1400 mm and 1700 mm above floor level to lower edge of sign plate.

C4.8.2.3

Signs positioned perpendicular to the path of travel are most likely to be noticed as many people with disabilities have limitations in the movement of their head, and reduced peripheral vision.

4.8.2.4 Lettering

The size, type and layout of lettering on signs shall be clear and legible.

C4.8.2.4

The recommended fonts are Arial, Times New Roman or Helvetica Medium.

4.8.2.5 Colour contrast

Lettering and symbols shall clearly contrast with the sign background.

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4.8.3 International symbol of access

The proportional layout of the symbol of access shall be as shown in Appendix E.

4.8.4 Car parks

Figure 4 shows the preferred wording for signs in accessible parking areas and buildings.

4.9 Viewing ranges

The ultimate height zone for comfortable common viewing is shown in figure 5.

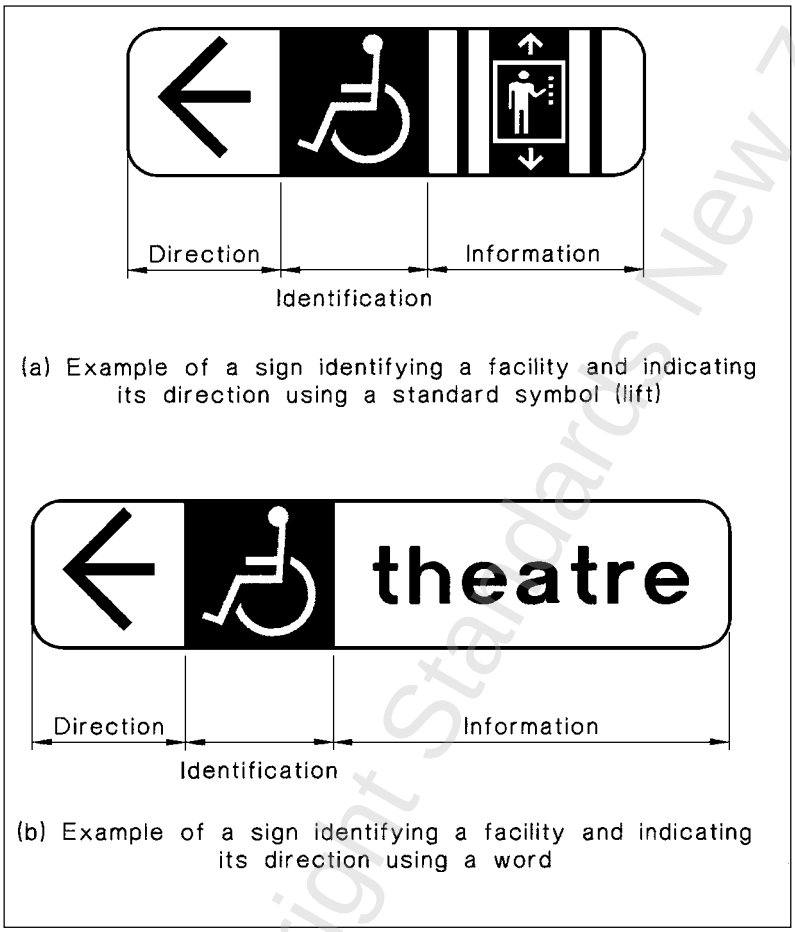


Figure 3 – Examples of signs indicating a facility and its direction



Figure 4 – Public parking sign

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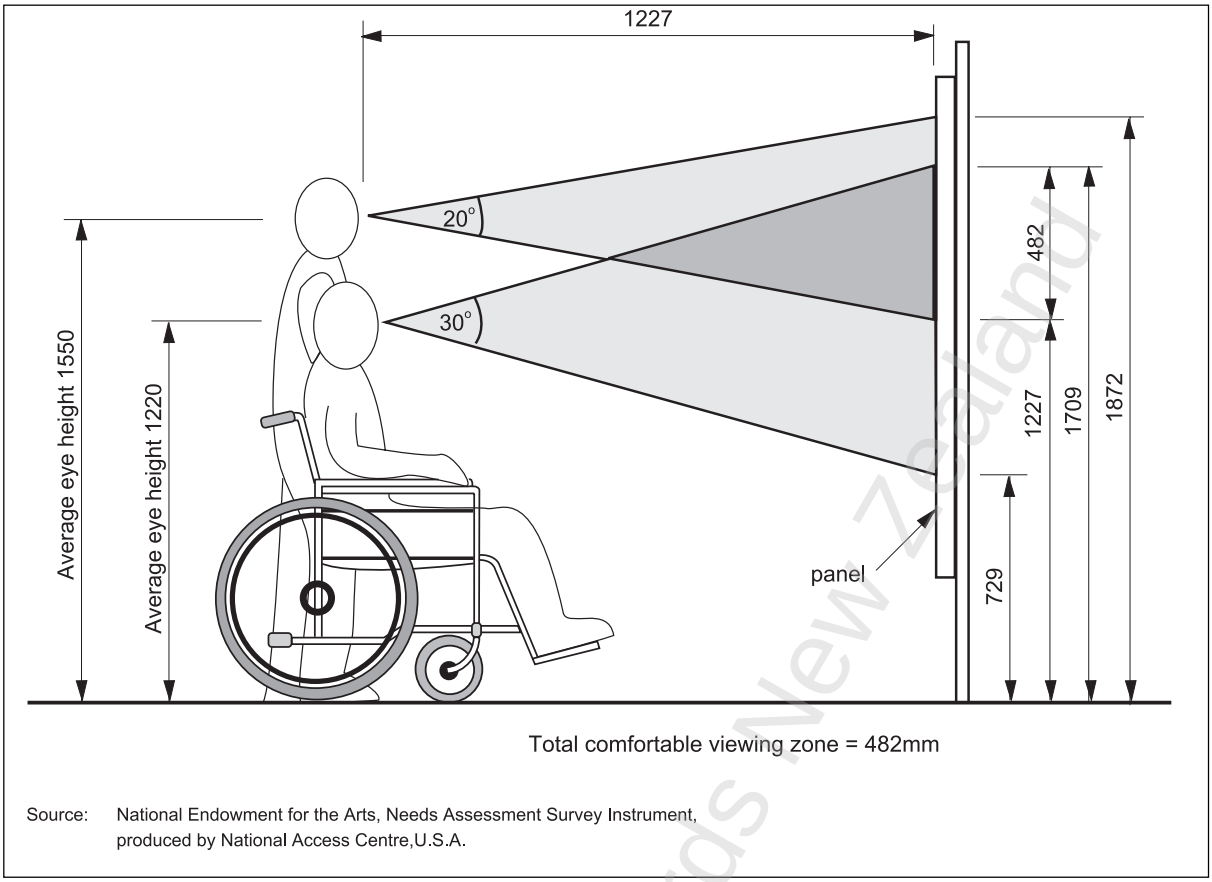


Figure 5 – Zones for viewing and for common viewing

C4.10.1

Factors that contribute to providing a good visual environment include:

(a) Consideration of visual clutter to examine whether or not an object is distinct against the background;

(b) Consideration of artificial and natural lighting options to investigate the absence of glare, accuracy of colour rendering and object modelling and the balance of illumination including graduated changes in levels of luminance through spaces;

(c) Consideration of:

(i) Size of object to be identified

(ii) Sharpness of object form

(iii) Distance to object

(iv) Complexity of form

(v) Context in which an object is presented

(vi) Consistency of, or familiarity with the form of an object

(vii) Contrast of figure against the background

(viii) State of dark adaptation

(ix) Use of any visual aids.

4.10 Visibility factors

4.10.1 General

The visual environment shall be designed so as to maximize the usefulness of whatever level of vision a user may have.

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4.10.2 Contrast

Where colour or texture changes are introduced they shall be made at corners, where there is a break in plane, at the junction of a stair tread and riser, or where a ramped surface meets a level surface.

C4.10.2

Colour change may be actual, or may be apparent e.g. by forming a permanent shadow. Variations in acoustic characteristics, lighting and wall and floor textures provide good cues about the environment for people who are blind or partially sighted.

Well-lit surroundings can mean the difference for someone who is partially sighted, of being independent or dependent. Glare from lights detracts from well-lit surroundings and the ability for those with loss of vision to navigate independently.

For people who are blind, variations in wall and floor textures can serve the same purpose.

4.10.3 Illumination levels

All illumination levels shall be not less than recommended in Appendix B of NZS 6703.

Illumination provisions shall highlight doors, signs, counters, stairs (top, bottom and treads) and other artificially lit areas.

C4.10.3

The illumination levels and requirements of NZS 6703 have been superseded in part by: AS/NZS 1680.0, which covers the general principles of safe movement in public areas of buildings; and AS/NZS 1690.2.4 and AS/NZS 1680.2.5, which give recommendations for the lighting levels necessary in industrial tasks and processes and hospitals and medical tasks respectively.
NZS 6703 should still be referred to for recommended lighting levels for circulation areas, entrances to buildings, car parks, offices and shops, public and educational buildings, homes and hotels.

Many people with disabilities require better lighting than is normally provided. This applies particularly to the elderly and those with impaired sight.

Lighting designers should avoid glare and sudden sharp changes in lighting levels. Diffused type lighting is preferred.

The use of natural light should be maximized where possible.

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C4.10.4.1

People with a visual impairment need to be able to: locate the door in the wall line and find the fittings on the door. Contrast is needed between the elements as doors are sometimes left partially open. [Dark blue with dark red is not effective for example, despite being a contrast in colour].

Glass doors set in a largely glassed wall and wooden panelled doors set in a similarly panelled wall are difficult to locate. Door handles and associated furniture should contrast with the door.

C4.10.5.1

This may be achieved through:

(a) Making the nosing of clear contrast colour with the rest of the stair;

(b) Using different colours on the risers and the treads.

C4.10.5.2

These cues should be consistently used throughout a building. (For more information on visual cues, refer to 8.5).

4.10.4 Doors

Also refer to 7.3.

4.10.4.1 Door visibility

Contrast in lightness – darkness of colour shall be achieved between:

(a) The door furniture (handles, keyhole plates etc.) and the door itself;

(b) Either the door architrave frame and the wall or the door and the wall;

(c) The door and the floor.

4.10.5 Steps and Stairs

4.10.5.1 Steps

There shall be a clear contrast between the tread and the rise of all steps, which form a flight of stairs (see figure 6).

4.10.5.2 Stair visibility

The top and bottom of stairs shall be indicated by visual contrast supported by tactile and auditory warning cues.

4.10.6 Visual contrast of services

Handrails, lifts, switches and sockets and other services shall contrast visually to their background.

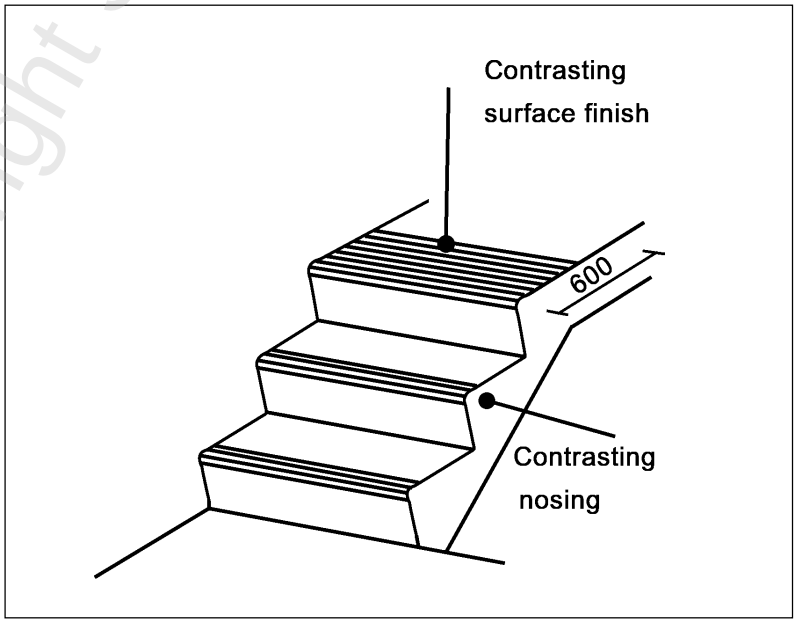


Figure 6 – Stair visibility

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4.11 Controls and fittings

4.11.1 General

Controls and operating mechanisms installed along accessible routes and in usable spaces shall comply with the following clauses.

4.11.2 Door operation

Doors shall be able to be opened with one hand.

C4.11.2

Many door-closers are too strong for people with disabilities to operate, especially those in a wheelchair. It becomes impossible to open or to keep the door open. (Refer to 7.3.5 for forces required.)

All doors opening into a circulation space should have rising butt hinges or equivalent very low weight spring closures, as partially open doors represent a hazard to people who are blind or who have a visual impairment.

4.11.3 Window controls

Locking and opening controls to windows shall be between 900 mm and 1200 mm above the finished floor level.

Handles operating locks and latches shall have a lever action and the end of the handle shall be returned towards the window.

C4.11.3

The recommended height for the window control is 1000 mm.

4.11.4 Electrical switches and socket outlets

Switches for electric light and power shall comply with the following requirements:

(a) All light switches shall be horizontally aligned with door handles at 900 – 1200 mm optimum above finished floor level;

(b) The toggle, rocker, push pad, or push button control of light switches shall project clear of the switch plate;

(c) Socket outlets shall be fixed between 500 mm and 1200 mm above the finished floor level and at least 500 mm from corners and within a 500 mm horizontal dimension from the front of any bench or fixed unit.

C4.11.4

The recommended width of any push pad or button is 20 mm.

4.11.5 Electronic access

Electronic access units for swipe-cards, key pads, door activating buttons etc. shall:

(a) Have a level area with a stable, firm, slip resistant surface, 1200 mm x 1200 mm immediately adjacent to the access unit;

(b) Be installed at 900 – 1200 mm, 1000 mm optimum, above the finished floor level;

(c) Be installed no less than 500 mm from an internal corner;

(d) Be installed adjacent to the door under control;

(e) Have sufficient time-delay for the door to be opened before the locking system re-activates.

4.12 Alerting devices

Fire alarm systems shall have an audible and visual alerting device.

4.13 Audible and visual

The audible and visual aspects of the alerting device shall comply with the requirements of NZS 4512.

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5 CAR PARKS

5.1 General

Section 47A of the Building Act covers the need to provide car parks, parking buildings and parking facilities, see Appendix A. Parking facilities or premises, whether private or public shall provide the required number of accessible car park spaces, refer to 5.4.

5.2 Location

5.2.1 Building owner provision

Parking spaces for people with disabilities shall be on the accessible route to a building and shall be provided close as practicable to the accessible entrance or to an accessible lift to the building or facility (see figure 1).

5.2.2 Council provision

Where car parking is provided by the local authority and not by the building owner then the required spaces shall be in the vicinity of the site or building and shall be connected to the site or building by an accessible route.

5.3 Signs

5.3.1

A sign incorporating the international symbol of access in accordance with 4.8, shall identify car park spaces. The sign shall be readily visible from a vehicle at the entrance to the car park, or guide signs shall be provided to indicate the direction of the space. The space shall have ground marking of the ISA, and may have additional signage.

5.3.2

Where an accessible main entrance to a building is not clearly visible from a street or parking area, directional signs of access shall be provided additional to any other necessary signs (see figure 1).

5.4 Number required

C5.4

Specific building types such as medical centres, entertainment centres and large retail facilities should provide greater numbers of accessible car parks than the minimum required.

Where car parking is provided, spaces for people with a disability shall be provided in accordance with the following table:

Table 1 – Number of car parks

Total number of car parks	Number of accessible car park spaces
1 – 20	Not less than 1
21 – 50	Not less than 2
For every additional 50 car parks or part of a car park	Not less than 1

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5.5 Car park dimensions

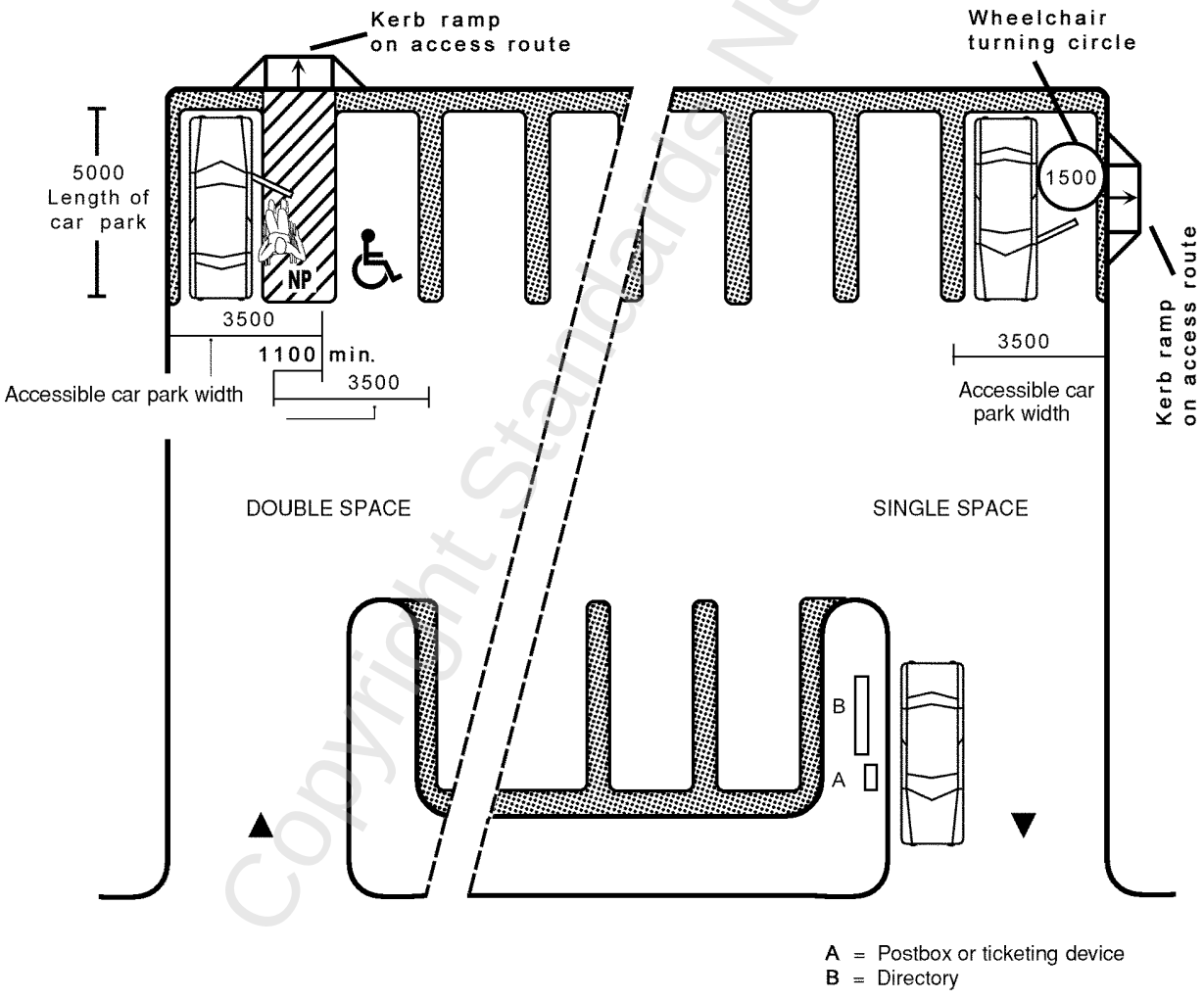
5.5.1 Width

5.5.1.1 90^0 parking
Car park spaces set at 90^o to the footpath shall be not less than 3500 mm wide (see figure 7).

5.5.1.2 Angle parking
Angle parks shall have an operational width of 3500 mm.

5.5.1.3 Parallel parking
Where the car park space is parallel and adjacent to a marked footpath on the same level as the parking space, the width of the common footpath may form part of the parking.

C5.5.1.1
The width of 3500 mm allows for the car and wheelchair to be on the same level when a person is transferring from one to the other.



CAR PARKING AND POSTBOX OR TICKETING DEVICE
by a widened exit of a carpark

Figure 7 – Car parking

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5.5.2 Length

The design parking space length shall be at least 5000 mm (refer to AS 2890.1). For vehicles that operate a rear-mounted hoist a further 1000 – 1300 mm is required, refer AS/NZS 3856.1.

C5.5.3

When a wheelchair hoist is used, although the wheelchair is stored on the roof in a flat position, it is raised to the full height of the wheelchair plus the height of the roof rack during the hoisting process.

5.5.3 Headroom in parking buildings

There shall be a vertical clearance of not less than 2500 mm along accessible routes in car park buildings and above car park spaces for people with disabilities. At the parking space this headroom shall extend from the entrance to the space to a distance of not less than 2160 mm from the front of the space (see figure 8).

5.6 Surface

The accessible car park shall provide a stable, firm, slip resistant flat surface with a slope not exceeding 1:50.

5.7 Access from car park

5.7.1

There shall be an accessible route from car parking areas.

C5.7.4

Driveways may double as ramps and the design should exploit the full potential of driveways and parking areas.

Good transitions are required for the safety of those with visual and mobility impairments. For wheelchair users it is important to ensure that any curvature and cross-fall on foot paths or ramps do not cause one wheel of the wheelchair to leave the ground thus causing loss of control by the user, refer to 6.1(b).

5.7.2

People with disabilities shall not have to pass behind parked cars when moving to an accessible route or when approaching an entrance.

5.7.3

Flat access shall be provided whenever possible between the car park space and the adjoining footpath. A kerb ramp shall be provided (refer to 13.4) if there is any change in level from the parking space to the footpath.

5.7.4

Whenever footpaths join other footpaths, ramps, driveways, or parking areas, the transition shall be effected without abrupt changes in level or transverse gradient (also refer to 6.6).

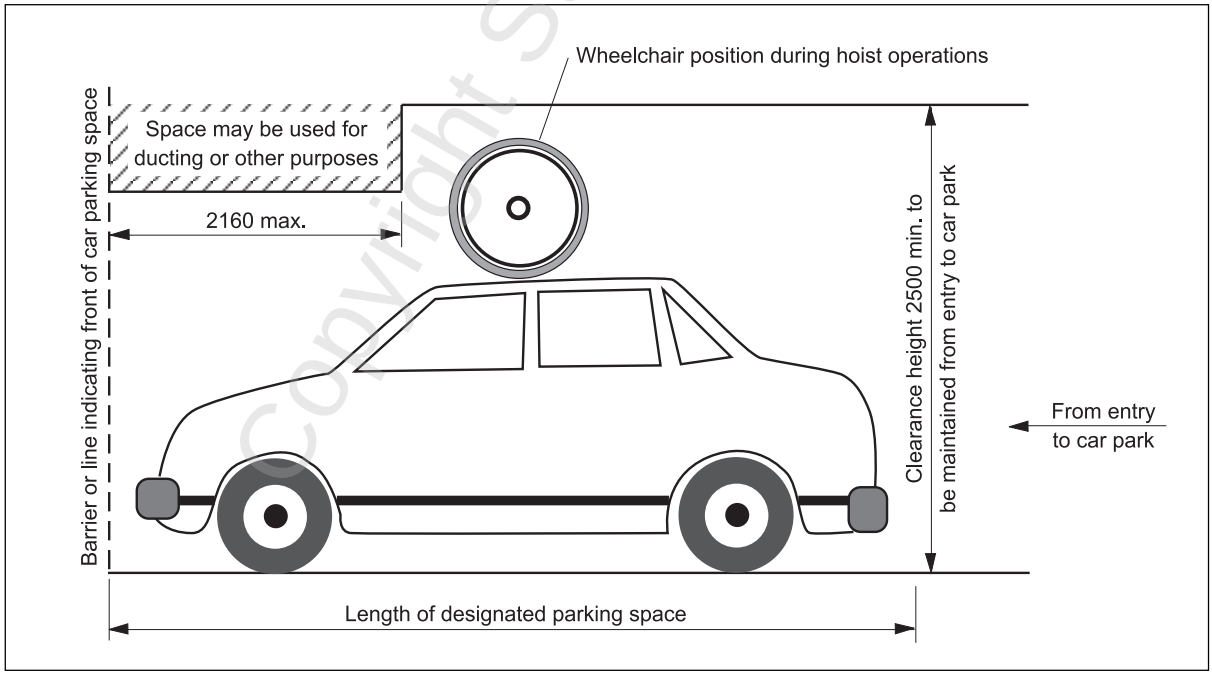


Figure 8 – Vertical clearance

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5.8 Shelter

Car parks, drop-off points and accessible routes shall be covered whenever practicable.

C5.8

People with disabilities can take a considerable time to transfer from a vehicle and to negotiate the accessible route to the building or facility. Covered car parks or drop-off points with space for two vehicles should be provided.

5.9 Facilities accessible from a vehicle

The siting and elevation of post boxes, ticket dispensers and other kerb-side machines or facilities intended to be used by people who drive shall comply with figure 9.

5.10 Directory boards

Directory boards sited less than 1000 mm from the kerb shall be raked at least 6° from the vertical and be no higher than 1750 mm above ground level.

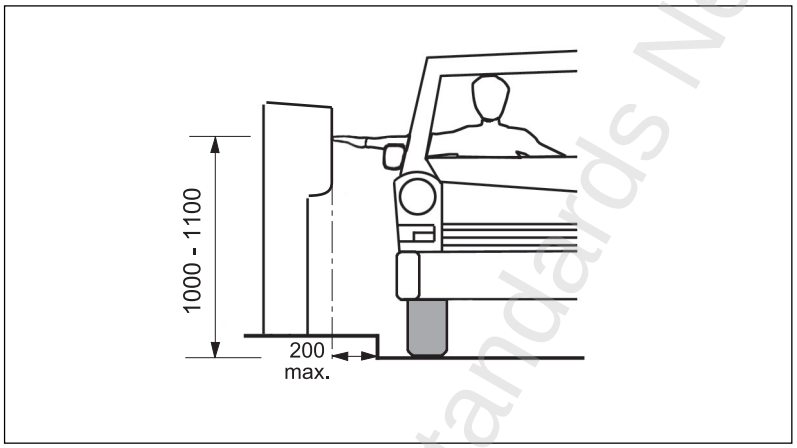


Figure 9 – Facilities accessible from vehicle

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6 FOOTPATHS, RAMPS AND LANDINGS

6.1 General

The design and construction of footpaths and ramps on accessible routes shall comply with the following requirements:

C6.1(b)
The transverse gradient or cross-fall of a footpath pulls the wheelchair to one side. A flatter surface also reduces the inclination of people who are blind or partially sighted to veer. Therefore wherever possible the transverse gradient should be flatter than the minimum requirements of this Standard.

(a) The minimum clear width shall be 1200 mm at kerb level;

(b) The transverse gradient of crowned or banked footpaths or ramps shall not exceed 1 in 50 (see figure 10).

(c) Openings between bollards and similar barriers to non-pedestrian traffic shall be positioned or constructed to allow for the passage of wheelchairs or guide dog users and should visually contrast against the background for pedestrians with visual impairment (also refer to 13.2.5 and figure 43);

(d) Landings shall be provided on footpaths and ramps in accordance with this Standard;

(e) When a footpath, ramp or landing is situated so that a person could fall 1 m or more then a barrier shall be provided that meets the requirements of NZBC Clause F4/AS1. This requires the barrier to be 900 mm above ramps and 1000 mm above footpaths and landings;

(f) The surfaces of footpaths, ramps and landings on accessible routes shall be slip-resistant with a texture that is usable by all people with disabilities (also refer to 4.6). Loose gravel or clay surfaces are not acceptable;

(g) Where pavers are used as surfacing they shall have a flat upper surface, (unless being used as a tactile indicator surface), and shall be laid butted on a firm base

6.2 Footpaths

6.2.1 Ground surface level

The natural ground surface adjacent to a footpath on an accessible route shall be as nearly flush with the finished surface of the footpath as possible, unless an upstand or barrier rail is provided.

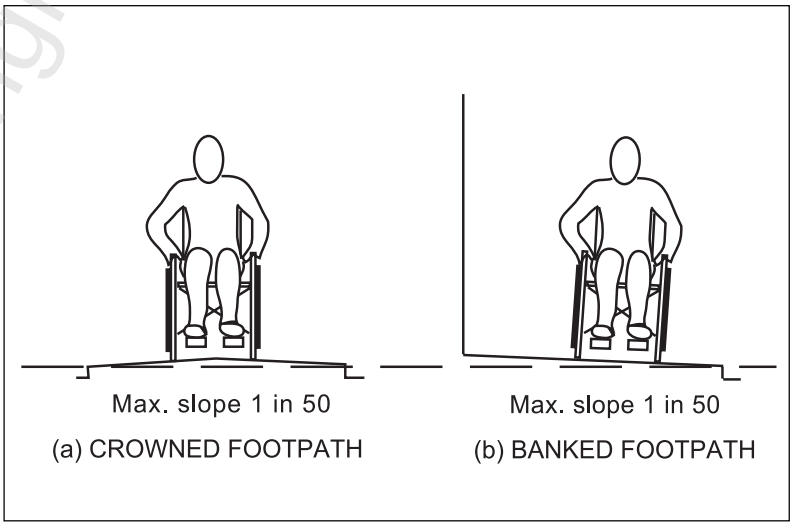


Figure 10 – Maximum allowable camber for footpaths and ramps

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6.2.2 Gradient
Where the longitudinal gradient of a footpath is steeper than 1 in 33 but does not exceed 1 in 20 (also refer to 6.2.3), then level rest areas (also refer to 6.5) shall be provided at intervals not exceeding 18 m. These shall be not less than 1200 mm in length.

6.2.3 Footpaths as ramps
Where the longitudinal gradient is steeper than 1 in 20, the access shall be treated as a ramp, refer to 6.4.

6.3 Moving walkways

6.3.1 General
Accessible moving walkways shall comply with the requirements of NZBC D2/AS3. The principal design factors are shown below.

C6.3.1
NZBC D2/AS3 uses BS EN 115 as its base reference document.

6.3.2 Gradient
The accessible moving walkway shall have a maximum gradient of 1 in 10 (5.7°). Where an accessible moving walkway is provided an alternative means shall also be available (e.g. lifts and steps).

C6.3.2
Because a moving walkway assists wheelchair users by providing the motive power, the maximum gradient must not exceed 1:10. A gradient of 1:14 is recommended.

6.3.3 Speed
The rated speed of the moving walkway shall not exceed 0.75 m/s.

6.3.4 Width
The pallet or tread width shall be not less than 900 mm or greater than 1200 mm.

6.3.5 Handrails
A moving walkway shall be provided with handrails on both sides, which must move at the same speed as the walkway.

6.3.6 Encroachment
The moving walkway shall be extended into lower and upper landings by at least 1200 mm, with the handrails being extended a further 300 mm minimum.

6.3.7 Rest areas and landings
Rest areas or landings are not required on moving walkways.

6.4 Ramps

6.4.1 General
Ramps can be straight, zigzag or L-shaped. Curved or circular ramps should not be considered as part of an accessible route.

C6.4.1
Where there is a chance to provide a ramp less steep than specified in this Standard, this option should be taken. If a curved or circular ramp is provided it needs to adequately address the relationships of gradient, radius and width.

When designing a building the following principles shall be considered:

(a) Ramps should be avoided where it is possible to plan a building with level access;

(b) Portable ramps are not an alternative to permanent ramps;

(c) Where possible blend in with the design of the building or associated landscape.

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C6.4.2.1
Where there is space, associated landscaping can be designed to incorporate a path with a slight slope to avoid constructing a ramp to overcome a difference between the surrounding ground level and the floor level.

C6.4.2.2
Every effort should be made to construct a ramp as flat as possible. A maximum gradient of 1 in 14 should be used wherever it is achievable.

6.4.2 Design

6.4.2.1 Approachability
The approach to a ramp shall be level and allow for adequate visibility and wheelchair turning space.

6.4.2.2 Gradient
The maximum gradient of a ramp other than a kerb or step ramp shall be 1 in 12, figure 11.

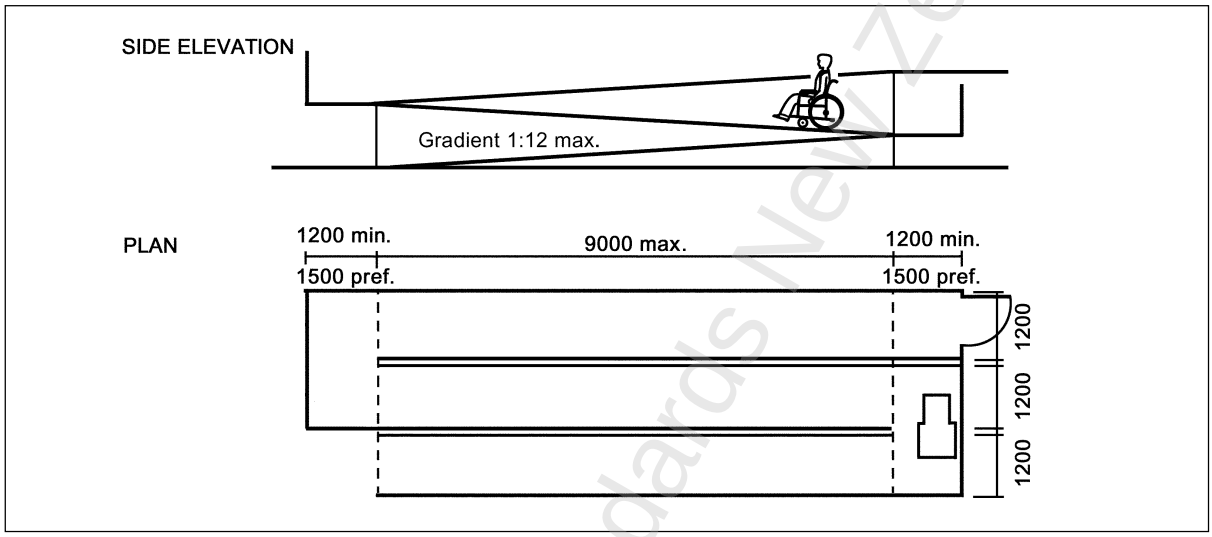


Figure 11 – Zigzag ramps: layout

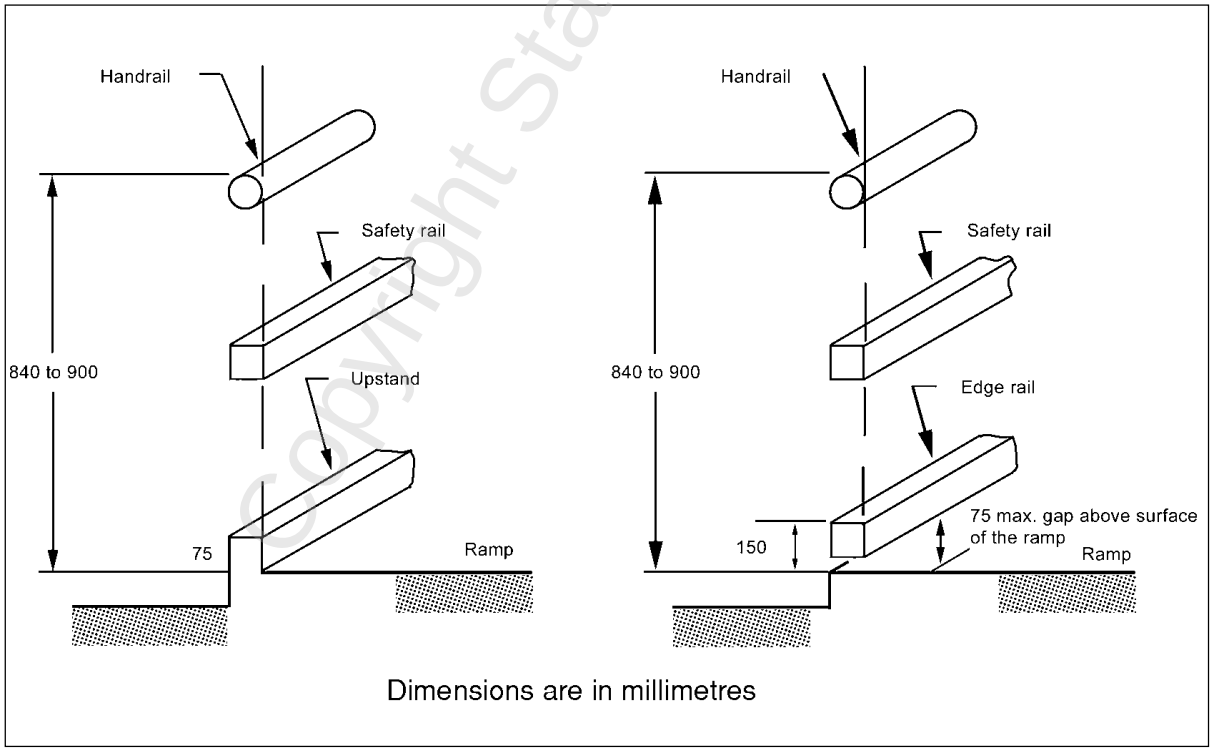


Figure 12 – Safety on ramps

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6.4.2.3 Gradient transition
Transitions from one gradient to another, as at the foot and head of ramps, shall be signalled by visual, textural and ideally, acoustic contrast.

C6.4.2.3
Auditory cues may be achieved through use of changes in material, e.g. suspended timber to concrete.

6.4.2.4 Width
The tread width of a ramp shall be not less than 1200 mm.

6.4.2.5 Ramp edge safety
Ramps with a drop-off on one side shall have an effective method of control to prevent wheelchair wheels running off the ramp. Upstands or edge rails as defined below may be used (see figure 12). In addition there shall be a safety rail to prevent a person with disabilities from falling under the handrail.

6.4.2.5.1 Upstand
A ramp upstand shall be not less than 75 mm in height.

6.4.2.5.2 Edge-rail
The underside of an edge rail shall be placed no more than 75 mm above the ramp.

C6.4.2.5.2
The edge-rail may be of similar material and design to the hand and safety rails, or may be of other materials and designs that will stop a wheelchair when moving against it.

6.4.2.5.3 Safety rail
A safety rail shall be provided mid-height between the upstand or edge rail and the handrail (see figure 12).

6.4.2.6 Handrails
Ramps (excluding kerb and step ramps) shall have handrails at a height of 840 – 900 mm on both sides of the ramp and as shown in figure 13, refer to Appendix F for handrail design and 8.6.2.2 for visual contrast requirements.

