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Background

Purpose: The UWA Building and Campus Access Guidelines have been developed for people involved in building or facilities management at The University of Western Australia (UWA) including designers, architects, landscape architects, engineers and any person carrying out new works, refurbishment or maintenance work within UWA.

These guidelines reflect:

• **Generally:** The seven Principles of Universal Design (internationally recognised as best practice design guidelines for people of all ages and abilities, now and into the future). These design principles are considered of such importance that they are reproduced on the following pages for easy reference.

• **Specifically:** The University’s commitment to equity and inclusion (as documented in the UWA Disability Access and Inclusion Action Plan [DAIAP]).

These guidelines provide:

• **Background information:** Enabling the reader to understand the functional requirements of people with a range of disabilities and some of the potential barriers to access when moving through the University campus.

• **Mandatory design requirements:** Based on current legislation, codes and standards, reflecting contemporary design principles to meet the needs of people with disabilities. Mandatory requirements are the minimum requirements to be met in the design and construction of all new buildings.

• **Additional features:** Moving the design towards best practice.

• **Alternative solutions:** A decision making process for occasions where minimum requirements cannot be met (e.g. topography or where requirements conflict with safety or heritage issues) is included.

The UWA Building and Campus Access Guidelines were first developed for The University of Western Australia by Ann O’Brien and Anita Harrop, Access Consultants (December 2008) and updated in 2011.

The development and production of these Guidelines has been a collaborative project between Facilities Management, Student Services (UniAccess) and Human Resources (Safety and Health and Equity and Diversity).
Principles of Universal Design

**Principle one: Equitable use**
The design does not disadvantage or stigmatise any group of users.

**Guidelines:**
1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
1b. Avoid segregating or stigmatising any users.
1c. Provisions for privacy, security, and safety should be equally available to all users.
1d. Make the design appealing to all users.

**Principle two: Flexibility in use**
The design accommodates a wide range of individual preferences and abilities.

**Guidelines:**
2a. Provide choice in methods of use.
2b. Accommodate right or left-handed access and use.
2c. Facilitate the user’s accuracy and precision.
2d. Provide adaptability to the user’s pace.

**Principle three: Simple and intuitive use**
Use of the design is easy to understand, regardless of the user’s experience, knowledge, language skills, or current concentration level.

**Guidelines:**
3a. Eliminate unnecessary complexity.
3b. Be consistent with user expectations and intuition.
3c. Accommodate a wide range of literacy and language skills.
3d. Arrange information consistent with its importance.
3e. Provide effective prompting and feedback during and after task completion.

**Principle four: Perceptible information**
The design communicates necessary information effectively to the user, regardless of ambient conditions or the user’s sensory abilities.

**Guidelines:**
4a. Use different modes (pictorial, verbal, tactile) for presentation of essential information.
4b. Provide adequate contrast between essential information and its surroundings.
4c. Maximise ‘legibility’ of essential information.
4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.
Principle five: Tolerance for error
The design minimises hazards and the adverse consequences of accidental or unintended actions.

Guidelines:
5a. Arrange elements to minimise hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
5b. Provide warnings of hazards and errors.
5c. Provide fail safe features.
5d. Discourage unconscious action in tasks that require vigilance.

Principle six: Low physical effort
The design can be used efficiently, and comfortably, with a minimum of fatigue.

Guidelines:
6a. Allow user to maintain a neutral body position.
6b. Use reasonable operating forces.
6c. Minimise repetitive actions.
6d. Minimise sustained physical effort.

Principle seven: Size and space for approach and use
Provide appropriate size and space for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:
7a. Provide a clear line of sight to important elements for any seated or standing user.
7b. Make reach to all components comfortable for any seated or standing user.
7c. Accommodate variations in hand and grip size.
7d. Provide adequate space for the use of assistive devices or personal assistance.
UWA policy

University policies: A number of policy documents and guidelines contain information on inclusion.

Place of these Guidelines in University policy: Sit under the UWA Disability Access and Inclusion Plan with information on ‘how to’ within the context of the physical environment.

UWA Disability Access and Inclusion Action Plan (DAIAP)

Required under: Disability Services Act 1993 (DSA).

Purpose: To proactively address the challenges of equitable access to educational, employment and cultural opportunities within the higher education sector for people with disabilities.

Main objectives: Six in all. Objective 3 addresses physical access and Way Finding, and states that UWA will continue to improve physical access and Way Finding to buildings facilities and campus services for staff, students and visitors with a disability.1

Availability: DAIAP can be viewed at www.equity.uwa.edu.au

Disability Discrimination Act 1992 and Heritage Legislation

UWA status: The grounds and several buildings are on the State Register of Heritage Places. Many other buildings appear on Municipal Inventories of Heritage Places. The University maintains its own register of heritage significance under its Heritage Conservation Plan.

Challenge to managers of heritage sites: Providing equitable and dignified access for all people.

Challenge explained: In his book Improving Access to Heritage Buildings2, Architect Eric Martin states:

‘The Disability Discrimination Act 1992 (DDA) is Commonwealth legislation requiring that people with disabilities be given equal opportunity to participate in, and contribute to, the full range of social, political and cultural activities. The goal of the DDA is not fulfilled by limited or parallel access, that is to provide the same means of use for all users. Instead, it promotes and protects equality of access – physical, informational and attitudinal.’

‘Heritage legislation at a Commonwealth, state or territory level seeks to conserve and protect the cultural heritage significance of a place. Significance is expressed in a statement describing the value of the place to us and to our society.’

_The legal view is that the Disability Discrimination Act will override Commonwealth, state or territory heritage legislation._

Martin tackles very difficult issues on providing universal equitable access whilst still retaining the heritage fabric of a building. The book discusses the legal framework that underpins equity issues, sets out strategies to identify and resolve access requirements and provides hands-on solutions from around Australia.

The book is freely available at www.environment.gov.au/heritage
Reference documents

Legislation: Provides guidance on overarching equity and dignity issues.

Regulation: Codes and standards, the technical documents on how to design accessible facilities.

Updates: Regularly reviewed and updated.

Revised information: Results from changing attitudes to social inclusion, advancements in technology and improved knowledge of how people with a range of disabilities are able to access their physical environment. This information is provided via feedback from users and ongoing research.

This document: To ensure information is contemporary, document has been developed so that information can be reviewed and updated on a regular basis.

Legislation, codes, standards and guidelines referenced in this document:

- Disability (Access to Premises – Buildings) Standards 2010 (Premises Standard) and Amendment 1 (2010);
- Guidelines on the application of the Premises Standard (2011);
- AS1428.1, 2009 Design for access and mobility Part 1: General requirements for access – New building work and Amendment 1 (2009);
- AS/NZ 1428.4.1, 2009 Design for Access and Mobility Part 4.1 Means to assist the orientation of people with vision impairment – Tactile ground surface indicators;
- AS1735 Parts 1, 2, 3, 7, 8, 12, 14, 15 and 16 – Lifts, escalators and moving walks;
- AS/NZ 2890.6, 2009 Off-street parking for people with disabilities;
- UWA Signage Manual;
- Vision Australia Fact Sheet on ‘Accessible Design for Public Buildings’;
- An Introductory Guide to the Slip Resistance of Pedestrian Surface Materials (1999);
- Accessible Scientific Laboratory Design;

Further information regarding each of the above is provided in Appendix 1.

1 UWA Disability Access and Inclusion Action Plan (DAIAP)
Using the UWA Building and Campus Access Guidelines

This document

**Bold type:** The text in bold type indicates terminology that is defined in the glossary or in the body of the UWA Building and Campus Access Guidelines.

New buildings

**Requirement:** Achieve equitable and dignified access solutions by adopting the principles in the UWA Building and Campus Access Guidelines as an integral part of the design for any new development or refurbishment.

**Recommendation:** Plan for access issues at a number of stages during the design, documentation and construction stages of a development.

**Access consultants:** Engage if the design team does not contain expertise in designing and access auditing. Access consultants are part of the design team to ensure compliance with the regulatory and legislative requirements.

Access requirements by project phase:

1. **Brief Development:** Ensure regulatory access requirements and *Universal Design* principles are incorporated, and that the responsibility for access planning is designated.

2. **Schematic Design:** Examine, evaluate, report and progressively provide input throughout the schematic design stage to define approaches and solutions necessary to ensure compliance with the regulations and a *Universal Design* approach.

3. **Design Development:** Review details progressively to identify any potentially non-compliant items and propose compliant, creative and cost effective solutions. Clarification and agreement at this stage will avoid unresolved issues later in the project.

4. **Contract Documentation:** Examine and review the contract documents, drawings and specifications to ensure compliance. The works should be signed off at this stage, prior to calling tenders. Changes after this time could incur time delays and/or cost variations.

5. **Construction:** Conduct site visits at critical phases to ensure that the construction works comply with the detail drawings. Access consultants must reach prior agreement with the architects on appropriate phases to monitor.

6. **Practical Completion:** Conduct a final inspection of the works on completion to ensure compliance and the correctness of the constructed details.
Using the UWA Building and Campus Access Guidelines continued

Refurbishments

Specific issues: Compliance challenges are presented in upgrading, refurbishing and retrofitting existing structures.

Examples:
- Changes in level with insufficient circulation space to install ramps or lifts;
- Retrofitting toilets with the constraints of existing plumbing.

This document: Issues specifically relevant to retrofits and refurbishments are highlighted in the Principles in Section Two of the UWA Building and Campus Access Guidelines.

Inadvertent barriers created between design and construction

Creation: Between the design and construction stages. While not always apparent on drawings, barriers can become apparent during or after construction.

Example: Sliding door, clear opening required is 850mm. 870mm opening, add a D handle and 60mm handle clearances and the door becomes too narrow for wheelchair access (740mm). The required width of sliding doors must not be less than 950mm, 1000mm preferred.

This document: Issues requiring particular attention in the construction stage are listed in the shaded area at the conclusion of the Principles in Section Two of the UWA Building and Campus Access Guidelines.

Individual solutions

Requirement: When it is not possible or practical to provide a completely accessible environment.

Individual access solutions: Adapt an environment or manage access with a policy, procedure or a management solution to suit an individual’s needs.

Identification: Design challenges that cannot meet the needs of all should be identified early in the planning stage.

Process: Discuss with UWA staff who regularly engage with students with disabilities to ensure that the basic access requirements are met (e.g. circulation space), allowing individual solutions to be developed in a cost effective manner with equitable and dignified management policies and procedures.

This document: Instances where individual solutions may need to be developed are identified with the words individual solutions within the Principles in Section Two of the UWA Building and Campus Access Guidelines.
Disability

**Design audience:** People of all ages and abilities.

**Audience characteristic:** Everyone is different, and the way individuals function within an environment may be unique to them.

**Example:** The position and design of an accessible toilet pan documented in AS1428.1 has been determined to accommodate the needs of people who, for example:

- are unable to stand and transfer, or slide, sideways onto the pan from a wheelchair;
- are unable to stand and transfer, or slide, onto the front of the pan from a wheelchair, facing the rear wall;
- are able to stand with support and transfer at an angle with the assistance of a carer;
- require a suitable facility to empty a urine bag;
- require a higher toilet seat and assistance to independently pull themselves up to a standing position.