C6.4.2.6
Where people could fall 1000 mm or more from a ramp, a barrier at a height of 900 mm is required, refer NZBC clause F4/AS1.

6.5 Landings for ramps

6.5.1 General
Ramps require level platforms or landings at the top and bottom, wherever there is a change in direction, wherever doors open off them and at intervals not exceeding 9000 mm (see figure 11), for ramp layout suggestions.

C6.5.2
The example given in figure 11, of a zigzag ramp shows the option of a 1500 mm landing. This option allows the wheelchair user to rotate the wheelchair through 360^{o}, enabling the landing to be used not only as a rest area, but also to return down the ramp.

Where possible a larger rest area, of 1500 mm in length, should be provided.

6.5.2 Size
Landings shall have a minimum dimension of 1200 mm.

6.5.3 Landing safety
Landings shall have handrails at a height of 840 – 900 mm on all open sides as shown in figure 12, (refer to Appendix F for handrail design).

C6.5.3
Where people could fall 1000 mm or more from a landing, a barrier at a height of 900 mm is required, refer NZBC clause F4/AS1.

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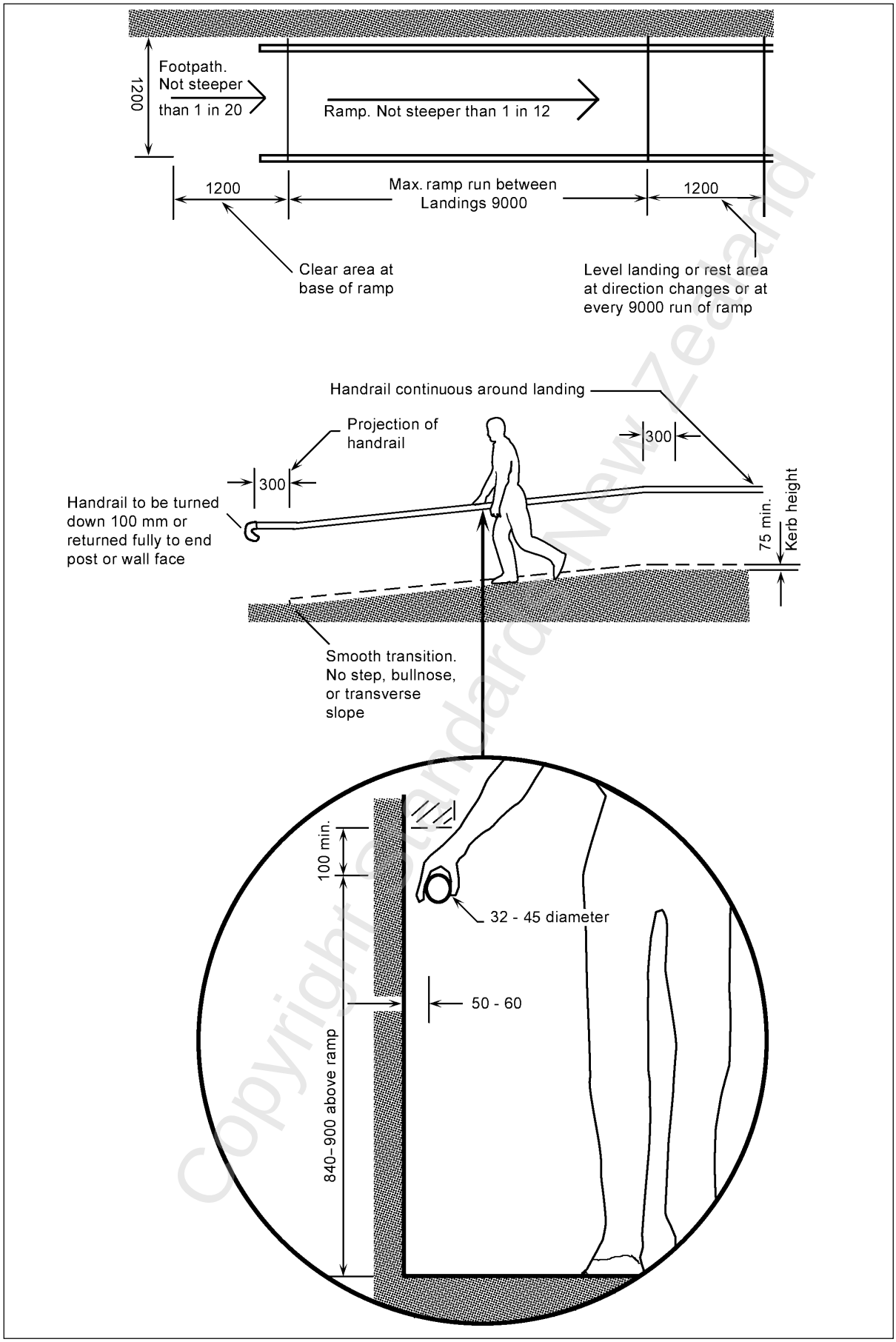


Figure 13 – Footpath and ramp handrails

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6.5.4 Doorways

Landings or level rest areas that are provided in accordance with 6.5.1 shall also make allowance for the opening of doors as follows:

(a) Where the door opens towards the ramp, a level rest area shall be provided in accordance with figure 14;

(b) Where the door opens away from the ramp, a level rest area shall be provided in accordance with figure 15.

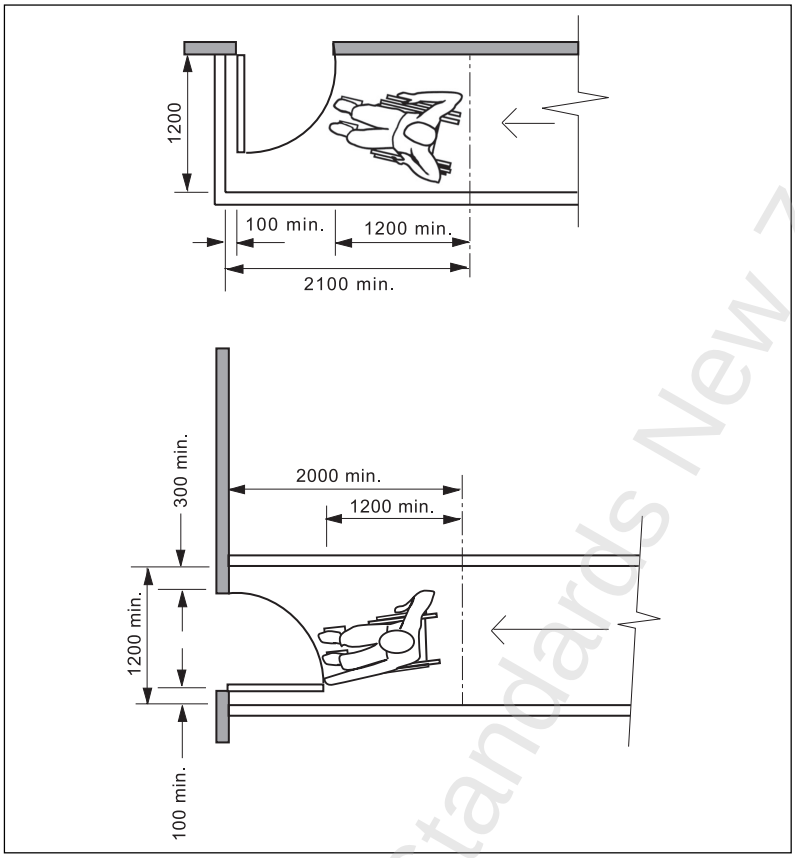


Figure 14 – Landings to outward opening doors

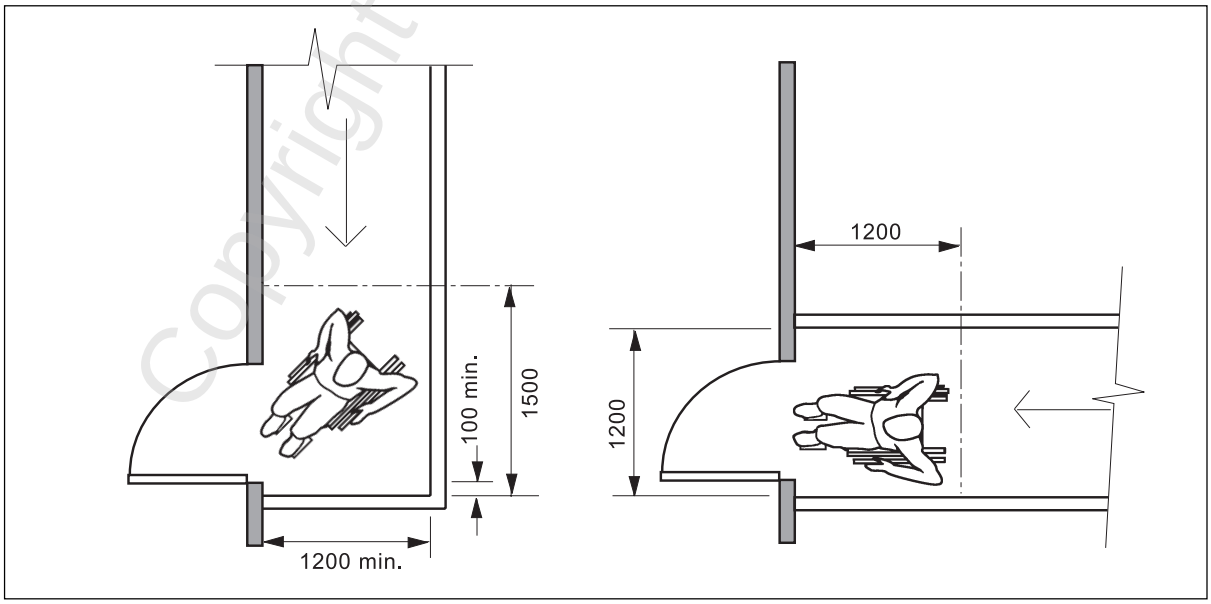


Figure 15 – Landings to inward opening doors

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6.6 Fairing of surfaces

6.6.1 Changes in gradient

Wherever ramps join other footpaths, ramps, landings, driveways, or parking areas, the transition shall be effected without abrupt changes in level or transverse gradient.

6.6.2 Changes in level

Step ramps formed between two horizontal surfaces shall conform to the requirements for kerb ramps (refer to 13.4) having a maximum slope of 1 in 8 and a maximum length of 1520 mm (see figure 16). (Also note requirements for ramps as in 6.5.1 and 13.3.1).

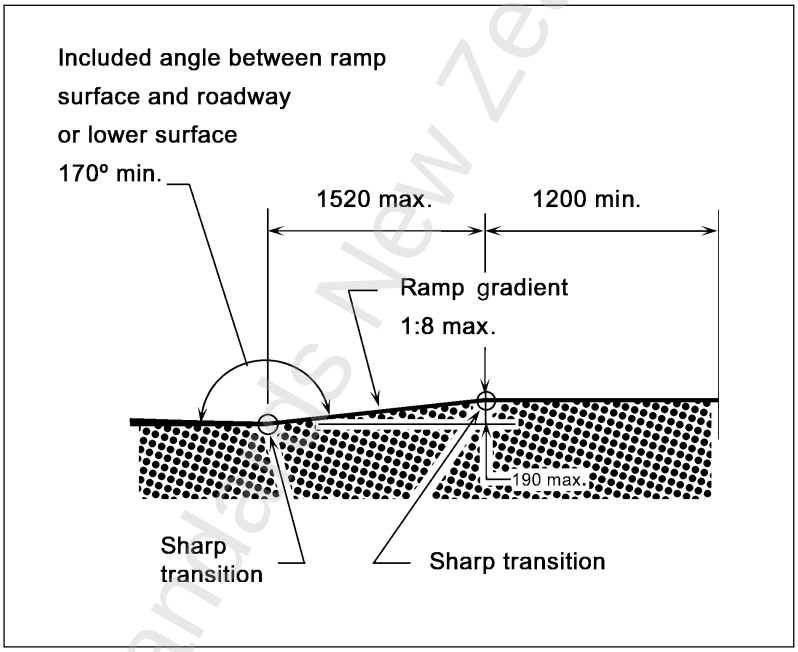


Figure 16 – Section through a step ramp

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7 ENTRANCES, CORRIDORS, DOORWAYS AND DOORS

7.1 Entrances

7.1.1 General

Direct access shall be provided to the main entrance of a building, or to the internal space served by the main entrance via the accessible route.

7.1.2 Signs

All accessible entrances to a building shall be identified with appropriate signs posted, only if they are other than the main or principal entrance.

7.1.3 Design

An accessible entrance to a building or premises shall have a level threshold or an approach via an incline or ramp with an appropriate gradient.

The design of a main entrance to a building shall provide for:

(a) A level approach space no less than 1200 mm x 1200 mm both inside and outside the entrance door (see figures 14 and 15);

(b) An entrance way that is illuminated so as to be clearly distinguishable from the surroundings;

(c) Any automatic door-opening device to remain open for at least five seconds, or as long as it takes to clear the door whichever is the longer. It shall have a strongly contrasting visual strip device on the moving edge(s);

(d) Any automatic door opening device to be activated by people approaching from shallow angles;

Some people who are blind or partially sighted may use the building face as a trail to the door.

(e) Elimination of thresholds whenever possible.

7.1.4 Thresholds

Accessible entrances to a building or premises or to rooms within the premises shall have a level threshold. If a stepped threshold is necessary it shall be designed as follows.

7.1.4.1 Stepped thresholds

When a stepped threshold is required and the change in level is 20 mm or less, no ramp is required. A strong visually contrasted strip shall be incorporated that is effective when approaching from either direction.

7.1.4.2 Ramped thresholds

If the change in level is greater than 20 mm a ramp is required which shall have a gradient not steeper than 1 in 8 and a going of not more than 450 mm (see figure 17).

7.1.5 Revolving doors

7.1.5.1 Side door

Where a revolving door or turnstile is installed a hinged or sliding door shall be provided as an alternative alongside (see figure 18). The alternative side door shall have an access sign to identify it as the accessible entrance and shall be unlocked during normal building occupation. (Also refer to 4.10.4.1.)

C7.1.1

Entrances also serve as exits, some of them being particularly important in an emergency. It is preferable that all entrances should be usable by people with disabilities.

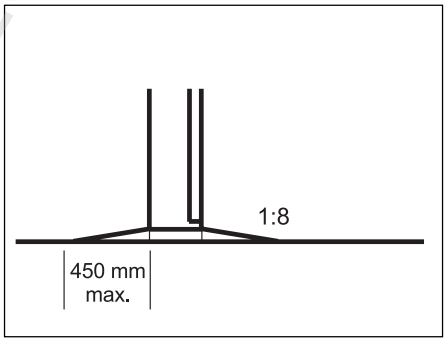


Figure 17 – Threshold ramp

C7.1.4.2

Thresholds and surface height changes in doorways are particularly inconvenient for wheelchair users, who may have low stamina or restrictions in arm movement. Complex manoeuvring is required to get over the level change while operating the door and negotiating the space on the other side.

C7.1.5.1

Most revolving doors are difficult for wheelchairs, scooters, prams, trolleys, and people with walking aids. A normal side-hung door installed as per 7.1.5.2 will allow access.

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C7.2.1
The corridor width of 1200 mm allows space for its use by people with disabilities and the aids they require, e.g. for a wheelchair and an ambulant person to pass, for a blind or aged person with a carer to walk side by side, or for a blind person and guide dog to use. This minimum width is also essential to allow a wheelchair to make a 90° turn into a doorway in one movement.

C7.3.1
If the door is a standard side-hung door that opens 90°, the clear width may be achieved by the use of an 810 mm single leaf door. If the door is pivot hung or otherwise fitted with hardware that will restrict the clear opening width, the door leaf size required increases to 860 mm. This is particularly relevant to sliding doors (see figure 20).

Wider clear openings of doorways, e.g. 810 mm, are recommended at entrances and throughout buildings. This is to allow for larger wheelchairs used by an increasing number of people with disabilities. There is also an increasing use of motorized scooters.

New Zealand manufactured stock doors of 860 mm give a clear opening of 810 mm.

In practice the majority of the exterior doors of public buildings have a clear opening of at least 860 mm.

7.1.5.2 Side panel to side door
If the side door is to be installed adjacent to a return-wall and if the door handle is to be on the side of the door adjacent to the return wall then a side panel, situated between the side door and the wall shall be provided (see figure 18). The minimum width of side panel shall be 300 mm.

7.2 Corridors

7.2.1 Minimum width of corridor
All corridors on accessible routes within a building shall have a minimum width of 1200 mm.

7.2.2 Length of corridor
There shall be a minimum corridor length of 1200 mm plus the width of the door (if it opens inwards), between one doorway and the next that cross a corridor and/or form a lobby (see figure 19).

7.3 Doorways

7.3.1 Clear opening
The minimum clear width of a doorway shall be 760 mm when the door is open (see figure 20).

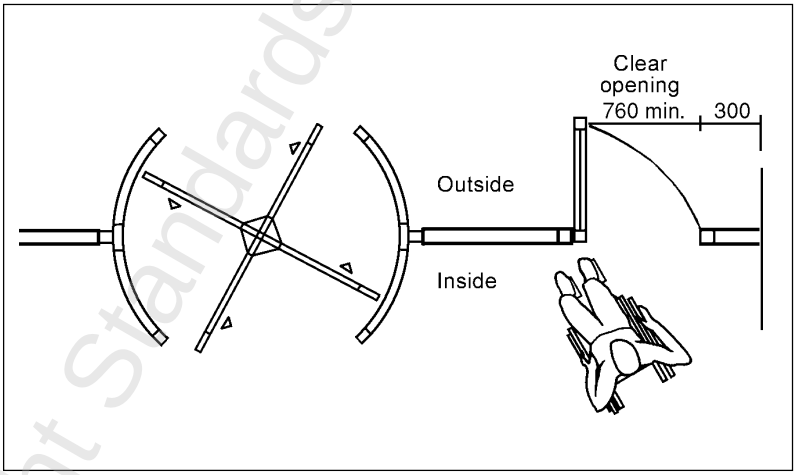


Figure 18 – Revolving door with side hung door

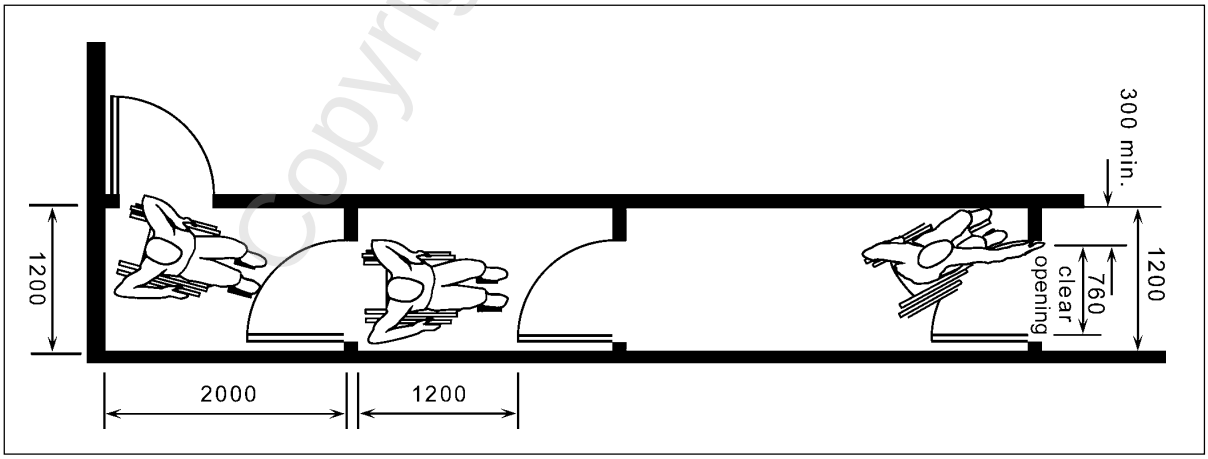


Figure 19 – Space requirements in confined spaces

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7.3.1.1 Double doors

Double doors on an accessible route shall have at least one leaf that provides a minimum clear opening of 760 mm, refer to 7.3.1.

C7.3.1.1

If necessary the leaf sizes will be unequal to permit the larger and 'opening' leaf to comply.

7.3.2 Door glazing

The glazing of doors shall comply with NZS 4223:Part 3 for human impact safety, in particular:

(a) Doors that swing in both directions shall incorporate glazing to provide adequate visibility for people with disabilities.

(b) Whenever transparent glazing material may be mistaken for a doorway or for an unimpeded path of travel, they shall be clearly marked as required by NZS 4223.3, clause 303.1.

C7.3.2(b)

Ideally, glazing should carry discernible patterning over most of the surface to allow for detection by people with severe loss of sight in discrete areas of the field of vision.

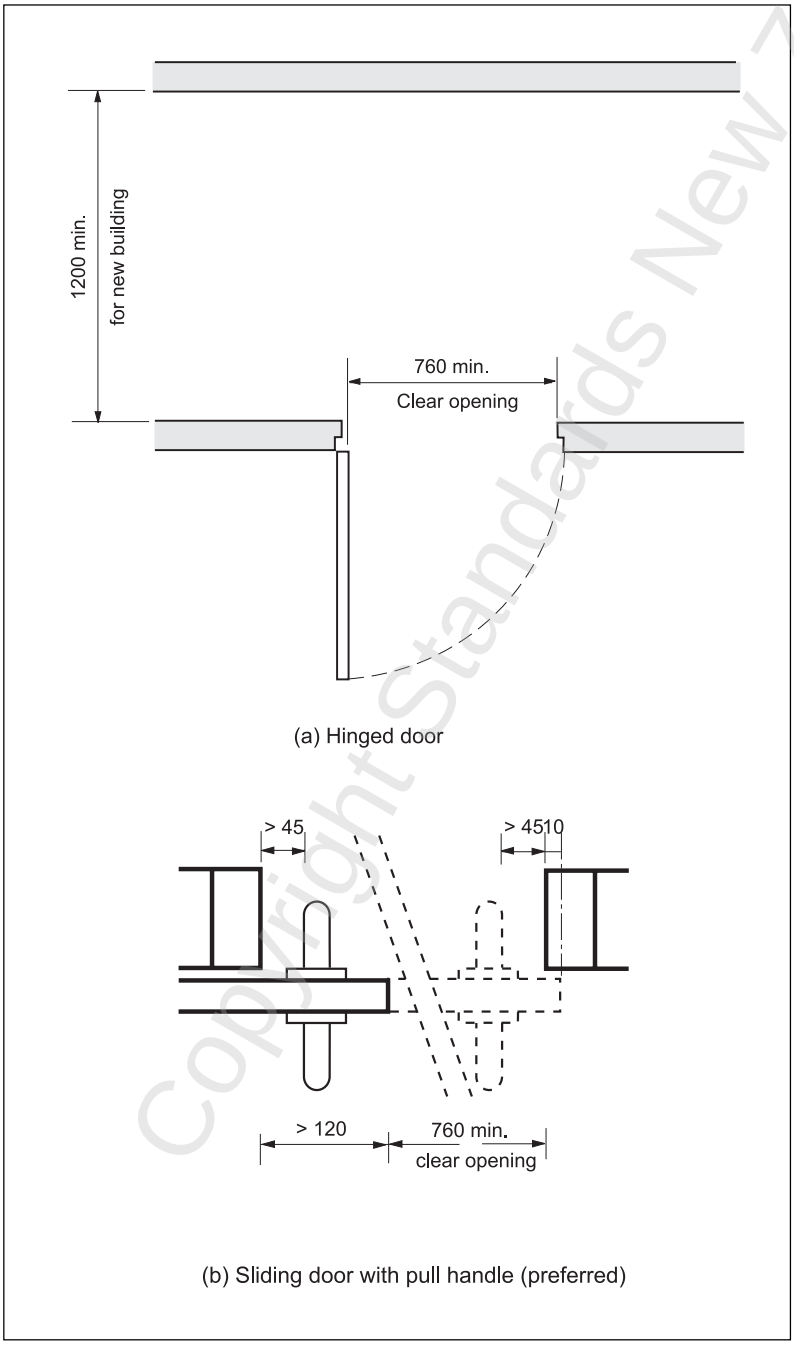


Figure 20 – Clear width of doorway

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(c) Figure 21 – Minimum glazing in doors on accessible routes shall apply but within certain building types e.g. hospitals, childcare centres, the lower dimension of glazing may need to be varied.

7.3.3 Offset of doors

Where a door opens back into an enclosed space, an unobstructed wall space of not less than 300 mm shall be provided at the side of the door adjacent to the handle (see figure 19).

7.3.4 Doorways to rooms

7.3.4.1 Doorway in corridor wall

When circulation spaces are equal to or greater than 1200 mm, the minimum clear width of a doorway to allow general access shall be 760 mm, refer to 7.3.1 and figure 20.

7.3.4.2 Recessed doorways

Any recessed doorway over 600 mm in depth shall be treated as a doorway across a corridor.

C7.3.4.3

An important visibility factor for doors is the opening contrast. (Lighting can be used to define this.)

7.3.4.3 Visibility

Doors shall be of a clear colour contrast with respect to their surroundings, refer to 4.10.4.

7.3.5 Forces required

The force required to push or pull open a non-fire door shall not exceed the following:

(a) Exterior hinged door: 38 N;

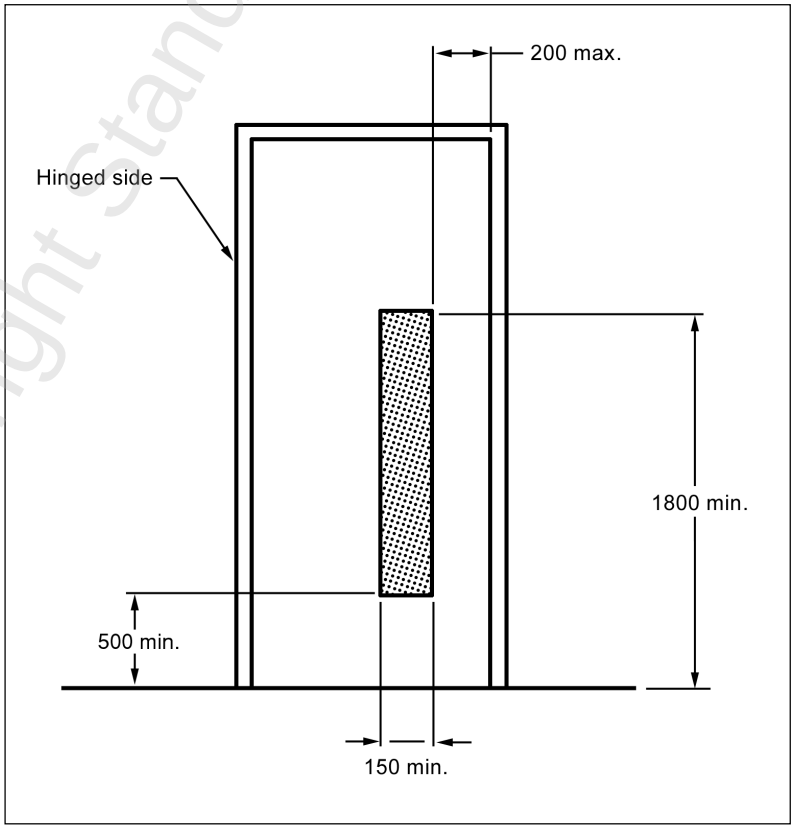


Figure 21 – Minimum glazing in doors

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(b) Interior hinged door: 22 N;

(c) Sliding or folding doors: 22 N.

7.3.6 Fire and smoke control doors

The force necessary to keep them shut and so be effective in a fire may not be easily overcome by people with disabilities. Studies suggest that a force of 70 N could be handled by up to 80 % of people with disabilities, and a force of 21 N could be handled by 95 % of the people with disabilities. In a pressurised situation the use of barometric relief dampers or other pressure regulating methods may be required. Wherever possible consideration should be given to the installation of complying hold open devices.

C7.3.5

These forces taken from ANSI A117.1.

Calculation of the correct size of door closer is based on the width of the door. The wider the door the stronger the door closer force required. The formula for calculating the force necessary to close a door against a known air pressure is:

Force = (P x A x W) / 2, where P = air pressure (pascals), A = surface area of door, w = width of door.

Table 1 of BS EN 1154:1996 identifies seven power sizes of door closer with various forces. Table 1 applies only to interior doors under ideal conditions so the door closer should be adjusted to a higher power setting where it is used as an exterior door and in windy or draughty interior conditions. For exterior doors, adjustable power sizes 2 – 6 and for interior doors, adjustable power sizes 1 – 5 are recommended.

Attention to the manufacturer's instructions is vital where installing door closers. Ongoing maintenance is necessary to adjust and maintain the required forces for both closing and latching a door.

There is a 'push-pull' device available to installers and building owners for measuring door closer forces.

7.3.7 Door handles and hardware

Door handles and related hardware and accessories shall comply with the following requirements:

(a) Handles shall be between 900 mm and 1200 mm (optimum 1000 mm) above the finished floor level;

(b) Handles operating locks and latches shall have a lever action and the end of the handle shall be returned towards the door;

(c) The door opening pressure shall be the minimum required to suit specific use and conditions (refer to 7.3.5).

C7.3.7

For devices such as a delayed action door-closer, rising-butt hinges are recommended.

Doorknobs with a twist or turn action or recessed handles do not provide an adequate grip for people with limited or reduced hand function.

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8 STAIRS

8.1 General

C8.1.1

Spiral or open riser stairs can be hazardous for elderly people and others prone to dizziness and vertigo. In addition people who wear leg braces or prosthetic devices need a solid riser to guide the foot up over the riser to the next step and to maintain balance. Those who use crutches place them against the riser of the step above the one they are on.

Appendix G shows an example of a service core plan with scissors stairs, a common design of stair in public buildings.

8.1.1

In all buildings where there is more than one floor a minimum of one accessible stair opening off an accessible route shall be provided whether or not lifts are installed.

Spiral and open riser stairs shall not be used for this purpose.

8.1.2 Design

Appropriate and safe stair design, whether aimed at achieving the best design for the public at large or for those members of the public who have disabilities, shall have features as shown below (also see figure 22):

(a) Steps that can be readily seen by all users with some useful vision;

(b) Treads large enough to provide adequate footing;

(c) Reachable, graspable handrails;

(d) Landings of reasonable size;

(e) Stair flights of limited length;

(f) Visual and tactile cues at top and bottom of each set of stairs and on nosings of treads;

(g) Lighting that reduces glare from point sources such as unshaded windows and exposed lamps shall be avoided and reflective polished surfaces minimized.

8.2 Single steps

There shall be no single steps.

8.3 Stair design

The basics of good stair design are shown in figures 22 and 23.

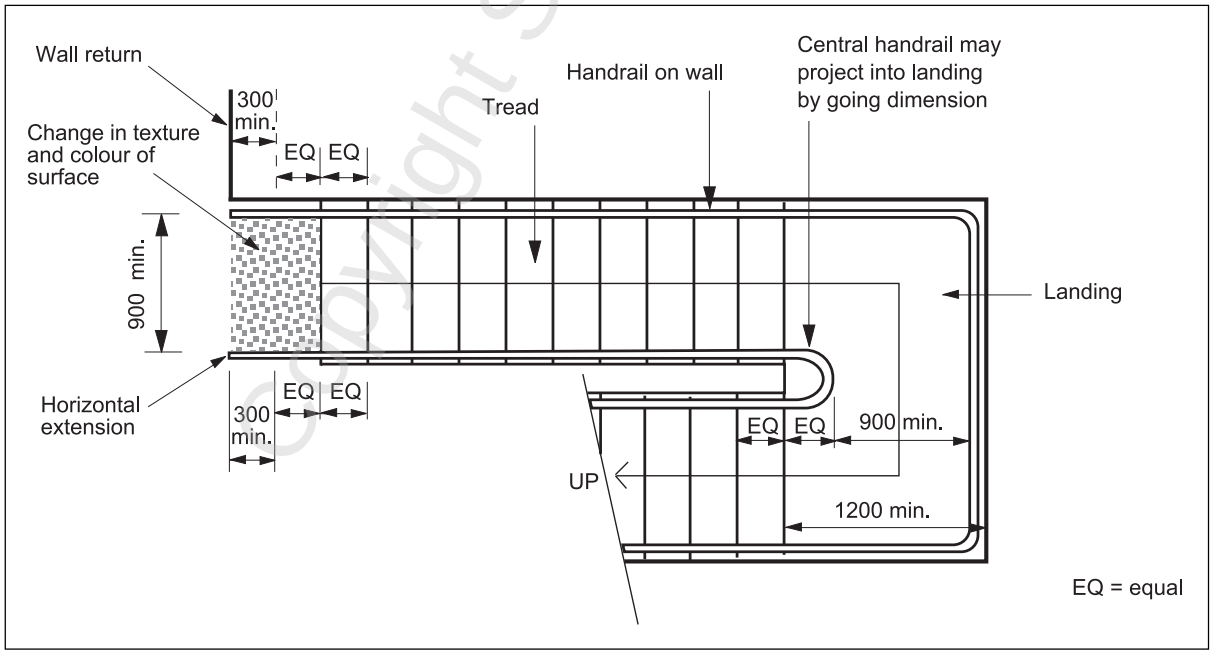


Figure 22 – Good stair design

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8.3.1 Pitch

The angle of pitch of stairs is measured between the horizontal and the pitch line, a line connecting the nosings of all treads in a flight (see figure 23).

C8.3.1

The pitch is a product of the step profile (see figure 25).

8.3.2 Height

The total rise of any flight of stairs shall not exceed 2500 mm.

C8.3.2

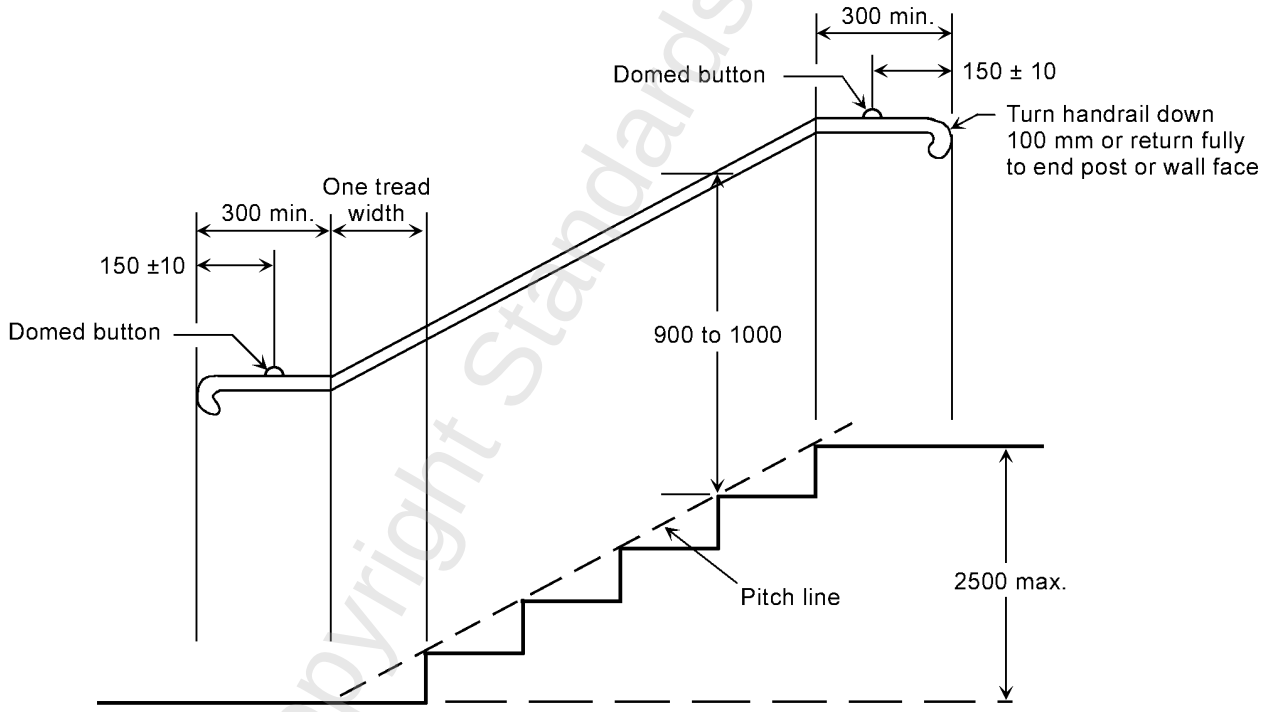
The purpose of this limitation is to ensure that there is an intermediate landing for safety and comfort.

8.3.3 Top and bottom steps

The line of the nosing of the top step of a flight of stairs shall not be closer than 300 mm to the point where an adjacent wall returns, and the bottom riser of a stair shall not be closer to an adjacent wall return than 300 mm plus the dimension of a tread (see figure 22).

8.3.4 Encroachment into corridors

The top or bottom step of any flight of stairs shall not encroach into corridors so that the effective minimum width of the corridor on accessible route or means of escape in fire is compromised. Where stairs do encroach, they shall be protected by a barrier, or a return wall indicated by a change in surface texture of the floor.



NOTE –

(1) The dimensions indicating the heights of handrails are taken from the nosing of the tread to the top of the handrail.

(2) The 300 mm extension is not required where the handrail is continuous, e.g. on the inside of an intermediate landing.