**Categorising people:** While generally not useful, having some understanding of the diversity of disability types and the functional implications can be useful.

**Disability descriptors:** Can be divided into physical, sensory and cognitive with each covering many types of disabilities or medical conditions.

### Physical disability

**Ambulant disability**

**Access characteristics generally:** May use a walking aid (stick or frame) or walk unaided.

**Unaided walking:** Could be slow, experience pain, have difficulty bending, be unsteady on feet or become easily fatigued. Could be able to walk, but not go up or down stairs.

**This document:** Terms *mobility device* or *wheeled mobility device* are used to describe assistive devices that may be employed by people who have an ambulant disability.

**Upper limb disability**

**Access characteristics generally:** Disabilities such as arthritis or poor control of the arms that result in restricted arm movements (e.g. reaching a lift button), or difficulty turning and grasping objects (e.g. turning on taps, opening doors or pushing a small control that is flush with the surrounds).

**People who use wheelchairs and scooters**

**Access characteristics generally:** Limitations in how far or high a person can reach, or difficulty in seeing over or around people or other barriers. Require sufficient clearance under benches, counters and desks to accommodate knees and footplates.

**Manual wheelchairs:** Users may become fatigued when moving around a challenging environment.
Further characteristics: Some wheelchair users, (e.g. people with paraplegia) are unable to move their legs and have a loss of sensation. However, other wheelchair uses may have some leg movement and may be able to stand or even walk for short distances.

Sensory disability

Blindness

Definition: People classified as legally blind may have up to 10% vision. Very few people have no vision at all. Many people who are blind are able to discern day from night and may be able to tell you if the sky is overcast.

Access requirements: All information, including signage, in a non-visual format.

Access characteristics generally: Can take place with the aid of either a guide dog or a mobility cane to detect objects and spaces around them. Guide dogs need to be accommodated.

Environmental cues: Assist in mobility and orientation. Include other senses such as:

- hearing (noisy traffic moving in a certain direction);
- smell (a garden or chemical laboratory); and
- touch (a change in temperature, or a different ground or floor surface, or the ‘feel’ of being in a certain type of environment such as a small room, a windy corridor, etc.).

Low vision (vision impairment)

Access characteristics generally: Have sufficient vision to find their way around an environment if it is safe, logical and clear (e.g. clear shoreline), uses good colour contrast and large, well designed signage.

Deafness

Definition: By degree of hearing loss. Degree spans from profound or total deafness to moderate hearing loss. People with mild deafness would usually be considered to be hard of hearing or having a hearing impairment.

Language: In Australia, many people who are deaf use Auslan (sign language) as their primary language, and usually have knowledge of English, which they consider to be their secondary language. Some people are able to lip read, speak, or read and write English.

Access characteristics generally: Require clear signage that is located in a logical position. Adequate lighting is required for signage, lip reading and Auslan interpreters.

Hard of hearing

Forms: One of many forms that can affect the quantity and quality of sound received; loss of loudness, sound distortions or sensations such as ringing in the ear.

Access characteristics generally: Good acoustics and hearing augmentation is required in lecture theatres and halls.
Cognitive disability

Definition: ‘Impaired thought processes’ come under the very broad heading of a cognitive disability. People who have an intellectual disability or neurological impairment may have cognitive impairments. This could be apparent in many forms, some of which could be:

- Memory loss or confusion;
- Lack of confidence and skills to make enquiries;
- Becoming overwhelmed or distressed in an area that is highly stimulating;
- Slowness or difficulty processing basic information;
- Difficulty in following instructions or interpreting detailed or complex information.

Access characteristics generally: Require logical, consistent surroundings, signage that is easy to read and understand. May find environments that have an over proliferation of information difficult to function in.

Types of disabilities

Long term disability includes people with a longstanding and ongoing disability. The person may have been born with the disability or have acquired it.

Temporary disability or injury may not cause a long term disability, but the person may require some form of assistance in the short term, e.g. a broken leg. This could happen to any student, staff or visitor to the University.

Episodic disability includes people who may have occurrences such as back pain or flare up of a fatigue-inducing illness. People with an episodic disability may use a mobility aid on some occasions and not on others.
Glossary

Circulation space

Definition: The amount of space required to enable movement and functionality.

Dependencies: The capacity of the person and the task being undertaken.

Example: The circulation space required for a change of direction on the midway landing of a ramp, with a 180 degree change of direction, is 2070mm by 1540mm which will accommodate a small to medium style wheelchair. However, larger less manoeuvrable wheelchairs may require 2270mm by 2450mm and some larger style scooters may require even more circulation space. AS1428.1 provides minimum circulation space requirements, which will not always be sufficient to accommodate the needs of some students and visitors with disabilities attending UWA.

Continuous accessible path of travel (Path of travel)

Description: The route a person with a disability can independently travel.

Through this document it is referred to as the path of travel or an accessway.

An accessway is defined in the Premises Standard as a continuous accessible path of travel to, into or within a building and accessible is defined as having features to enable use by people with a disability.

Universal access requirement: Needs to be unobstructed in width (including sufficient space for wheelchair users to pass and turn), length, height and surface. There are clear access provisions required to ensure all accessways to and within a building meet the needs of people with a mobility, sensory or cognitive disability. (See Figure A)

Example: A walkway or ramp, or an open plaza, reception or foyer area and internal corridors and their associated landings, passing and turning spaces.

Occurrence: A continuous accessible path of travel should link all public transport stops, taxi ranks, accessible parking and drop off bays, public footpaths and to and within accessible buildings throughout the campus.
Cross fall

Definition: Gradient perpendicular to the *path of travel*.

Acceptable maximum: 1:40.

Excessive *cross fall*: Steeper than 1:40.

Affects: People with poor balance and those using wheeled mobility aids.

Effect on manual wheelchair users: Research shows 50% more effort is needed for a manual wheelchair user to push themselves along a level footpath with a *cross fall* of 1:33, than for a level footpath at the acceptable maximum *cross fall* (1:40). For manual wheelchair users this is a wasted expenditure of energy.

Effect on others: A *cross fall* >1:40 on a ramp can create an unstable surface for people using manual wheelchairs or other wheeled *mobility devices*.

*Figure B*: This kerb ramp has a sloped camber. The gradient of the ramp combined with the gradient of the camber results in an unstable surface that requires unnecessary effort to negotiate in the intended direction of travel.

Grab rail

Definition: A rail used for stability when performing a task, such as transferring on and off a toilet seat. The *grab rail* has a 30–40mm diameter, slightly smaller than a *handrail*, so that the user can gain a tighter grip. *(See Figure C)*

Handrail

Definition: A rail used along a path of travel to assist in guiding pedestrians.

Mobility impairment: Provides some stability at stairs and ramps and along lengthy walkways. Handrails are required on both sides of stairs and ramps to provide support to people who may have the use of one arm or hand and are required to ascend and descend the stairs or ramp.
Handrail continued

Ramps and stairs need to be designed so that they are set back sufficiently off the accessible path of travel so that the required handrail terminations do not project into any cross pedestrian traffic.

Vision Impairment: Highly effective navigational cue.

Assistance offered: Details at either end of stair and ramp handrails (such as the horizontal end, turn under and the level of luminance contrast) assist a user with severe vision impairment to predict where the stairs or ramp terminate and in which direction to travel when stepping off a stairway or a ramp. (See Figure D)

International symbol for deafness

Status: Internationally recognisable symbol.

Purpose: Indicates a facility is accessible to people who are deaf.

Description: A blue square overlaid in white with a stylised image of an ear.

Reference: AS1428.1 Clause 8.2.2 and Figure 12
Access Code D3.6(b), D3.7(1-3) Part D4

International symbol of access

Status: Internationally recognisable symbol.

Purpose: Indicates that facilities are accessible to people with disabilities.

Note: Many people with disabilities do not use wheelchairs. The symbol represents the general concept of disability.

Use: At an entrance to a building or a restroom indicates that the facility is accessible to everyone, regardless of their ability.

Description: A blue square overlaid in white with a stylised image of a person using a wheelchair.

Reference: AS1428.1 Clause 8.21 and Figures 10 and 11.

Landmark

Definition: Any familiar object, sound, odour, temperature, visual or tactile cue that is easily recognised and has a permanent location in the environment.

Purpose: When installed adjacent to (but not obstructing) a path of travel, can provide a visual, auditory or tactile cue to pedestrians.

3 Orientation and Mobility Information Kit, Association for the Blind WA, www.abwa.asn.au
Glossary continued

Long Cane

Description: Used by a person who is blind when moving independently in an environment. The person sweeps the cane in an arc from left to right, just wider than their body.

Luminance contrast

Definition: The difference in the light/dark properties of two adjacent surfaces rather than just their colours. It is luminance contrast that is important to enhancing vision, not colour contrast, because it offers light / dark differences that can be picked up more easily by people who have low vision.4

Use: Very helpful in assisting people with low vision to locate important aspects of a building such as doorways, signs, handrails, rubbish bins and objects of interest. Contrast is also used to highlight potential hazards such as edges of steps or poles.

Testing: Assessing luminance contrast (this is different from colour contrast) is usually undertaken using sophisticated laboratory and in-the-field testing equipment providing assurance that the luminous reflectance values of one surface differs sufficiently from the surrounds, and can be easily detected by people with low vision or vision impairment.

Some assessors will take a black and white photo to demonstrate subjectively the luminance contrast between two surfaces. Definitive and objective luminance contrast assessments are carried out with a photometer or a portable instrument such as the ColorLuminator.

Appropriate luminance contrast for people with low vision or a vision impairment provides a higher level of safety and / or enhances Way Finding:

- On all step edges, achieved with contrasting nosings;
- On Tactile Ground Surface Indicators, whether using tiles or discrete domes;
- On statutory, informative, directional signage;
- At all doorways provided between the door and wall or door and door frame;
- On hazard warning strips on any glazing or glass doors that could be mistaken as an opening.

Clearly documented information regarding luminance contrast is available in ‘Designing for people with partial sight and color deficiencies’ by Aries Arditi available from the Lighthouse Vision Trust website on the web-page ‘Effective Color Contrast’.

www.lighthouse.org/accessibility

4 Accessible Design for Public Buildings, Vision Australia www.visionaustralia.org.au
Glossary continued

Mobility device
Definition: A device used by an ambulant (walking) person to assist them move within their environment.

This document: The terms mobility device (e.g. crutches, frame and walking stick) or wheeled mobility device (e.g. walking frame with wheels or wheelchair) are used to describe assistive devices that may be employed by people who have an ambulant disability. (See Figure E)

Scooter
Characteristics: Battery operated scooter is generally much larger and heavier than a power wheelchair. They can have three or four wheels and are generally operated by thumb controls. Scooter users may use their scooter for moving over long distances, but then may 'park' their scooter and walk shorter distances (for example into a room). However, this cannot be assumed. (See Figure F)

Shoreline
Definition: The border or edge of a footpath or building line. A method of describing the way a person who has low vision or is blind navigates, using the path edge or building line as a directional cue.

Examples of common obstructions along building shorelines – bike racks were added after the building was constructed.

Tactile ground surface indicators (TGSIs)
Description: Raised domes and stripes placed in patterns on the ground to provide tactile information, designed to be read tactually underfoot, through the tip of a long cane, or visually because of their high luminance contrast to the surrounding surface.
Use in Australia: Two types used under AS 1428.4: Warning tiles (designed to indicate hazards such as stairs or roadways), and directional tiles (used to assist people to negotiate difficult environments such as wide open spaces).

**Warning TGSIs** at the base of stairs – in good colour contrast to the surrounding tiles. In this application.

**Directional TGSIs** are used as a *Way Finding* cue to a designated point of entry to a train.

**Warning TGSIs** have been used in this example to identify to pedestrians the hazard of the water’s edge.

**Purpose:** Useful *Way Finding* cues for people with vision impairment.

**Consistent use:** Placement is a key consideration during installation.

**Overuse:** Should not be overused as they are only one part of a *Way Finding* system.

**Limitation:** Hazard style TGSIs will warn of a hazard, but will not assist in determining what the hazard is.

**Installation in public buildings:**
- **Warning TGSIs:** Install at stairways, ramps and kerb ramps where the kerb ramp leads to a hazardous environment such as a roadway.
- All other TGSI applications, including Directional installations: Consider carefully and discuss with an expert during the design stage to ensure that:
  - the application enhances access;
  - TGSI’s are necessary, as other navigational cues do not provide sufficient information;
  - TGSI application does not give incorrect, superfluous or confusing information; and
  - the TGSI application does not create an additional hazard, particularly to people using wheeled mobility aids.
Glossary continued

Universal Design

Definition: A framework for the design of places, things, information, communication and policy to be usable by the widest range of people operating in the widest range of situations without special or separate design.

Explained: A human-centred design of everything with everyone in mind. Also called Inclusive Design, Design-For-All and Lifespan Design.

Principles: Seven principles detailed at the commencement of the UWA Building and Campus Access Guidelines. Additional information can be sourced at www.adaptenv.org/

Way Finding

Definition: The method used by people to find their way around an environment. The concept is broader than signage and encompasses a range of other environmental cues.

Typical cues: A range including signage, a handrail on a flight of stairs, a garden bed, a water feature or some other distinct architectural feature.

Cue characteristics for people with low vision: Can be felt (a handrail or perhaps Braille signage), or heard (a water feature), or smelt (a perfumed plant).

Wheelchair

Definition: A wheeled mobility device in which the user sits.

A manual wheelchair: Propelled manually (by pushing the wheels with the hands).

A power (electric) wheelchair: Operated by an on-board battery pack with the wheelchair user directing the wheelchair, usually with a ‘joystick’ control. (See Figure G)
**Wheelchair footprint**

**Definition:** The clear floor space required to accommodate a stationary *wheelchair*. This space is 800mm wide and 1300mm long. This space is said to accommodate 90% of *wheelchairs* and *wheelchair* users. It should be noted that some *wheelchairs* could be larger and these dimensions do not include powered *scooters* (gophers).

**Reference:** *AS1428.1 Figure.1* *(See Figure H)*
## Section two

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Siting and approaches to buildings

Principles generally

Siting: Ensure placement and design do not inadvertently create access barriers for people with disabilities.

Unintentionally created access barriers: Costly to rectify, and can be avoided if early planning is based on Universal Design principles.

Way Finding: Facilitated by good siting, approaches and design, ensuring equitable and dignified access for people with disabilities.

DESIGN PRINCIPLES

Equitable use

Principle: The design does not disadvantage or stigmatise any group of users.

Requirement: Employ acceptable, contemporary practice to design so that persons with physical disabilities (including vision or hearing loss) are not required to take a more complex, longer or more difficult route to gain access.

Enhancement: Landscaping can enhance the ease by which people with mobility, cognitive or sensory disabilities gain access by providing cues regarding the direction of travel to a destination.

• Level access: Provide to the main and preferably secondary entrances. If there are no alternatives then ramp access to the secondary entrances could be considered.

• Travel distance: Ensure people with disabilities are not required to travel a greater distance or more complex route to gain access to the main or secondary entrances of the building.

• Entrances and Landmarks: Identify by the use of landscape as well as building features. Provide visual, tactile or auditory cues.

Simple, intuitive use

Principle: Use of the design is easy to understand, regardless of the user’s experience, knowledge, language skills, or current concentration level.

Requirement: Plan buildings and entry points so that they are logical, predictable and easy to find.

Enhancement: Facilitate easy movement along all paths leading to the building for all people regardless of their perceptive and language skills or previous experience with the building/location.

• Way Finding: Use landscaping and pathways, luminance contrast along path borders and landmarks in the external design of the building.

• Barriers: Avoid deliberately or inadvertently designing barriers or things that cause confusion or disorientation when leading to a building approach or entrance.
The approach to a building through good path design, effective landscaping and the avoidance of visual clutter or physical barriers, will enable a person to approach a building intuitively, locating the entrance without risk of injury or disorientation.

**Low physical effort**

**Principle:** The design can be used efficiently and comfortably, and with a minimum of fatigue.

**Requirement:** Ensure building designs reduce the effort required to access a building. Effort reduction strategies include siting a building on level ground and within proximity to other key facilities.

**Enhancement:**

- **Orientation:** Ensure the main entrance faces towards common use amenities, main entrances of other buildings and frequently used paths of travel.

- **Paths of travel:** Minimise length and exposure to weather. Maintain straight paths as far as possible.

- **Additional provision:** Support (e.g. handrails) and resting spaces where a greater physical effort is required (e.g. long paths, steps and ramps).

A building sited on a hill or set up from ground level creates access barriers such as distance and gradient. The addition of stairs and ramps increases the distance to travel and energy required, particularly for people using mobility devices.

Monochromatic finishes with no distinguishing features makes Way Finding into this entrance particularly confusing for people with a vision impairment. This fully glazed, frameless facade makes the entrance door difficult to detect and differentiate from sidelights / glazed walls.

To improve this entrance: Less glazing or framed glazing and an easy to detect feature at the doorway.
Siting and approaches to buildings continued

A clearly defined path of travel and a feature over the entranceway makes the door easy to find.

This newly erected building in West Perth illustrates the way in which the building is sited on the land can have a significant impact on access for all people.

The footpath on the right hand side provides level staff only egress from the ‘rear’ of the building. This is an opportunity lost, where the ‘front entrance’ of the building could have been sited to provide level access.

This elevation has been designated as the ‘front entrance’ and has a flight of stairs. To meet the needs of people with mobility disabilities, a ‘special’ low rise enclosed passenger platform lift has been installed, for people with disabilities only, adjacent the stairs.
Internal design

Principles generally

**Principle:** All internal areas within a building must be accessible to people with disabilities by provision of a clear *continuous accessible path of travel* to and within each level. There are some broadly defined exceptions to this outlined in the Premises Standard.

**Internal design:** Based on intuitive and logical design with design features that enhance rather than impede *Way Finding*. The building must enable use by all people regardless of their ability.

DESIGN PRINCIPLES

Equitable use

**Principle:** The design does not disadvantage or stigmatise any group of users.

**Practical considerations:**

- **Key facilities and services:** Locate together where they can be found with little or no need for additional assistance, rather than locating accessible amenities such as toilets ‘out the back’ or at an inequitable distance.

- **Plan configuration:** Right-angled elements assist people with low vision to orientate themselves and move assuredly about a building. Avoid diagonal or curved elements wherever possible.

- **Glazing generally:** Avoid the use of extensive glazing at the end of corridors or adjacent to stair cases.

- **Ceiling to floor glazing:** Provide good visual cues to indicate where the floor ends and the glass wall begins, such as carpet / vinyl strips at the base of glass walls, glazed doorways and sidelights.

- **‘Special’ facilities:** Avoid solutions that can be seen as uniquely required for people with sensory or mobility impairments when a generic solution meeting the needs of all users is possible.

- **Facilities needing additional assistance to operate:** Avoid generally. This includes situations where independent access is not possible (e.g. a *wheelchair* platform lift that is key locked or cannot be operated independently).

Simple, intuitive use

**Principle:** Use of the design is easy to understand, regardless of the user’s experience, knowledge, language skills, or current concentration level.

**Practical considerations:**

- **Independent navigation:** Facilitate with a logical and simple design. People who are blind or with low vision rely on their memory to navigate around a building.

- **Key amenities:** Centralise toilets and vertical access (lift and stairs) in a building core near the main reception area to facilitate access. Locate together with the design repeated through each level.
Section two – Internal design – principles

Internal design continued

- **Way Finding:** Use design features to enhance, rather than unintentionally impeding.
  - **Service doors:** Paint out and provide colour contrast to door frames of key rooms such as toilets, lecture theatres, tutorial rooms and offices.
  - **Colour:** Use colour contrasting door frames, door handles and skirting boards or colour contrasting trim on the floor surface to assist people with low vision. Use carpet trim, colour contrasting skirting boards or patterns in carpet edging to act as a **Way Finding** cue rather than as an unintentional distraction to **Way Finding**.
  - **Texture:** Provide changes in floor textures at key decision making points and / or at key features such as a reception desk, e.g. a carpet insert in a vinyl floor or a low pile / inset door mat provides a tactile and visual cue at doorways.
  - **Glar:** Avoid the use of shiny or light reflective surfaces that cause glare.

- **Large areas:** Break down into smaller ‘rooms’ with landmarks to assist with **Way Finding**. Ensure clearly identifiable pathways are retained and not obstructed by furniture or overhead obstructions such as open staircases.

Low physical effort

**Principle:** The design can be used efficiently and comfortably, and with a minimum of fatigue.

**Practical considerations:**

- **Key facilities and services:** Locate together (see **Key amenities** above) in a position where a person with impaired mobility does not travel further than everybody else.

- **Entry and access doors:** Automatic doors require minimal physical effort by any user.

- **Lifts:** Less physical effort required than stairs or ramps.

- **Unisex accessible toilets:** Use doors that are light to open and slow to close.

- **Floor surfaces:** Choose matt surfaces that are slip resistant and non-light reflective.

![The service door has been ‘painted out’, a useful **Way Finding** technique to discourage people from entering areas not designed for public access.](image)
In this example colour contrast surrounding the door provides a visual cue to the public entrance.

The use of colour and texture assist in **Way Finding** within a building.

The monochromatic colour and the extensive use of unframed and unmarked glazing is a visual distraction to those with low vision, reliant on environmental cues for **Way Finding**.

**Way Finding** could be improved by using colour contrasting borders on the carpet and coloured handrails or borders at the top of the glass balustrade.
Accessible parking bays (angled or parallel)

ACCESS PRINCIPLES

Characteristics

• **Design and location:** Meet the needs of disabled passengers or drivers who require additional parking bay width, length, a safe place to transfer, or a bay in close proximity to the facility they need to access.