Figure 23 – Pitchline and extension of handrails

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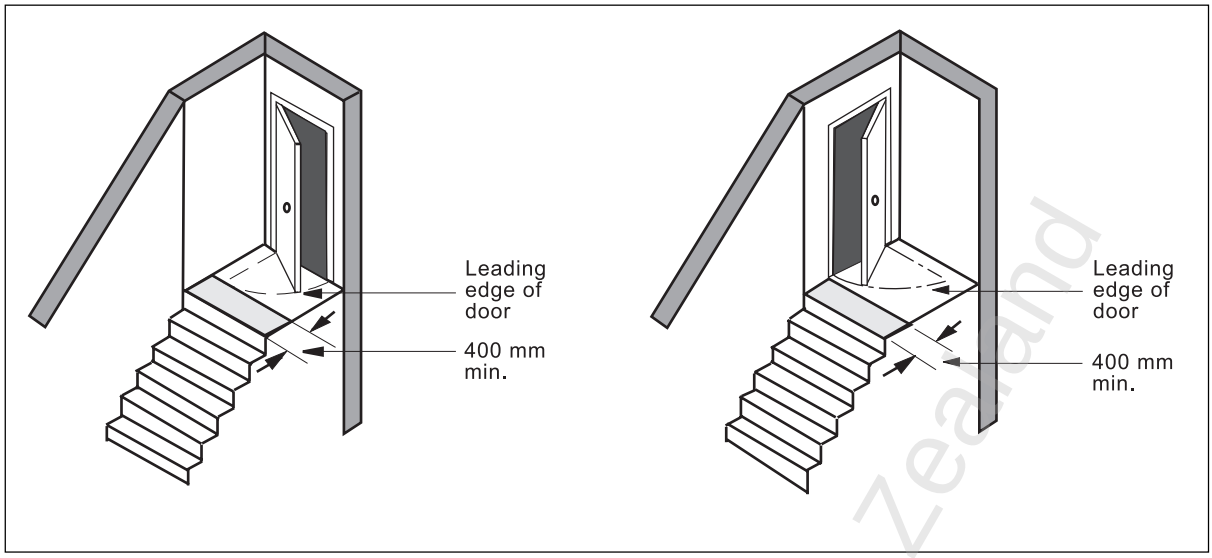


Figure 24 – Opening of doors

8.3.5 Opening of doors

No door shall open directly across the top of a flight of stairs or swing so that it obstructs the top or bottom step unless there is a clear width of 400 mm between the fully open door and the top or bottom of the stair (see figure 24).

8.3.6 Landings for stairs

C8.3.6.1

Section 21A of the Fire Service Act 1975 requires evacuation plans to include people with disabilities.

8.3.6.1

Landing lengths of at least 1200 mm (including mid-flight landings, whether on a straight or zigzag set of stairs) are required to ensure that wheelchair users may be safely carried down (up) stairs in their own wheelchairs in an emergency, (generally the preferred evacuation method). This length ensures both a safe resting-place for the wheelchair user and enables other people to pass safely.

8.4 Stair construction

8.4.1 Width of stairs

The minimum width between handrails on stairs shall be 900 mm (see figure 22).

8.4.2 Risers and treads

The steps of a flight of stairs shall be in accordance with the following requirements:

(a) Risers and treads shall be uniform for all steps in any one flight;

A 5 mm variation in riser height can cause stairs to become less safe, even if it is the very top or bottom riser that is a different dimension.

(b) Staircases shall have maximum rises of 180 mm and minimum tread of 310 mm in accordance with figure 25.

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8.4.3 Nosings

Nosings shall be rounded and not project more than 25 mm (see figure 25).

C8.4.3

Nosings with sharp or abrupt angles or projecting risers prevent the sliding foot action described in C8.1.1 and can cause tripping.

8.5 Provision of auditory and visual cues

8.5.1 Surface treatment

A change in surface treatment with strong colour contrast shall be provided at the head and foot of any internal flight of steps (see figure 22).

C8.5.1

This assists people with a vision impairment to negotiate the stairs safely and smoothly. For general safety unexpected protrusions and significant changes in slip resistance should be avoided. For carpeted areas, a flush warning surface with similar slip resistance but a corduroy patterning running across the line of travel could be considered.

8.5.2 Stairwells

Strategic changes in the auditory environment shall also be used to help people identify the presence of the stairwell – especially the more potentially dangerous head of the flight.

C8.5.2

The placement of specific sound sources such as fans at this point can act as useful cues. The use of harder, more reflective surfaces in the stairwell walls and ceiling in comparison to the connecting corridors may also assist through emphasising the presence of sound sources within the well or other people using the stairs. (For further information refer to 4.10.5.2.)

8.6 Handrails

8.6.1 General

Handrails shall be provided on both sides of accessible stairs and steps.

8.6.2 Design

8.6.2.1 Size and shape

The design of the handrail shall meet the requirements of Appendix F. Handrails shall be continuous (also refer to 8.6.3) with no obstructions to the movement of the hand along its length. Dome buttons shall be provided as shown on figure 23.

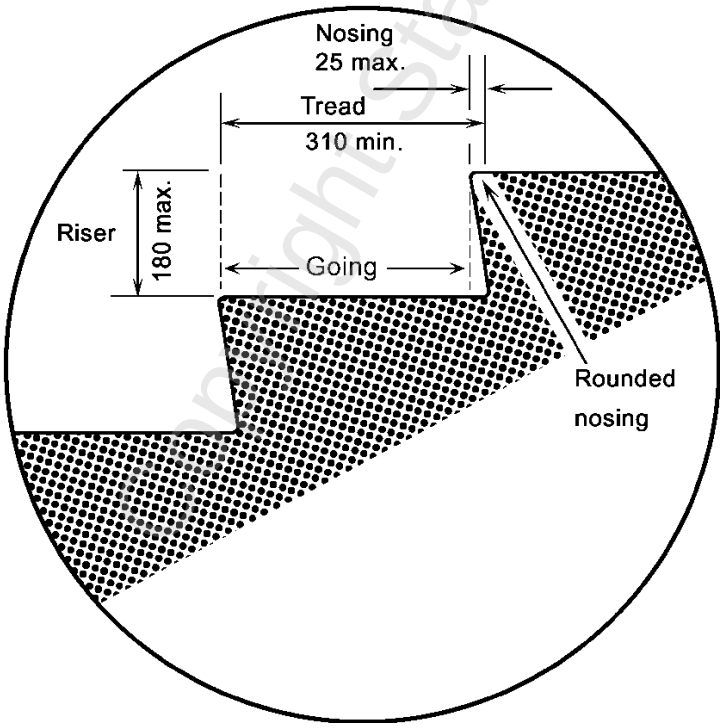


Figure 25 – Basic profile of stairs

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8.6.2.2 Contrast
Handrails shall contrast visually to their background, refer to 4.10.

8.6.2.3 Projecting ends
Handrails shall not have projecting ends that will create a hazard. The ends of handrails shall be turned down 100 mm or returned fully to the end-post or wall face.

8.6.3 Position
Stairs and ramps shall have handrails on both sides, which shall be continuous around landings (see figure 22), except at doorways.

8.6.4 Installation

8.6.4.1 Position
The handrail shall be installed parallel to the entire pitchline of the stairs (see figure 23).

8.6.4.2 Clear space
The clear space between a handrail and the adjacent wall surface shall be 50 – 60 mm at the sides and 100 mm above.

8.6.4.3 Height
The height of a handrail above the nosing of the tread shall be between 900 mm and 1000 mm (see figure 23).

8.6.5 Extensions

8.6.5.1 Position and size
Horizontal extensions to the handrail commence after the completion of the pitchline as measured vertically at the top and bottom of the flight of stairs (see figure 23). The length of an extension shall be 300 mm minimum at the top step and 300 mm plus the going at the bottom step.

8.6.5.2 Encroachment
Handrails shall not project into any other path of travel, except when a centre handrail projects into a landing by the distance of the stair going.

8.6.6 Fixing
Handrails shall be securely fixed and rigid. A handrail shall be able to support a weight of 110 kg. (Refer to Appendix F.)

Handrails shall be fixed so that there is no obstruction to the passage of the hand along the grip.

C8.6.3
Handrails on both sides of stairs and ramps are necessary for people with disabilities who may have a right-handed or left-handed capability.

A handrail on each side also enables some people with locomotive problems to swing down narrow stairs. This is a very quick and efficient process for those who can perform it, especially when quick egress is needed in an emergency.

C8.6.4.3
The dimensions indicating the heights of handrails are taken from the nosing of the tread to the top of the handrail.

C8.6.5.1
The 300 mm minimum horizontal extension is the critical dimension, with the one going extension at the bottom being required to ensure that the horizontal extension is at the same height as the handrail on the stair.

The horizontal extensions are required as a safety issue:

(a) To protect people from moving traffic, thus avoiding the hazard of being pushed over at the top of a flight of stairs. The handrail extensions at the bottom of a flight of stairs as shown in figures 22 and 23, serve the same safety purpose;

(b) The handrail extensions also serve the purpose of clearly indicating both the start and the finish of the stair.

The 300 mm extension is not required where the handrail is continuous, e.g. on the inside of an intermediate landing.

C8.6.5.2
The projection shown in figure 22, avoids the sudden increase or decrease in the height of the handrail as it makes the 180^0 turn up or down the stair.

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9 LIFTS

9.1 General

9.1.1 Lifts

All accessible lifts shall comply with 9.2 of this Standard, with NZBC D2.3.5 and NZS 4332.

Platform lifts and stair lifts shall not be used as an alternative to this requirement.

C9.1.1

The requirements relating to lifts in buildings to which the access requirements apply, have the effect of requiring lifts to be designed so that they are usable by all users, whether they have disabilities or not.

9.1.2 Signs

Accessible lifts shall be clearly sign-posted.

9.1.3 Provision of lifts

9.1.3.1 General

An accessible route shall include a lift to upper floors where:

(a) Buildings are four or more storeys high;

(b) The upper floor(s) of any building are to be used as the public reception areas of:

(i) Banks

(ii) Central government offices or government agencies

(iii) Regional government offices

(iv) Local government offices and facilities.

(c) The upper floor(s) are designed or intended to be used as:

(i) Public areas of hospitals, medical consulting rooms, dental surgeries, and other primary health care centres

(ii) Places of public assembly for 250 or more people

(iii) Public libraries.

9.1.3.2 Two and three storey buildings

Where 9.1.3.1 is not applicable a lift is not required when:

(a) Buildings are two storeys high and have a gross floor area of the upper floor of less than 400 m^2;

(b) Buildings are three storeys high and have a gross floor area of the upper floors of less than 500 m^2;

provided that the ground floor complies with the requirements of this Standard and the upper floors have access for ambulant people with disabilities.

9.1.4 Lift cars and lift installation

The NZBC requirements for mechanical installations on accessible routes are defined in NZBC Clause D2, D2.3.5 (refer to Appendix B).

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9.2 Design

Figure 26 shows the main requirements for lifts, but these should not prevent other designs, systems and technological developments from being permitted. The Standard does not specify all the requirements for an accessible lift, i.e. its speed or its construction.

9.2.1 Lift foyer

The unobstructed depth of floor in front of lift doors shall be not less than 1800 mm.

9.2.2 Lift cars

C9.2.2.1

The minimum dimensions of the lift car as shown in this Standard allow an attendant and other passengers to use the lift at the same time as a wheelchair user. This size does not allow many wheelchairs to turn through 180°.

9.2.2.1 Size

Lifts serving an accessible route shall have a minimum interior clear space of 1400 mm by 1400 mm as shown in figure 26.

9.2.2.2 Levelling accuracy

The levelling accuracy of the lift car at each landing shall be within a tolerance of + or – 20 mm under all loading conditions.

C9.2.3

The door width of 900 mm shown in figure 26, is required so that a wheelchair user can easily enter the lift during the pause period of 5 seconds. The width and depth of the lift car are also designed to promote ease of entry.

9.2.3 Lift doors

The lift door installation shall provide for the following:

(a) Lift doors shall open sideways and be power operated;

(b) Lift doors shall provide a minimum clear opening of 900 mm;

(c) The doors shall remain open for not less than 5 seconds before the passenger protective device becomes operative;

(d) Passenger protective devices shall be provided to ensure that car and landing doors will not close while the opening is obstructed, subject to the delayed closing provisions which operate if the door is held open for more than 10 seconds; and

(e) Lift doors shall be of a clear colour contrast with respect to their surroundings.

C9.2.4

Tactile and visual controls assist blind people and others with impaired vision. Such control buttons can be designated by raised or indented standard alphabet characters or letters.

9.2.4 Lift controls

Lift controls, whether in the lift lobby or in the lift car, shall be situated between 900 – 1350 mm above floor level (see figure 26). Controls shall comply with the following requirements:

(a) Call buttons shall have a tactile distinction from the faceplate. Buttons shall have a positive movement for actuation and shall have a width or diameter of not less than 20 mm.

(b) Raised or indented designations for control buttons shall be placed immediately to the left of the button to which they apply and shall have a minimum height of 15 mm, see figure 26;

(c) The alarm button or emergency telephone shall not be higher than 1350 mm above finished floor level;

(d) Designations in Braille shall be placed immediately to the left of the standard designation.

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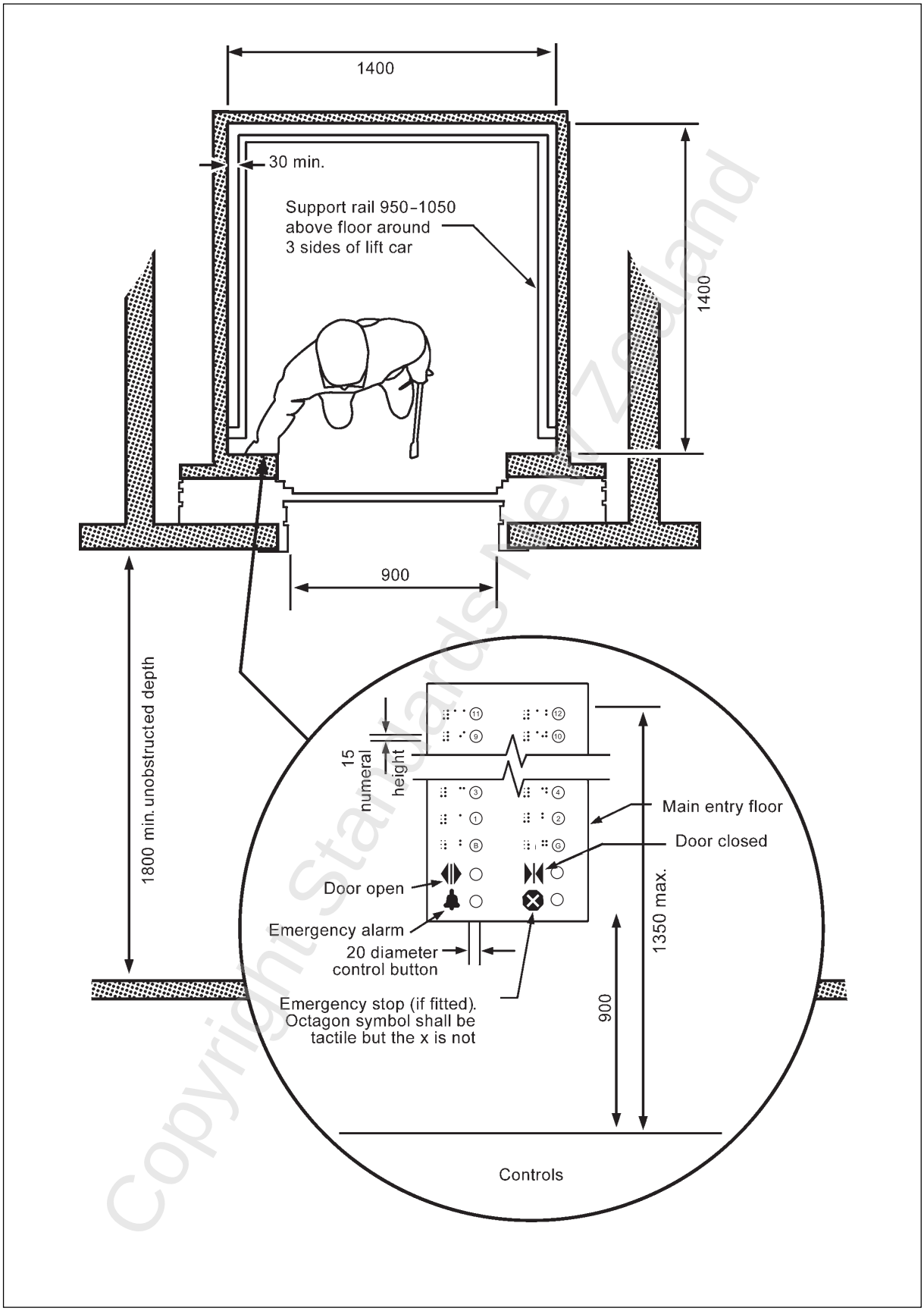


Figure 26 – Lift car dimensions and control panel

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9.2.5 Lift indicators

Lift indicators shall be provided as follows:

(a) 'Lift coming' or 'call accepted' indicator. These shall be provided at each landing.

(b) 'Lift arrival' and 'lift direction' indicators. These shall be provided at each lift landing and shall be signalled in advance both visually and audibly. The visual signal shall be an illuminated arrow. The audible signal shall be two gongs to indicate downward travel and one gong upward travel.

(c) Lift position indicator. A visible and whenever possible, audible lift position indicator shall be provided. The visible position indicator shall be fitted in the lift so those passengers facing the main doorway can easily read it.

(d) Floor indicators. In all cases where audible signals e.g. voice announcements, of floor level are not used, raised tactile numbers shall be provided on the leading edge of landing doors, or on the entrance architrave as close as practical to the landing doors, to indicate the floor level position of the lift. These tactile numbers shall have a raised profile, be not less than 20 mm in height and shall be sited 1350 mm above finished floor level.

In this situation, tactile numbers on the leading edge of the lift door are the only way a blind person can find out what floor the lift has stopped at.

On any lift covering more than three floors on an accessible route an audible indication of floor level shall be used. It is preferable that audible indicators are also used on lifts of only two and three storeys.

9.2.6 Support rails

Support rails shall be provided in lifts. Support rails shall be on all walls except those in which doors are installed. Such rails shall provide for a minimum clear finger space of 30 mm from the wall surface, have a recommended diameter of 30 – 40 mm, and shall be installed between 950 – 1050 mm above the finished floor level.

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10 TOILET AND SHOWER FACILITIES

10.1 General

All accessible toilet facilities shall be provided on an accessible route.

This Standard recognizes two main types of toilet facility:

(a) Facilities with separate WC cubicles and/or urinals and separate wash hand basins plus an accessible unit with internal handbasins. These are usually gender-specific;

(b) A toilet facility based on a number of self-contained toilet units each containing at least a water closet and a hand basin. These may be all-gender or gender-specific.

In addition toilets may contain showers and parenting facilities.

C10.1

The design of toilet and shower facilities is intended to provide for unaided use by a person with a disability.

10.2 Location

10.2.1

Accessible toilet facilities shall be provided on the main entry level to all buildings. In addition, in multi-storey buildings additional accessible toilets shall be distributed evenly and throughout the building. Alternatively, wherever toilets are provided at least one shall be an accessible toilet.

10.2.2

Accessible toilets shall be provided such that the route to them shall not traverse different tenancies within the building.

10.3 Signs

Accessible toilet facilities shall be sign-posted (refer to 4.8).

10.4 Number of toilets and showers

The number of accessible toilets and showers to be provided shall comply with NZBC G1/AS1. At least one all-gender accessible toilet unit shall be provided that can be reached without going through an area reserved for one gender.

C10.4

In most buildings with fewer than 300 occupants, one all gender accessible toilet is sufficient. For larger buildings another all gender toilet should be provided but when sanitary facilities are provided in groups of two or more locations, accessible facilities should be provided at each location.

The principle advantage of an all-gender facility is the ability to use the facility accompanied by a helper of the opposite gender. In addition there should be greater utilization of the facility since it is available to all people.

All-gender toilets are recommended in all situations especially in those areas used by the general public (for example shopping areas).

The provision of accessible toilet units and shower units may be individual or in any combination with each other to suit design requirements. It is recommended that combined shower/toilet units be used if a shower is required.

NZS 4241 covers the calculation of the number of toilet units required (including accessible units) in public toilets in general, and is useful for areas outside those defined in NZBC G1/AS1.

10.5 Design

10.5.1 General

This section defines minimum requirements to produce a desired end result. In some cases there may be alternative ways of achieving this result.

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10.5.2 Accessible toilets

Accessible toilets shall be designed to provide manoeuvring space so that people in wheelchairs may use each type of fixture, refer to 10.5.4.

Accessible toilet units allow:

(a) Use by anyone;

(b) Increased ease of use because the larger floor area that allows a wheelchair to turn through 360o in one movement;

(c) Greater utilization of the facility because of the larger size of the unit permits its use as a family/parenting room.

10.5.3 All-gender accessible toilet units

The provision of at least one all-gender accessible toilet unit is a requirement of all toilet facilities.

10.5.4 Dimensions

Accessible toilet units shall have sufficient space to allow wheelchair users to transfer to the toilet pan from the side of the pan; to approach and use the pan from the front; and for use by a commode.

The minimum dimensions of a compartment shall be 1900 mm by 1600 mm (see figure 27).

C10.5.4

The floor dimensions in the toilet layout shown in this Standard are minimum measurements and may be increased. If nappy changing tables are to be provided then the floor area will need to be increased so that manoeuvring space is not obstructed.

NZS 4241 provides examples of accessible toilet unit floor dimensions that are based on experience and are greater than the minimum requirements. The Standard also gives examples of alternative positioning of toilet fixtures and fittings.

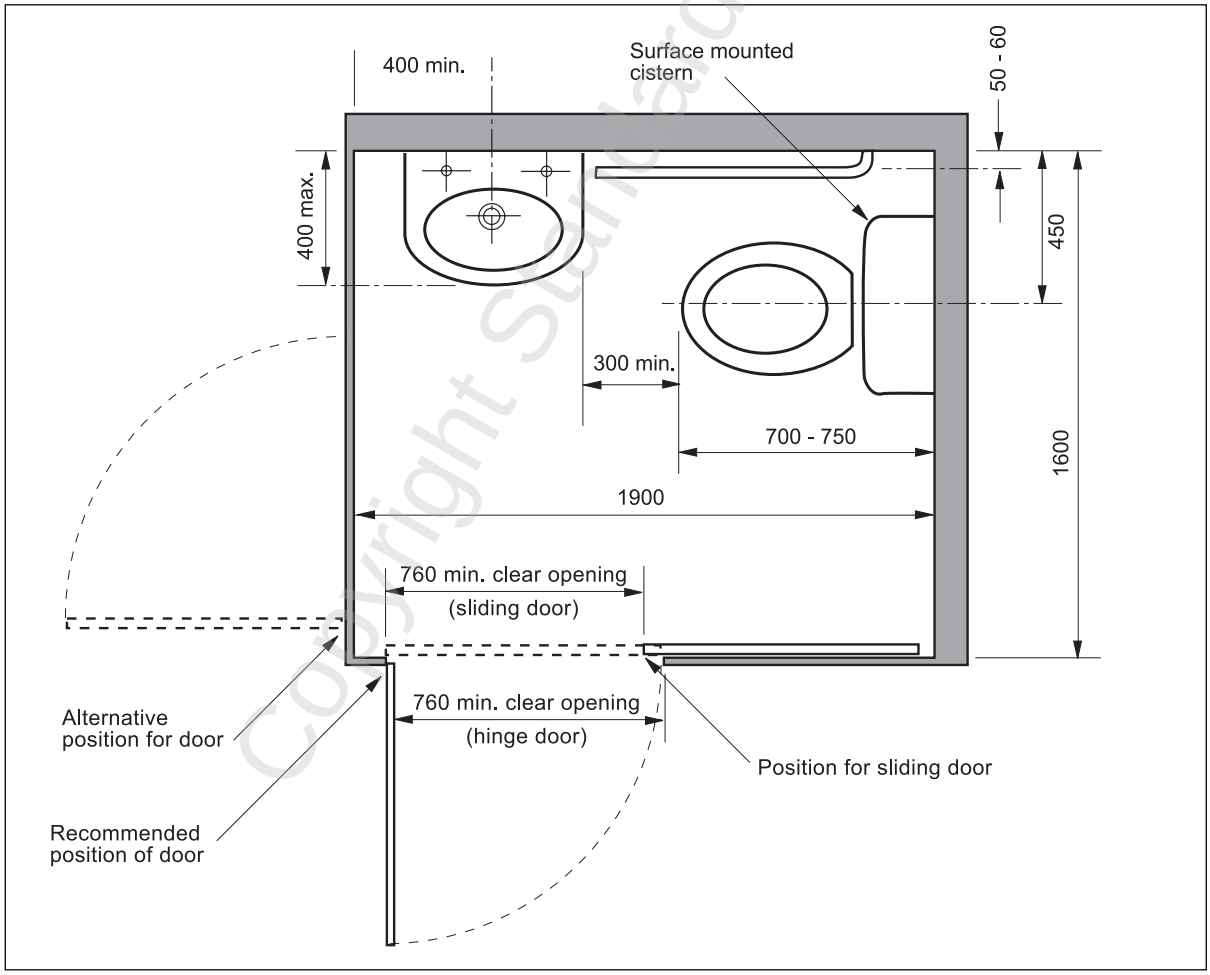


Figure 27 – Accessible toilet units

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10.5.5 Toilet doors

All doors serving toilet facilities shall:

(a) Be provided with a suitable indicator bolt of suitable size and simplicity of operation to be readily usable by those with limited hand movement;

(b) Be able to be opened from the outside in an emergency;

(c) Have pull rails and kick plates as shown in figure 28.

10.5.6 Toilet pans

If two or more accessible toilet units are provided at least one shall have a pan position of the opposite hand, refer to 3.3.2.

C10.5.5

An outward-opening door is preferred. Inward opening doors can only work effectively if there is a turning circle space of 1500 mm diameter beyond the open door.

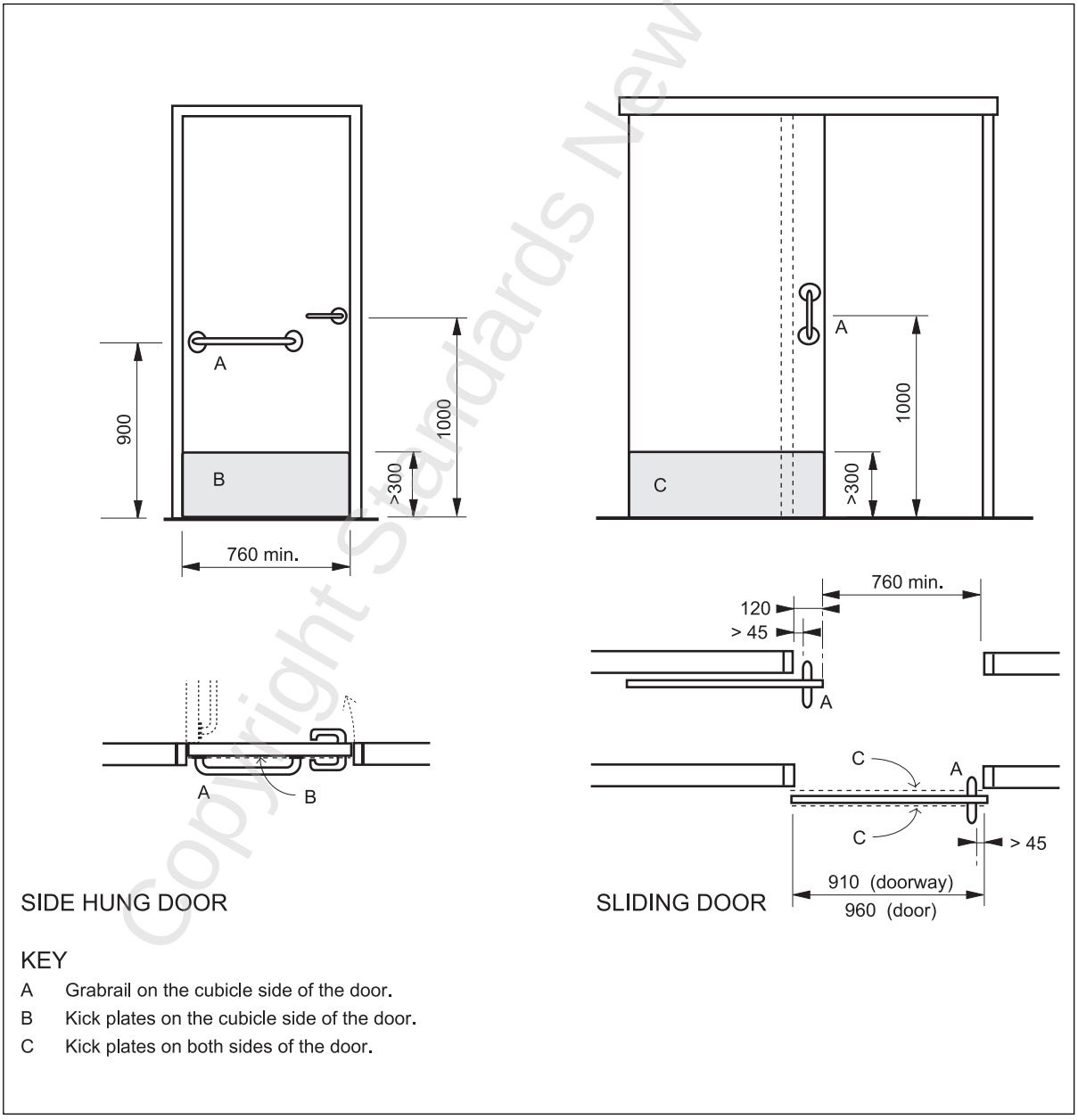


Figure 28 – Grab rails and kick plates on toilet doors

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C10.5.6.1
Side-trunked or side-vented toilet pans should be avoided to permit the use of a commode, when required. This applies to any obstructions at the side of the pan.

10.5.6.1 Siting
The toilet pan shall be sited so that:

(a) The front edge of the toilet seat shall be 700 – 750 mm from the back wall;

(b) The centre-line distance of the toilet seat from the nearest side-wall shall be 450 mm;

(c) There is no obstruction at the side of the pan to inhibit the use of a commode;

(d) There is no obstruction at the back of the pan to inhibit the use of a commode;

(e) The front edge of the toilet seat is 300 mm minimum from the wash basin except as provided in 10.5.8;

(f) The toilet lid is supported between 10° and 15° beyond the vertical to provide a backrest for the user.

10.5.6.2 Height
The height of the top surface of the toilet pan seat shall be 460 mm.

C10.5.6.3
False wall provides back support.

10.5.6.3 Wall-hung pans
Wall-hung pans shall be fixed on a false wall (see figure 29) and comply with 10.5.6.1. If there is no false wall, a seat bracket is required.

10.5.6.4 Flushing control
The flushing control shall be easily operable, and positioned as in figure 32.

10.5.7 Urinals
If accessible urinals are to be provided, they shall be constructed without a step and at least one stall shall be fitted with a horizontal grab rail. There shall be a clear space at least 760 mm wide and 1200 mm deep in front of the urinal.

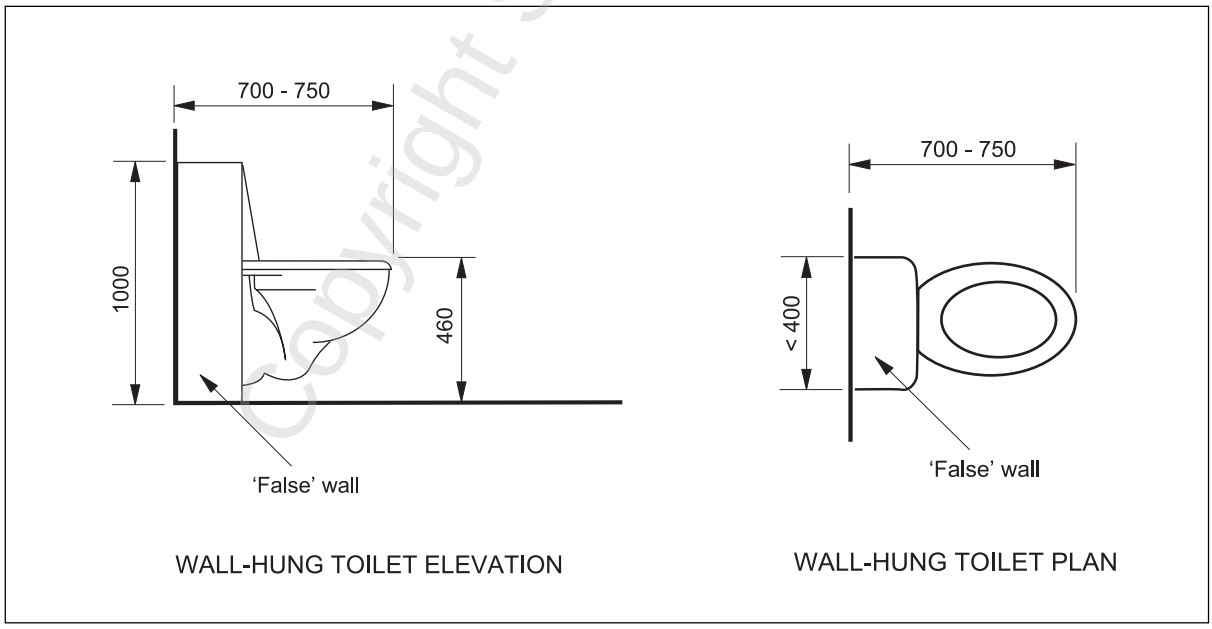


Figure 29 – Wall hung pans

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10.5.8 Washbasins

10.5.8.1 Standard washbasin

Standard washbasins, having a maximum depth of 400 mm, shall comply with AS/NZS 1730 and be installed so that:

(a) The centre line of a washbasin is at least 400 mm from a wall forming a return to the wall on which it is fixed (see figure 27);

(b) Washbasins shall provide a minimum clearance of 675 mm on the underside as shown in figure 30;

(c) Water supply pipes and waste outlets do not encroach on the required clear space under the washbasin;

(d) Exposed hot water pipes are to be insulated or otherwise covered;

(e) There is a clear space at least 760 mm wide and 1200 mm deep in front of the basin;

(f) Near to the toilet with its nearest edge 300 mm minimum away from the front of the toilet pan (see figure 27).

10.5.8.2 Provision of water

The washbasin shall be provided with:

(a) A mixed flow of water delivered through a central outlet;

(b) A maximum water temperature of 55 °C at delivery point. Refer to G12/AS1.

(c) All controls at 50 – 60 mm clearance from any obstruction;

(d) If taps are provided:

(i) They shall have lever or capstan handles easily operated by a person with limited hand function;

(ii) The hot water tap shall be placed to the left of the cold water tap.

(e) Plugs shall be connected to, or form, part of the washbasin.

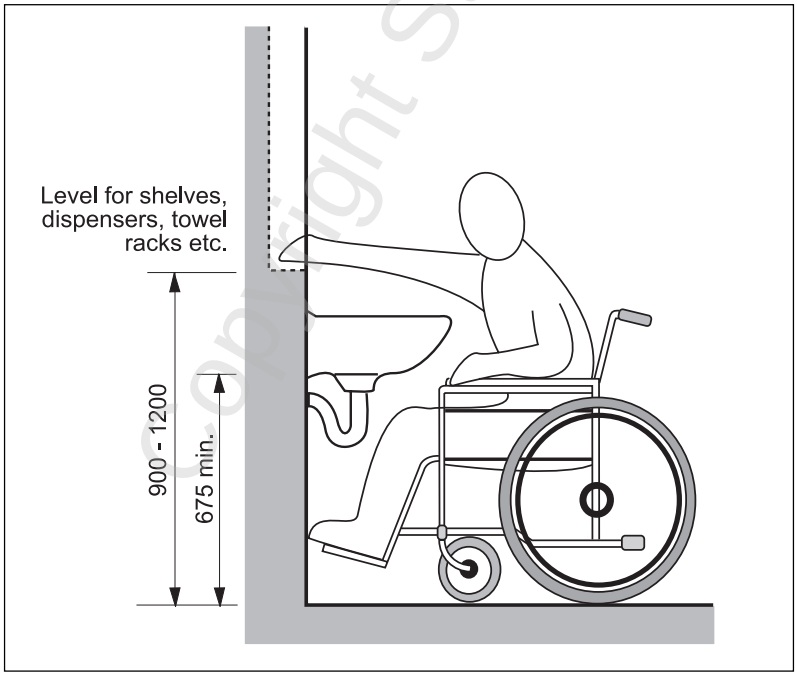


Figure 30 – Location and clearances for washbasins and fittings

C10.5.8.1

In this case a washbasin with rounded corners, or a 'circular' wash basin should be installed so that a wheelchair user can still approach the toilet pan from the front or the pan may be used by a commode.

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10.5.9 Grab rails

Grab rails shall meet the requirements of Appendix F.

10.5.9.1 Location

Pull rails and grab rails shall be installed as shown in figure 28, on doors and figure 31, in toilets.

10.5.10 Toilet facility fittings

Toilet facilities shall include the amenities and fittings required in this Standard.

10.5.10.1 Design

Fittings shall be simple and operable with one hand.

10.5.10.2 Position

The provision of fixed grab rails, toilet paper holders etc. shall be in accordance with figure 31. In addition:

(a) The toilet paper dispenser and waste sanitary napkin receptacles shall be located within easy reach of a person using the toilet pan;

(b) Soap dispensers, sanitary towel disposal units, hand-dryers etc. shall be installed at a height between 900 mm and 1200 mm above the finished floor level but shall not encroach into the wheelchair manoeuvring space;

(c) If a mirror is provided, the lower edge shall be not more than 1000 mm above the finished floor level.

10.5.10.3 Visibility

All fittings shall contrast visually to their background.

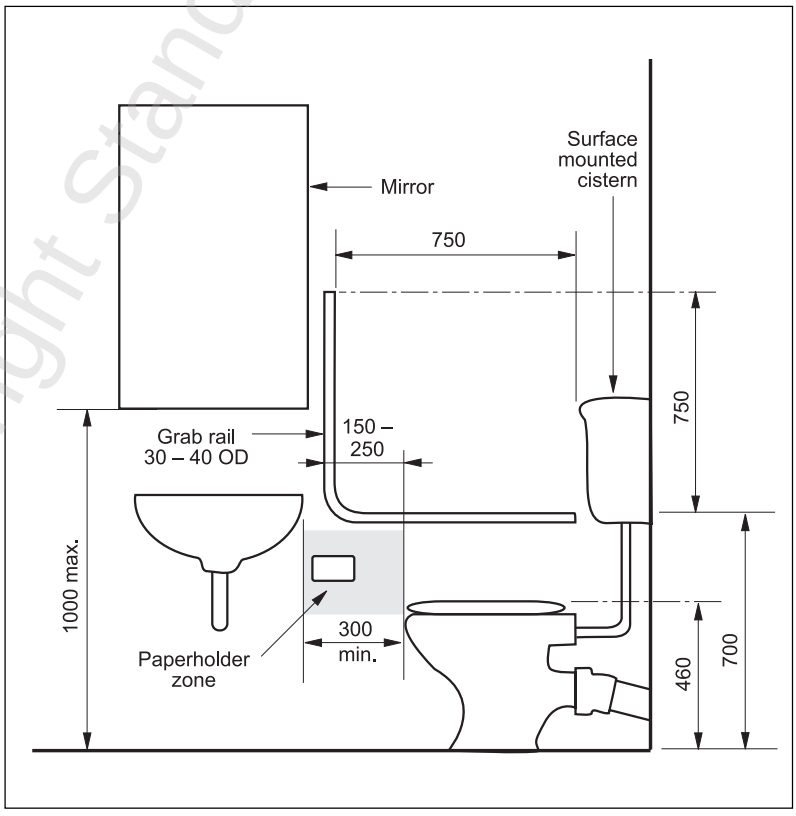


Figure 31 – Toilet unit fittings – positioning of grab rail and paper roll holder

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10.5.11 Showers

Where showers are required for staff or public use, a wet-area shower shall be provided for people with disabilities. If two or more shower cubicles are provided, at least one shall have a seat and controls for the opposite hand.