Wider/longer bays

• **Reason:** Additional space is required:
  – On either side of their vehicle, depending if they are a driver or passenger, to enable a transfer to/from the vehicle to a **mobility device**;
  – At the rear of their vehicle to unload a **wheelchair** from the boot;
  – To deploy a rear or side mounted hoist and alight from the rear or side of the vehicle; or
  – To unload a **wheelchair** or **scooter** from a rear mounted trailer or carrier.

• **Placement:** As close as possible to a main entrance for people who can’t walk long distances.

**Distances:** 60 metres is the acceptable maximum distance a person with mobility impairment should be expected to walk before arriving at their destination or sitting to rest.

• **Proximity versus the slope of the bay:** It is more appropriate to position a bay on level ground, slightly further away, than on sloped ground where safety of transferring a person from a car to a **wheelchair** would be compromised.

At construction:

• **Location:** Ensure the accessible bay is located where it will be possible to retain a clear, safe, continuous **path of travel** from the bay to all accessible facilities that the bay services.

  **Impediments:** Do not install speed humps, bollards or drainage grates in an area where they can become an access barrier. This includes between the bays, the parking payment machines and the main entrance of a building.

• **Drainage:** Ensure adequate drainage so that water does not pool in the area where transfers need to take place.
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<th>Key features – Mandatory</th>
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<td><strong>Number of bays</strong></td>
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<tr>
<td>2% of total bays per car park to be designated as accessible.</td>
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<tr>
<td>For tertiary institutions with limited parking facilities, accessible spaces should be provided on request where justified. Two percent is a guide that is appropriate to a tertiary institution with large car parks.</td>
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<tr>
<td>Follow up by monitoring the demand for spaces to assess if provision is satisfactory.</td>
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**Identification:**
- Identify the parking space using the international symbol in white on a blue background;
- Bay line markings in yellow;
- Mark the shared area with longitudinal lines;
- Sign at the head of the bay; and
- Where there is a total of five or less bays, the accessible bay need not be identified by markings or signage.

The use of non-contemporary terminology such as ‘disabled parking bay’ is not acceptable. Identification of the bay with the access symbol and blue line markings is sufficient.

- Provide directional signage to bays if the bays are not visible from car park entry.

**Path of travel from bay(s):**
- Connect bay(s) to the main accessible entrance(s) of the building and / or adjacent principal walkways with an accessible path of travel.

Ensure speed humps do not occur where wheelchair users need to cross or negotiate roadways.
Accessible parking bays (angled or parallel) continued

- Use kerb ramps at changes in level.
- Meet design requirements.
- Should not be obstructed by parked cars.
- A vehicle mountable kerb is not an acceptable replacement for a well designed kerb ramp.

AS2890.6
Clause 2.5
Parallel Clause 2.2.2 and Figures 2.6
AS1428.1
Clauses 10.7.1, 10.7.2, 10.7.3 and 10.8.3

Key features – Towards Best Practice

Location and safety:
- Away from traffic flow (e.g. busy entrance driveway).
- Avoid the necessity for pedestrians to move along a roadway (provide separate pedestrian and vehicle zones).
- Minimise road crossing.
- Ensure there is good passive surveillance with easy access to main entrance.

✔ This parking design assists people with disabilities as the ‘no parking’ area adjacent to the accessible bay provides increased width for transferring from the vehicle or deploying a side mounted hoist and keeps the access point to the footpath clear of parked vehicles.

Note: this photo demonstrates the concept of a ‘shared space’ and has not been strictly designed to AS2890.6.

✘ Although this may have been considered the only possible accessible parking retrofit location it has the following problems:
- The bay is on a slope making a transfer from a vehicle to a wheelchair unstable.
- The path to the buildings is excessively sloped, with a steep camber making it unsafe for a person using a wheeled mobility aid.
Inappropriate terminology has been used to identify parking bays. Avoid the term ‘disabled’. If wording is required use ‘accessible’.

The use of the international access symbol provides sufficient information to identify the accessible bay.

Two accessible parking bays with a central ‘shared space’.

Vehicular entry into ‘shared space’ should be obstructed by one, not two bollards.
ACCESS PRINCIPLES

**Purpose:** Undercover bays are particularly desirable as they provide protection from inclement weather for people with disabilities.

**Reason:** Car transfers often take a considerable length of time and due to the nature of the transfer task, people are often unable to use umbrellas or easily put on rain protective clothing.

**Overhead clearance:**
- Sufficient to accommodate a van from the car park entrance to the bay.
- Sufficient to deploy a roof mounted *wheelchair* hoist which, when activated, raises the *wheelchair* to full height above the vehicle.
- In a retrofit situation where overhead clearance (2500mm) cannot be satisfied install clearly visible signage indicating clearances provided.

**Location and safety:**
- Separate vehicle and pedestrian zones.
- Where the driveway (vehicle ramp) is steeper than a pedestrian ramp, an alternative means of access is required.

**At construction:**
- **Service pipes:** Ensure installations above accessible bay do not encroach into the required overhead clearance (2500mm).
- **Path of travel:** Ensure the clear, safe, continuous *path of travel* from the accessible parking bay to all accessible facilities is retained, e.g. no speed humps.

**Key features – Mandatory**

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A roof mounted wheelchair hoist. When the wheelchair is being deployed, the hoist raises the wheelchair to its full height on top of the vehicle. A 2.5m minimum overhead clearance is therefore required in undercover parking areas.
Parking controls

Parking payment machines

ACCESS PRINCIPLES

Accessibility: Where parking payment is required, machines need to be accessible to those using wheelchair and mobility devices.

Path of travel:
- **Continuity:** From the accessible bay(s) to the machine.
- **Raised footpath:** Provide a kerb ramp up to the footpath.
- **Circulation space:** Provide sufficient in front of the machine to enable a person with a **mobility device**, including a **wheelchair**, to be safe, stable and stationary while operating the payment machine.

Instructions and controls:
- **Light:** Provide sufficient so that instructions can be easily read at night.
- **Written instructions:** Provide easy to read/interpret instructions at a height that can be read by all.
- **Luminance contrast:** Maximise for LED displays, e.g. black on white.
- **Controls:** Large and easy to operate for people with poor grip or reduced hand strength, e.g. people with arthritis.

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<td>Figure 24</td>
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<tr>
<td>Provide level access from the bay to the machine.</td>
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<td>Alternatively, install a kerb ramp that complies with design requirements.</td>
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<td>Provide a flat landing in front of the machine.</td>
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Visual display located between 1200-1600mm.

AS1428.2

Figure 30
This ticket machine is located on an elevated footpath, inaccessible to wheeled mobility device users as no kerb ramp has been installed.

To provide access for all to the parking machine, provide a kerb ramp up from the roadway on to the raised footpath.

This ticket machine has:

✔ Ample circulation space in front, providing easy access for a person with a mobility impairment.
✔ Level access from the accessible bay providing easy access for a person with a wheeled mobility aid.
✔ Good lighting so that instructions can be read at night time.

Accessed controlled entry

ACCESS PRINCIPLES

The access or intercom pedestal should be, where practical, positioned so it can be reached by a driver who uses a wheelchair.

Key features – Towards best practice

Locate where it can be reached from the vehicle.  

AS2890.6  
Appendix A, Note A4
## Drop off bays

### ACCESS PRINCIPLES

**Generally:**
- **Application:** Principles that apply to drop off bays also apply to taxi ranks.

**Purpose:**
- **Convenience:** Enables passenger drop of at a convenient location close to the main entrance, with the driver parking the vehicle in the general car park.

**Reason:**
- **Accessible parking bay(s):** Allows use by another as the car or van can be parked in a standard parking bay. A shelter and seat will allow the passenger to wait for the driver.
- **Fatigue:** A person who may get fatigued can be dropped off in a location close to the main entrance.

**Size:**
- A **wheelchair** or **mobility device** user needs a wider and/or longer space.
  - A **wheelchair** hoist deployed from the rear or side of a van.
  - Unloading a **mobility device** or **wheelchair** from the boot or a rear mounted trailer or carrier.

### Key features – Mandatory

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### Key features – Towards best practice

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<td>Connect to main accessible entrance of the building and/or adjacent principal <strong>walkways</strong>.</td>
<td>Clause 6</td>
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</table>

| Provide a sheltered **rest area** near the drop off bay. |  |
Drop off bays continued

Drop off bay located in a safe position away from busy roadway and has good design features including:

✔ A kerb ramp for easy access to adjacent footpath.
✔ Sufficient width and length to accommodate a van.
✔ A seat nearby that allows people to rest while waiting to be picked up.

Bay could be more easily located with the addition of elevated identification signage.

✘ Trip hazard in foreground.
Accessways

ACCESS PRINCIPLES

Definition: A continuous accessible path of travel or accessway is an uninterrupted path of travel to, into or within a building, providing access to all accessible features.

AS1428.1 2009 Clause 4.6 and Access Code Part A1.1

Includes:

• An external walkway, courtyard, open plaza etc with a gradient not steeper than 1:20;
• Internal corridor, plaza, reception area, foyer etc;
• Ramp, step ramp, kerb ramp, threshold ramp;
• Associated landings;
• Pedestrian crossings and building shorelines;
• Lifts (while considered part of an accessway, mechanical lifting devices such as lifts will be addressed in a separate section.)

Excludes:

• Steps and stairs (where steps / stairs* are provided a continuous accessible path of travel must be provided, unless exempted);
• Turnstiles;
• Revolving doors;
• Escalators and moving walkways. AS1428.1 Clause 6.1

*Steps and stairs are an important means of providing vertical access and are required to be designed to meet the needs of people who are ambulant. They will be addressed in a separate section.

Design considerations:

• Height: Minimum height of 2000mm, except at doorways (1980mm).

• Width:
  – Minimum width of 1000mm.
  – However, in order to accommodate anticipated traffic volumes in a university setting, to be sufficient to accommodate anticipated traffic flow in both directions. A diagram depicting this is provided at the end of this section.

• Shoreline: Keeping the edge of a building or footpath free from hazards, intrusions or obstructions such as open windows, skirtings, telephones, bike racks, fire hose reels or extinguishers, air conditioning units and the like will enable the edge of the accessway to be used as a navigational cue by a person who is blind or has low vision.
  – Clutter: Keep free for the minimum width or in response to anticipated traffic flows.
  – Tactile cues: Design in tactile cues at path edges (e.g. grass edge / raised garden bed adjacent a path).
  – Open space adjacent to a building: The building edge is often used as a navigational shoreline by a person with a vision impairment. Requires the same attention to the detailed design as a designated footpath.
Accessways continued

- **Passing spaces** and **turning spaces**:
  - In a building, the provision of **passing spaces**, where a direct line of sight is not available, eliminates the necessity for a wheelchair user to reverse up an **accessway** where another pedestrian who is a mobility device user is encountered. Where required, passing spaces are provided at a maximum interval of 20 metres.
  - In a building, **turning spaces** are required where the accessway does not continue (for example there is no intersecting corridor) and at 20 metre intervals along the accessway.
  - Corridors can be designed to incorporate **passing spaces** that also serve as **turning spaces**.
  - Where corridors intersect, at the end of corridors or where a **turning space** is required, spatial requirements for the degree of turn necessary are clearly defined.

- **Surface**: The surface of any **accessway** must be traversable by a person using a mobility device, who has an ambulant or sensory disability. Impediments could include – heavily raked joints in brick paving, deep and uneven cobbles, heavily patterned flooring that could be difficult to interpret, carpet trims. Paving tolerances are specific and cannot exceed 5mm (bevelled or rounded edges) or 3mm where there are vertical edges.

- **Draining grates, tree grates and service covers**:
  - Where required along an accessway, install flush with the adjacent surface.
  - Where service covers and TGSIs are required in the same location, adhesive TGSIs could be retrofitted.
  - Install with the long dimension of a grate perpendicular to the main direction of travel to avoid trapping wheelchair tyres.

- **Soft floor coverings**: Carpet to be traversable by people who use a wheelchair. Thick pile or moveable or thick underlay can impede the travel of a mobility device user.

- **Recessed matting**: Recessed matting to not create an additional access barrier caused by changes in level, lips, gaps or the bristle.

- **Gradient**: Defines whether the surface is a **walkway** or a **ramp**.

- **Walkways and ramps**: Flat landings are required at any change in direction to enable those using wheeled mobility devices / wheelchair to turn on a stable, level surface.

- **Doorways and gates**: Require a flat landing and the necessary **circulation space**.

- **Direction**: A logical accessible path of travel between, to, into or within buildings and facilities assists **Way Finding** for people who are blind or have a vision or cognitive impairment.

- **Transition**: **Kerb ramps** or **step ramps** at any changes in level or **TGSIs** where the transition between the footpath and a hazard (roadway) is level.

- **Vision / glazing**: Large expanses of glazing that may not be visually detected and mistaken as an opening or a doorway can be hazardous to all and particularly for people with low vision.

Where glazing may be mistaken for an opening or doorway, and is not designed with a suitable barrier (chair rail, handrail, transom), the glazing needs to be marked with a contrasting line that can be seen by people, regardless of which side the glazing is being viewed through.
## Key features – Mandatory

<table>
<thead>
<tr>
<th>Feature</th>
<th>AS1428.1</th>
<th>Clause</th>
<th>Figure</th>
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</thead>
<tbody>
<tr>
<td><strong>Height:</strong></td>
<td></td>
<td>Clause 6.2</td>
<td>Figure 2</td>
</tr>
<tr>
<td>• Meet design requirements.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Width:</strong></td>
<td></td>
<td>Clause 6.3</td>
<td>Figure 2</td>
</tr>
<tr>
<td>• Meet design requirements.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In areas of low volume traffic: a minimum unobstructed width of 1000mm.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>A width of 1000mm will enable a <strong>wheelchair</strong> user to move along the path, without passing space for other pedestrians.</td>
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<td></td>
</tr>
<tr>
<td>For example, this may be a minor pathway infrequently used by students or visitors.</td>
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<tr>
<td>• In areas where passing (two way traffic) is likely: a minimum unobstructed width of 1500mm.</td>
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<td></td>
<td></td>
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<tr>
<td>• A width of 1500mm will enable a <strong>wheelchair</strong> and pram user to pass.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>For example, commonly used pathways to secondary building entrances.</td>
<td></td>
<td></td>
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<tr>
<td>• In areas where high volume traffic and frequent passing is likely: a minimum unobstructed width of 1800mm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A width of 1800mm will enable two <strong>wheelchair</strong> users to pass.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For example, pathways leading to main building entrances and connecting principal buildings / faculties.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Building perimeters:</strong></td>
<td></td>
<td>Clause 6.3</td>
<td>Figure 2</td>
</tr>
<tr>
<td>• Must be kept clear for at least 1000mm.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be used as a navigational <strong>shoreline</strong> for a person with a vision impairment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Passing spaces:</strong></td>
<td>Access Code</td>
<td>Clause D3.3 (c) (i)</td>
<td>Figure 3</td>
</tr>
<tr>
<td>Provide where required and meet design requirements.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Turning spaces:</strong></td>
<td>Access Code</td>
<td>Clause D3.3 (c) (ii)</td>
<td>Figure 4 and 5</td>
</tr>
<tr>
<td>• Provide where required and meet design requirements.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Accessways continued

<table>
<thead>
<tr>
<th>Circulation spaces:</th>
<th>AS1428.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Meet design and space requirements.</td>
<td>Clause 13.3</td>
</tr>
<tr>
<td>• Used in combination to allow access through doorways / gates, in both directions.</td>
<td></td>
</tr>
<tr>
<td>• Gradient and crossfall no steeper than 1:40.</td>
<td></td>
</tr>
<tr>
<td><strong>Surface:</strong></td>
<td>AS1428.1</td>
</tr>
<tr>
<td>• Slip resistant.</td>
<td>Clause 7</td>
</tr>
<tr>
<td>• Texture traversable by people using a wheelchair, have an ambulant or sensory</td>
<td></td>
</tr>
<tr>
<td>disability.</td>
<td></td>
</tr>
<tr>
<td><strong>Construction tolerances:</strong></td>
<td>AS1428.1</td>
</tr>
<tr>
<td>• Abutment of surfaces to have a smooth transition.</td>
<td>Clause 7.2</td>
</tr>
<tr>
<td>• Tolerances for raked joint pavers to meet design requirements.</td>
<td>Figures 6 and 7</td>
</tr>
<tr>
<td><strong>Soft fixed or recessed floor coverings:</strong></td>
<td>AS1428.1</td>
</tr>
<tr>
<td>• To be of a style that does not impede a traversing wheeled mobility device or</td>
<td>Clause 7.4.1 and 7.4.2</td>
</tr>
<tr>
<td>cause a trip hazard either by the style used or method of fastening.</td>
<td>Figure 8</td>
</tr>
<tr>
<td><strong>Grates:</strong></td>
<td>AS1428.1</td>
</tr>
<tr>
<td>• To be of a style that does not impede a traversing mobility device with small</td>
<td>Clause 7.5 (a) and (b)</td>
</tr>
<tr>
<td>openings laid transverse to the dominant direction of travel.</td>
<td></td>
</tr>
<tr>
<td><strong>Glazing:</strong></td>
<td>Access Code</td>
</tr>
<tr>
<td>• Where there is no chair rail, handrail or transom, any glazing on an accessway,</td>
<td>Clause D3.12</td>
</tr>
<tr>
<td>capable of being mistaken for a doorway must be marked.</td>
<td>AS1428.1</td>
</tr>
<tr>
<td></td>
<td>Clause 6.6</td>
</tr>
</tbody>
</table>

| Key features – Towards best practice                                               |                                               |
|-------------------------------------------------------------------------------------|                                               |
| **Rest areas:**                                                                    | AS1428.2                                      |
| • Provided every 60 metres.                                                         | Clause 7 (Note)                               |

**At construction ensure:**

- Abutting surfaces are flush with no lips or gaps.
- Sharp transitions between planes of landings and walkways / ramps.
- Camber is sufficient to eliminate water pooling without creating an access barrier by exceeding 1:40.
- Documented gradients allow for construction tolerances. Sometimes when a path is constructed the topography is slightly steeper than anticipated.
Exemptions:

- Some exemptions to a level or storey, other than the entrance level, in Class 5, 6, 7b or 8. **Access Code Clause D3.3 (f)**
- An accessible path of travel to an area that would be considered inappropriate due to the particular purpose for which the area is used. **Access Code Clause D3.4**

Design **accessways** to accommodate the anticipated traffic flow, in both directions. Consider ambulant pedestrians and include the capacity to accommodate people using **mobility devices** including larger style wheelchairs, scooters and bicycles. Consultation is required at the planning stage to determine anticipated traffic flows and ensure **accessway** widths, whether path, corridor or ramp, are sufficient.

Surfaces to be traversable by mobility devices ensuring the mortar joints do not cause a trip or stumble hazard or cause a wheelchair tyre to be diverted in an unintended direction. Avoid cobbles or heavily raked joints.
This grass edge provides a useful *shoreline* (tactile navigation line) for a person with a vision impairment using a *long cane*.

The grey concrete against the green grass provides good colour contrast for people with low vision.

The air conditioning unit mounted on an external wall obstructs the potential shoreline. Overhead clearance of 2000mm is required to enable pedestrians to pass safely under an overhead obstruction.

These external stairs obstruct a busy pedestrian zone. The barriers, installed to improve safety are at waist and head height and would not be detected by a person using a *long cane*.

A barrier lower than 200mm above the floor surface could be installed providing an obstruction that can be detected by a person using a long cane (indicated by blue line).

This *shoreline* is obstructed by a temporary ‘A frame’ signage board positioned against the building line.

Keep all building lines clear of obstructions.
Accessways continued

A grate with good design features:

✔ Gaps significantly less than 13mm;
✔ Laid perpendicular to the path of travel.

The second photo demonstrates a grate that could be a hazard to a person using a walking aid as the gaps are greater than 13mm (approximately 28mm), sufficient to trap a walking stick or long cane.

✘ There is a change in level where the service cover meets the adjacent pavement, creating a small lip that poses a trip hazard.

✘ The correct installation of TGSIs at the base of steps. However, they have not been laid over the service cover.

Applying adhesive tiles over the cover improves safety for pedestrians reliant on tactile cues.
Accessways – walkways

ACCESS PRINCIPLES

Definition: An accessway that is level, or has a gentle gradient not exceeding 1:20, usually a path or footpath.

Use:

- **Walkways** are generally preferred to ramps, as:
  - **Cost**: Greater for a ramp (e.g., handrails and TGSIs) than for a walkway.
  - **Accessibility**: Gradients steeper than 1:20 are not easily negotiated by some people using mobility aids.

- **Ramps** are preferred to walkways when:
  - **Direct access**: Can be achieved by installing a ramp.
  - **Travelling distance**: Walkway is grossly inequitable for the user.

Design considerations:

In addition to the design considerations of accessways:

- **Gradient**:
  - No steeper than 1:20.
  - In the direction of travel.

- **Crossfall**: To be provided for shedding of water.

- **Landings**: Regular landings provide opportunity for rest along lengthy paths.

- **Edge treatment**:
  - A suitably treated walkway edge (kerb or kerb rail and handrail) prevents a wheelchair user in inadvertently moving off the path; or
  - Provides a stable surface if they unintentionally leave the path (600mm ground surface abutting the sides of the walkway).

Landscaping:

- **Plant growth pattern**: Ensure trees and shrubs will not create a barrier (e.g., drop nuts or seed pods or disturb pavers by their root growth).

- **Colour contrast**: Provide edges to assist Way Finding for pedestrians who have low vision. (e.g., grass or colour contrasting brick edge against concrete path).

**At construction:**

- **Trip hazards**: Ensure abutting surfaces are flush with no lips or gaps.

- **Cross fall**: Sufficient to eliminate water ponding without creating an access barrier by exceeding 1:40.