Accessible shower cubicles may be complete in themselves or be part of a combined accessible toilet/shower facility.

10.5.11.1 Size

The minimum area for a shower unit and drying space is shown in figure 33.

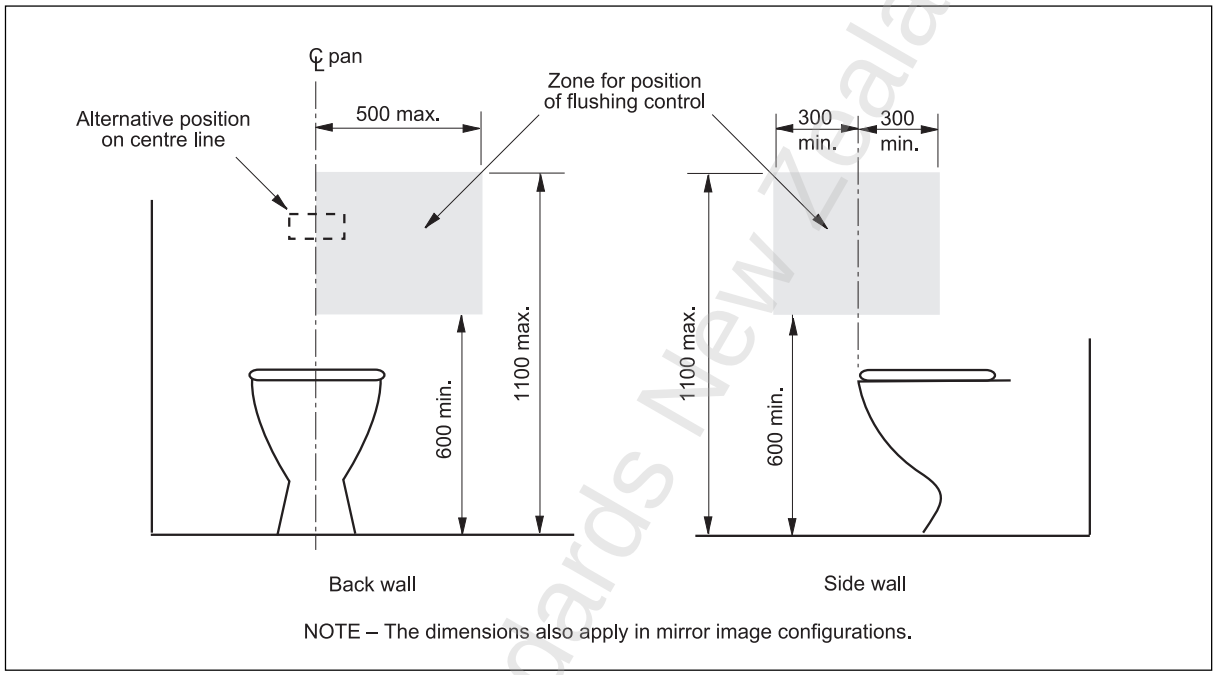


Figure 32 – Toilet unit fittings – zone for position of flushing control

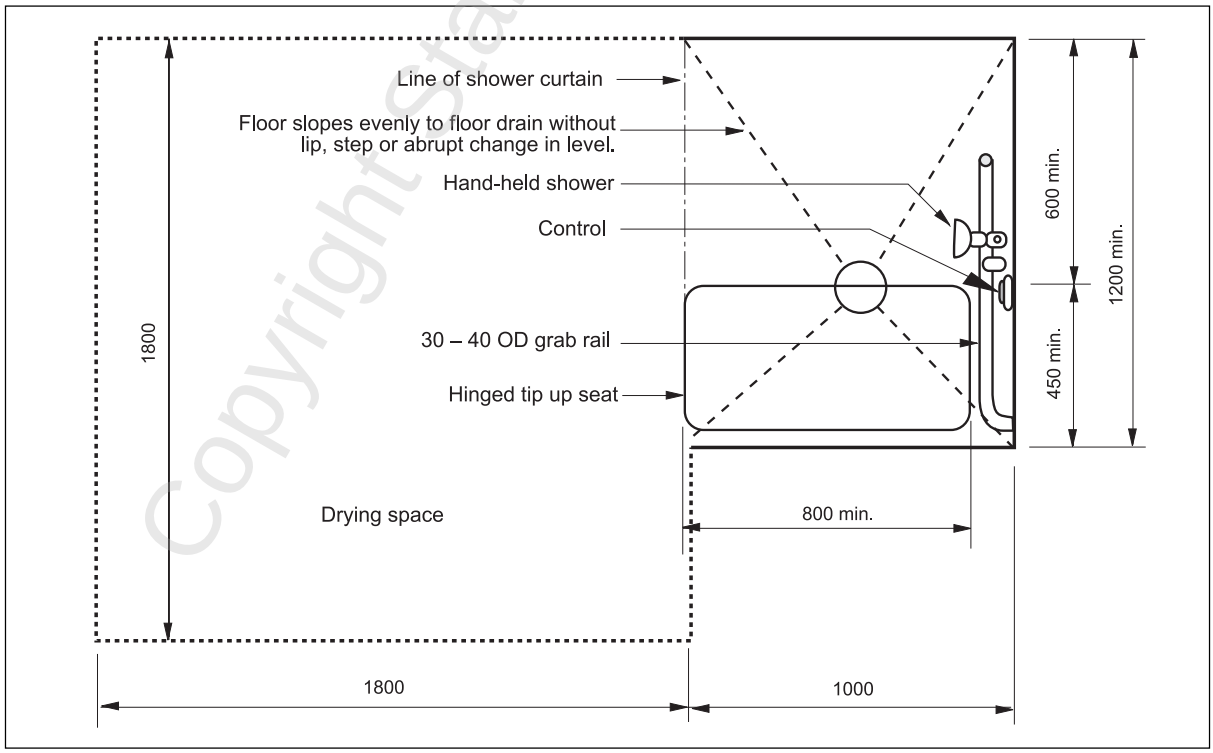


Figure 33 – Minimum space required for a single shower unit

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10.5.11.2 Design

If the drying space is used for dressing and undressing it shall be separated from the shower.

Walls and partitions enclosing a shower and less than 1800 mm high shall be sufficiently robust to resist the impact of a falling body and shall be of sufficient strength to carry grab rails, refer to Appendix F.

C10.5.11.3

As shown in figure 35, the area for the wet area shower also serves as the space beside the toilet pan for side transfer to the pan.

10.5.11.3 Floor

The floor shall:

(a) Be continuous with that of the shower;

(b) Have a fall of no less than 1:50 toward the waste situated toward the corner made by the walls, see figure 35. All floor surfaces inside the shower cubicle shall be impervious and slip resistant.

C10.5.11.3(c)

A grille running inside the wet area is an effective way of reducing spread of water. However, this should not be necessary if the floor area has been properly installed and slopes evenly to floor drain.

(c) Have any drainage provided between the shower and drying space, or the provision of a floor-level guide for moveable doors, partitions or shower curtain, flush with the floor.

C10.5.11.4

A flexible, adjustable hand-held shower hose enables control of the direction of water flow by people of different heights and abilities and allows somebody to assist the user.

10.5.11.4 Fittings

Shower cubicles shall have:

(a) Grab rails, soap holders, and shower controls and fittings fixed in accordance with figure 34;

(b) A hand-held showerhead attached to a flexible hose installed to enable the user to shower while sitting or standing;

(c) A fitting shall be provided to allow the showerhead to be attached at various angles and heights between 1000 mm and 1900 mm above the finished floor level (see figure 34);

A combined slide rail/grab rail satisfying the requirements of Appendix F5, F6 and F7 may be acceptable.

(d) A lever operated mixer shall be provided;

(e) A water supply where the hot water has a maximum temperature of 55 °C, refer to NZBC G12/AS1;

(f) A self-draining, slip resistant seat, 800 mm x 450 mm minimum, provided inside the shower cubicle at a height between 450 mm and 550 mm above the finished floor level. This seat shall be securely fixed to the wall and shall be hinged so that it swings or folds out of the way;

(g) A clothes hanging device shall be fitted, positioned between 1200 mm and 1350 mm above the finished floor level in drying spaces.

These fittings shall be arranged as shown in figure 34:

10.5.12 Combined toilet and shower

Where toilet, hand basin, and shower are combined they shall be provided in accordance with figure 35.

10.5.13 Baths

Baths and combination bath/showers shall not be used as an alternative to showers, but may be provided in addition.

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Figure 34 – Shower cubicle fittings

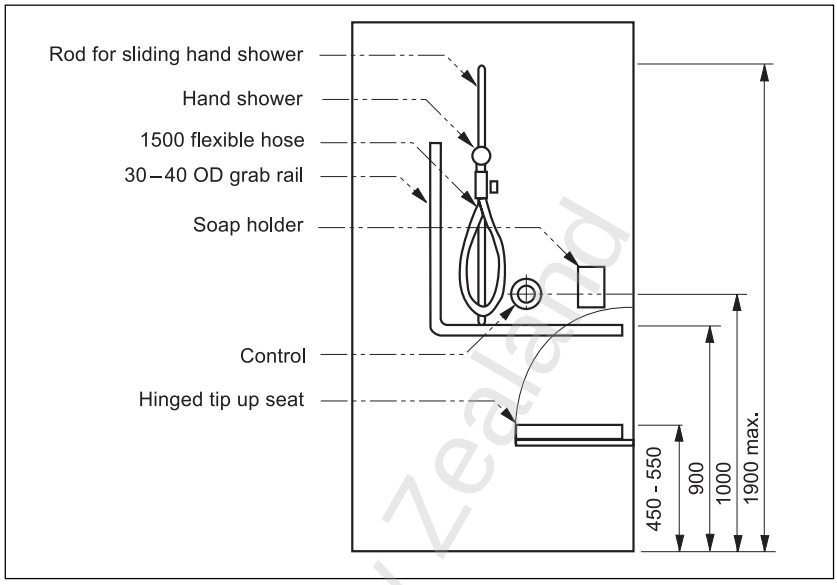
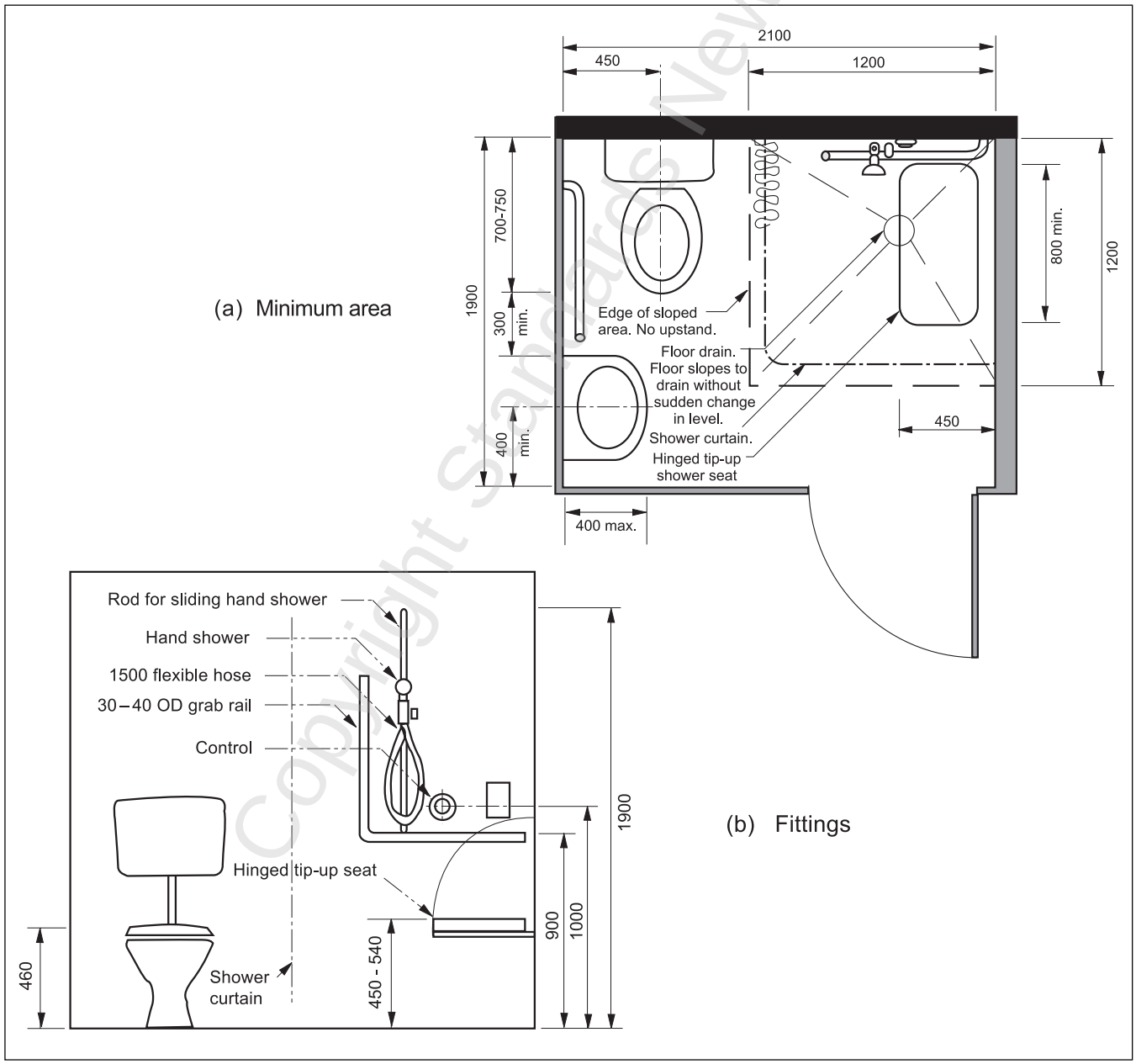


Figure 35 – Combined toilet and shower



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11 PUBLIC FACILITIES

11.1 Public counters and desks

C11.1.1
Requirements for reception counters and desks need to ensure that people with disabilities are able to carry out the normal processes and activities expected at that counter or desk.

11.1.1 General
Reception counters and desks for public use on an accessible route shall have at least one space for use by people in wheelchairs as visitors and staff working in the reception area (see figure 36). Such a space shall be at least 900 mm wide.

11.1.2 Other forms of counters and desks
Additional examples of public counters such as in public bars, shops, supermarket checkouts shall comply with 11.1.1 as shown in figure 37.

C11.1.3
Where security is a requirement, consideration should be given to the innovative use of step-down counters, security grilles or toughened glass.

11.1.3 Screens
Wholly transparent screens on counter tops shall be provided with a clearly visible contrast strip.

11.2 Telephones

11.2.1 General
Accessible telephones shall be on an accessible route.

11.2.2 Clear floor or ground space
Whether located on the street or in a foyer of a building the approach to an accessible telephone shall be free of obstacles. It shall:

(a) Have a clear floor or ground space of at least 1200 mm by 1200 mm that will allow either a forward or parallel approach by a person using a wheelchair;

(b) Not be restricted by stepped bases, enclosures, and fixed seats.

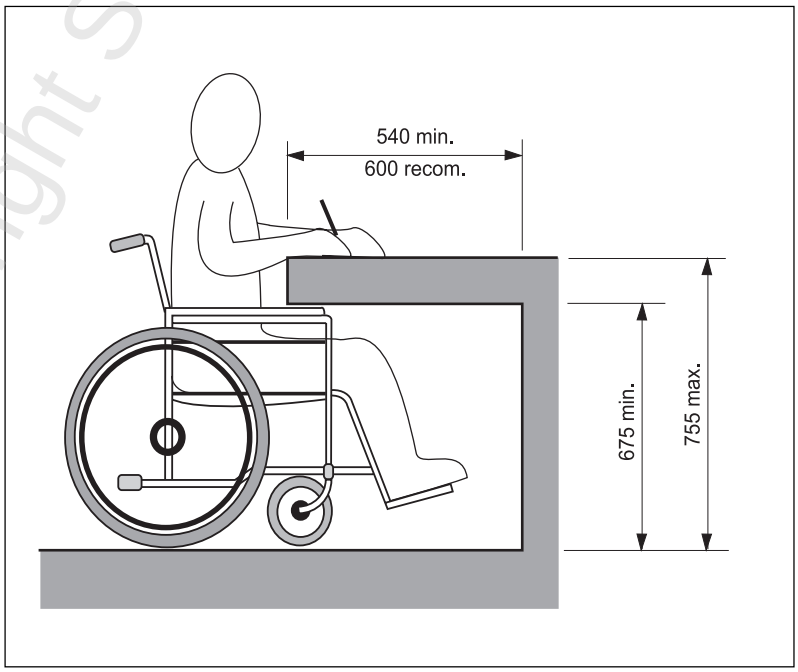


Figure 36 – Public counters and desks

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11.2.3 Design

The design shall provide a user with privacy and accessibility:

(a) An enclosed booth must have a door, which opens outwards;

(b) The parts of the telephone that are essential to its basic operation shall not be higher than 1200 mm above the ground or floor;

(c) Accessible telephones shall be equipped with a minimum handset cord length of 750 mm;

(d) Accessible telephones should have push button controls whenever possible;

(e) Telephone directories, if provided, should be in a position that is convenient for use by a wheelchair user;

(f) Shelving shall be set at 775 mm minimum above the ground or floor; and

(g) Open cubicles shall be 540 mm minimum deep.

C11.2.3

In an enclosed booth space for manoeuvring a wheelchair can be increased by providing 150 mm clear under space around base of walls.

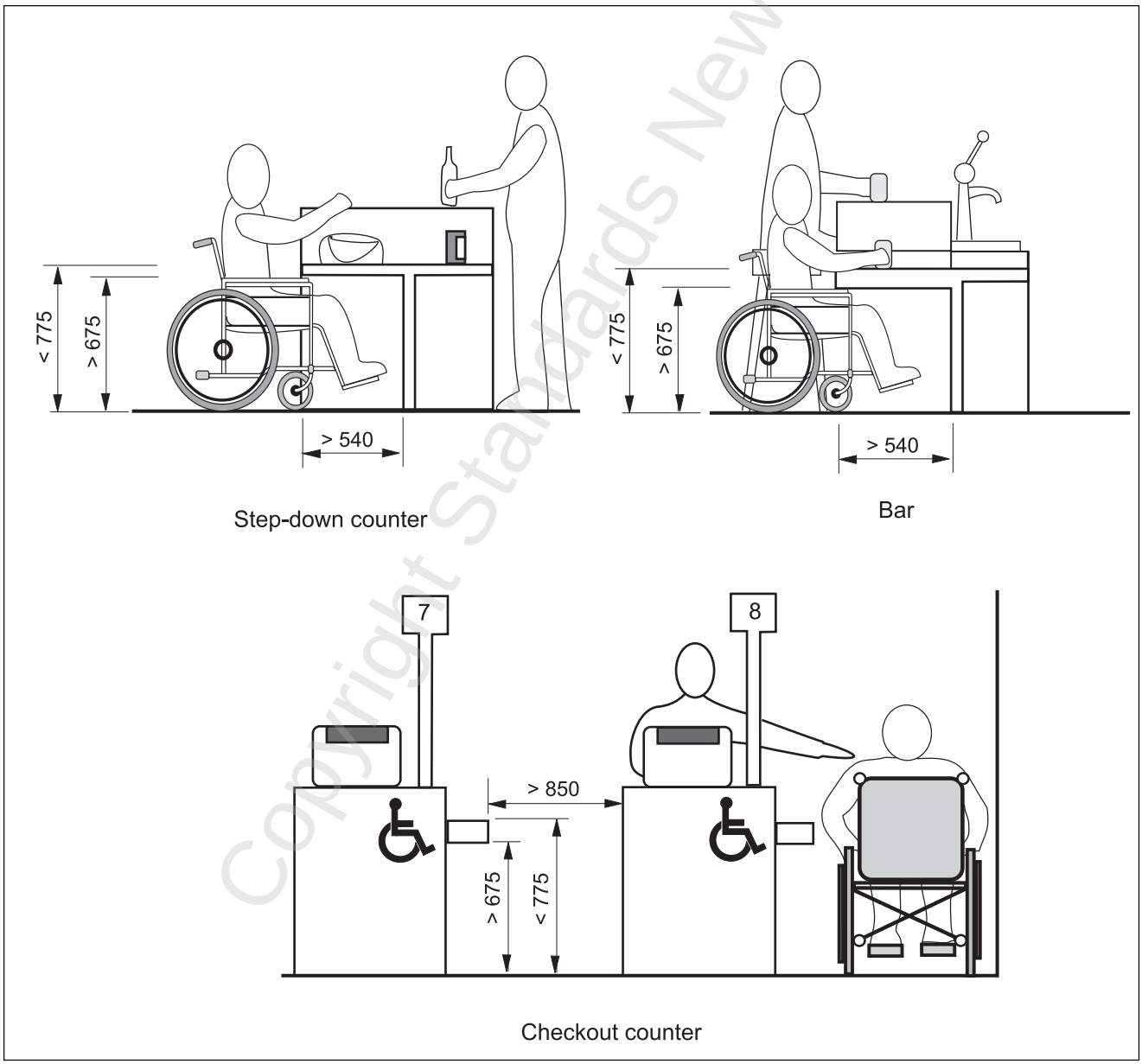


Figure 37 – Public counters

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11.2.4 Detection by people with visual impairment

Accessible telephone booths or stands shall have:

(a) Part of the structure within 150 mm of the ground that will be detectable by a cane user;

(b) Colour contrast to the surroundings.

C11.2.5

Telephones for people with a hearing impairment are not commonly found in public areas in New Zealand but they are available. Such equipment is usually of specialised design. Several techniques are used to aid people with hearing impairment such as receivers that generates a magnetic field in the area of the receiver cap, TTY systems, volume controlled telephones and bone-conductance telephones.

11.2.5 Accessible equipment for people with a hearing impairment

If a telecommunications device for the deaf is provided, the location of such equipment shall be indicated by strategically placed signage. For examples of accepted signage see figure 38.

11.3 Automatic tellers, vending machines

Automatic tellers, vending machines etc. shall comply with the principles of approachability, accessibility required and usability as described for the use of telephone controls (refer 11.2). Figure 39, shows examples of dimensions for height of automatic teller and vending machine.

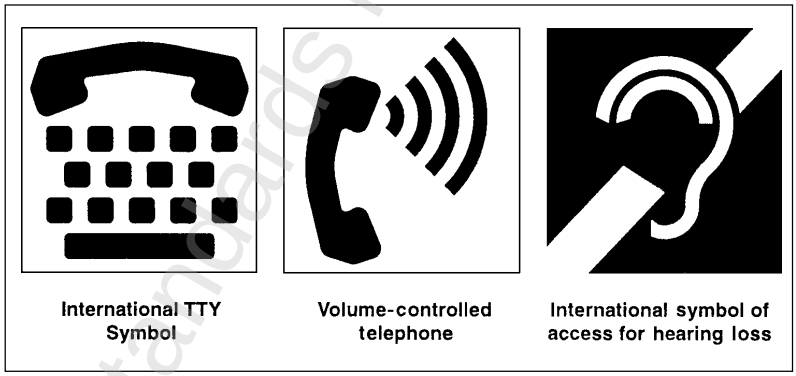


Figure 38 – International symbols for people with hearing impairment

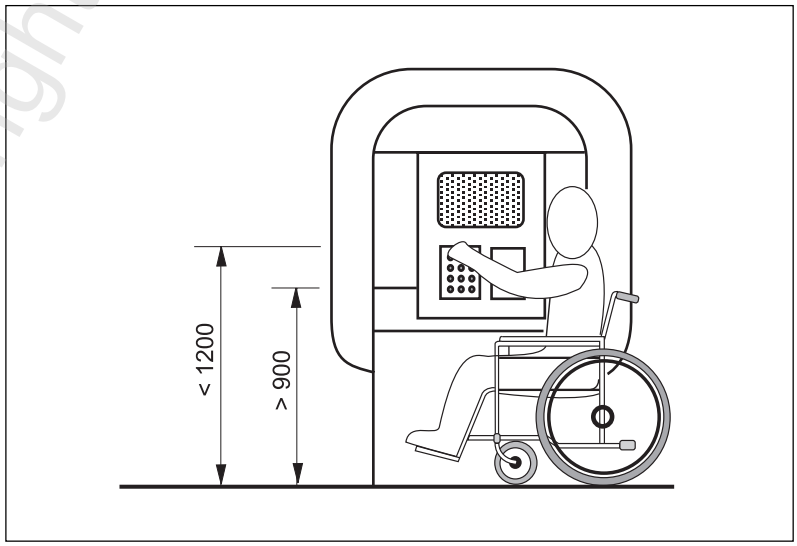


Figure 39 – Automatic teller or vending machine

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11.3.1 Keypads and keyboards

Accessible keypads and keyboards shall:

(a) Have privacy of use;

(b) Have key surfaces that are raised from the base and separated from each other;

(c) Have key surfaces recommended at least 1 mm above the base and with a separation of at least 3 mm between keys;

(d) Have a logical and consistent arrangement of numbers and letters;

(e) Have colour contrast for the keypads;

(f) Preferably have telephone pad arrangement used for numbers and the typewriter arrangement for letters;

(g) Have clearly identified special function keys, and

(h) Have a single raised dot or braille marking on the number 5 key.

11.3.2 Information display

To be accessible the information display shall:

(a) Be situated at a height so that it can be easily read by a person in a wheelchair (see figure 5);

(b) Be protected from reflected glare or shall be angled from the vertical to prevent reflected glare (refer to 5.10);

(c) Use lettering that is visible to a person with normal sight from a point 1000 mm in front of the screen;

(d) Use plain characters, 5 mm high, which contrast well with the background.

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12 PLACES OF ASSEMBLY, ENTERTAINMENT AND RECREATION

12.1 General

Provision shall be made to accommodate people with disabilities in rooms and areas used for meetings, entertainment, assembly and recreation. In all cases this provision shall be on an accessible route.

12.2 Places of assembly and entertainment

People with disabilities shall be able to be seated as part of an audience. They shall be able to speak, lecture or entertain an audience from the main stage of a place of assembly or entertainment and have access to all backstage facilities including performers changing areas, toilet shower facilities and the green room.

12.2.1 Part of an audience

12.2.1.1 Number of wheelchair spaces

The number of spaces provided shall be as follows:

(a) 1 – 250 people: not less than two spaces;

(b) For every 250 people or part thereof extra, add one space.

12.2.1.2 Location of wheelchair spaces

In all cases the spaces reserved for wheelchair users shall be:

(a) Adjacent to and included in normal seating provisions (see figure 40);

(b) Spread as evenly as possible throughout the area;

(c) Of adequate size to allow for wheelchair manoeuvrability;

(d) On level ground and floor surfaces.

C12.2.1.2

An example of how wheelchairs can be located adjacent to normal seating is shown in figure 40. This also shows a grandstand seating arrangement.

12.2.2 Listening systems

Where a sound amplification system is provided, a listening system shall be installed to cover the total area of the room. Guidance on listening systems is found in Appendix H.

12.2.2.1 Usability

The recommended design sound levels for various functional areas of buildings given in AS/NZS 2107 shall be adhered to, for effective hearing.

C12.2.2.1

Care shall be taken to comply with these recommendations in the installation of air-conditioners, computer machinery etc. In order to hear effectively when background noise is present the recommended signal-to-noise ratio is 15 dB minimum.

12.2.2.2 Signs

A sign indicating that a listening system is installed or is available shall be provided in accordance with 4.8 at the main door or doors to the enclosed space. Where the listening system does not cover the total area of the enclosed space, such signs shall designate the boundaries of the area served.

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12.2.3 As a speaker or performer

Ramp access shall be provided to podium or stage areas. Accessible facilities shall also be provided for artists, including changing areas, toilets, showers, and the green room. An accessible route shall be available from these facilities to the audience area.

12.3 Places of recreation

People with disabilities shall be able to access and use all parts of a recreation facility in accordance with the requirements of this Standard.

12.3.1 Swimming pools

12.3.1.1 Accessibility of facilities

Accessible toilets, showers and changing rooms designed using the principles of this standard shall be provided on an accessible route.

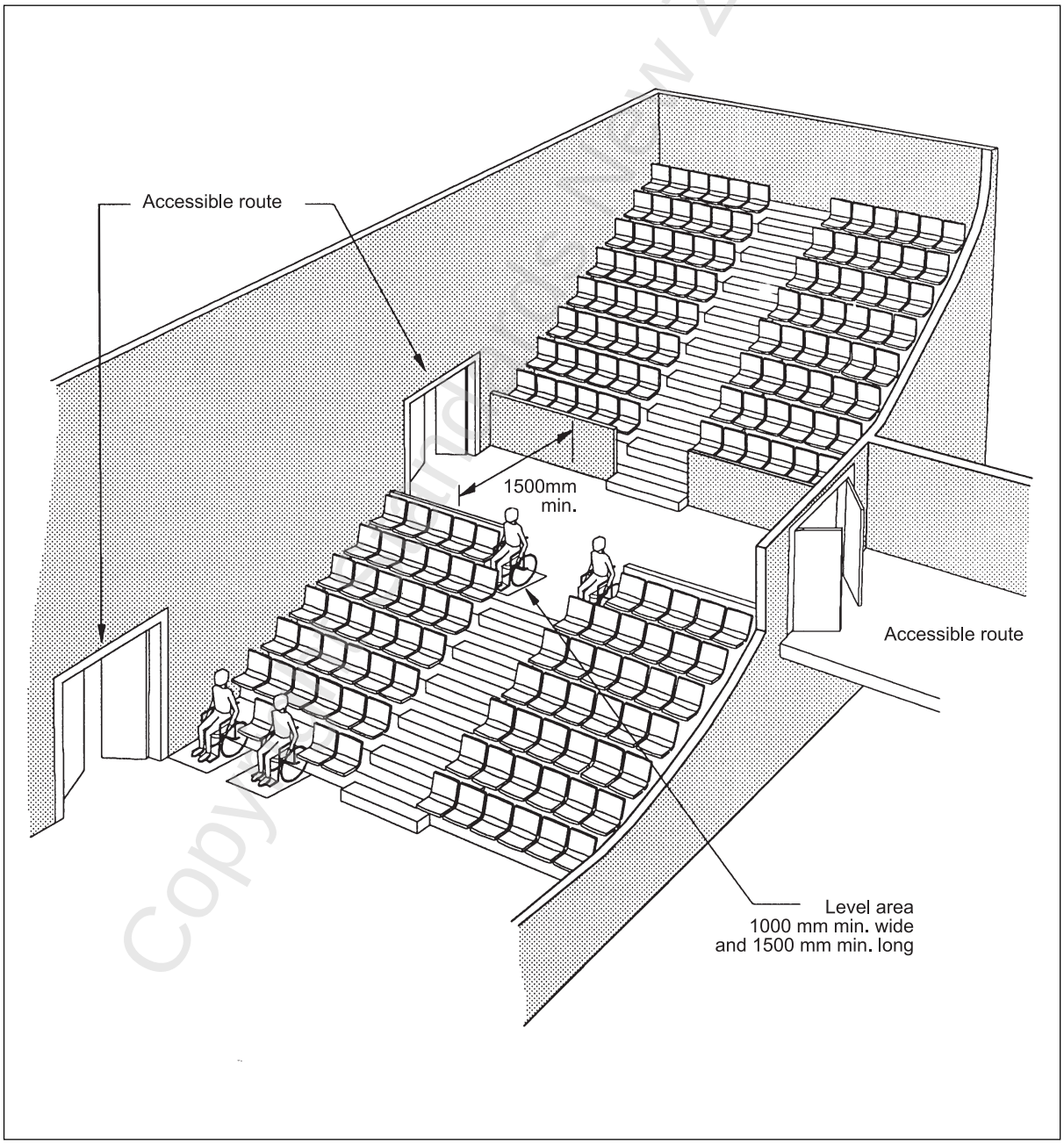


Figure 40 – Places of assembly – Examples of seating arrangements

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C12.3.1.2

A ramp that leads from the poolside into the pool is the preferred means of access to the water. A slope of 1:12 down to a water depth of 1200 mm is acceptable.

12.3.1.2 Access to the pool

The swimming pool shall be available from an accessible route and unaided access to the water shall be possible from the poolside.

12.3.2 Sports track and field activities

12.3.2.1 Accessible facilities

Accessible toilets and showers and changing rooms using the design principles in this standard shall be provided on an accessible route.

12.3.2.2 Access to the sports track or field

Sports tracks and fields shall be accessible via an accessible route.

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13 ACCESSIBLE OUTDOOR PUBLIC AREAS

13.1 General

For urban areas to be accessible to people with disabilities, territorial local authorities and town planners etc. shall have regard for the construction and siting of footpaths and the servicing of the area by public transport. See Appendix A, A4 and A5.

13.1.1 Accessways

All accessways shall be at least 1200 mm wide, have a maximum crossfall of 1 in 50 and shall as nearly as is reasonably practicable conform to the requirements of an accessible route (refer to section 4 and Appendix D. Many footpaths act as accessways.

13.1.2 Public transport

Whenever possible, public transport drop-off points shall be situated on accessways and shall be as close as practicable to accessible routes and to the main entrances of buildings of major public importance.

13.2 Outdoor hazards

13.2.1 General

For an accessway to be usable by people with disabilities it shall be free from hazards or obstructions. Where hazards or obstructions are permanent there shall be a designed arrangement e.g. tactile surface, which will guide the accessway user around the obstruction or steer them to the other side of the accessway (see figures 41 and 42). Movable obstructions like tables and chairs shall be placed and controlled so as to leave a clear route.

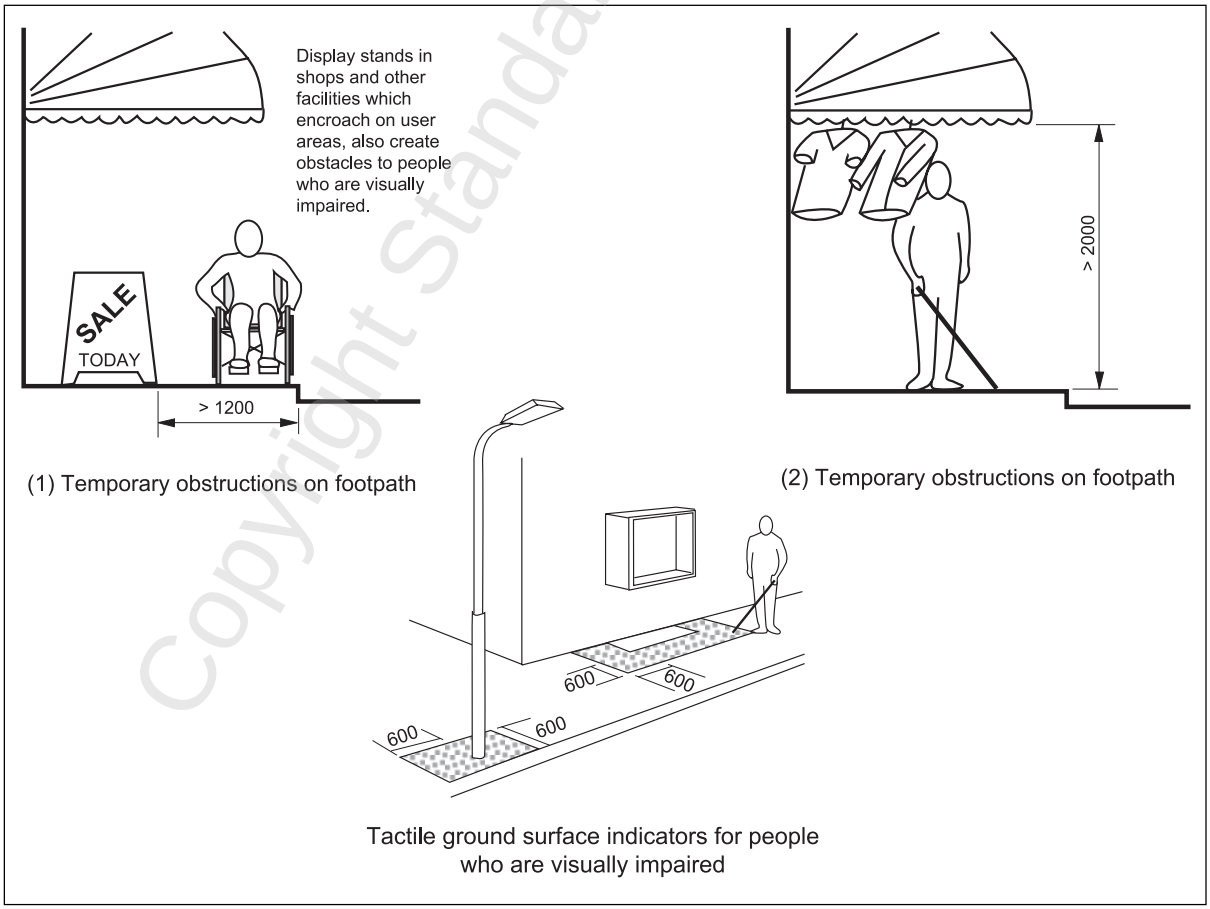


Figure 41 – Outdoor hazards

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13.2.2 Overhead obstructions

Hanging signs, lights, awnings, and similar objects shall have a minimum clearance of 2000 mm above the ground or finished floor level of the accessible route, accessway or usable area (see figure 41).

13.2.3 Permanent and temporary obstructions

Objects fixed permanently to the ground or to the side of an accessway e.g. telephone booths or outdoor furniture, including temporary obstructions such as display stands, billboards, sandwich boards etc. shall:

(a) Not intrude into or obstruct the 1200 mm clear accessway;

(b) Have a feature within 150 mm of the ground that will be detectable by a person using a white cane;

(c) Be colour contrasted to the surroundings.

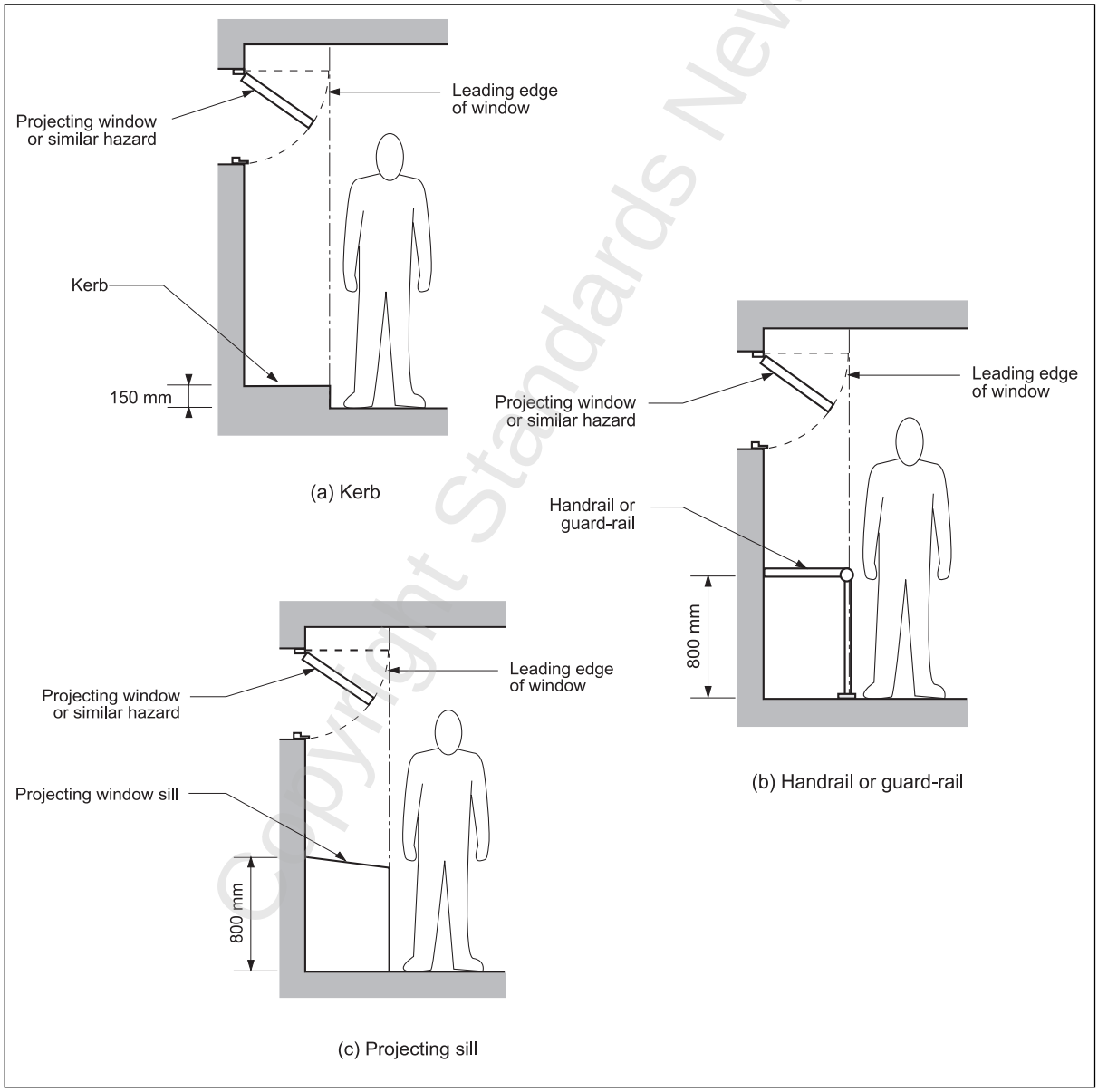


Figure 42 – Protection from dangerous projections

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13.2.4 Windows

Windows or doors shall not open across a footpath, corridor, stair, or ramp so that they obstruct access, unless this is unavoidable, e.g. for emergency exits to buildings.

13.2.5 Bollards

Openings between bollards and similar barriers to non-pedestrian traffic shall be positioned or constructed to allow for the passage of wheelchairs (see figure 43).

C13.2.5

Landscape lighting may be incorporated into bollards, as they become particularly hazardous at twilight.

13.3 Kerb design

13.3.1 General

Kerbs and channels/gutters shall be designed to allow a wheelchair or person with a walking aid to safely and easily negotiate the transition between two surfaces, see figures 44 and 46.

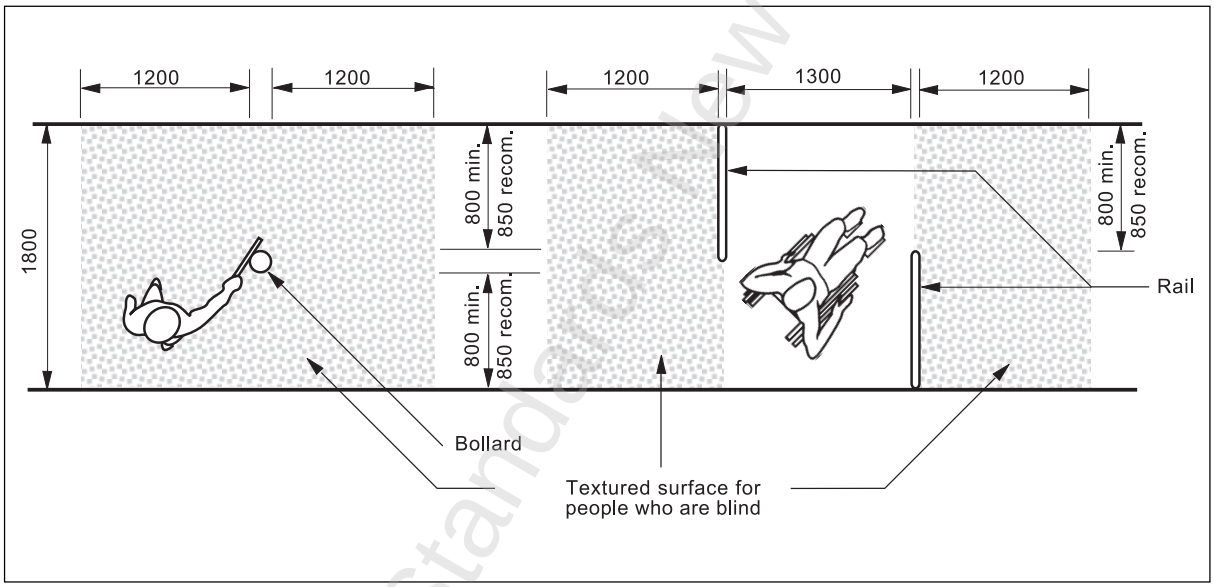


Figure 43 – Space required between bollards, etc.

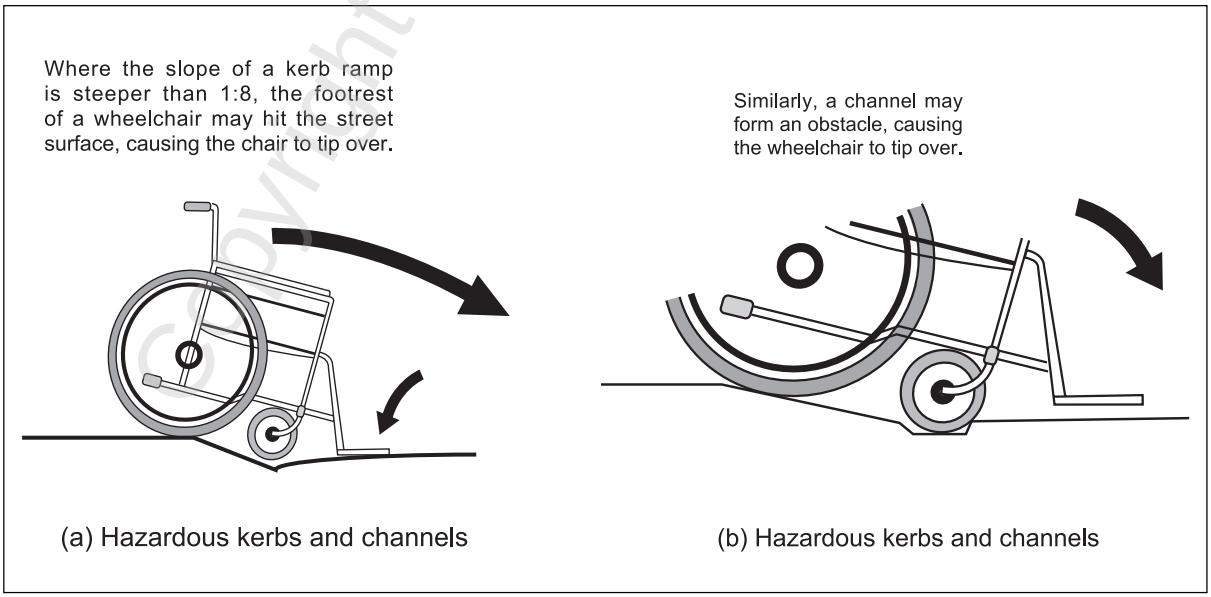


Figure 44 – Kerb and channel design

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13.4 Kerb ramps

13.4.1 Local authorities

When the territorial authority forms or constructs or makes permanent improvements to footpaths and kerbs, the kerb ramp shall comply with this section of this Standard, refer also to Appendix A, A4.1.

There will be situations where the local geography will not allow a standard kerb ramp to be provided. Other solutions that provide reasonable and adequate access, may be approved by the Council provided the principles of location 13.4.2, design 13.4.3 and surface finish 13.4.4, have been applied to the alternative designs.

13.4.2 Location

13.4.2.1 General

Kerb ramps shall be:

(a) Located so that users have an unobstructed view of traffic approaching from any direction;

(b) Provided at pedestrian crossings;

(c) Provided where footpaths cross a kerb at road intersections.

13.4.2.2 Location of ramps

13.4.2.2.1 Offset ramps

The kerb ramp shall be offset from the intersection corner to line-up with the direction of travel, see figure 45(a).

13.4.2.2.2 Corner ramp

Where the ramp cannot be offset from the corner, or where an intersection allows pedestrian traffic to cross the road at any angle the kerb ramp shall be graded and carried around the quadrant, refer to figure 45(b).

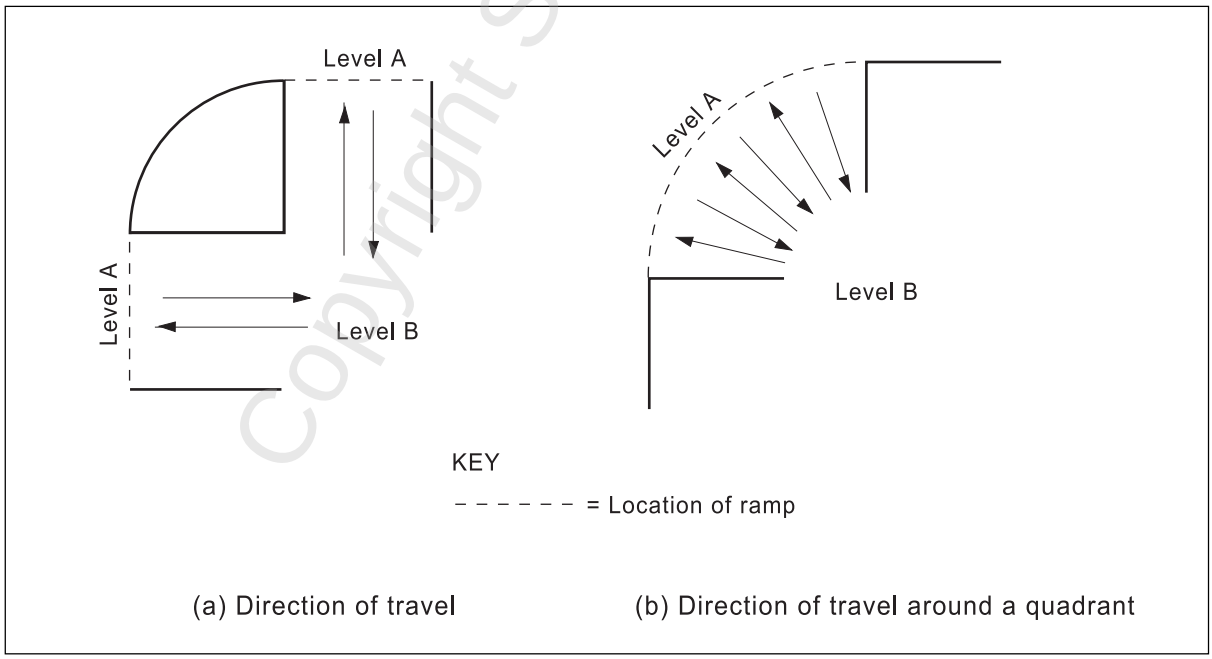


Figure 45 – Location of kerb ramps or step ramps

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13.4.3 Design

13.4.3.1 Construction

The ramp shall be constructed as shown in figure 46. It shall have:

(a) A gradient not steeper than 1 in 8;

(b) A maximum length of 1500 mm;

(c) No variation of slope from side to side;

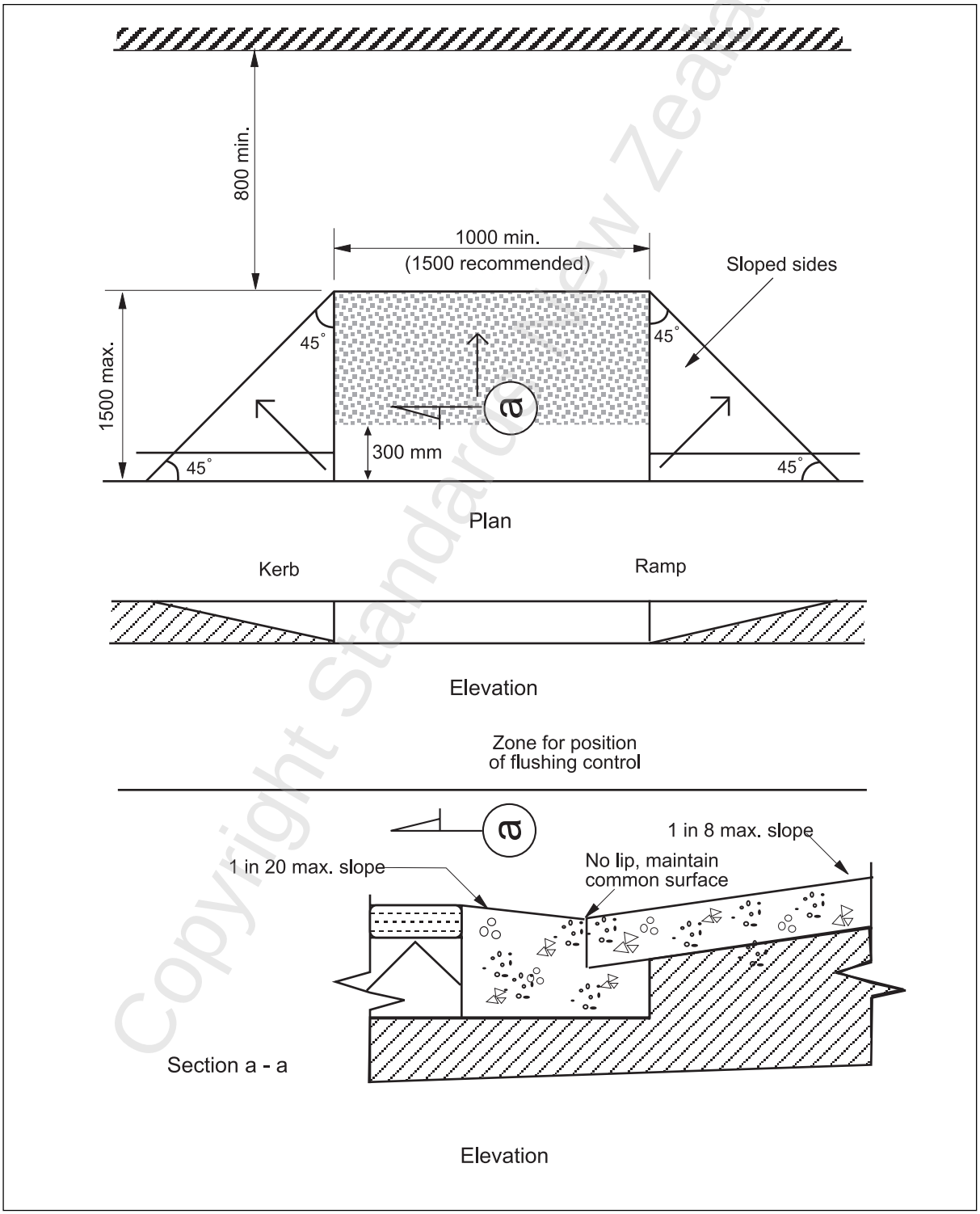


Figure 46 – Kerb ramps

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C13.4.3.1(d)
Invariably the junction between a road or gutter surface and a kerb ramp slopes downward to a point at the kerb edge of the gutter. In this situation any upstand i.e. vertical difference in height, between ramp and gutter, becomes very difficult for a wheelchair to negotiate (also see figure 44).

(d) No upstand between channel/gutter and ramp;

(e) A change in surface texture to delineate the common surface at the bottom of the ramp between kerb line and road edge gutter. Tactile ground surface indicators are recommended to best perform this function (refer to 13.4.5.2);

(f) A maximum camber or crossfall on either the road or footpath leading to the ramp, of 1 in 20;

(g) A minimum of 800 mm of space between the top of the ramp and any obstruction.

C13.4.3.1(h)
The recommended width of 1500 mm allows most wheelchairs or prams and wheelchairs to pass each other in different directions (see figure D10).

(h) A minimum width of 1000 mm.

C13.4.4
The slip resistant finish could take the form of rough brooming or similar texture.

13.4.4 Surface finish

A kerb ramp shall have a slip resistant finish, contrasting in both colour and texture with the adjacent footpath and road as shown in figure 47.

13.4.5 Alignment cues

C13.4.5.1
The alignment cue could be the use of landscaping or tactile surfaces.

13.4.5.1 General

An accurate alignment cue shall be provided to aid a person who is blind or has vision impairment before setting off from the kerb ramp.

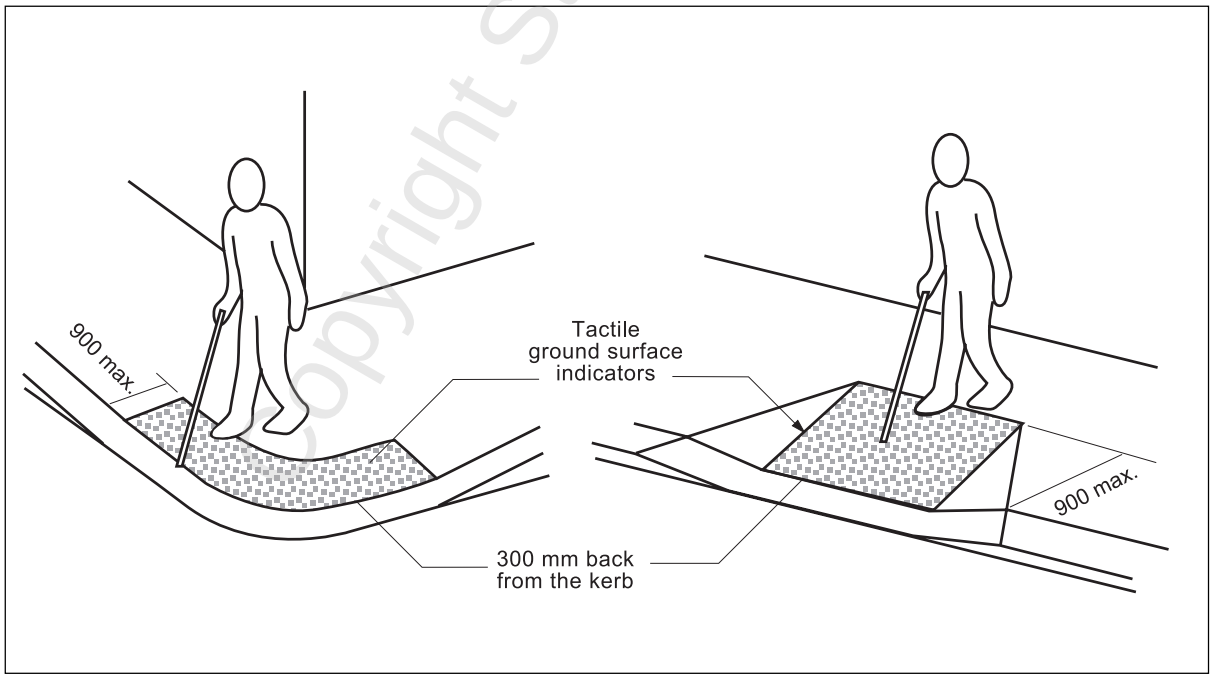


Figure 47 – Tactile ground surface indicators at kerb ramps

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13.4.5.2 Tactile ground surface indicators

A tactile change of surface, whether of concrete or other slip resistant material, shall be used to indicate the full width of the ramp and extended for the full face of the ramp. Such a change in texture should be set on the ramp 300 mm up from the common surface between the kerb line and road edge gutter (see figures 46 and 47).

C13.4.5.2

The tactile change of surface and the remaining surface of the ramp aid orientation for people with a visual impairment. AS 1428.4 describes some types of tactile surface indicators. It is important that any raised or domed portion of a tactile ground surface indicator does not obstruct the passage of the small front wheels of wheelchairs. Further research is required to establish maximum diameter and height for raised or domed portion and minimum gap between these portions.

13.4.5.3 Road crossings

Wide road crossings, which are part of accessible routes, shall be provided with alignment cues to aid the blind or people with vision impairment (see figure 48).

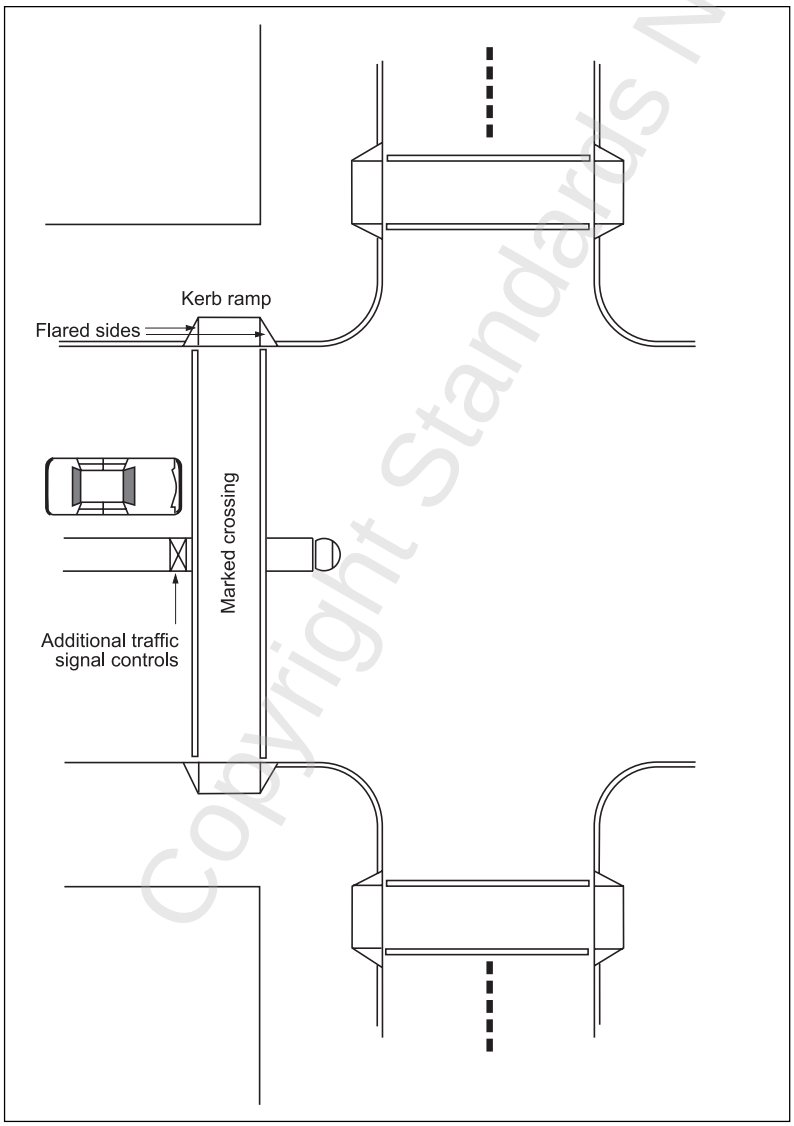


Figure 48 – Road crossings

C13.4.5.3

Alignment cues could take the form of:

(a) Off-setting the kerb ramp and crossing from the building edge in the direction of travel (see figure 48). This prevents visually impaired people from continuing straight ahead and unwittingly entering the crossing;

(b) Median refuges;

(c) Raised cues, thermoplastic lines or similar markings to define crossing direction;

(d) Change in surface finish on road through use of pavers or similar contrasting texture change;

(e) Tactile ground surface indicators.

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13.4.6 Audible traffic signals

Whenever an audible traffic signal is installed it shall have:

(a) An audible locating signal;

(b) An audible crossing signal; and

(c) A tactile 'cross signal' which clearly indicates the pedestrian "cross" and "wait" phases.

The audible traffic signal system and installation shall comply with Section 5 of RTS14, published by the Land Transport Safety Authority.

13.5 Street furniture

13.5.1 General

C13.5.1

In pedestrian malls and similar places, all street furniture shall be positioned clear of the accessible path of travel (see figure 49).

Street furniture, which includes objects such as seats, tables, drinking fountains, planter boxes, rubbish bins and the like, shall comply with the following:

(a) Objects shall not protrude into an accessible path of travel. Seats shall be a minimum of 500 mm away from the path of travel;

(b) Objects shall be of a colour that provides a contrast with their background and have a luminance factor of not less than 0.3 (30 %).

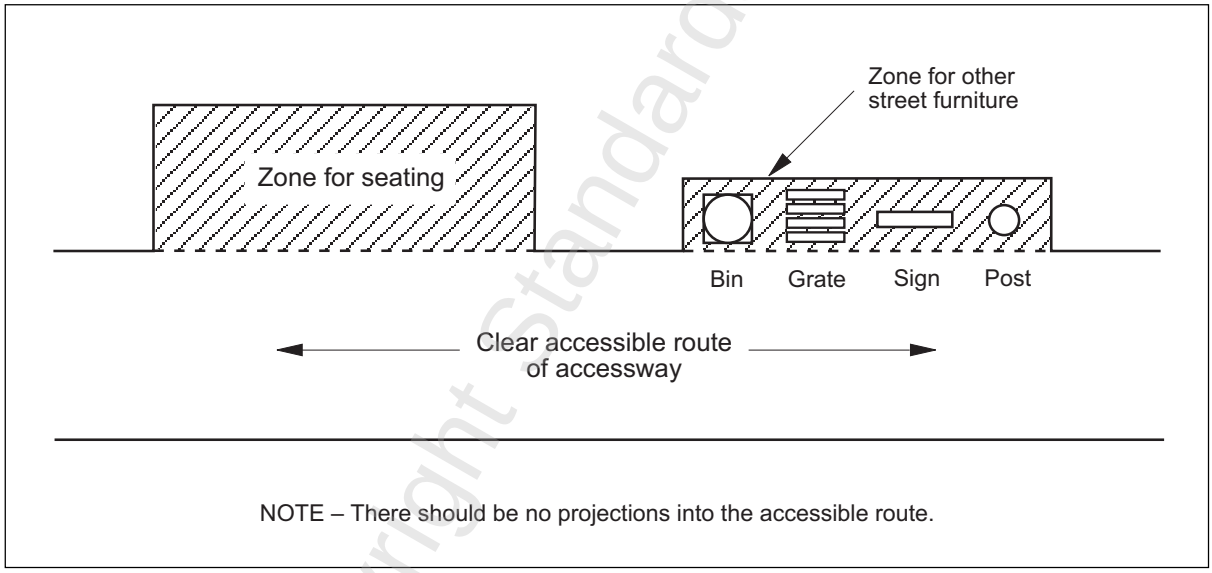


Figure 49 – Example of position of street furniture

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13.5.2 Seating in pedestrian areas

The design and installation of seating shall be as follows:

(a) The front of the seat shall have a clear space between any legs at ground level to within 150 mm of the front edge of the seat, and to within 100 mm of the seat height to allow for rearward adjustment of feet when rising (see figure 50);

(b) Where armrests are provided, the top surface of the armrests shall be at a height of 260 ±40 mm above the seat.

13.5.3 Car parks

13.5.3.1 Signs

Figure 4 shows the preferred wording for signs in public parking buildings and public streets monitored by parking wardens.

13.5.3.2 Car park size

The provisions of 5.5 of this Standard apply.

13.5.3.3 Surface

The provisions of 5.6 of this Standard apply.

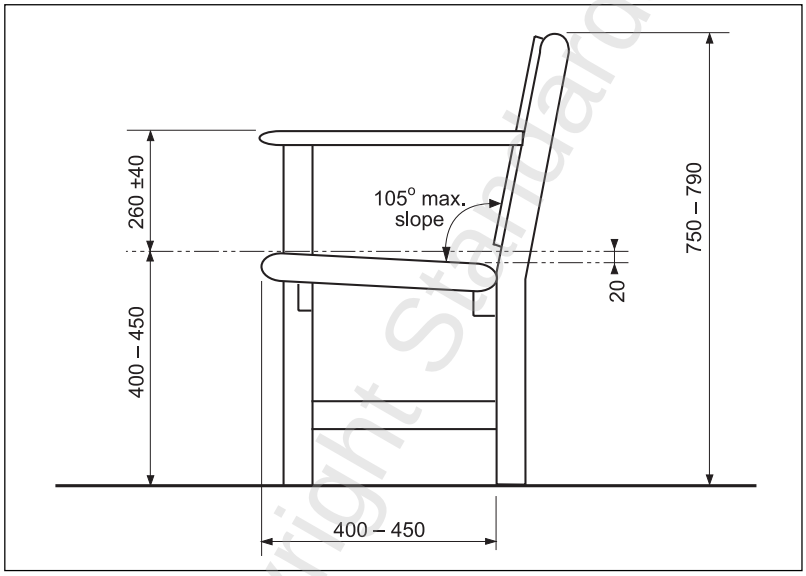


Figure 50 – Typical park bench seating

C13.5.2

(a) Seats should generally be 450 mm high but where a high proportion of elderly users are anticipated, heights up to 520 mm are preferred. Children and small people may prefer seats as low as 350 mm high. Where possible, a range of seat heights should be provided;

(b) A typical park bench is shown in figure 50;

(c) For outdoor tables, see Clause 24, AS 1428.2;

(d) Armrests should be provided for all seats;

(e) The front edge of the seat shall have a minimum radius of 30 mm;

(f) No edge or projection shall have a radius of less than 5 mm unless protected from contact with the user;

(g) The seat shall drain free of water.

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14 ACCESSIBLE ACCOMMODATION

14.1 Scope

This section covers accommodation for people with disabilities. Some of the topics go beyond the requirements of the New Zealand Building Code, refer to 1.4.5.1. The information also has application for the design of private dwellings for people with disabilities.

14.2 Application

The type of accommodation to which this section applies is defined in section 47A(4)(j) of the Building Act 1991 as: Hotels, motels, hostels, halls of residence, holiday cabins, groups of pensioner flats, boarding houses, guest houses, and other premises providing accommodation to the public. Section 4(k) also identifies old people's homes.

14.3 General

Accommodation that is intended to be used by people with disabilities shall be built and fitted-out in a manner that meets their needs and in compliance with the minimum requirements of this Standard.

14.4 Access

Accessible accommodation shall be on an accessible route.

14.4.1 Lifts

Lifts are not required in two and three storey hotels and motels provided that the accessible accommodation units, reception office, restaurant, bars and other communal facilities are on the ground floor.

14.5 Accessible accommodation units

C14.5.1

In open communal accommodation with no discrete units, it is suggested that every 4 – 6 people constitute a 'unit', and accessible toilet/shower/ washing facilities are provided according to table 2.

14.5.1 Accommodation units

Under this Standard:

(a) In motels each self-contained unit is an accommodation unit;

(b) In a hotel, each room or suite of rooms that is intended for one person or family is an accommodation unit;

(c) In dormitory accommodation where each bedroom holds 4 – 6 people, then each bedroom is an accommodation unit.

14.5.2 Number of accessible accommodation units

The minimum number of accessible accommodation units shall comply with table 2.

Table 2 – Number of accessible units

Total number of accommodation units or total number of cabins, tent sites or caravan parks	Number of accessible accommodation units
1 – 10 11 – 25 For every 25 units thereafter	1 2 Add 1 unit

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14.6 Arrival and departure

14.6.1 Car parks

A clearly marked reserved accessible parking space at the main accessible entrance shall be provided to assist the process of booking in and booking out.

14.6.2 Reception

Hotel and motel patrons with disabilities shall be able to register and book out at reception with the same convenience as the other guests and the counter shall be usable by people with disabilities (refer to 11.1).

14.6.3 Public and guest areas

The public reception area shall be on an accessible route.

There shall be no internal steps on the accessible route.

C14.6.3

These requirements enable guests with disabilities to move easily to and through the building to guest rooms, bars, dining room, swimming pools, spas, hair salons, shops, conference and function rooms.

14.6.4 Telephones

There shall be at least one telephone in a public area within easy reach of a person in a wheelchair (refer to 11.2).

C14.6.4

A seat located near to the telephone should be provided for ambulant people with disabilities.

14.6.5 Toilets

In a hotel or motel complex at least one accessible toilet shall be available in public areas of the complex for the use of hotel guests, casual patrons and staff.

At least one accessible toilet unit shall be provided for restaurant and bars.

14.6.6 Alerting devices

Alerting devices shall be provided on accessible routes and in accessible accommodation, refer to 4.12. Where the installation of an automatic fire alarm system is required, an alerting device shall be installed within every accessible accommodation unit. In all cases this alerting device shall be located within the unit in a position clearly visible from the bed or beds and have an audible and visible signal.

14.7 Accessible accommodation

14.7.1 General

Accessible accommodation requires consideration of the needs of the blind, the partially sighted, the deaf and hearing impaired, and of wheelchair users. The placing of controls, the use of bench tops, appliances etc. and the provision of adequate circulation space in all rooms are items to which the designer should give particular attention. Whatever kitchen facilities are to be provided, they shall be accessible as described below.

C14.7.1

A doorbell with flashing internal lights will enable a person with a hearing disability to know that someone is requesting access.

Information on zones of reach for wheelchair users is to be found in Appendix D. (Figures D12 and D13).

All fittings should contrast with their background.

14.7.2 Car parks

There shall be at least one accessible car park for each accessible accommodation unit based on the following:

(a) The ratio of accessible car parks to total car parks shall be the same ratio as accessible accommodation units to total units;

(b) One accessible car park space for each accessible accommodation unit located as close as practicable to each unit and on an accessible route to that unit.

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14.7.3 Doors

Doors and their catches shall comply with 4.11.

14.7.4 Kitchens and laundries

The facilities of kitchens and laundries shall be accessible having a clear floor space of 1500 mm x 1500 mm. Each item shall be within reachable range, refer Appendix D. Front loading washing machines and driers require 1500 mm clear front space.

14.7.4.1 Space dimensions

Minimum space dimensions are illustrated in figure 51.

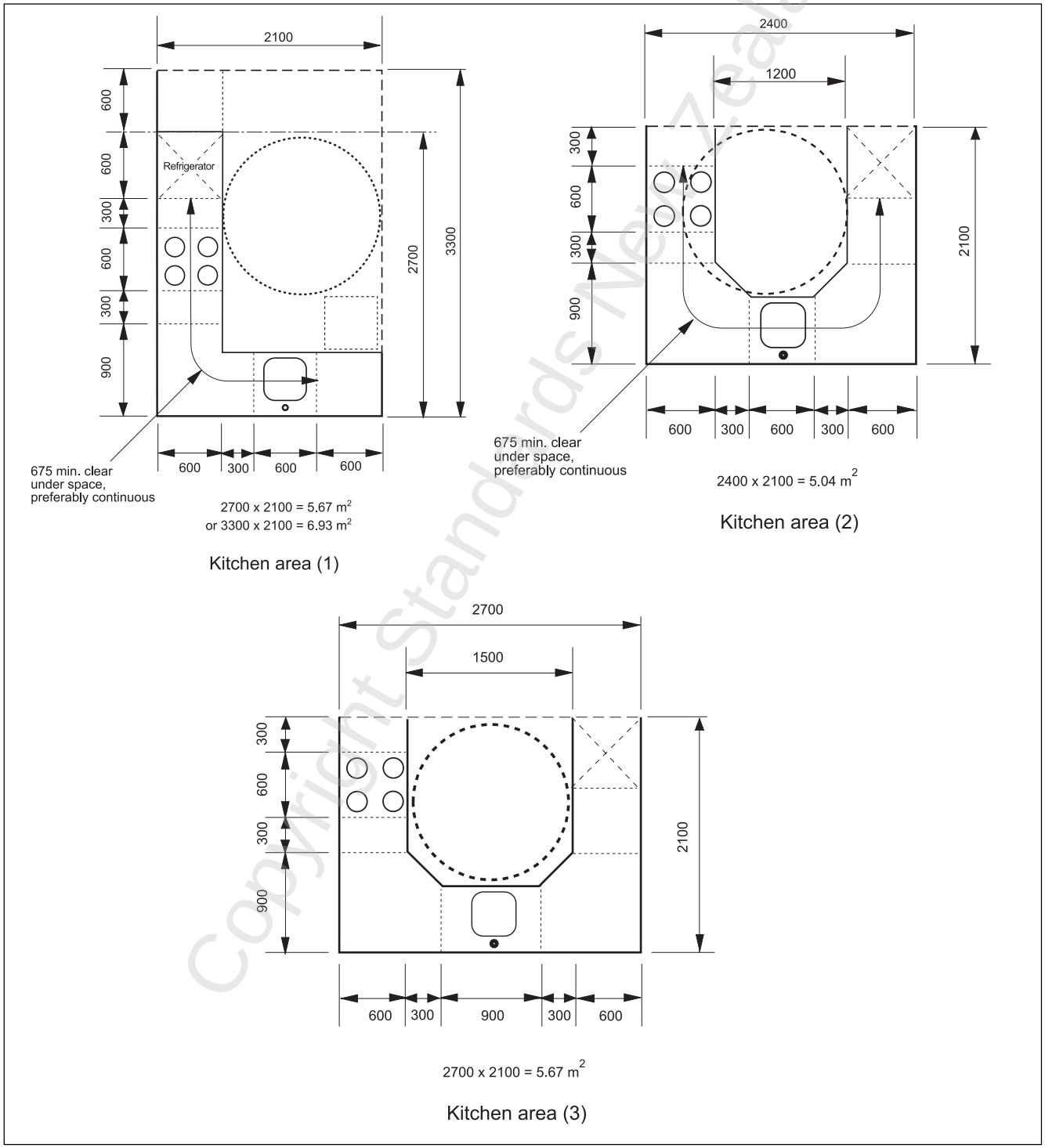


Figure 51 – Example of kitchen layout and dimensions

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14.7.4.2 Work surfaces

Work surfaces shall:

(a) Be at a consistent level and have an uninterrupted flow;

The user should be able to slide goods along the surfaces.