- **Construction tolerances**: Ensure documented gradients allow for construction tolerances. Sometimes when a path is constructed the slope is slightly steeper than documented.
**Accessways – walkways continued**

### Key features – Mandatory

<table>
<thead>
<tr>
<th>Feature</th>
<th>Requirement</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gradient:</strong></td>
<td>• No steeper than 1:20.</td>
<td>AS1428.1 Clause 4.24</td>
</tr>
<tr>
<td><strong>Edges:</strong></td>
<td>• Meet design requirements.</td>
<td>AS1428.1 Clause 10.2(a)</td>
</tr>
<tr>
<td><strong>Landings:</strong></td>
<td>• Provide a landing at every change in direction.</td>
<td>AS1428.1 Clause 10.1(a)</td>
</tr>
<tr>
<td></td>
<td>• Meet design requirements for relationship between gradient and landing frequency.</td>
<td>AS1428.1 Clause 10.2(b)</td>
</tr>
<tr>
<td></td>
<td>• There is a concession to frequency of landing provision where an edge barrier and handrail is provided.</td>
<td>AS1428.1 Clause 10.2(b)</td>
</tr>
<tr>
<td></td>
<td>• Landings to meet design requirements – whether a 90° or 180° change in direction is required or the walkway continues in the same direction.</td>
<td>AS1428.1 Clause 10.8.1</td>
</tr>
<tr>
<td></td>
<td>• Provide a camber or crossfall no steeper than 1:40 when the gradient is shallower than 1:33. This is for the shedding of water. Bitumen surfaces require a camber or crossfall no steeper than 1:33.</td>
<td>AS1428.1 Clause 10.1(d)</td>
</tr>
</tbody>
</table>

**At construction ensure:**

- Abutting surfaces are flush with no lips or gaps.
- Camber is sufficient to eliminate water pooling without creating an access barrier.
- Documented gradients allow for construction tolerances. Sometimes when a path is constructed the topography is slightly steeper than anticipated.
When designing the landscaping consider the expected growth pattern of plants to ensure they will not become a hazard. Avoid plantings that can obstruct accessible paths of travel:

🚫 Avoid planting trees and shrubs that overhang or encroach on to the walkway.
🚫 Avoid planting trees and shrubs that drop nuts, seeds or leaves, to an extent that the accessible walkway is disturbed or made hazardous.

This walkway (building line) is obstructed by a number of barriers:

🚫 Bikes and bike racks.
🚫 A step down onto a sloped driveway, leading to the under cover car park. In response to the step (hazard), the fence, which creates an additional barrier, has been constructed.
Accessways – (pedestrian) ramps

ACCESS PRINCIPLES

Definition: An inclined access way with a gradient steeper than 1:20 but not steeper than 1:14, used where level access cannot be achieved or level access requires the pedestrian to travel a significantly longer or circuitous route.

Use:
- **Ramps**: Preferable over a walkway only when:
  - **Direct access**: Shorter more direct path can be achieved by installing a ramp. A very long circuitous walkway may cause fatigue or exposure to weather.
  - **Travelling distance**: If walkway distance is grossly inequitable for the user of a wheeled mobility device.

Design considerations:
- **Requirement**: Where there is insufficient space to install a ramp that complies with all of the following requirements, an alternative solution will be required.
- **Gradient**: Between 1:20 and 1:14.
- **Format**: A single straight ramp with the necessary landings and changes of direction to accommodate the required change in level.
- **Unacceptable solutions**:
  - **Series of ramps**: Not acceptable practice to achieve a significant change in level. An alternate design is required.
  - **Series of connected ramps**: Rise no steeper than 3.6m.
  - **Curved ramps**: Difficult for wheelchair users to negotiate.
- **Long straight ramps**: Hazardous for a wheelchair user if they ‘lose control’. Provide change(s) of direction in long ramps to avoid a potential ‘launching pad’.

Location:
- Ramp surface, handrails and TGSIs do not protrude into cross pedestrian traffic at a property boundary.
- Ramp surface and handrails do not protrude into cross pedestrian traffic within an internal corridor.

Surface:
- **Generally**: Slip resistant with no lips or gaps.
- **Cross fall**: <1:40.
  - Greater than 1:40 can create an unstable surface for people using manual wheelchairs and wheeled mobility devices.
  - Propelling across a significant cross fall can cause instability and/or fatigue and may prevent access for some people.

Landings:
- **Provision**: At all changes in direction, at the top and at the base of the ramp.
- **Reason**: To enable a change in direction and/or provide a rest point.
- **Shared landings**: Where stairs and a ramp have a shared landing, the base of the ramp must not lead directly onto the top of stairs. This creates a serious hazard for people using wheeled mobility devices.
Accessways – (pedestrian) ramps continued

- Step ramp landings cannot overlap (or share) a ramp landing.

**Handrails:**
- **Installation:** On both sides of the ramp. Some disabilities can prevent a person using one of their arms, or their arm is weak.
- **Tactile cue:** Provide directional assistance to people who are blind or have low vision when using the ramp.
- **Visibility:** Provide good **luminance contrast** to assist people with low vision to locate the **handrails**.
- **Material:** Ensure material and colour are not heat absorbing.
- **Extension:** Extend **handrails** past the top and bottom to provide stability for a person entering and leaving the ramp. Extensions must not protrude past a balustrade and encroach into a **path of travel**.

**Sides and edges:**
- **Ramp edges:** Must not create a hazard for a person using a **wheeled mobility device**
  - Be level with the adjacent surface for at least 600mm; or
  - Must have a barrier, such as a wall or kerb / kerb rail that does not create an entrapment for **wheelchair** footplates.

**Tactile ground surface indicators:**
- **Installation:** At the top and bottom to provide warning to pedestrians who are blind or have low vision of the pending hazard (change in gradient).

**Portable / temporary ramps:**
- **Unacceptable use:** Where there are more than two steps. An alternative solution needs to be found.

**At construction:**
- **Transition:** Sharp, no lips or gaps at the top or bottom.
- **Tolerance:** 3-5mm is allowable.
- **Even rise:** Ensure inconsistent gradients along the ramp are not inadvertently created by concrete slumping.
- **Run-off:** Ensure water does not pool at the bottom of the ramp or on intermediate landings.
- **Gradient tolerance:** Document gradients that allow for construction tolerances and still meet the gradient requirements for a ramp.
- **Off-site handrail manufacture:** Check that the design details and dimensions accommodate landings and the required horizontal extensions at the top and base, so that the **handrails** have a consistent height in relation to the surface of the ramp on installation.
### Key features – Mandatory

#### Design requirements:
- If it is deemed a ramp is required it must be designed and prominently positioned as an integral part of the path of primary travel, to provide equitable and dignified access.
- Meets design requirements of an accessway and ramp – gradient, landings, set back, handrails, kerbs and kerb rails and TGSIs.

#### Rise:
- Where the vertical rise exceeds 3.6m a lift must be installed.

#### Ramp set back:
- Requirements for the surface, handrails, TGSIs to be set back, whether at a property boundary or internal corridor.

#### Gradient:
- AS1428.1 requires ramps to be no steeper than 1:14 where the ramp length exceeds 1900mm.
- As some people using wheeled mobility aids find a gradient of 1:14 difficult to walk or wheel up it is not to be used on the UWA campus. A gradient no steeper than 1:16 is to be used where a walkway gradient cannot be achieved.

#### Landings:
- Installed at top and base, at required intervals and any change in direction.
- Requirement for angle of approach between ramp and landing.
- Requirement for sharp transition between ramp and landings.
- Cannot overlap a step ramp landing.

#### Handrails:
- Required on both sides.
- Designed to accommodate acceptable handrail terminations and not projecting into cross pedestrian traffic.

#### Kerbs and kerb rails:
- Required on both sides of the ramp and intermediate landings.
- Meet design requirements.

#### Warning style tactile ground surface indicators (TGSIs):
- Installed at the top and base.
- Installed on landings where handrails are discontinuous.
- Manufactured and installed to be in luminance contrast and meet design requirements of AS1428.4.1.
Curved ramps:
- Ideally avoid designing curved ramps.
- If resigning a curved ramp – meet design requirements.

Key features – Towards best practice
During the design process all efforts should be put towards eliminating ramps where possible.
Where a ramp user is required to travel longer distances than people able to use steps, the ramp is to be covered and provide protection from weather.

Exceptions and exemptions
- Fire isolated ramps: Do not need to meet requirements for ramps.
  Access Code Clause D3.3(a) (i)
- Some exemptions to a level or storey, other than the entrance level, in Class 5, 6, 7b or 8 buildings.
  Access Code Clause D3.3 (f)
- Ramp does not need to meet requirements when providing access only to an exempted area.
  Access Code Clause D3.4

✔ Ramp has been designed as an integral part of landscape to provide an alternative path of travel to the stairs.
  It is wide with a spacious landing, has a gentle slope and is on a direct path of travel.
  The ramp would be improved with the installation of:
  - Warning style TGSIs at the top and base.
  - Handrails to both sides.
  - Kickboards to existing handrail.

✔ This switchback ramp has been well designed to accommodate a significant change in level. It meets requirements for width and gradient and has handrails on both sides.
This ramp along the face of the building provides alternate access to the stairs, in a design in keeping with the building. It has the following features:

- **Handrails** on both sides and a kerb edge on the exposed side.
- A slip resistant surface.
- Warning style **TGSIs** at the top and base.

The ramp would be improved by:

- Setting **TGSIs** back 300mm from the bottom of the ramp (rather than being set against the bottom of the ramp).
- Installing **TGSIs** in good colour contrast to the surrounds to provide a visual as well as tactile cue to pedestrians with vision loss.
- Continuing the handrails for 300mm past the end of the ramp, parallel to the surface below, then turn under 180 degrees.
- In order that the handrail does not become a hazard for cross pedestrian traffic it would be necessary to extend the kerb to the end of the handrail.

These **handrails** are easy to see as the colour provides excellent **luminance contrast** against the wall.

The wall fixings enable the hand to move freely along the top of the handrail.
This pedestrian ramp had been retrofitted to an existing building. The good design features are:

- **Handrails** installed predominately to both sides.
- Kerb rails incorporated into handrail design on the exposed sides of the ramp.
- A slip resistant surface.

The design would be improved by:

- Installing **handrails** on both sides of the ramp, for the entire length of the ramp.
- Eliminating the lip at the base of the ramp.
- Installing warning style TGSIs at the top and base of the ramp.

Two solutions to the same access barrier (steps within a corridor):

- The steps have been retained and a narrow ramp without all the required design features has been set over the top.

The preferred solution where access for all has been achieved with a gently sloping ramp, the full width of the corridor.
Accessways – flush transitions and kerb ramps

ACCESS PRINCIPLES

Pedestrians navigating the footpaths, walkways and pedestrians crossings through the external environment require a safe and accessible path of travel that navigates kerbs and flush transitions.

Design considerations:
Kerbs or flush transitions require treatment to enable safe access for all people.