(b) Be heat-resistant, where it is necessary to slide hot utensils along work surfaces;

(c) Include a clear "set-down" space next to the oven cooktop, refrigerator and dishwasher;

(d) Be smooth for easy cleaning;

(e) Be of a non-glare finish;

(f) Be a lighter colour than that of the vertical surfaces. The luminance factor of the vertical surface shall be not less than 0.3 (30 %) different from surrounding horizontal surface and the surface finished with a contrasting edge strip.

(g) For people who are partially sighted, horizontal surfaces need to be easily distinguished from vertical surfaces. Fittings should contrast with their background.

(h) Be set with the top surface at a height of 775 maximum and 675 minimum clear under space from the finished floor;

(i) Have at least one work surface with a clear width opening beneath the surface of not less than 900 mm to allow for a front approach by a wheelchair.

C14.7.4.2

Some ambulant people with disabilities prefer to work while seated on a stool. Consideration should therefore be given to this when determining bench height.

Where pull-out work surfaces are provided, e.g. as a set-down beside a stove, they should be fitted with handles and heat-resistant surfaces. A stop should be incorporated to ensure that shelves cannot accidentally be pulled right out.

14.7.4.3 Sinks

Sinks shall have a maximum bowl depth of 150 mm.

The clearance underneath shall comply with the requirements for washbasins (refer to 10.5.8.2). The underside of the sink bowl, exposed pipes, taps and fittings shall be insulated to avoid burns.

C14.7.4.3

A shallow sink is essential for users in wheelchairs and for short people.

14.7.4.4 Taps

Taps shall be easily operated by a person with limited hand function; (refer to 10.5.8.2).

C14.7.4.4

Wherever practicable, taps operating on the principle of a ball valve using synthetic rubber or ceramic or hydraseal type of washers should be used. These are generally easier to turn on and off, have a maintenance-free life and are easy to replace.

14.7.4.5 Ovens

Wall ovens, where provided, shall:

(a) Have a door which on opening, does not obstruct access;

The drop-down type of oven door that does not slide away is not recommended as it limits reach for wheelchair users.

(b) Be installed so that the bottom shelf is on approximately the same level as the adjacent work surface;

If a side-hinged oven door is used, the clear worktop should be on the opposite side to the hinges, see figure 52.

(c) Have controls situated within the zone of common reach shown, see figure 52 and figures D14, D15 and D17;

(d) Be easy to operate by the intended user and clearly marked;

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(e) Have a light and a timer.

For people with vision impairments, tactile indicators shall be provided on all controls.

14.7.4.6 Cooktops

Cooktops, where provided, shall:

(a) Be flush or as close to flush as possible with the adjacent heat-resistant benchtops;

(b) Have countertop controls;

(c) Be positioned away from trafficable areas within the kitchen;

(d) Have automatic ignition on gas burners;

(e) For people with vision impairment have tactile markings on all controls.

14.7.4.7 Range hood

A range hood with an external exhaust is preferred to a recirculating type that requires regular filter changes.

14.7.4.8 Storage

Storage shall comply with the following:

(a) Shelves, cupboards and drawers shall be designed and installed to allow the user to work in an organized manner, refer also to Appendix D, figures D13 to D18;

People who are blind or partially sighted need to be able to lay hands on the right implements and cooking ingredients safely and quickly.

(b) Cupboard and drawer handles shall be:

(i) Able to accommodate the reach ranges in figures D13 and D18;

(ii) Shaped to provide easy grip for those with manipulative impairment;

(iii) Clearly identified by colour with a luminance contrast to the background of not less than 0.3 (30 %).

(c) Clothes-hanging rods or hooks, set at a maximum of 1350 mm from the floor, shall be provided for wheelchair users (see figure D16).

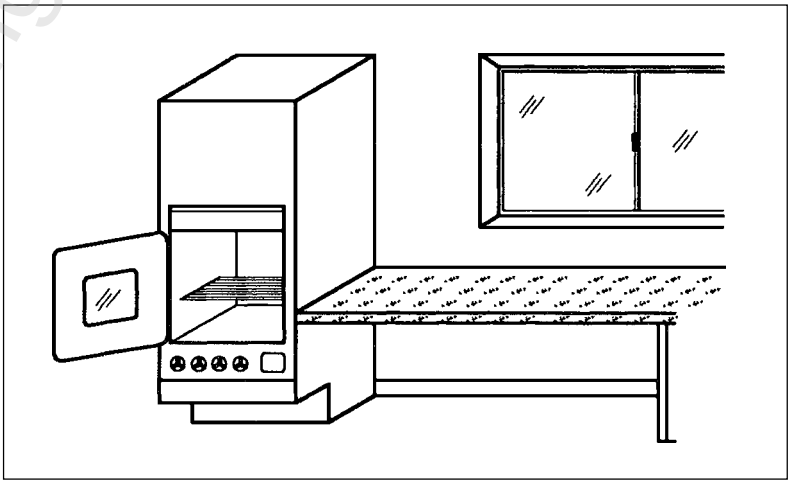


Figure 52 – Oven with worktop to allow for set-down

C14.7.4.8

Drawers or slide-out wire baskets are preferred, rather than large open cupboards.

Rotating shelves, which have a lip of not less than 5 mm, are preferred for corners.

Mobile storage units provide an efficient and practical method of storage in the kitchen. Mobile storage units can be kept in knee spaces below the preparation benches. The units can be moved to give more preparation space yet allow positioning close to meal preparation areas where utensils can be accessed easily.

Sliding doors should be fitted with stops so that the door stops a minimum distance of 50 mm from the door handle.

Handles should be easily grippable by people with impaired hand function.

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14.7.4.9 Benches

Corners of benches shall be rounded to reduce the risk of injury.

'Toe' recesses 250 – 300 mm high shall be provided along the front of all benches.

14.7.4.10 Refrigerator

A refrigerator shall be accessible (see figure 51).

The clear worktop space alongside a refrigerator shall be on the side opposite to the hinge of the door.

14.7.4.11 Dishwasher

Dishwashers, where provided, shall be installed close to the sink and crockery and cutlery storage areas.

14.7.4.12 Laundry tubs

Where laundry tubs are provided, at least one shall be installed at the height above floor level and with a clearance underneath that is in accordance with the requirements for washbasins, refer to 10.5.8 and NZBC G2/AS1.

C14.7.4.12

These requirements are particularly for users in wheelchairs:

(a) Consideration may be given to installing a kitchen sink rather than a deep standard-sized laundry tub;

(b) The tub should be accessible from the front. If it is not practical to provide knee access below laundry tubs, planning may allow for a parallel approach rather than a frontal approach.

14.7.4.13 Washing machine and dryer

Where washing machines are provided, at least one front-loading machine shall be available with controls clearly marked and easy to operate.

C14.7.4.13

Soft touch controls are preferred, located within a reachable range (see figures D14, D15 and D17).

Plumbing outlets for washing machines should be permanently fixed.

14.7.4.14 Shelves

Where shelving is provided, it shall be within a reachable range (see figures D16 and D17).

C14.7.4.14

Adjustable shelving is useful so that the space can be arranged to suit the individual.

14.7.4.15 Ironing board

Where an ironing board is provided, it shall be securely fixed, dropdown or hinged, with sufficient manoeuvring space.

C14.7.4.15

Portable ironing boards are often unsteady and difficult to erect.

14.7.4.16 Clothes-line

Where a clothes-line is installed, it shall be on an accessible route.

It shall be usable by people who are either standing or seated and shall be installed so that its operating height is between 1000 mm and 1600 mm from the ground surface.

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14.7.4.17 Power outlets

Switches for electric light and power shall comply with the following requirements:

(a) All light switches shall be horizontally aligned with door handles, except that at least one room light shall have a bedside switch;

(b) The toggle, rocker, push pad, or push button control of light switches shall project clear of the switch plate;

(c) Socket outlets shall be fixed between 500 mm and 1200 mm above the finished floor level and at least 500 mm from corners;

(d) Switches and socket outlets shall contrast in colour to their surroundings.

14.7.4.18 Lighting

Lighting shall comply with 4.10.3.

14.7.4.19 Dining and lounge space dimensions

Minimum space dimensions for dining and lounge rooms are shown in figure 53.

14.7.5 Bedrooms

14.7.5.1 Minimum space dimensions

Minimum space dimensions for bedrooms are shown in figure 54.

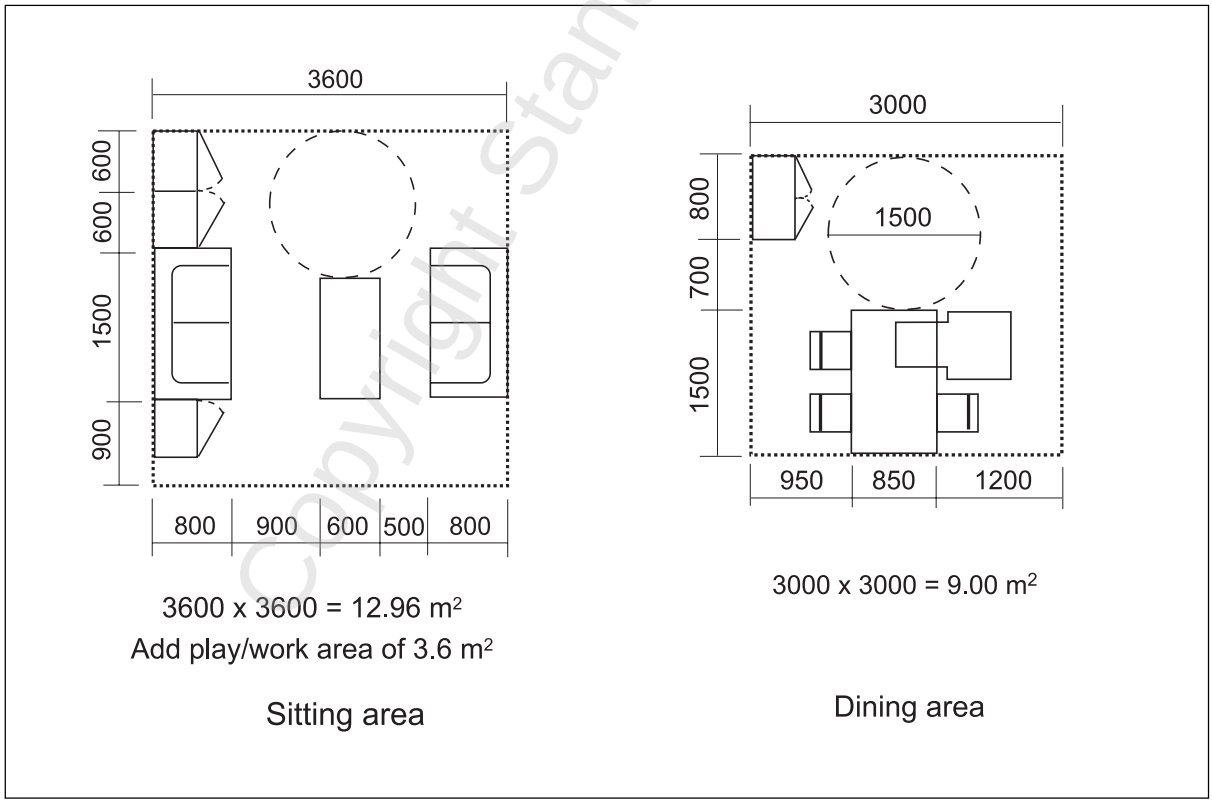


Figure 53 – Example of dining and lounge layout and dimensions

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14.7.5.2 Access to facilities

People with disabilities shall be able to move freely around the bed and shall be able to reach the:

(a) Tea/coffee making facilities;

(b) Door handles;

(c) Light switches;

(d) Curtain pull cords;

(e) Wardrobe rail;

(f) Extra pillows and blankets;

(g) Telephone;

(h) Television and radio controls.

Telephones in accessible units shall be adjacent to a bed and be located on that side of the bed to which there is wheelchair access.

14.7.6 Wall and floor finishes

Floor surfaces shall be easy to maintain and slip-resistant when wet or dry.

14.7.7 Bathroom/toilet/shower

The toilet/shower aspects of a bathroom/toilet/shower unit in accessible accommodation shall meet the requirements for accessible toilets and showers of section 10.

C14.7.7

The general principle of being able to reach items such as a towel rail, hairdryer, shaving point and a bathroom heater shall apply. Mirrors should be placed at usable heights (see figure 31).

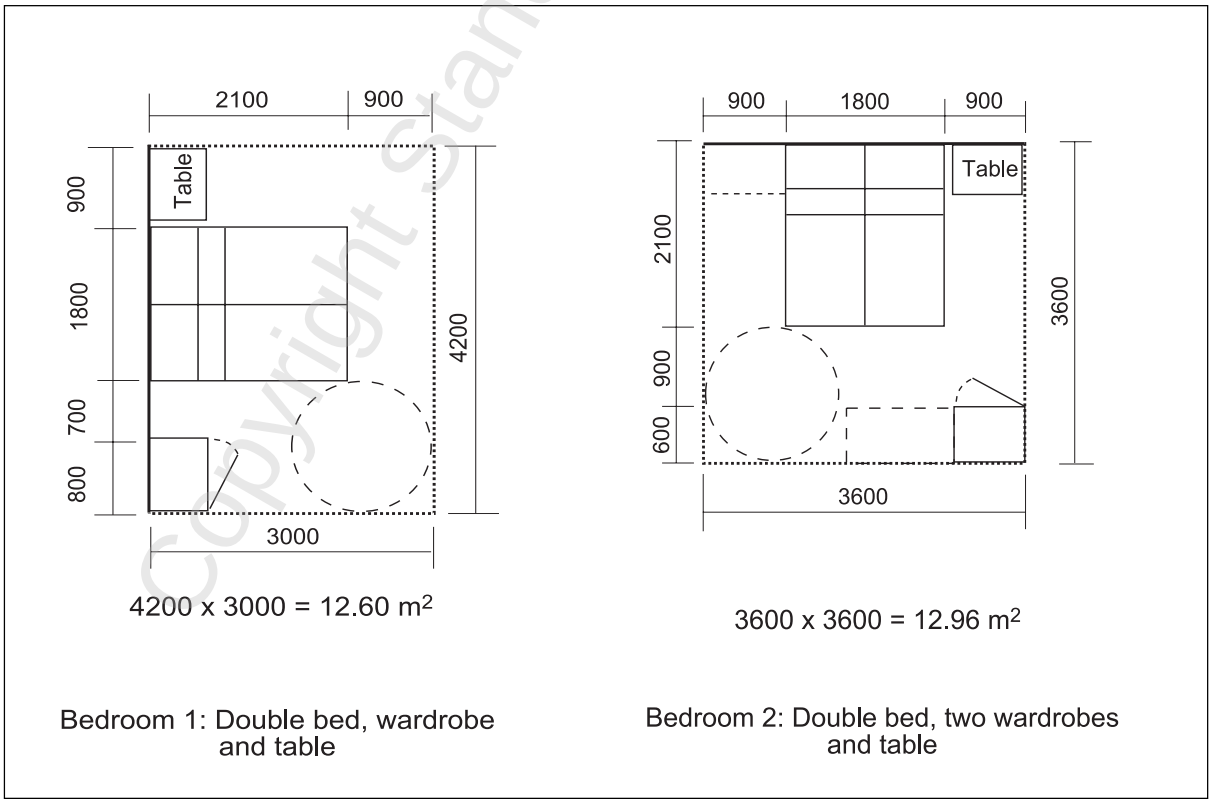


Figure 54 – Example of bedroom layout and dimensions

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14.7.8 Motor camps, camping grounds, holiday parks, resorts, backpackers, lodges and hostels, etc.

14.7.8.1 Car parks

One car parking space shall be provided for each accessible unit, immediately adjacent wherever possible.

14.7.8.2 Accessible units

Accessible units shall be connected to the communal facilities by an accessible route.

14.7.8.3 Toilet/showers

Where an ablution block contains communal toilet and bathroom facilities all-gender combined toilet, hand basin, and shower shall be provided in accordance with table 3.

Table 3 – Number of toilets

Users	All-gender facility
1 – 100	1
101 – 300	2
300 or more	3

14.7.8.4 Communal facilities

All communal facilities including reception, office, shop, dining room, kitchen, laundry, ablution block and recreation rooms shall be usable areas connected to an accessible route.

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APPENDIX

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APPENDIX A
STATUTORY OBLIGATIONS RELATING TO ACCESS AND BUILDING
(Informative)

A1 Scope
This Appendix covers legislation that has a direct effect on the provision of access and facilities for people with disabilities.

A2 Purpose
The Appendix is intended to draw to the attention of designers, building owners and territorial councils the obligations laid down by New Zealand law when designing a building or operating a building.

A3 Building Act 1991
The Building Act in its purpose section 6(2)(e) refers to the need to:

"Provide, both to and within buildings to which section 47A of this Act applies, means of access and facilities that meet the requirements of that section to ensure that reasonable and adequate provision is made for people with disabilities to enter and carry out normal activities and processes in those buildings."

A3.1 Obligations of building owner and designer
The full text of the access requirement in section 47A of the Building Act 1991 is:

"47A. ACCESS AND FACILITIES FOR PERSONS WITH DISABILITIES TO AND WITHIN BUILDINGS –

(1) In any case where provision is being made for the construction or alteration of any building to which the public are to be admitted, whether on payment or otherwise, reasonable and adequate provision by way of access, parking provisions, and sanitary conveniences, shall be made for persons with disabilities who may be expected to visit or work in that building and carry out normal activities and processes in that building.

"(2) Notwithstanding the provisions of subsection (1) of this section, in respect of the alteration of any existing building or premises, the Building Industry Authority may at any time by determination under Part III of this Act provide for a waiver or modification from all or any of the requirements of this section if, having regard to all the circumstances, the Building Industry Authority determines that it is reasonable to grant the waiver or modification.

"(3) Any provision that is made to meet the requirements of disabled persons in accordance with New Zealand Standard Specification No 4121 (being the code of practice for design for access and use of buildings by persons with disabilities) and any amendments thereof (whether made before or after the commencement of this subsection), or in accordance with any standard specification that is in substitution therefor, shall, in respect of matters subject to this Act, be deemed to be one of the documents establishing compliance with the building code for the purposes of section 49 of this Act.

"(4) The provisions of this section shall apply to, but shall not be limited to, buildings, and parts of buildings, (including driveways, accessways, and passages within and between complexes and developments, and associated

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landscaping, if any) that are intended to be used for or associated with one or more of the following purposes:

(a) Land, sea, and air passenger transport terminals and facilities and interchanges, whether wholly on land or otherwise:

(b) Public toilets wherever situated:

(c) Banks:

(d) Childcare centres and kindergartens:

(e) Day-care centres and facilities:

(f) Commercial buildings and premises for business and professional purposes, including computer centres:

(g) Central, regional, and local government offices and facilities:

(h) Courthouses:

(i) Police stations:

(j) Hotels, motels, hostels, halls of residence, holiday cabins, groups of pensioner flats, boarding-houses, guest houses, and other premises providing accommodation for the public:

(k) Hospitals, whether public or private, nursing homes, and old people's homes:

(l) Medical and dental surgeries, and medical and paramedical and other primary health care centres:

(m) Educational institutions, including public and private primary, intermediate, and secondary schools, universities, polytechnics, and other tertiary institutions:

(n) Libraries, museums, art galleries, and other cultural institutions:

(o) Churches, chapels, and other places of public worship:

(p) Places of assembly, including auditoriums, theatres, cinemas, halls, sports stadiums, conference facilities, clubrooms, recreation centres, and swimming baths:

(q) Shops, shopping centres, and shopping malls:

(r) Restaurants, bars, cafeterias, and catering facilities:

(s) Showrooms and auction rooms:

(t) Public laundries:

(u) Petrol and service stations:

(v) Funeral parlours:

(w) Television and radio stations:

(x) Car parks, parking buildings, and parking facilities:

(y) Factories and industrial buildings where more than 10 persons are employed:

(z) Other buildings, premises, or facilities to which the public are to be admitted, whether on payment or otherwise.

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"(5) Where any provision required by this section is made at a building in compliance therewith, a notice or sign that indicates in accordance with the international access symbol that provision is made for the needs of persons with disabilities shall be displayed outside the building or so as to be visible from outside it.

"(6) For the purposes of this section, the term "person with a disability" means any person who suffers from physical or mental disability to such a degree that he or she is seriously limited in the extent to which he or she can engage in the activities, pursuits, and processes of everyday life."

A3.2 Obligations of the Crown

Section 5 of the Building Act 1991 binds the Crown.

A4 Obligations of the Council

A4.1 Footpaths and channels

The Council shall provide safe and easy passage for people with disabilities from kerb to kerb of any road.

Section 331 of the Local Government Act 1974 provides:

"(1) [ ]The council may, in such manner as it thinks fit, form [[or upgrade]] footpaths on one side or both sides of any road, and may construct those footpaths of such dimensions and of such materials and in such manner as it thinks fit, and may impose a charge not exceeding half the cost of those works upon the owners of lands and buildings fronting the road. The amount so imposed shall be payable to the council and until paid shall be in every case a charge on the land.

"(2) In forming or reforming any road or part thereof (not being a road in a rural area), the council shall ensure that reasonable and adequate provision is made for the kerb and channel of any footpath or part thereof to be formed or reformed so as to permit safe and easy passage from kerb to kerb of any mechanical conveyance normally and lawfully used by a disabled person:

"Provided that the [Director of Land Transport Safety] may at any time exempt in whole or in part the forming or reforming of any road or part thereof from any requirements of this subsection, if, having regard to all circumstances, he considers that it is reasonable to grant the exemption."

A4.2 Alterations and changes of use

Section 38 of the Building Act states that:

"No building consent shall be granted for the alteration of an existing building unless the territorial authority is satisfied that after the alteration the building will –

(a) Comply with the provisions of the building code for means of escape from fire, and for access and facilities for use by people with disabilities (where this is a requirement in terms of section 47A of this Act), as nearly as is reasonably practicable, to the same extent as if it were a new building; and

(b) Continue to comply with the other provisions of the building code to at least the same extent as before the alteration."

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When processing a Building Consent, Section 34(7) of the Building Act also prohibits territorial authorities from granting a waiver or modification of the Building Code, or any document intended for use in establishing compliance with the Building Code, relating to access and facilities for people with disabilities. (Also refer section 47A(2) in A3.1 of this Appendix).

Similar provisions apply with respect to the changes of use of buildings under section 46 of the Building Act.

"Change of use of buildings, etc.—

"(1) It is the duty of an owner of a building to advise the territorial authority in writing if it is proposed–

(a) To change the use of a building and the change of use will require alterations to the building in order to bring that building into compliance with the building code; or

(b) To extend the life of a building that has a specified intended life in terms of section 39 of this Act.

"(2) The use of the building shall not be changed unless the territorial authority is satisfied on reasonable grounds that in its new use the building will –

(a) Comply with the provisions of the building code for means of escape from fire, protection of other property, sanitary facilities, and structural and fire-rating behaviour, and for access and facilities for use by people with disabilities (where this is a requirement in terms of section 47A of the Building Act) as nearly as is reasonably practicable to the same extent as if it were a new building; and

(b) Continue to comply with the other provisions of the building code to at least the same extent as before the change of use.

"(4) Where a territorial authority is required to consider an application for the issue of a certificate pursuant to section 224 (f) of the Resource Management Act 1991 for the purpose of giving effect to a subdivision which affects a building or any part thereof, the territorial authority shall only issue that certificate if it is satisfied on reasonable grounds that the building will –

(a) Comply with the provisions of the building code for means of escape from fire, protection of other property, and access and facilities for use by people with disabilities (where this is a requirement in terms of section 47A of the Building Act) as nearly as is reasonably practicable to the same extent as if it were a new building; and

(b) Continue to comply with the other provisions of the building code to at least the same extent as before the application for a subdivision affecting that building or part thereof was made."

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A5 Human Rights Act 1993

Section 43(3) states that:

"Nothing in subsection (2) of this section limits the provisions of section 47A of the Building Act 1991."

A6 Resource Management Act 1991

The Second Schedule to the Resource Management Act 1991 covers matters that may be provided for in Policy Statements and Plans. It provides in both Part I (Matters related to Regions) and Part II (Matters related to Districts) for the inclusion of any matter relating to the management of any actual or the potential effects of any use, development or protection described in Parts I and II of the Schedule on the community or any group within the community (including minorities, children and disabled people).

A7 Fire Safety (Evacuation of Buildings) Regulation 1992

Regulation 21 of the Fire Safety (Evacuation of Buildings) Regulation 1992 provides that:

"No problems of fire safety and evacuation from a building shall be a cause to limit or prevent any person with disabilities from entering or carrying out normal activities and processes within the building, or any part of it, which the person would otherwise be permitted to enter or use."

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APPENDIX B
PERFORMANCE REQUIREMENTS OF THE NEW ZEALAND BUILDING CODE RELATING TO ACCESS AND FACILITIES FOR PEOPLE WITH DISABILITIES

(Informative)

B1 Scope

This Appendix covers the performance requirements of the New Zealand Building Code relating to access and facilities for people with disabilities.

B2 Building Regulations 1992

The Building Code in the First Schedule to the Building Regulations 1992 prescribes the objectives together with the functional requirements for buildings and the performance criteria with which buildings must comply in their intended use.

The objectives in respect of access and facilities for people with disabilities is to ensure that they are able to carry out normal activities, functions and processes within buildings as required by section 47A (previously Section 25 of the DPCW Act 1975) of The Building Act with respect to people with disabilities includes the objectives, functional requirements and performance criteria described below.

The 'performance requirements' of the Code clauses related to specific building matters must be complied with, whereas the 'functional requirements' are present essentially to define the purpose and scope of the performance requirements.

B3 Performance objectives

The parts of the Building Code clauses quoted below are those with specific provisions for people with disabilities.

NOTE – All words in the following section that are in italics are defined in the New Zealand Building Code Handbook.

Provisions	Limits on application
Clause D1 – ACCESS ROUTES	
OBJECTIVE	
D1.1 The objective of this provision is to:	
(a) Safeguard people from injury during movement into, within and out of *buildings*,	
(b) Safeguard people from injury resulting from the movement of vehicles into, within and out of *buildings*, and	
(c) Ensure that *people with disabilities* are able to enter and carry out normal activities and functions within *buildings*.	Objective D1.1(c) shall apply only to those *buildings* to which section 47A of the Building Act 1991 applies.
FUNCTIONAL REQUIREMENT	
D1.2.1 *Buildings* shall be provided with reasonable and adequate access to enable safe and easy movement of people.	Requirement D1.2.1 shall not apply to *Ancillary buildings* or *Outbuildings*.
D1.2.2 Where a *building* is provided with loading or parking spaces, they shall be constructed to permit safe and easy unloading and movement of vehicles, and to avoid conflict between vehicles and pedestrians.	

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Provisions	Limits on application
PERFORMANCE	
D1.3.2 At least one *access route* shall have features to enable *people with disabilities* to:	Performance D1.3.2 shall not apply to *Housing, Outbuildings, Ancillary buildings*, and to *Industrial buildings* where no more than 10 people are employed.
(a) Approach the *building* from the street boundary or, where required to be provided, the *building* car park,	
(b) Have access to the internal space served by the principal access, and	
(c) Have access to and within those spaces where they may be expected to work or visit, or which contain facilities for personal hygiene as required by Clause G1 "Personal Hygiene".	
D1.3.3 Access routes shall:	
(a) Have *adequate* activity space,	
(b) Be free from dangerous obstructions and from any projections likely to cause an obstruction,	
(c) Have a safe cross fall, and safe slope in the direction of travel,	
(d) Have *adequate* slip-resistant walking surfaces under all conditions of normal use,	
(e) Include stairs to allow access to upper floors irrespective of whether an escalator or lift has been provided,	
(f) Have stair treads, and ladder treads or rungs which: (i) provide *adequate* footings, and (ii) have uniform rise within each flight and for consecutive flights,	
(g) Have stair treads with a leading edge that can be easily seen,	
(h) Have stair treads which prevent children falling through or becoming held fast between treads, where open risers are used,	Performance D1.3.3(h) shall not apply within *Industrial buildings*, *Outbuildings* and *Ancillary buildings*.
(i) Not contain isolated steps,	Performance D1.3.3(i) shall not apply with *Detached Dwellings* or within *household units* of *Multi-unit Dwellings*, or to *Outbuildings* and *Ancillary buildings*.
(j) Have smooth, reachable and graspable *handrails* to provide support and to assist with movement along a stair or ladder,	Performance D1.3.3(j) shall not apply to isolated steps.
(k) Have *handrails* of *adequate* strength and rigidity as required by Clause B1 "Structure",	
(l) Have landings of appropriate dimensions and at appropriate intervals along a stair or ramp to prevent undue fatigue,	
(m) Have landings of appropriate dimensions where a door opens from or onto a stair, ramp or ladder so that the door does not create a hazard, and	
(n) Have any automatically controlled doors *constructed* to avoid the risk of people becoming caught or being struck by moving parts.	

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Provisions	Limits on application

D1.3.4 An *accessible route*, in addition to the requirement of Clause D1.3.3, shall:

(a) Be easy to find, as required by Clause F8 "Signs",

(b) Have *adequate* activity space to enable a person in a wheelchair to negotiate the route while permitting an ambulant person to pass,

(c) Include a lift complying with Clause D2 "Mechanical Installations for Access" to upper floors where:

(i) *buildings* are four or more storeys high,

(ii) *buildings* are three storeys high and have a total design occupancy of 50 or more persons on the two upper floors,

(iii) *buildings* are two storeys high and have a total design occupancy of 40 or more persons on the upper floor, or

(iv) an upper floor, irrespective of design occupancy, is to be used for the purposes of public reception areas of banks, central, regional and local government offices and facilities, hospitals, medical and dental surgeries, and medical, paramedical and other primary health care centres,

(d) Contain no thresholds or upstands forming a barrier to an unaided wheelchair user,

(e) Have means to prevent the wheel of a wheelchair dropping over the side of the *accessible route*,

(f) Have doors and related hardware which are easily used,

(g) Not include spiral stairs, or stairs having open risers,

(h) Have stair treads with a leading edge which is rounded, and

(i) Have *handrails* on both sides of the *accessible route* when the slope of the route exceeds 1 in 20. The *handrails* shall be continuous along both sides of the stair, ramp and landing except where the *handrail* is interrupted by a doorway.

D1.3.5 Vehicle spaces and circulation routes shall have:

(a) Dimensions appropriate to the *intended use*,

(b) Appropriate crossfall, and slope in the direction of travel,

(c) *Adequate* queuing and circulation space, and

(d) *Adequate* sight distances.

D1.3.6 Vehicle spaces for use by *people with disabilities*, shall, in addition to the requirements of Clause D1.3.5, be:

(a) Provided in sufficient numbers,

(b) Located to avoid conflict between vehicles and people using or moving to or from the space, and

(c) Easy to find as required by Clause F8 "Signs".

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Provisions	Limits on application
Clause D2 – MECHANICAL INSTALLATIONS FOR ACCESS	
OBJECTIVE	
D2.1 The objective of this provision is to:	
(a) Safeguard people from injury and loss of amenity while using mechanical installations for movement into, within and out of *buildings*,	
(b) Safeguard maintenance personnel from injury while servicing mechanical installations for access, and	
(c) Ensure that *people with disabilities* are able to carry out normal activities and processes within *buildings*.	Objective D2.1(c) shall apply only to those buildings to which section 47A of the Building Act applies.
FUNCTIONAL REQUIREMENT	
D2.2 Mechanical installations for access into, within and out of *buildings* shall provide for the safe and easy movement of people, and for the safety of maintenance personnel.	
PERFORMANCE	
D2.3.5 Mechanical installations on *accessible routes* shall:	
(a) Where the passenger conveyor is manually controlled, provide:	
(i) controls which are easily identifiable and easy to use,	
(ii) *adequate* notification that the passenger conveyor has registered a summoning call, and	
(iii) *adequate* notification that the passenger conveyor has arrived, and of its future direction of travel,	
(b) Where the passenger conveyor is fully enclosed and serves more than two levels, provide an *adequate* means of informing occupants of their location,	
(c) Where appropriate, have doors which:	
(i) are power operated,	
(ii) are readily distinguishable from their surroundings, and	
(iii) where automatic, remain open sufficiently long to enable *people with disabilities* to pass through, and	
(d) Have *handrails* within the passenger conveyor.	
Clause F8 – SIGNS	
OBJECTIVE	
F8.1 The objective of this provision is to:	
(a) Safeguard people from injury or illness resulting from inadequate identification of *escape routes*, or of hazards within or about the *building*,	
(b) Safeguard people from loss of *amenity* due to inadequate direction, and	

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Provisions	Limits on application
(c) Ensure that *people with disabilities* are able to carry out normal activities and processes within *buildings*.	Objective F8.1(c) shall apply only to those *buildings* to which section 47A of the Building Act 1991 applies.
FUNCTIONAL REQUIREMENT	
F8.2 Signs shall be provided in and about *buildings* to identify:	Requirement F8.2 shall not apply to *Detached Dwellings*, or within *household units* of *Multi-unit Dwellings*.
(a) Escape routes,	
(b) Emergency related safety features,	
(c) Potential hazards, and	
(d) Accessible routes and facilities for *people with disabilities*.	
PERFORMANCE	
F8.3.1 Signs shall be clearly visible and readily understandable under all conditions of foreseeable use.	
F8.3.2 Signs indicating potential hazards shall be provided in sufficient locations to notify people before they encounter the hazard.	
F8.3.3 Signs to facilitate escape shall:	
(a) Be provided in sufficient locations to identify *escape routes* and guide people to a *safe place*, and	
(b) Remain visible in the event of a power failure of the main lighting supply, for the same duration as required by Clause F6 'Lighting for Emergency'.	
F8.3.4 Signs shall be provided in sufficient locations to identify *accessible routes* and facilities provided for *people with disabilities*.	
Clause G1 – PERSONAL HYGIENE	
OBJECTIVE	
G1.1 The objective of this provision is to:	
(a) Safeguard people from illness caused by infection or contamination,	
(b) Safeguard people from loss of *amenity* arising from the absence of appropriate personal hygiene facilities, and	
(c) Ensure *people with disabilities* are able to carry out normal activities and processes within *buildings*.	Objective G1.1(c) shall apply only to those *buildings* to which section 47A of the Building Act 1991 applies.
PERFORMANCE	
G1.2 *Buildings* shall be provided with appropriate spaces and facilities for personal hygiene.	
G1.3.4 Personal hygiene facilities provided for *people with disabilities* shall be *accessible*.	Performance G1.3.4 shall not apply to *Housing, Outbuildings, Ancillary buildings*, and to *Industrial buildings* where no more than 10 people are employed.

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Provisions	Limits on application
Clause G2 – LAUNDERING	
OBJECTIVE	
G2.1 The objective of this provision is to ensure:	
(a) *Adequate amenities* for people to do laundering, and	
(b) That *people with disabilities* are able to carry out normal activities and processes within *buildings*.	Objective G2.1(b) shall apply only to those *buildings* to which section 47A of the Building Act 1991 applies.
FUNCTIONAL REQUIREMENT	
G2.2 *Buildings* shall be provided with *adequate* space and facilities for laundering.	Requirement G2.2 shall apply only to *Housing*, old people's homes, early childhood centres, camping grounds and work camps.
G2.3.4 *Accessible* facilities shall be provided for *people with disabilities*.	Performance G2.3.4 shall apply only to camping grounds.
Clause G3 – FOOD PREPARATION AND PREVENTION OF CONTAMINATION	
OBJECTIVE	
G3.1 The objective of this provision is to:	
(a) Safeguard people from illness due to contamination,	
(b) Enable hygienic food preparation without loss of *amenity*, and	
(c) Ensure that *people with disabilities* are able to carry out normal activities and processes within *buildings*.	Objective G3.1(c) shall apply only to those *buildings* to which section 47A of the Building Act 1991 applies.
FUNCTIONAL REQUIREMENT	
G3.2.1 *Buildings* shall be provided with space and facilities for the hygienic storage, preparation and cooking of food, that are *adequate* for the *intended use* of the *building*.	Requirement G3.2.1 shall apply to *Housing*, work camps, old people's homes and early childhood centres, and where appropriate shall also apply to *Commercial* and *Industrial buildings* whose intended uses include the manufacture, preparation, packaging or storage of food.
PERFORMANCE	
G3.3.5 Where facilities are provided for *people with disabilities* they shall be *accessible*.	Performance G3.3.5 shall apply only to camping grounds and *accessible* accommodation units in *Communal Residential buildings*.