Flush transitions:
A flush transition is welcomed by a person using a wheeled mobility device but can create a hazard for a person with a vision impairment if there is no kerb, that provides a suitable tactile cue.

Tactile ground surface indicators (TGSIs) installed at flush kerbs alert people with a vision impairment to the hazard (e.g. vehicular way) by the tactility and luminance contrast of the TGSIs.

Warning tactile ground surface indicators TGSIs:
Are used to alert pedestrians of a hazard, and the need to stop and consider before proceeding. They do not indicate what the hazard ahead is.

Bollards:
- Used to prevent the movement of vehicles off the vehicular way onto the pedestrian footpath.
- Can prevent access for wheelchair users if installed too close together or on the face of a kerb ramp.
- Can be a hazard to people who are blind or have low vision as their location may be unexpected.
- See the section in this document addressing bollards.

Flush transition design considerations:
- Warning style TGSIs: Required where an accessway joins the vehicular roadway with a flush transition. The TGSIs are used to delineate a pedestrian area from the vehicular roadway.
  - to be laid across the full width of the path of travel.
  - and perpendicular to the directional of pedestrian travel when approaching the hazard (roadway).
  - installed 600 – 800mm deep to ensure they are detectable underfoot as a person is striding.
  - set back 300mm from the hazard, to warn pedestrians in sufficient time, of the hazard.
Accessways – flush transitions and kerb ramps continued

Key features – Mandatory – Flush transitions

<table>
<thead>
<tr>
<th>Design requirements:</th>
<th>See accessway section.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meets design requirements of an accessway.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Warning TGSIs</th>
<th>AS1428.4.1 Clause 2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TGSIs are to be manufactured to meet requirements.</td>
<td>Clause 2.3.1 &amp; 2.3.2</td>
</tr>
<tr>
<td></td>
<td>Clause 2.3.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TGSI Placement:</th>
<th>AS1428.4.1 Figure 2.5(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement to meet requirements for a flush transition.</td>
<td></td>
</tr>
</tbody>
</table>

The three access barriers identified in this photograph are:

- The left side of the kerb ramp directs pedestrians who are blind or have low vision into parked vehicles and parking payment machine (red arrow).
- Those relying on the white lines to cue them are led into the bollards (blue arrow).
- Trees are located on the edge of the crossing.

This crossing could be improved by aligning the kerb ramps and crossing and ensuring the path of travel is barrier free with any necessary bollards painted in good colour contrast.

This photo demonstrates:

✔ A flush pedestrian crossing.
✔ 1000mm between bollards, sufficient space to enable wheelchair access.
✔ Bollards that can be easily seen as they are 900mm high and in good colour contrast to the surrounds.

The addition of warning style TGSIs set back 300mm from the roadway would provide a cue to a person who is blind or has low vision that there is a hazard (roadway) ahead.
Accessways – flush transitions and kerb ramps

Kerbs:
A kerb edge is welcomed by a person with a vision impairment as it tactually defines the pedestrian safe zone and moving traffic. The kerb however, is a barrier for a person who is a wheeled mobility device user.

Kerb ramp:
A kerb ramp provides a continuous accessible path of travel for a person using a wheeled mobility aid and a cue for a person with a vision impairment to step off the footpath and align to the opposite side of the road where the journey can continue. It is part of an accessible path of travel, design according to requirements.

Kerb ramp design considerations:
- **Permissible height:** For rises not exceeding 190mm.
- **Gradient:** No steeper than 1:8.
- **Surface:** Slip resistant.
- **Cross fall:** Less than 1:40. A cross fall greater than 1:40 can create an unstable surface and requires significantly more energy for people using manual wheelchairs and wheeled mobility devices.
- **Sides:** Tapered sides where it protrudes into cross pedestrian traffic.
- **Level landings:** At the top and bottom of the ramp to enable a change in direction and / or to provide a rest point.
- **Landing length:**
  - No less than 1200mm in the direction of travel.
  - Single change in direction minimum 1500 x 1500mm.
  - T junction – 1500mm x 2000mm.
- **Alignment:** Aligned in the direction of travel.
- **TGSIs:** Generally, kerb ramps are exempt from the application of TGSIs unless the kerb ramp has a gentle (undetectable under foot) slope and leads onto a busy traffic area.

At roadways at pedestrian crossings:
- **Alignment:** Aligned in the direction of travel at either end of the crosswalk so that a person with a vision impairment is directed onto a crosswalk, toward the opposite side.
- **Correspondence:** A corresponding kerb ramp must be provided on the opposite side of the vehicular roadway.
- **TGSIs:** Warning style TGSIs can be applied to warn pedestrians of the hazard (roadway).
- **Diagonal crossing:** Kerb ramps must never direct pedestrians into the middle of an intersection.

This design solution is dangerous for people using wheeled mobility aids who may be slow to realign their wheelchair with the possibility of unseen traffic approaching from behind. People who are blind may become disorientated and unable to determine the direction required to approach a kerb ramp on the opposite side of the road.
Key features – Mandatory – Kerb ramps

Design requirements:
• Meets design requirements of an accessway. See accessway section.

Design requirements:
• Meet design requirements for a kerb ramp. AS1428.1
  Clause 10.7
  Figure 24(A)
  Figure 24(B)
  Figure 24(C)

Landings:
• Meet design requirements for length of landings where:
  – they are in the direction of travel (1200mm). AS1428.1
  Clause 10.8.3
  Figure 24(A) (Note)
  Figure 24(B)
  Figure 24(C)
  – there is a single change in direction (1500 x 1500mm).
  – they are at a T junction (1500 x 200mm).

Warning TGSIs:
• Generally exempt for kerb ramps. AS1428.4.1
  Clause 2.1 (Note)

Warning TGSIs at roadways (pedestrian crossings):
• Warning style TGSIs installed in the face of a kerb ramp where the ramp enters a hazardous area (roadway). AS1428.4.1
  Clause 2.3.3 (c)
  Figure C1
• Set back 300mm from the edge of the roadway.
• Manufactured and installed to meet design requirements.

Aligning kerb ramps at either end directing pedestrians across a safe zone to the opposite footpath.

Warning style TGSIs extending for the width of the ramp, set back 300mm from the hazard (the edge of the roadway) with sufficient luminance contrast to their background so they can be easily seen.

0mm setback to wall on right causes sight restriction that requires drivers to use angled mirror to see anyone approaching. Pedestrians cannot see exiting vehicles without entering the roadway.
Accessways – flush transitions and kerb ramps continued

✔ Well designed kerb ramp at a pedestrian crossing:
  • A gradient of 1:8.
  • A slip resistant surface.
  • Tapered sides.
  • A minimum width of 1200mm.

✔ Well aligned and constructed kerb ramps at a roadway:
  • Aligning and perpendicular to the direction of travel.
  • Gradient of 1:8.
  • Slip resistant surface.
  • Tapered sides.
  • Minimum width 1200mm.
  • TGSI’s for the width of the face of the ramp and set back 300mm from the hazard (roadway).
ACCESS PRINCIPLES

Purpose: To accommodate a change in level no higher than 190mm.

Use generally: Only in a retrofit situation. All new buildings must be designed with level access at all doorways.

Design considerations:
- **Permissible height:** For rises not exceeding 190mm. Where rise >190mm, a pedestrian ramp with a landing and gradient not exceeding 1:14 is required.
- **Cross fall:** <1:40. A cross fall >1:40 can create an unstable surface and requires significantly more energy for people using manual wheelchairs and wheeled mobility devices.
- **Sides:** Tapered where it protrudes into cross pedestrian traffic, otherwise provide a suitable barrier.
- **Level landings:** At the top and bottom of the ramp to enable a change in direction and / or to provide a rest point.
- **Unacceptable use:** A series of step ramps to accommodate a significant change in level. An alternate design solution is required.

At doorways:
- **Landing:** Required directly in front of the doorway to provide a stable surface for manoeuvring mobility devices.
- A landing or step ramp cannot overlap a landing for another step ramp or (pedestrian) ramp.
- **Size:** Landing must extend past the latch side of the door to enable a wheelchair user to approach the door handle.

Key features – Mandatory

Design requirements:
- Meets design requirements of a continuous accessible path of travel (an accessway) and a step ramp, for:
  - width
  - maximum rise
  - maximum length
  - gradient
  - splay of edges for cross pedestrian traffic / suitable barrier
  - slip resistant surface

Landings:
- Length dependant on whether a change in direction is required.
- No change in direction, minimum length of 1200mm.
- Change in direction required, minimum length 1500mm.
- Landings between two step ramps or a step ramp and (pedestrian) ramp cannot overlap.
Accessways – step ramps continued

At doorways:
• Landing to meet requirements for circulation spaces at doorways.

AS1428.1
Clause 10.8.2 & 13.3
Figure 25(D)

Key features – Towards best practice
• In some instances, where a step ramp may not be anticipated, provision of colour contrast will assist people to detect a kerb ramp and potential trip hazard.

In this retrofit situation the step ramp has been installed to eliminate a step at a door. It is a good design, installed across the full width of the path of travel (doorway) and has:
• No lips or gaps.
• Tapered sides.
• A landing at the base and top (landing inside the automatic door of the building).

This external step ramp has good design features:
• Positioned opposite a main entrance.
• Extends for the width of the entrance.
• Has good colour contrast making it easy to detect and providing good Way Finding cue for the entrance.

The ramp would be improved with tapered sides.
ACCESS PRINCIPLES

Application:
• **Definition:** A ramp at a doorway accommodating a minor change in level not exceeding 35mm.
• **Rise exceeding 35mm:** A threshold ramp cannot be used and a step ramp is required.
• **Use:** Only in a retrofit situation. All new buildings require level access at all doorways.

Design:
• **Maximum depth:** 280mm from door into *path of travel*. This enables a person using a *wheelchair* to reach a door handle while keeping the rear wheels on a stable, level surface.
• **Fixing:** Must be secure.
• **Tapered edges:** Required where a ramp protrudes into the *path of travel* and does not abut a wall.
• **Unacceptable practice:** A threshold ramp at the top of a pedestrian, step or kerb ramp without an intermediary landing.

Key features – Mandatory

Application:
• Threshold ramps to be used in a **retrofit** only where the change in level at a doorway is between 5mm and 35mm. New buildings to have level entry, eliminating the need for a threshold ramp.

Design:
• Meets design requirements of accessways and threshold ramps. See accessways section AS1428.1 Clause 10.5 Figure 21
• Where located along a *path of travel* ramp requires splayed sides. AS1428.1 Clause 10.5

Key features – Towards best practice

**Colour contrast:**
• To assist in eliminating a trip hazard provide ramp with 30% *luminance contrast* to the adjacent surfaces.

*x* Threshold ramp has been installed at a secondary entrance. While it eliminates the small step at the doorway it is not well designed. The ramp would be improved if replaced with one that has:
• A gradient of 1:8 or less.
• Tapered sides.
• No lip at the base.
Bollards, poles and chicanes

ACCESS PRINCIPLES

Generally:

- **Use**: Pedestrian and traffic management.
- **Unintended consequence**: Poles, bollards or chicanes, bus shelters, signage, etc. installed in the **accessway** can create obstacles to universal access.