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Provisions	Limits on application
Clause G5 – INTERIOR ENVIRONMENT	
OBJECTIVE	
G5.1 The objective of this provision is to:	
(a) Safeguard people from illness caused by low air temperature	
(b) Safeguard people from injury or loss of *amenity* caused by inadequate activity space	
(c) Safeguard people from injury caused by unsafe installations and	
(d) Ensure that *people with disabilities* are able to carry out normal activities and processes within *buildings*.	Objective G5.1(d) shall apply only to those *buildings* to which section 47A of the Building Act 1991 applies.
FUNCTIONAL REQUIREMENT	
G5.2.1 *Buildings* shall be *constructed* to provide:	
(a) An *adequate*, controlled interior temperature	Requirement G5.2.1(a) shall apply only to *habitable* spaces, bathrooms and recreation rooms in old people's homes and early childhood centres.
(b) *Adequate* activity space for the *intended use*, and	Requirement G5.2.1(b) shall apply only to old people's homes.
(c) *Accessible* spaces and facilities.	Requirement G5.2.1(c) shall apply only to *Communal Residential, Communal Non-residential*, and *Commercial buildings*.
G5.2.2 Heating appliances in *buildings* shall be installed in a way that reduces the likelihood of injury.	
PERFORMANCE	
G5.3.2 Heating appliances, and any attached cables, pipes or other fittings shall be securely fixed in place.	Performance G5.3.2 shall apply only to old people's homes and early childhood centres.
G5.3.3 *Habitable* spaces shall have sufficient space for activity, furniture, and sanitary and mobility aids.	Performance G5.3.3 shall apply only to old people's homes.
G5.3.4 Where reception counters or desks are provided for public use, at least one counter or desk shall be *accessible*.	Performance G5.3.4 applies only to *Communal Residential, Communal Non-residential*, and *Commercial buildings*.
G5.3.5 *Buildings* shall be provided with listening systems which enable enhanced hearing by people with hearing aids.	Performance G5.3.5 applies only to: (a) *Communal Non-residential* assembly spaces occupied by more than 250 people, and (b) Any theatre, cinema, or public hall, and (b) Assembly spaces in old people's homes occupied by more than 20 people.
G5.3.6 Enhanced listening systems shall be identified by signs complying with Clause F8 "Signs".	

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Provisions	Limits on application
Clause G9 – ELECTRICITY	
OBJECTIVE	
G9.1 The objective of this provision is to ensure that:	
(a) In *buildings* supplied with electricity, the *electrical installation* has safeguards against outbreak of *fire* and personal injury, and	
(b) *People with disabilities* are able to carry out normal activities and processes within *buildings*.	Objective G9.1(b) shall apply only to those *buildings* to which section 47A of the Building Act 1991 applies.
FUNCTIONAL REQUIREMENT	
G9.2 Where provided in a *building*, *electrical installations* shall be safe for their *intended use*.	
PERFORMANCE	
G9.3.4 In *buildings* intended for use by *people with disabilities*, light switches and plug socket outlets shall be *accessible* and usable.	Performance G9.3.4 shall not apply to *Housing, Outbuildings, Ancillary buildings*, and to *Industrial buildings* where no more than 10 people are employed.
Clause G12 – WATER SUPPLIES	
OBJECTIVE	
G12.1 The objective of this provision is to:	
(a) Safeguard people from illness caused by infection from contaminated water or food,	
(b) Safeguard people from injury due to the explosion of a pressure vessel or from contact with excessively hot water,	
(c) Safeguard people from loss of *amenity* arising from lack of hot water for personal hygiene, or from a water supply which is offensive in appearance or odour, and	
(d) Ensure that *people with disabilities* are able to carry out normal activities and functions within *buildings*.	Objective G12.1(d) shall apply only to those *buildings* to which section 47A of the Building Act 1991 applies.
FUNCTIONAL REQUIREMENT	
G12.2 *Buildings*, provided with drinking water outlets, *sanitary fixtures* or *sanitary appliances*, shall have a safe and *adequate* piped water supply.	
PERFORMANCE	
G12.3.8 Water supply taps shall be accessible and usable for *people with disabilities*.	Performance G12.3.8 shall not apply to *Housing, Outbuildings, Ancillary buildings*, and to *Industrial buildings* where no more than 10 people are employed.

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APPENDIX C
DESIGN FOR ACCESS AND MOBILITY – ALTERATIONS TO BUILDINGS
(Normative)

C1 Scope
Sections 38 and 46 of the Building Act refer to alterations and changes of use of buildings. This Appendix relates to section 3 of this Standard: Design rules for access and mobility, which establishes the design parameters for the construction of new buildings.

C2 General
When an existing building is altered, the alteration shall not have the effect of decreasing accessibility or usability of the building to less than it was before the alteration.

When an existing building is to be altered, all accessible aspects, as detailed in sections 2 to 14 of this Standard, shall be reviewed and the provisions complied with as nearly as is reasonably practicable.

C3 Application
The design solutions given in this Appendix are suggested as ways of meeting the requirement to provide access and facilities "as nearly as is reasonably practicable, to the same extent as if it was a new building". They are to be used only when there is no other way of bringing the building into compliance with the Building Code. They shall not be used in new buildings.

Section 47 of the Building Act
In the exercise of its powers under sections 46 and 64 to 71 of, and the third Schedule to, this Act the territorial authority shall have due regard to the following matters:

(a) The size of the building;

(b) The complexity of the building;

(c) The location of the building in relation to other buildings, public places and natural hazards;

(d) The intended life of the building;

(e) How often people visit the building;

(f) How many people spend time in, or in the vicinity of the building;

(g) The intended use of the building; including any special traditional and cultural aspects of the intended use;

(h) The expected useful life of the building and any prolongation of that life;

(i) The reasonable practicality of any work concerned;

(j) In the case of an existing building, any special historical or cultural value of that building; and

(k) Any other matter that the territorial authority considers to be relevant.

It should be noted that in relation to the above, under section 34 (7) of the Building Act a Territorial Authority has no powers to waive or modify the access requirements.

CC3 Discussion on alterations
Even when it is not possible to make an altered building accessible to the extent necessary to enable its full use by an unaided wheelchair user because, for example, existing structural conditions would require removing or altering a load bearing member which is an essential part of the structure frame, or because other existing physical or site constraints prevent complete compliance, the alteration must still provide accessibility to the full extent possible. Any elements or features of the altered building that can be made accessible shall comply with the access requirements. It is possible in most cases for workable access to be provided for ambulant people with disabilities.

If it has been decided under, S38 and S46 of the Building Act that it is not reasonably practicable to install a lift then the ground floor of the building has to have access and facilities, and the upper floor or floors still have to be made accessible for ambulant people with disabilities. One of the main features, which assist ambulant people with disabilities, is the installation of handrails on both sides of stairs and steps. Sometimes a centre handrail on external steps is a workable alternative when it is not possible to fix a handrail on each side of the steps.

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C3.1 Cost

The Territorial Authority, in deciding what is reasonably practicable, under sections 38 and 46 must have regard to all the circumstances.

If for example one of the grounds for seeking lesser provisions is that it will be unreasonably costly to comply in all respects with the requirements of section 47A, the circumstances that the Territorial Authority should take into account in reaching a decision could include:

(a) The need to offset the benefits of full compliance against the costs of such compliance, i.e. the installation of a lift adds to the value, the economic viability, the usefulness and convenience of a building. The construction of ramps, both internal and external, can have a similar effect by providing, for example, usable goods trolley routes;

(b) The extent of the structural alterations which may be needed to install a lift, and the ways in which these costs may be lessened;

(c) The possibility of combining a goods and passenger lift.

It should be noted that all of the above does not consider any general costs savings to the community that the access requirements may have in enabling people with disabilities to enter employment when they would otherwise be on a benefit.

There is also no consideration given to any savings in accident and injury costs from the potentially safer built environments that may result from good implementation of access requirements.

Recognition of a building as an 'historic building' may be obtained via the New Zealand Historic Places Trust or as a listing in the district plan by the local authority.

C4 Entrances (refer to 7.1.1)

Alternative entrances at the back or side of a building shall be acceptable provided they are located on an accessible route from the car park and have a direct connection to the internal space served by the main entrance.

When an alternative entrance to a building for people with disabilities is not immediately obvious then a sign giving direction to the alternative accessible entrance shall be installed at the main entrance.

C5 Doorway in corridor wall (refer to 7.3.4.1)

The clear width of doorways is governed by the existing circulation space, i.e. the width of the corridor. The following table C1 shows the increased door width required with narrower corridors such as may be found in existing buildings.

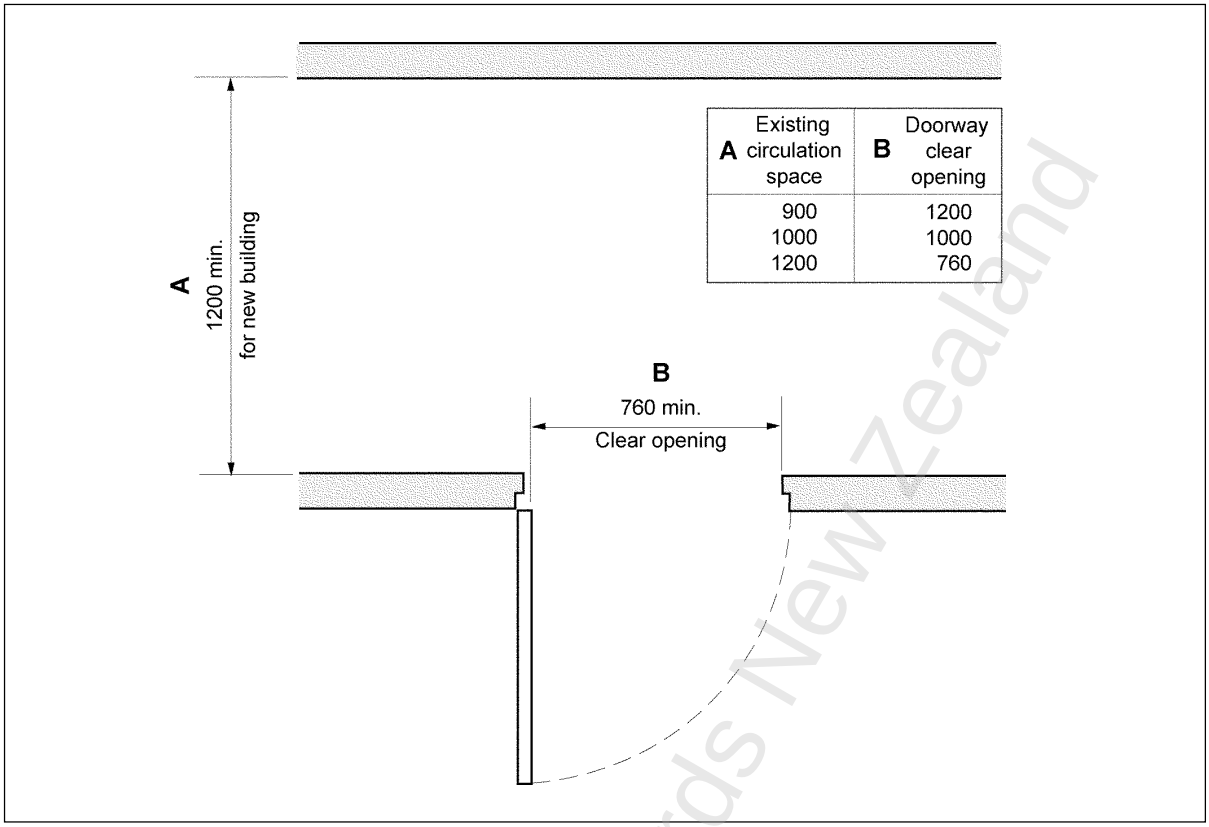
Table C1 – Clear width of doorway

Existing circulation space (mm) – A	Doorway clear opening (mm) – B
900	1200
1000	1000
1200	760

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Figure C1 illustrates the table C1 dimensions.



A Existing circulation space	B Doorway clear opening
900	1200
1000	1000
1200	760

Figure C1 – Doorway width for narrow corridors

C6 Lifts (refer to 9.2.2.1)

This clause provides for the circumstances under which smaller lifts may be installed or continue to be used in existing buildings. It applies when it is not reasonably practicable to comply with the lift requirements of 9.2.2.1.

C6.1 Reduced lift car size

Two sizes are given:

(a) For use by a wheelchair user alone, the lift car shall be at least 900 mm by 1400 mm.

(b) A car size of 900 mm by 1575 mm allows room for a person accompanying and will accommodate some scooters.

CC6.2

Controls are preferred on both sides of the lift as there is no room to manoeuvre a wheelchair once it is in the car.

C6.2 Controls

When C6.1 is used the operating controls shall be placed in the centre of the lift sidewall.

CC6.3

Wherever practicable, with reduced-size lifts, consideration should be given to providing more than one entry/exit from the lift car.

C6.3 Doors

Reduced-size lifts shall be fitted with a power-operated door, at least 900 mm wide and opening in the narrower dimension of the lift car.

C6.4 Enclosure

Reduced-size lifts shall be enclosed on all four sides.

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C6.5 New Zealand Building Code requirements

All lifts shall comply with NZBC D2/AS1.

C7 Vertical platform lifts

C7.1

Powered lifting platforms shall comply with BS 6440. Platform lifts shall not be used as an alternative to the requirements of 7.1.3 (i.e. main entrances shall preferably have a flat access but may be ramped).

C7.2

BS 6440 covers the transportation of people with disabilities between fixed levels in which the maximum height of the platform above the lowest level in public buildings does not exceed:

(a) 2.0 m when there is no liftway enclosure or floor penetration;

(b) 4.0 m when the liftway is enclosed.

These types of lifts may be installed to enable people with disabilities to reach a stage in a hall etc.

C8 Stair-lifts

Stair-lifts shall not be used as a means of complying with access requirements for reasons given in CC8. However, they may be considered for use in private dwellings – such stair-lifts shall comply with BS 5776.

CC8

Stair-lifts are a mechanical means of ascending and descending stairs. The stair-lift track is either fixed to the stairs or to the wall side of the stairway. A stair-lift either has a chair or wheelchair platform and is usually operated by the occupant.

People with disabilities generally avoid using stair-lifts in public, because they attract attention when being operated. They are seen by many as a "special provision for the disabled" and they can impede the other users of the stairs.

Stair-lifts are ideal in private dwellings but should not be considered in public places for the following reasons:

They are in conflict with this Standard which requires handrails on both sides of the stair;

The stair track reduces the available width of stair – as most stairs are incorporated into a means of egress, this will cause a hazard;

Stair-lifts are prone to vandalism and abuse in public spaces;

Preventative maintenance programmes are required by section 44(j) of the Building Act but are often not implemented.

Where the stair-lift has a chair, a wheelchair user is required to transfer from the wheelchair to the chair and the wheelchair would then have to be carried by an attendant to the next level.

For a person with arthritis, stroke, angina etc., using a stair-lift with a wheelchair platform would be unwise, as the person would be required to stand on the platform without the support of a handrail.

Stair-lifts and inclined railways are subject to local authority permit application and any approval procedure.

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CC9.1

This could be done by combining two standard toilet compartments into one by removing the common partition, creating one toilet pan and fittings as shown in figure C2.

Many existing toilet cubicles are difficult for people with disabilities to enter and use because of the position of the door and the fact that it opens inwards. Often this situation can be overcome by the simple expedient of re-hanging the door so that it opens outwards.

Inward-opening doors can work effectively if there is a turning circle space of 1500 mm diameter beyond the open door.

Other problems include toilet vestibules with double doors that can be difficult to negotiate and may trap a wheelchair between the doors.

CC9.2

Insufficient door widths may be improved by using swing-clear hinges. Also consider using sliding doors.

CC10

It is possible to adapt existing handrails by changing their fixing or by providing a new handrail that is easily grasped by people with disabilities, see figure C3.

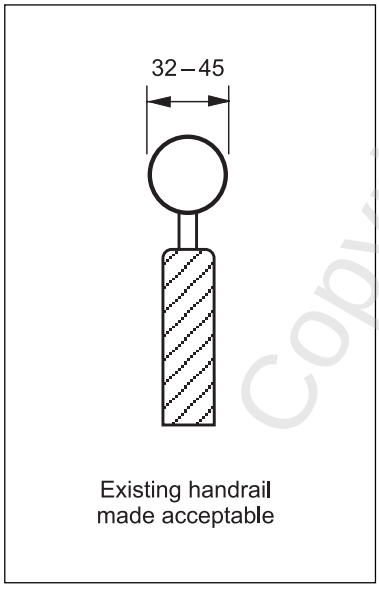


Figure C3 – Handrail adaptation

C9 Toilets

C9.1 Compartments

Existing toilet compartments shall be modified so as to be accessible to people with disabilities (refer 10.5).

C9.2 Door widths

Door widths shall be widened whenever possible to provide a minimum clear opening of 760 mm (refer to C5).

C10 Handrails (refer to 6.4, 6.5, 8.6)

The requirements for handrails and grab rails shall apply to altered buildings.

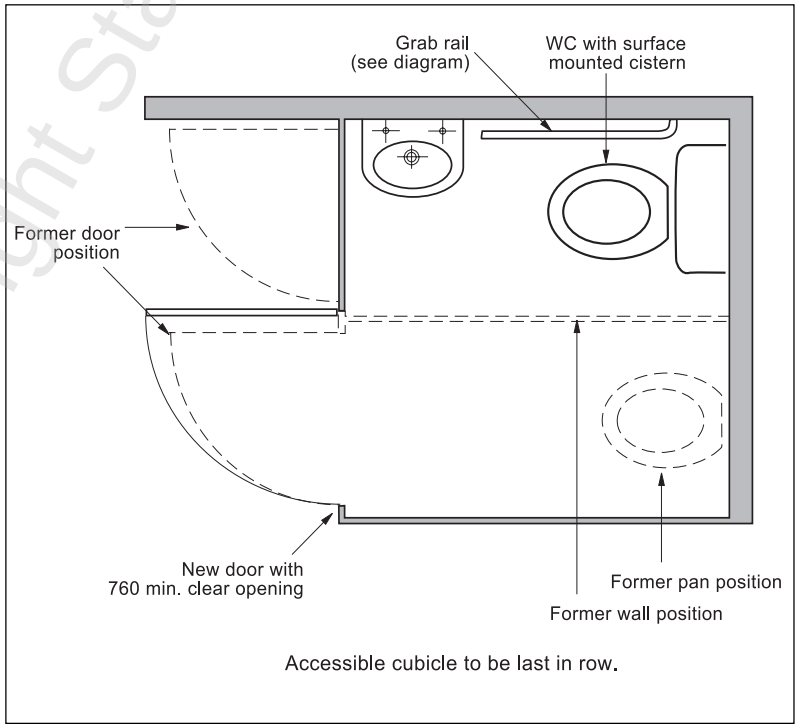


Figure C2 – Toilet compartment in existing building

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APPENDIX D
PEOPLE WITH DISABILITIES – MOBILITY AND MOBILITY AID INFORMATION
(Informative)

D1 Scope
This Appendix presents information and data associated with people with disabilities and their aids to mobility that affect the design of buildings, travel along an accessible route and the use of furniture and fittings.

D2 General
This Appendix is designed to provide information to help designers, builders, building officials etc. to appreciate the main problems met by people with disabilities and to give background to the requirements of this Standard.

D3 People with disabilities

D3.1 Ambulant

D3.1.1 Clear width
People who are ambulant with mobility aids need a clear width of 1000 mm.

D3.1.2 Walkers
Walkers and walking frames are produced in many variations with bases consisting of a combination of feet, wheels and castors. In general these have a 590 – 700 mm base width.

D3.1.3 Steps
The 180 mm step rise shown in figure 25 is on the high side for the comfort of the majority of people with disabilities.

Records show that more accidents occur while going down stairs, and studies have shown that a 310 mm tread provides increased safety during descent of the stairs.

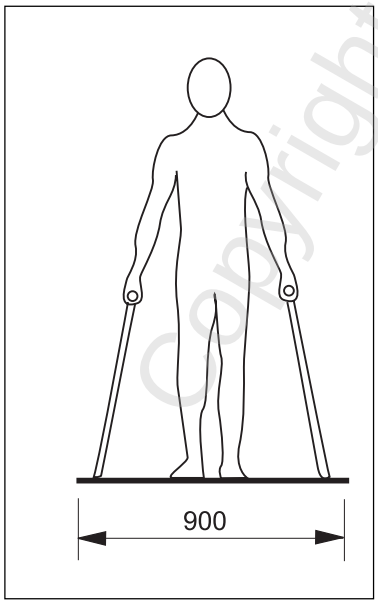


Figure D1 – Crutches

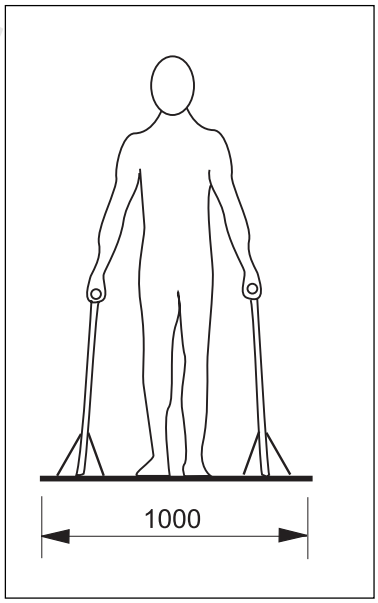


Figure D2 – Tripods

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The optimum dimension of 310 mm tread with 150 mm risers gives a smaller rise and increased tread and adds to comfort and safety.

D3.1.4 Handrails and grab rails

D3.1.4.1 Height

Stair research has established that for young adults and elderly stair users alike, higher handrails are more useful, the best performance by both population groups occurred with heights between 915 mm and 965 mm at all stair slopes measured from the pitch line. The average preferred handrail height for young and old subjects alike was 927 mm.

D3.1.4.2 Shape

A graspable handrail requires contact of the rail with at least 80 mm of the hand measured from the top knuckle of the index finger around to the thumb, refer NZBC D1/AS1 figure 26. This represents a grip of 270° around the rail. The profiles of handrails and grab rails in Appendix F are derived from this requirement.

D3.2 Sight impairment

D3.2.1 General

Sight impairment ranges from focussed vision but for only part of the field of view, through blurred vision where detail merges with the background, to total loss of sight.

D3.2.2 Clear width

People with a visual impairment using mobility aids need a clear width of up to 1200 mm.

Passage widths for people who are blind or partially sighted

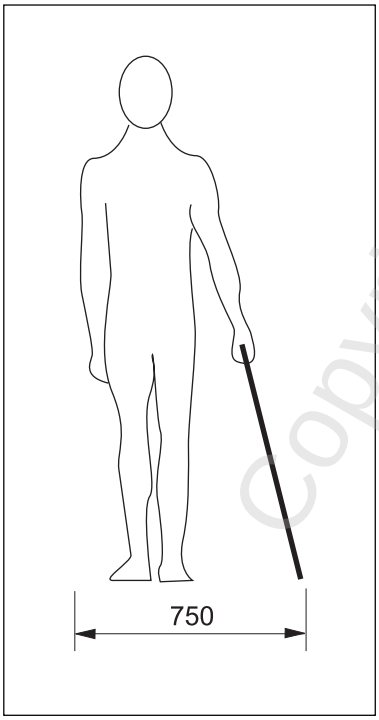


Figure D3 – White cane

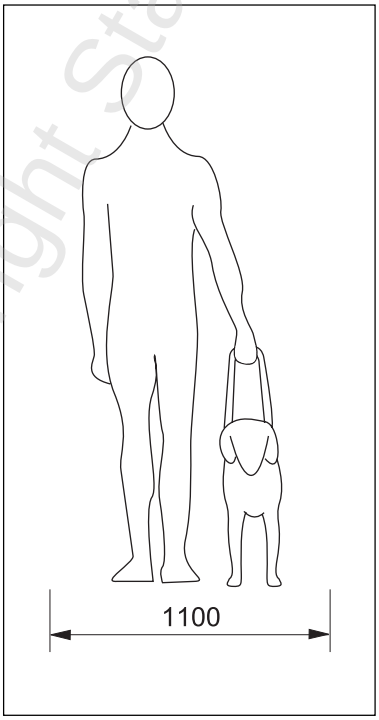


Figure D4 – Guide dog

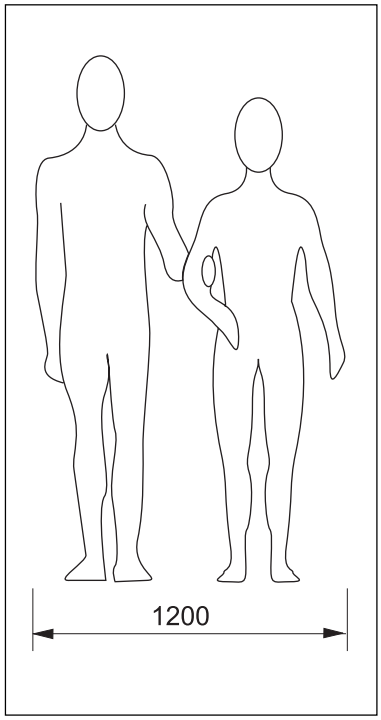


Figure D5 – Sighted guide

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D3.2.3 Colour and contrast

Good contrasting visibility characteristics aid partially sighted people. The contrast may be by use of colour at the change of plane on an object, e.g. a bench top, back and front lip or change in stair-nose colour, by change in pattern on a surface, or by use of illumination.

D3.2.4 Contrast through illumination

Good distinction between features on an accessible route or in accessible accommodation can be obtained by using natural or artificial light. A luminance factor difference between an object or surface and its surroundings of 0.3 is recognized as being needed.

It is important that all fittings, e.g. electrical, door controls, sanitary fittings etc. contrast with their surroundings.

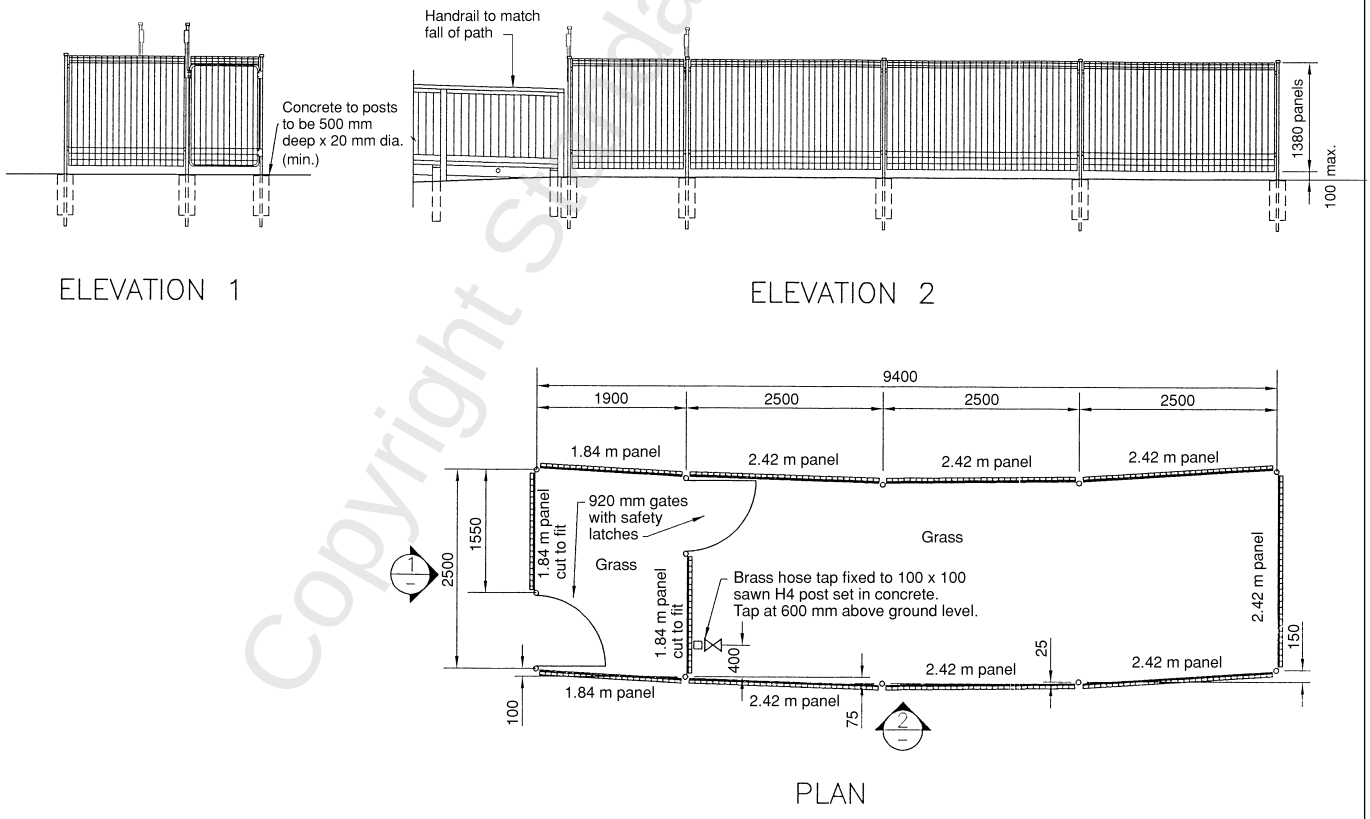
D3.2.5 Tactile and audible cues

People with vision impairments also rely on tactile cues, a change in surface texture, to indicate a major change in the accessible route. Examples are the nosings on stairs and the use of tactile ground surface indicators, both indoors and outdoors.

Coincident with the installation of tactile cues, a change of material will also provide audible cues e.g. a change from concrete to rubber, carpet or timber.

D3.2.6 Guide dog run

Where a guide dog run may be required, a suggested layout is shown in figure D6.



Source: Kelburn Parade – Proposed Guide Dog Run, Plan and Details, produced by Victoria University of Wellington, Facilities Management Service

Figure D6 – Guide dog run

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D3.3 Wheelchairs

D3.3.1 General

Wheelchairs are either pushed by an attendant manually, self-propelled by the owner or motorized. The motorized wheelchair is powered by batteries which are usually charged overnight and, which vary the wheelchair dimensions and weight from a standard manual wheelchair.

D3.3.2 Size

Average unoccupied motorized wheelchairs/scooter sizes (NZ) are given in table D1, for a seat width average of 450 mm. This Standard recommends a basic 1500 mm turning circle to cover most wheelchairs, however, a turning circle of 1985 mm is recommended wherever there is heavy use of motorized scooters.

Table D1 – Average dimensions of motorized wheelchairs and scooters (unoccupied)

	Overall width	Length	Seat height
Motorized	600 – 760	1000 – 1130	460 – 530
Scooter	610 – 650	1120 – 1600	–

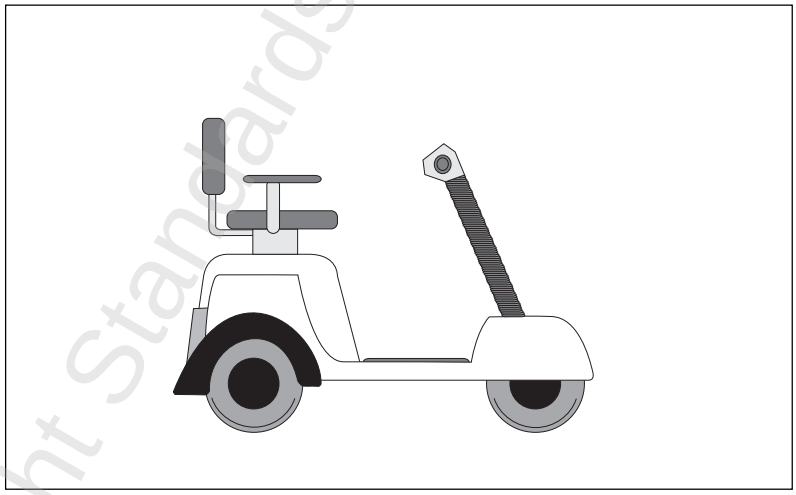


Figure D7 – Basic scooter profile

D3.3.3 Other dimensions

Other dimensions associated with wheelchairs are illustrated in figure D8.

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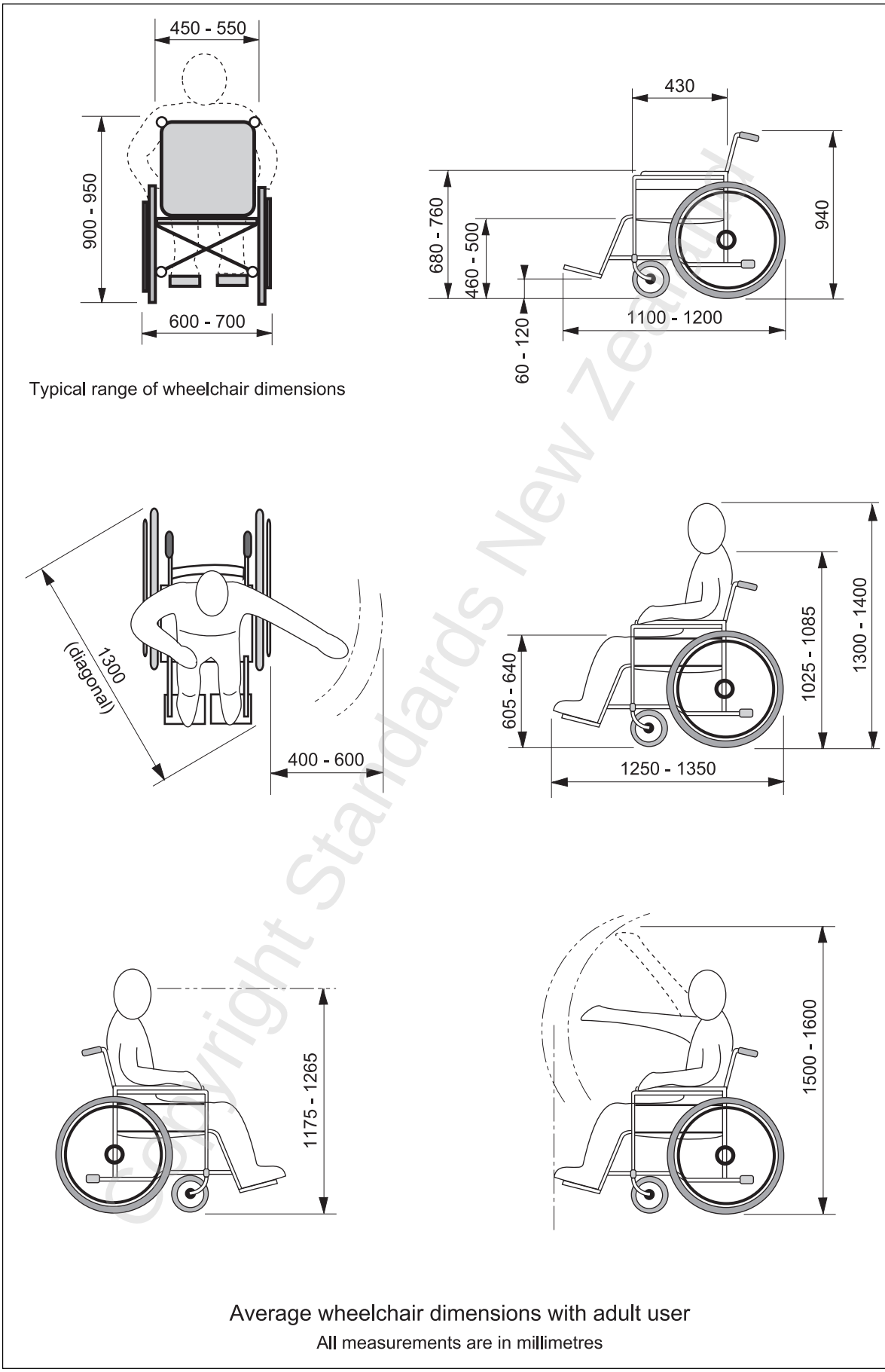


Figure D8 – Typical wheelchair dimensions

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D3.3.4 Minimum clear floor space

The minimum clear space required to accommodate a single stationary wheelchair and occupant is 800 mm x 1300 mm, see figure D9.

D3.3.4.1 Clear width

A minimum clear width of 1200 mm is required on an accessible route, this allows for a person in a wheelchair to pass a person walking. For two wheelchairs to pass a space of 1800 mm is required, see figure D10. Alternatively a passing arrangement as shown in figure D11 is possible.

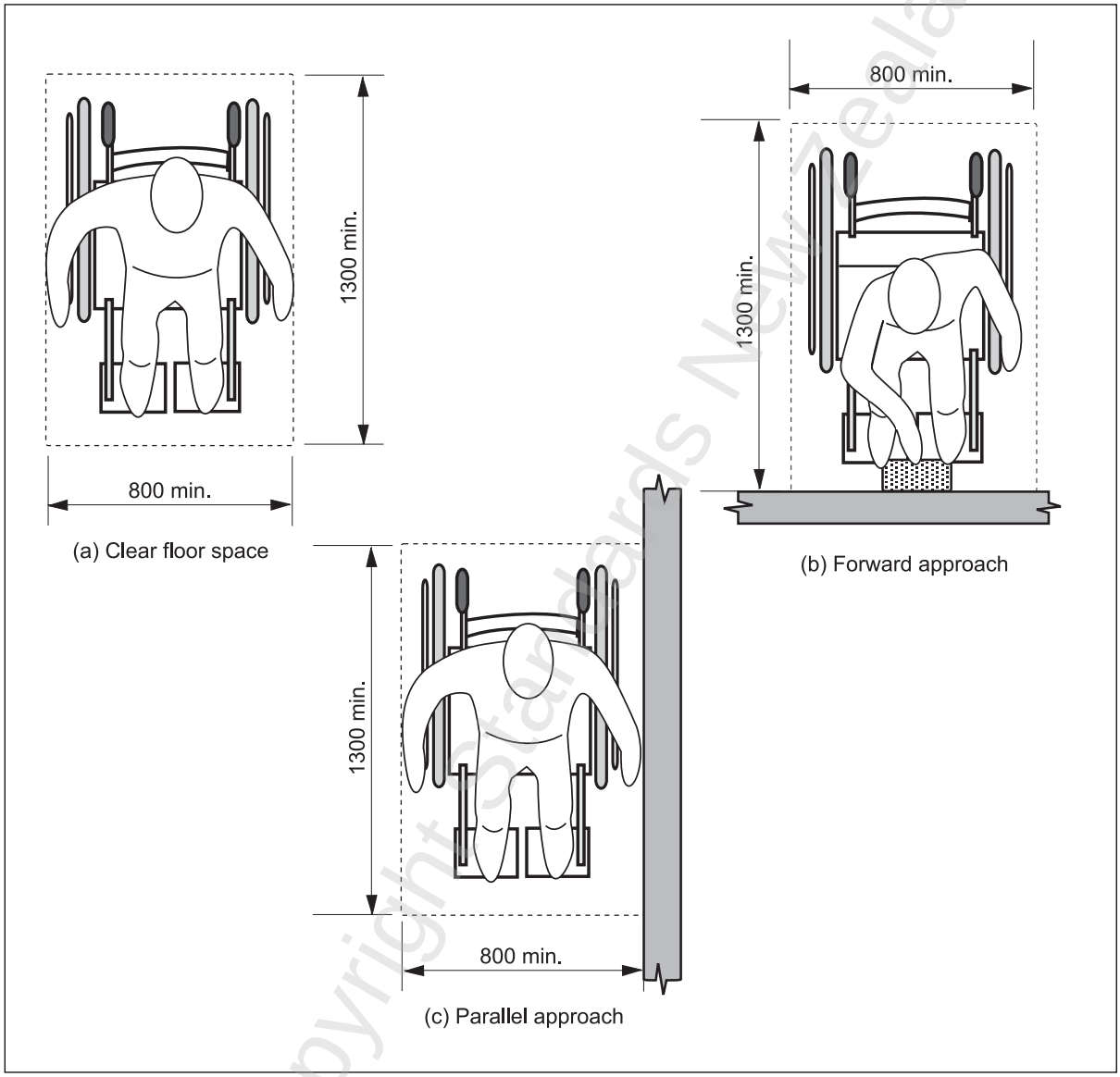


Figure D9 – Minimum clear floor space

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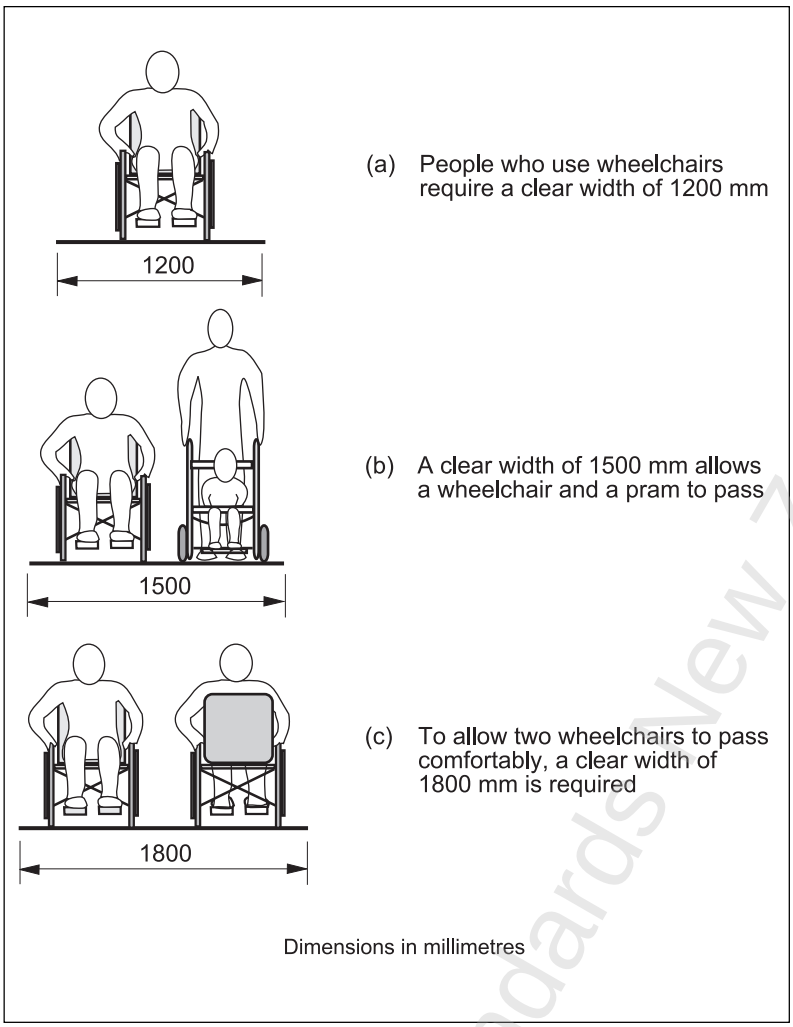


Figure D10 – Clear widths

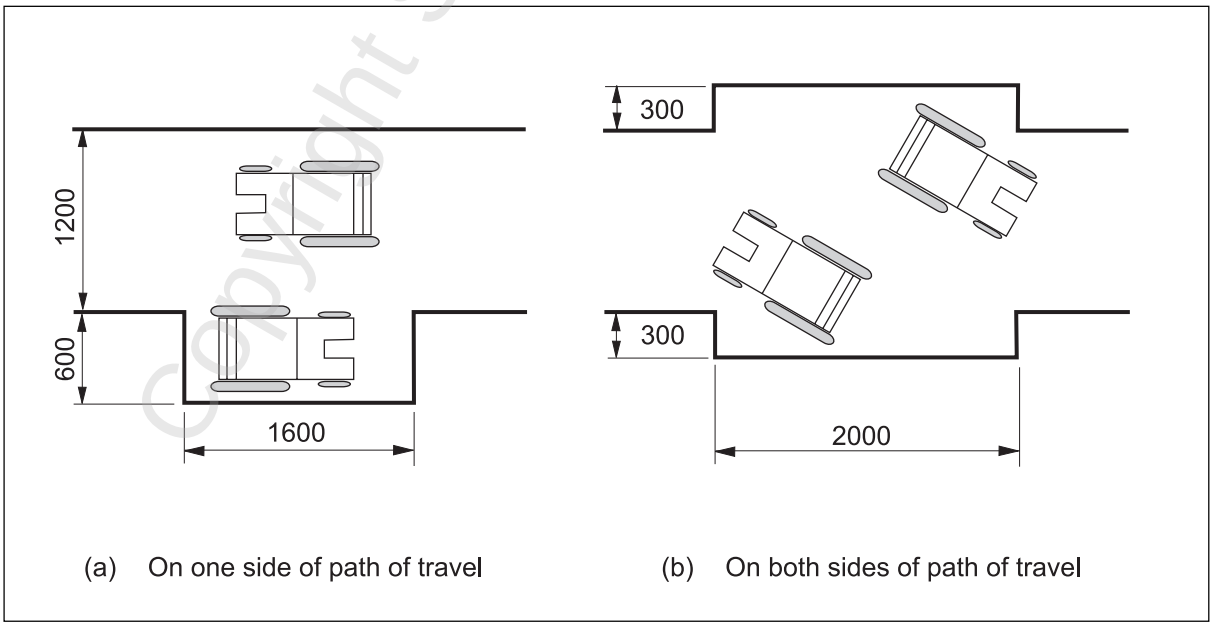


Figure D11 – Passing space for wheelchairs

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D3.3.4.2 Turning space

The corridor dimension of 1200 mm used in this Standard is a minimum dimension and relies on additional turning space available at the clear openings of doorways and at open plan and widened corridor areas. From time to time in this Standard, 1500 mm is indicated as a minimum turning circle dimension.

A full 360^{o} turn space of 1950 mm x 1950 mm is required for most motorized scooters.

Distances required for wheelchair manoeuvrability between tables and chairs are shown in figure D12.

D3.3.5 Reach

The reach possible from a wheelchair is shown in figures D13 to D17. The reach for people with ambulant disabilities is shown in figure D18.

D3.3.6 Viewing range

The height zone for comfortable viewing is shown in figure 5. This height zone has been computed from the averaged eye height of tall males and short females standing, and the average height of people seated in wheelchairs.

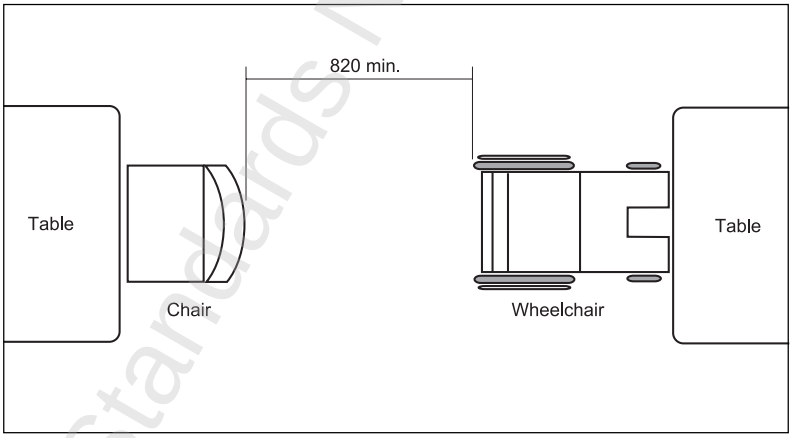


Figure D12 – Distance between tables and chairs

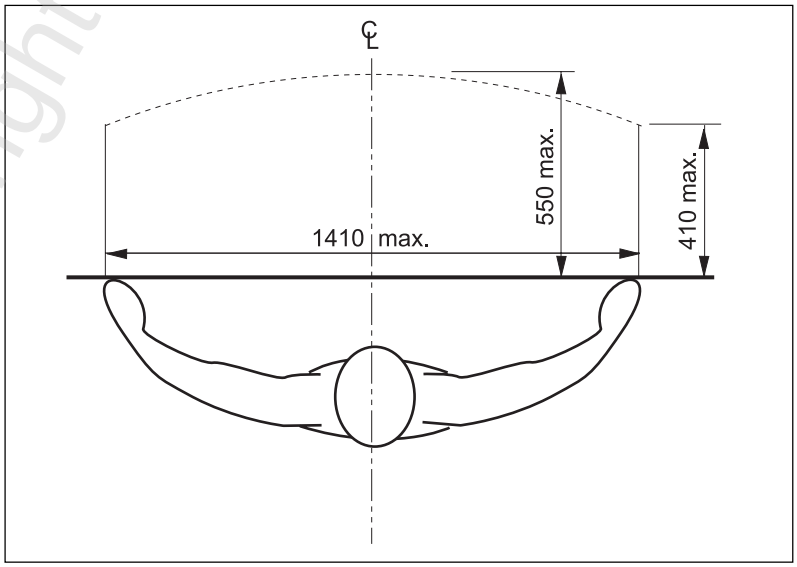


Figure D13 – Maximum horizontal reach to objects on table or bench tops

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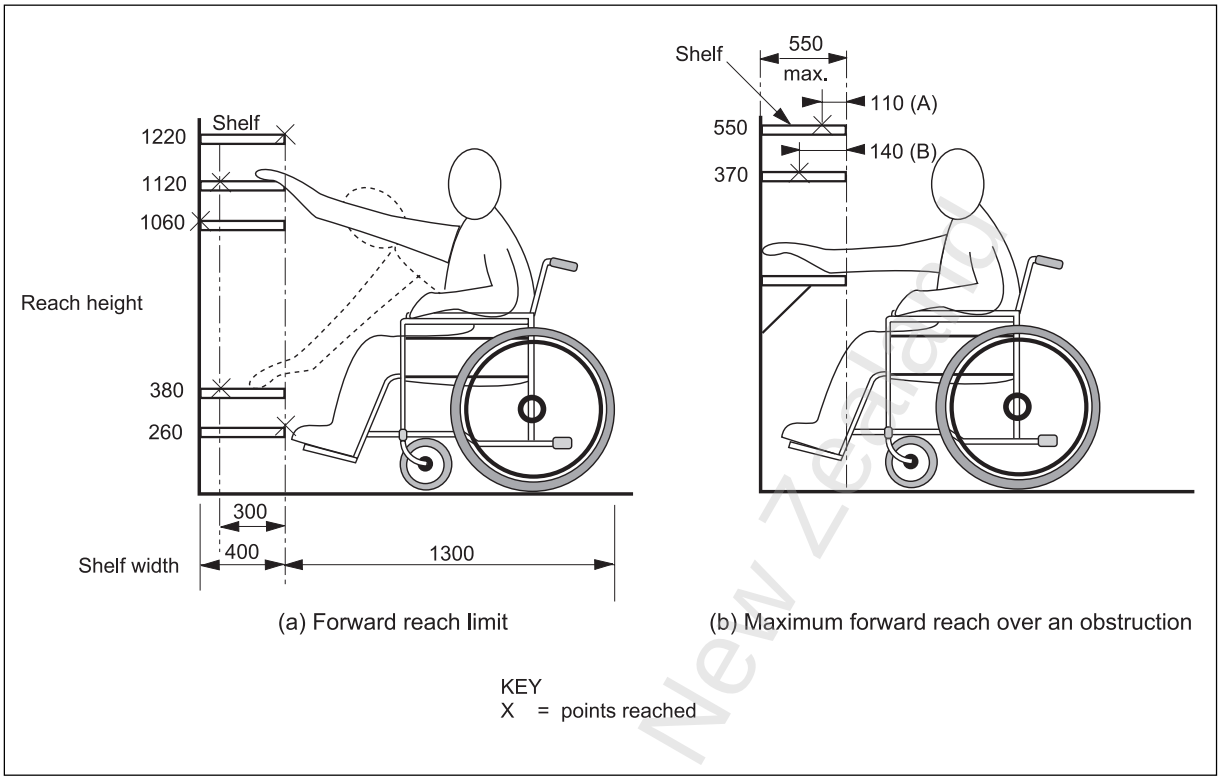


Figure D14 – Forward reach from a wheelchair

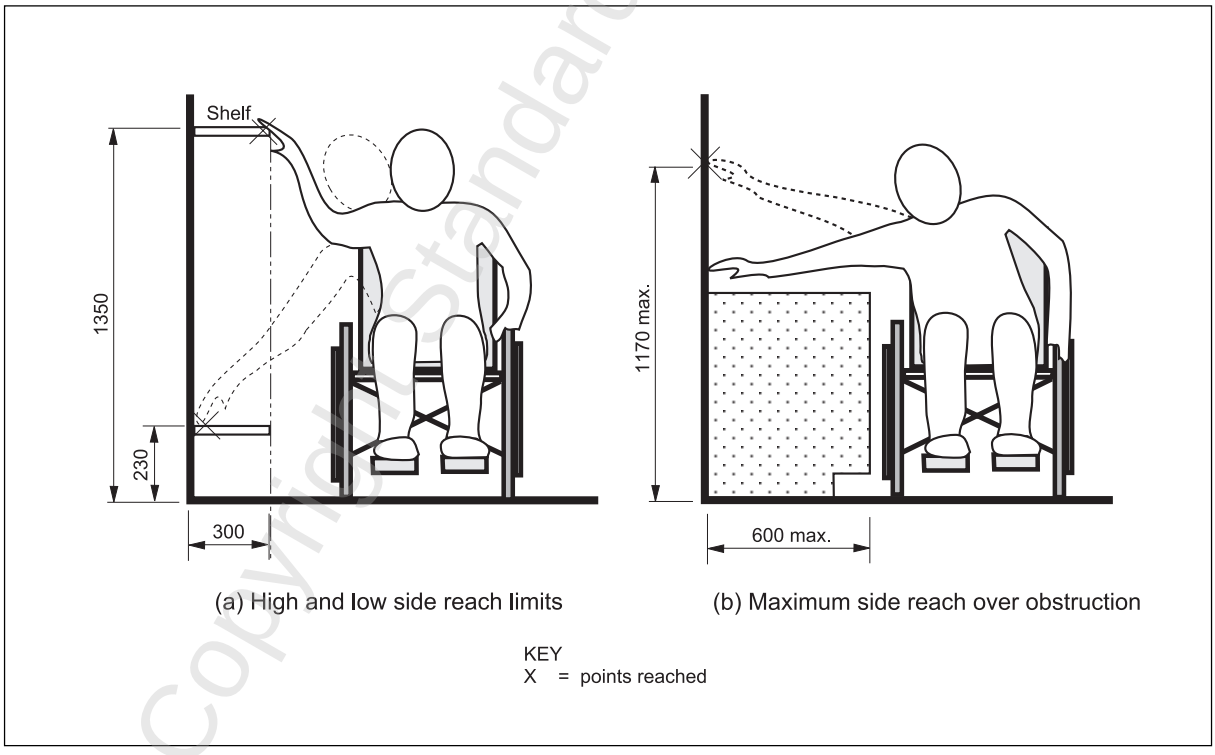


Figure D15 – Side reach from a wheelchair

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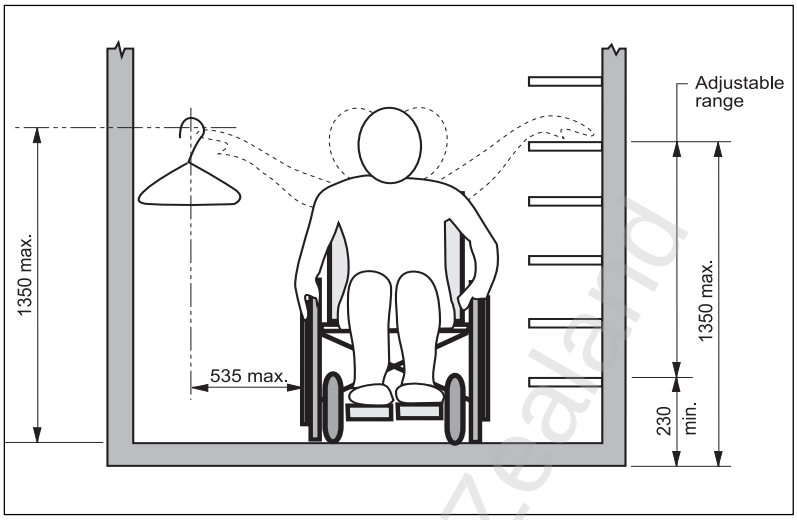


Figure D16 – Storage shelves and wardrobes

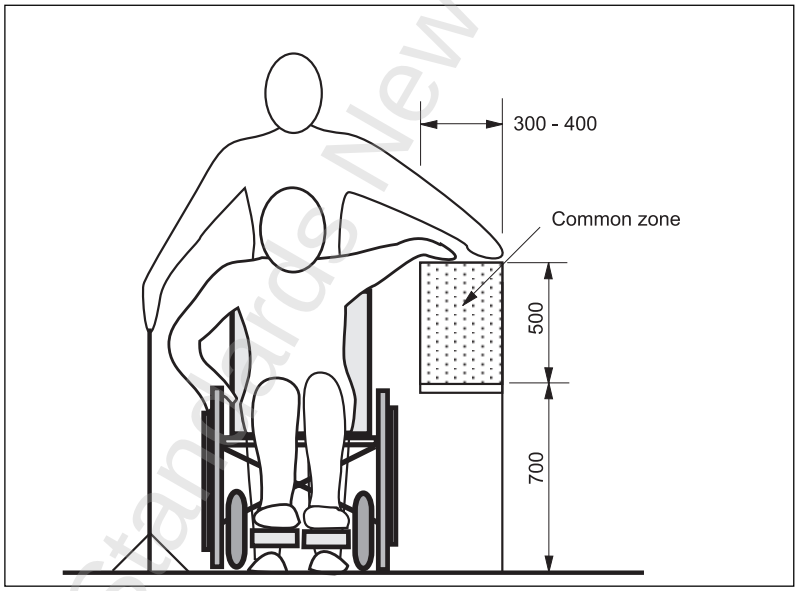


Figure D17 – Area of common reach for ambulant people with disabilities and wheelchair users

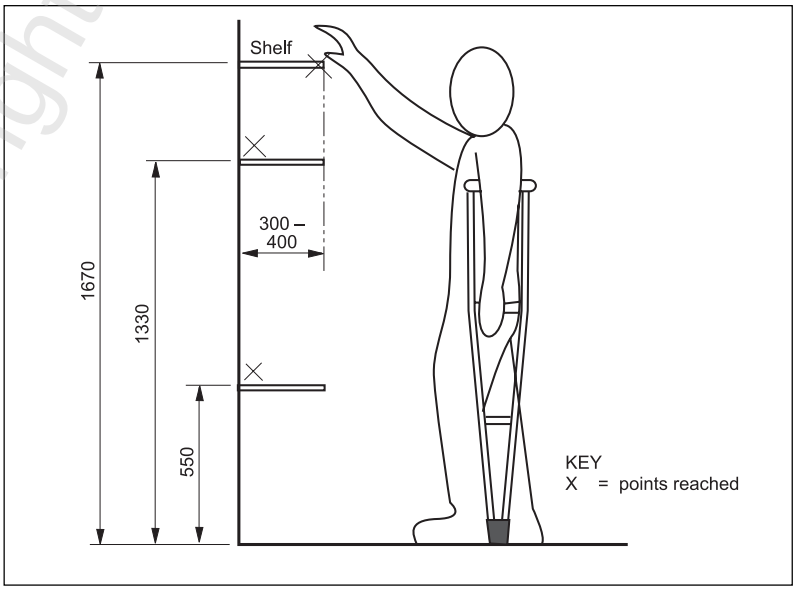


Figure D18 – Ambulant reach

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APPENDIX E
INTERNATIONAL SYMBOLS
(Normative)

E1 Scope

This appendix covers the requirements for the production of the international symbols for access and for deafness.

E2 International symbol for access

E2.1 Layout

The proportional layout of the symbol for access shall be in accordance with figure E1.

E2.2 Colour

The colour of the figure shall be white on a blue background. The blue shall be 'Safety blue' BS 5252 Colour No. 18E53. However, other colours may be used to "fit" with the decor, provided there is a colour contrast between the symbol and its background.

CE2.3

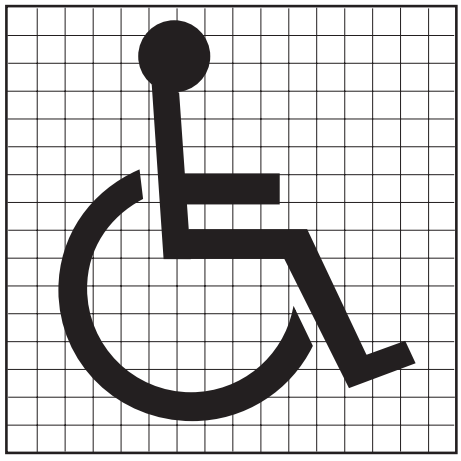
The sign can be used either with or without the directional arrow.

E2.3 Use

The international symbol for access is used to identify buildings and facilities that are fully accessible in the terms of this Standard or the NZBC. It is also used on signs to indicate the direction of an accessible facility such as a car park or toilet.

For signs identifying a facility, the figure shall face to the right. For indicating the direction to a facility, the figure shall face in the direction to be indicated (see figure 3).





NOTE –
The grid is for positional purposes only.

Figure E1 – International symbol for access

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E3 International symbol for deafness

E3.1 Layout

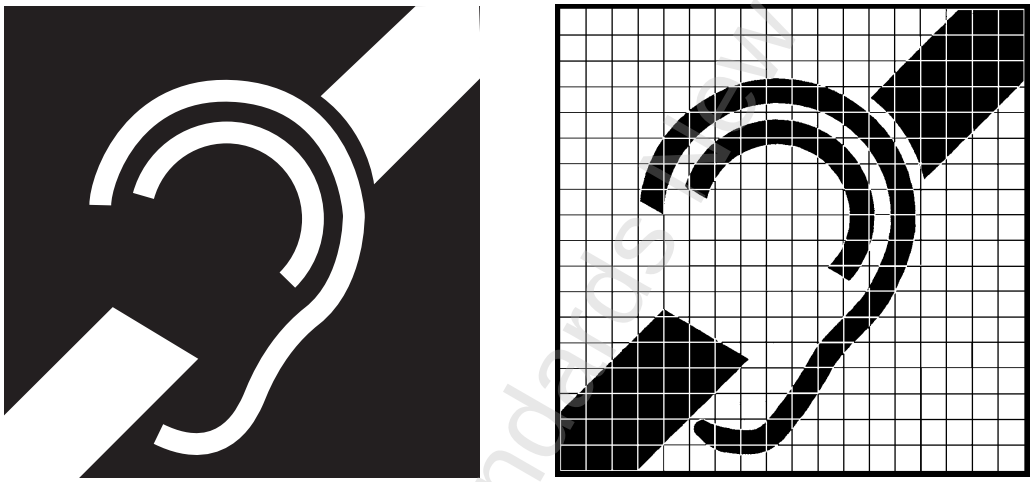
The proportional layout of the symbol for deafness shall be in accordance with figure E2.

E3.2 Colour

The colour of the figure shall be white on a blue background. The blue shall be 'Safety blue' BS 5252 Colour No. 18E53. However, other colours may be used to "fit" with the decor, provided there is a colour contrast between the symbol and its background.

E3.3 Use

The international symbol for deafness is used to indicate that aids are available to help the deaf, e.g. hearing augmentation – listening system.



NOTE –
The grid is for positional purposes only.

Figure E2 – International symbol for deafness

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APPENDIX F
HANDRAILS AND GRAB RAILS
(Normative)

F1 Scope
This Appendix describes the type and basic installation requirements for handrails, lift support rails and grab rails as used in this Standard.

F2 General
Handrails and grab rails serve different functions. A handrail is used as a guide for general support and to occasionally take full weight both in regular use and for accidental slip, trip or stumble. A grab rail is usually of smaller diameter and is more often used to take the full weight of a person with a disability. Full weight is applied both as a direct downwards force, e.g. in maintaining balance, and as a leverage force e.g. when lifting the body.

Many people brace their forearms between a rail and the wall to give them more leverage and stability.

F3 Handrails

F3.1 Shape

F3.1.1 Length
A handrail shall be continuous along the length of a ramp or staircase, except when there are doorways opening off a landing.

F3.1.2 Grip shape
The handrail shall be rounded with an outside dimension of between 32 mm and 45 mm and shall provide a secure grip, see figure F1. The ideal handrail is a circular section.

F3.1.3 Obstructions
There shall be no obstruction to the movement of the hand along the length.

F3.1.4 End of handrail indicator
A domed button to indicate the imminent termination of the rail shall be fixed at 150 mm from the end of the rail (see figure 23).

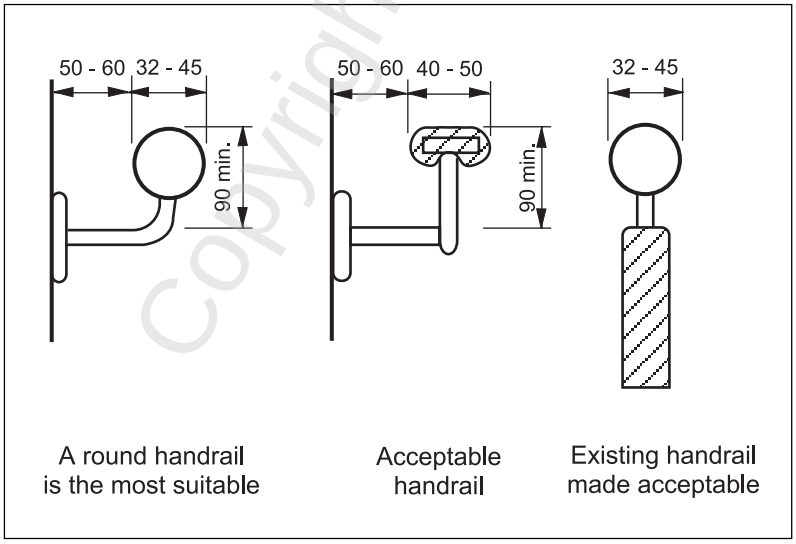


Figure F1 – Handrails

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F4 Installation of handrails

F4.1 Clear length

Handrails shall be installed so that there is a clear space of 50 – 60 mm between the handrail and the wall for its full length.

F4.2 Stairs, ramps etc.

F4.2.1

The handrail shall extend past the start and finish of the stairs or ramp by at least 300 mm (see figures 22 and 23).

F4.2.2

Handrails shall be installed at the height required by this Standard, refer to 6.4.2.6 and 8.6.

F5 Grab rails

F5.1 Shape

Grab rails shall allow an opposing grip by the full hand and shall be of circular section of 30 – 40 mm, see figure F2.

CF5.2
Highly polished surfaces provide insufficient grip.

F5.2 Grip

The surface of grab rails at the point of use shall be non-slip.

F6 Installation of grab rails

F6.1 Clear length

Grab rails shall be installed so that there is a clear space of 50 mm minimum between the rail and the wall for the full length.

F6.2 Installation

Grab rails are primarily intended for use in toilets, showers and bathrooms, refer to section 10.

F7 Load-bearing test for handrails and grab rails

Handrails and grab rails and the method of fixing to their support shall be capable of sustaining a force of 1100 N (110 kg) applied in any direction at any point. The force shall be applied for a period of 2 minutes after which there shall be no sign of fracture of the fixings points nor shall there be deformation greater than 5 mm. With the force removed, there shall be no permanent deformation greater than 1 mm.

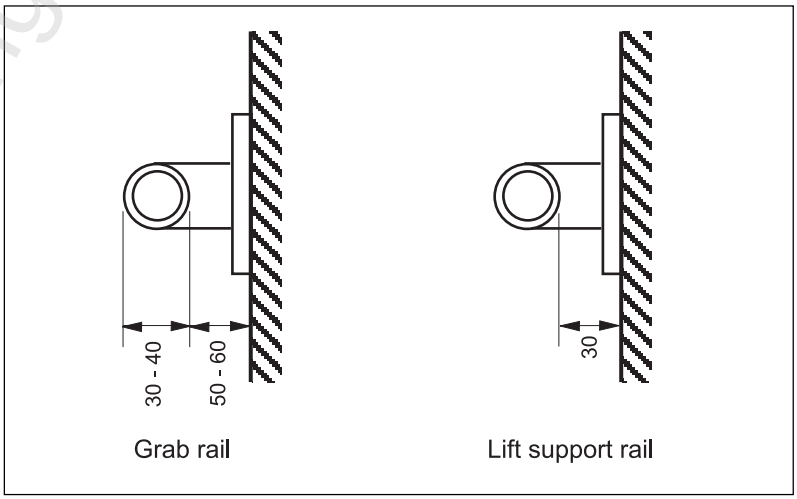


Figure F2 – Size and spacing of a grab rail

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APPENDIX G
SCISSOR STAIRS

(Informative)

G1 Scope

This Appendix gives an example of a service core plan with scissor stairs.

G2 General

Figure G1 shows an example of a plan of service core to a building with scissor stairs. This is a common design of stair in public buildings. Various design features should be noted.

The centre partition wall requires a continuous handrail around it at each landing which coincides with a floor level, refer to 8.3.

The projection of the handrail into the landings at the points shown in figure G1 still permits, if necessary, a wheelchair to turn through 180^{o} by allowing its footrests to pass under the handrail.

The centre partition is not required to extend into the landing area. The handrail may be positioned as shown in figure G1 provided that it does not intrude into the landing by more than the going.

Scissor stairs shall have mid-flight landings at a height of 2500 mm maximum (refer to 8.3.6).

When the doors to the toilet facilities open off the landings at floor levels and these levels form part of the corridor system in the building, it is preferable that the landings are wide enough to enable a wheelchair to turn through 360^{o} at the positions shown in figure G1. A landing width in excess of the minimum of 1200 mm is required by this Standard and is recommended to enable a wheelchair user to open and close doors off landings, including fire doors.

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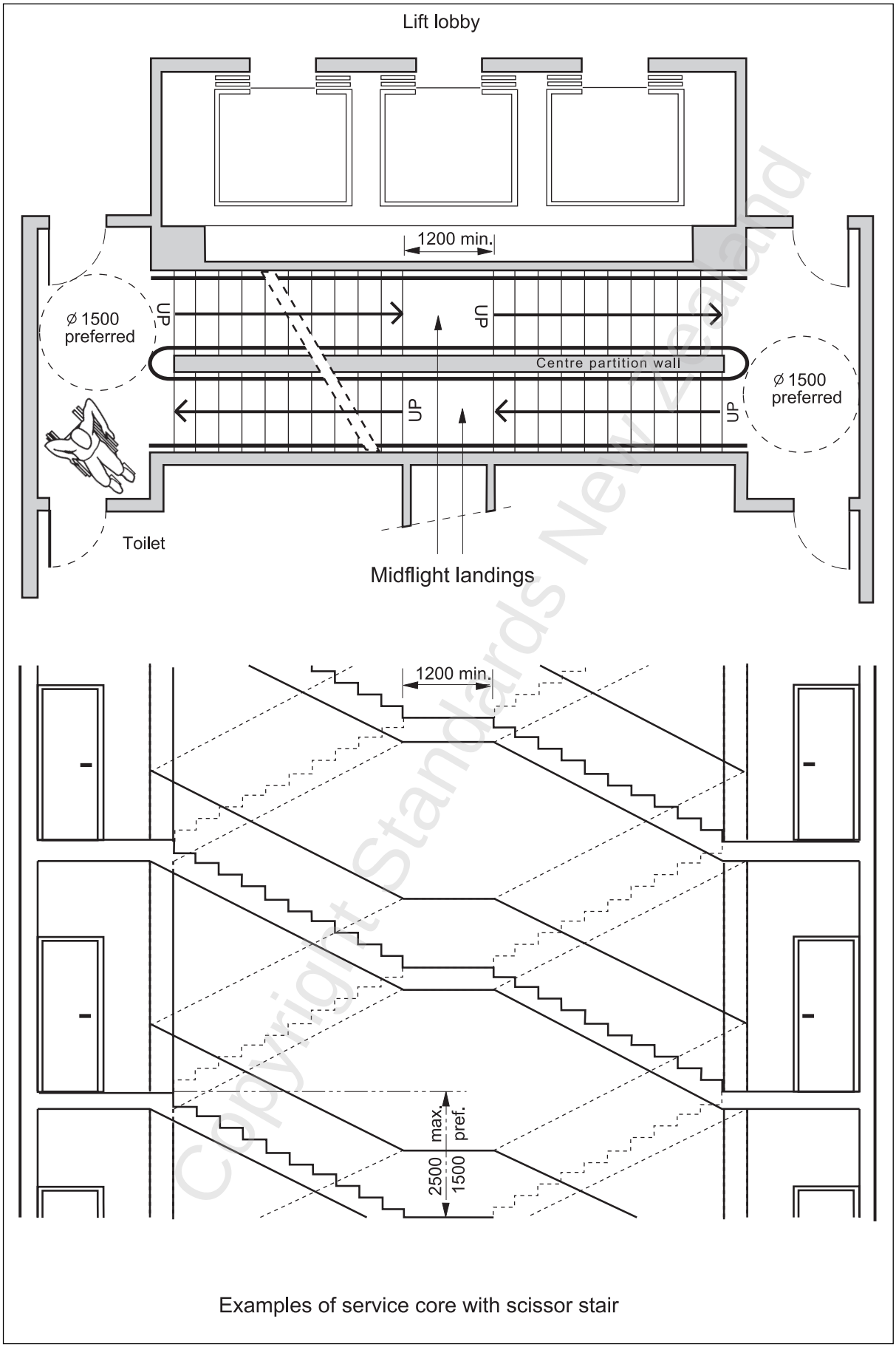


Figure G1 – Scissor stair design

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APPENDIX H
HEARING AUGMENTATION – LISTENING SYSTEMS
(Informative)

H1 Scope
This Appendix provides informative information on listening systems.

H2 General
When choosing a listening system the following considerations apply:

(a) The system needs to be usable by people who do not have hearing aids and by people who:

(i) Have hearing aids with a "T" switch

(ii) Have hearing aids with audio input

(iii) Have hearing aids without a "T" switch or audio input.

(b) The frequency response and the adjustable volume gain of the receivers needs to be suitable for people with varying severity of hearing impairment;

(c) It is essential that the equipment provided is safe and easy to manipulate and that the hygiene of reusable ear-pieces on receivers can be ensured;

(d) The system chosen needs to be suitable for the intended use and not be subject to interference from, or cause interference to, any other equipment. For example, audio-loops may be subject to interference from nearby electrical installations; radio-frequency transmissions may interfere with other transmission on similar bands; strong lighting may interfere with infrared transmission.

(e) It is essential that the system does not interfere with the listening enjoyment of others, e.g. sound leakage from headphones;

(f) Where privacy is required, as in courtroom proceedings, infrared transmission is suitable because it will not pass through walls.

H3 Listening systems
Acceptable types of listening systems include audio-frequency induction loops, FM radio-frequency transmission, infrared systems or similar.

An induction loop system must include any necessary microphones and amplifiers in addition to the wired loop.

Other types of listening systems must include appropriate transmitters and receivers.

H3.1 Audio-frequency induction loop systems
People using hearing aids that are fitted with a magnetic induction coil can directly receive the audio-frequency induction loop system. This is a standard hearing aid option. The recommended magnetic field strength, as specified in AS 1088.4, is 20 ±3 dB relative to 1 ampere per metre for an input signal of level equal to the long-time average level of input speech. This field was chosen so that it is high enough to produce an acceptable signal-to-noise ratio over environmental electromagnetic noise for power

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installation and the like, yet not so high as to cause overloading of hearing aids.

The audio-frequency induction loop system cannot be used successfully in multiple installations close together, e.g. in adjacent rooms, owing to mutual interference resulting from spill-over of the magnetic field outside the looped area, both vertically and horizontally.

H3.2 Infrared light transmission systems

In this system, a modulated light beam is transmitted to special receivers worn by the listeners. The line of sight from transmitter to receivers must be unobstructed. The system may become inoperative when the receivers are exposed to direct sunlight.

It may be used as an alternative to the audio-frequency induction loop system when multiple room installations are required to operate simultaneously.

H3.3 The VHF frequency-modulated radio system

Unlike the induction field radio system this system operates in the very high frequency (VHF) band, where a number of channels for use by hearing impaired people have been allocated by the ITU. It can therefore make use of different channels to avoid mutual interference when a number of transmitters have to be used in one building.

Because of the short wavelength used, the received field strength reduces slowly as the distance from the transmitter increases. Potentially it has greater range than the induction field radio system. The system needs an external antenna that is short enough to be carried on the person. On the other hand, induction field radio systems use loop antennae mounted internally in the receiver.

H3.4 Induction field radio system

The induction field system is a frequency-modulated system normally operated on a carrier frequency of 3175 kHz allocated by the International Telecommunications Union (ITU). This allocation is shared by other radio services, which may occasionally interfere.

The basic feature of the induction field radio hearing aid system is its localised wireless transmission in which the induction field is strong near the transmitter but rapidly becomes weaker with increasing distance; a low power battery-operated version is limited to a range of about 12 metres. When several systems are in use in a confined area, the receiver responds only to the strongest signal.

This system is particularly useful when the speaker, wearing a portable transmitter and associated microphone, must move about in company with the listeners, for example on guided tours in museums and art galleries.

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