Design considerations:

- **Location**: Off the **accessway** and away from any building line.
- **Where installed**: In or adjacent to a **accessway**:
  - **Luminance contrast**: Ensure sufficient against surrounds.
  - **Obstacles**: Locate at least 1000mm (1200-1500mm preferred) away from the building edge.
  - **Circulation space**: Provide at least 1000mm (1200-1500mm preferred) between bollards/poles and 1500mm through chicanes.
- **Visibility and detectability**:
  - **Chicanes and U rails**: Ensure installations across paths of travel are detectable to those who are blind and use a **long cane**.
  - **Existing installations**: Where bollards, poles chicanes and U rails already exist, apply warning strips to enhance detection by people with low vision.

### Key features – Mandatory

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong></td>
<td>A minimum 900mm high. To be detected by a person with a vision impairment who is visually scanning in front of them as they walk.</td>
</tr>
<tr>
<td><strong>Circulation space</strong></td>
<td>At least 1000mm (1200-1500mm preferred) space between poles/bollards to enable <strong>wheelchair</strong> access.</td>
</tr>
<tr>
<td></td>
<td>At least 1500mm through the chicane including the entry and exit points.</td>
</tr>
<tr>
<td><strong>Detection</strong></td>
<td>Provide chicanes and U rails with a cross bar no higher than 200mm above ground level. This will enable people who are blind and use a <strong>long cane</strong> to detect the obstruction.</td>
</tr>
<tr>
<td></td>
<td>In existing situations, apply a colour contrast strip around the bollard (such as yellow), that is 30% <strong>luminance contrast</strong> to the background colour.</td>
</tr>
</tbody>
</table>

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AS1428.1 Clause 6.3
AS1428.1 Clause 6.5.1
Accessible Design for Public Buildings
Vision Australia Fact Sheet

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64 UWA Building and Campus Access Guidelines
This pedestrian crossing has bollards installed to prevent vehicle entry while not impeding access for all:

✔ Bollards are 900mm high (detectable to those with a vision impairment).
✔ There is a 1000mm gap to enable wheelchair access (1200-1500mm preferred).
✔ Bollards are in good **luminance contrast** to their background.
✔ The U rails have had warning strips applied in **luminance contrast**.
✔ The chicane has wide gaps to enable **wheelchair** access.

✘ The U rails are located across a **path of travel** where they are an obstacle to people who are blind and use a **long cane**.

The base of obstacles located across a path of travel should be detectable by a **long cane**. The bottom edge should be less than 200mm above the floor surface (indicated by blue line).

✘ Bollards have insufficient **luminance contrast** to the background pavers and may not be detected by people with low vision.

To improve visibility, warning strips should be installed on the bollard, in **luminance contrast** to the bollard and the surrounds.

**Note:** In the street reserve, the local authority has jurisdiction over traffic management issues including sight obstructions to motorists.

✘ Trees and poles create obstructions on the accessible **path of travel**.

Locate all obstructions off the accessible **path of travel** and away from the building line.
Rest areas

ACCESS PRINCIPLES

Generally:

- **Purpose**: Provide opportunities for people with reduced stamina to rest.

- **Composition**: Will include a hardstand, sufficient *circulation space* and a seat with a *wheelchair* ‘parking space’. Can be enhanced with the addition of shade, a drinking fountain and bin.

Location:

- **Placement**: Along all main, long walkways.

- **Shelter**: Preferred.

- **Set back**: Do not obstruct the walkway.

- **Accessibility**: Connect to the walkway.

- **Prohibition**: Do not place seats along a building line. Maintain the principle of a *shoreline*.

Rest area design:

- **Circulation space**: Sufficient for *mobility device* users to approach and use the amenities.

- **Amenities** (seats, drinking fountains, bins): Provide with *luminance contrast* to the surrounds (a visual cue for a person with low vision).

Seat design:

- **Design generally**: Facilitate the sitting and standing actions and provide support to people while seated.

- **Multiple seats**:
  - **Arm rests**: Seats adjacent *wheelchair* ‘parking spaces’ should have only one armrest, at opposite end to ‘parking space’.
  - **Preference**: Provide seats of varying heights.

Drinking fountain design:

- **Controls and outlets**: Provide at both sitting and standing heights.

- **Activation**: Easy to use lever or push button operated by the hand, forearm or elbow.

- **Orientation**: Spout and controls towards the *wheelchair circulation space*.

Bin design:

- **Height**: Reachable by both seated and standing people, with easy access to the receptacle.
## Rest areas

### Key features – Mandatory

<table>
<thead>
<tr>
<th>Rest areas:</th>
<th>AS1428.2 Clause 7(Note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provided every 60m.</td>
<td></td>
</tr>
<tr>
<td>• Set on a hard stand that is level and even.</td>
<td></td>
</tr>
<tr>
<td>• 1540mm x 2070mm <strong>circulation space</strong> should be provided in front of all amenities provided in the rest area.</td>
<td>AS1428.1 Clause 6.5.3 Figure 5</td>
</tr>
</tbody>
</table>

### Seating:

<table>
<thead>
<tr>
<th>AS1428.2 Clause 27.2 Figure 32</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Connected to but set back 500mm from the path of travel.</td>
</tr>
<tr>
<td>• Provide 800mm wide <strong>wheelchair</strong> ‘parking space’ adjacent to the seat.</td>
</tr>
<tr>
<td>• Designed to not absorb heat.</td>
</tr>
</tbody>
</table>

### Drinking fountains:

<table>
<thead>
<tr>
<th>AS1428.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Meet design requirements.</td>
</tr>
</tbody>
</table>

### Bins:

<table>
<thead>
<tr>
<th>AS1428.2 Figure 23</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Meet design requirements.</td>
</tr>
</tbody>
</table>

### Key features – Towards best practice

<table>
<thead>
<tr>
<th>AS1428.2 Clause 27(b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Visibility:</strong> Street furniture to be in 30% <strong>luminance contrast</strong> to their background.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AS1428.2 Clause 27.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Heights:</strong> A variety from 350 – 520mm in multiple seat locations.</td>
</tr>
</tbody>
</table>

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A seat facing a local vista, connected to, but set back from, a pathway, with sufficient space beside the seat to park a pram or **wheelchair** and sufficient space in front of the seat to gain access. This is a well designed rest area that would be further enhanced with the installation of a drinking fountain and bin, accessible to all.

Rest area has a seat with a backrest and space adjacent to enable a **wheelchair** user to park beside the seat and transfer on to it should they desire, or to sit with others.
**Rest areas continued**

- ✔ Retention of a clearly defined walkway, distinguished with colour contrasted paving and centrally located seats, trees and bins.

- ✔ Two examples of drinking fountains that provide water spouts at both sitting and standing heights.

- ✔ This photo demonstrates a drinking fountain with knee access and an easy to use lever control.
ACCESS PRINCIPLES

Purpose: Useful means of vertical access for many people with disabilities. Some people with disabilities who are able to walk may prefer to use stairs rather than a ramp.

Additional requirements: Must include:
- a means of guidance and stability (handrails), and
- visual warning (luminance contrast) for people with a vision impairment.

Design considerations:
- **Stairs generally:** An efficient and effective means of moving people between levels. Do not eliminate from a design.
- **Alternatives:** When stairs are installed, provide an alternative means of moving between levels (e.g. ramp / lift) in the design. Locate near the stairs to enhance Way Finding and to provide an equitable choice.
- **Stair design:** Include the following:
  - **Treads:** Regular for full width of stair. Spiral stairs are difficult to negotiate.
  - **Risers:** Regular for whole stair. Irregular risers present people who are blind, and those who anticipate consistency and predictability, with a serious hazard.
  - **Closed (opaque) risers:** Required. Open and translucent risers or light coming through an adjacent window can disorient some people with vision loss.
  - **Tread overhang:** Avoid leading edges overhanging the riser as the protruding lip can create a trip hazard.
  - **Under-stair space:** Enclose, or include an architectural feature that is detectable at ground level by a long cane, avoiding a head height hazard.
- **Location:**
  - **Centrality:** As centrally as possible so they are easy and logical to find.
  - **Safe placement:** Perpendicular to or at the side of the path of travel to avoid the risk of someone accidentally falling down them.
Stairs are to be set back:
- At a property boundary so that the stairs, handrails and TGSIs do not protrude into cross pedestrian traffic.
- At an internal corridor, so that the handrails do not protrude into cross pedestrian traffic.
- **Handrails:**
  - **Installation:** On both sides of the stairs.
  - Some disabilities can prevent a person using one of their arms, or their arm is weak. Two handrails allow a choice of support when ascending and descending.
  - On wider stairs a centrally located handrail is acceptable.
  - **Tactile cues:** Handrails provide a tactile cue and directional assistance to people who have vision loss or are blind.
  - **Luminance contrast:** Provide to assist people with low vision to locate the handrails.
  - **Extension:** Extend handrails past the top and bottom of stairs to provide stability for a person entering and exiting the stairs.
  - **Handrails** are not to protrude past a balustrade and encroach into a path of travel. The location of the 300mm horizontal handrail extension must be considered when designing space requirements for stairs.
- **Height**: Ensure the design details and dimensions that accommodate landings and the required horizontal extensions at the top and base are carried through to manufacture and installation, so that the handrails have a consistent height in relation to the stair nosings on installation.

- **Nosings**:
  - **Application**: To the leading edge of each tread. This strip provides a visual cue to the location of the tread edge to people with low vision.
  - **Properties**: Ensure the strip is in luminance contrast to the surface of the tread and riser.

- **Tactile ground surface indicators**:
  - **Locations**: Install warning TGSIs at the top and bottom of stairs.
  - **Properties**: Provides both a tactile and visual cue with luminance contrast to the surrounding surface.
  - **Landings**: Where handrails are continuous on both sides through midway landings (ideal) TGSIs are not required on the landings. Where they are discontinuous (for example, there is a door entering into a landing) TGSIs are required, with the depth dependant on the size of the landing.

### Key features – Mandatory

<table>
<thead>
<tr>
<th>Building entrance:</th>
<th>AS1428.1 Clause 11.1 (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level access to the main entrance of the building is essential. Stairs as the principal means of access to a new building is not acceptable.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Set back:</th>
<th>AS1428.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement for the stairs, handrails and TGSIs to be set back at a property boundary.</td>
<td>Clause 11.1 (a) Figure 26 (A)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Requirement for the stairs and handrails to be set back at an internal corridor.</th>
<th>AS1428.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clause 11.1 (b) Figure 26 (B)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Risers:</th>
<th>AS1428.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be opaque.</td>
<td>Clause 11.1 (c)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surface:</th>
<th>AS1428.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treads to be slip resistant.</td>
<td>Clause 7.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nosing:</th>
<th>AS1428.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement for nosing profile to meet requirements.</td>
<td>Clause 11.1 (d) (e) (f) &amp; (g) Figures 27 (A) &amp; (B)Clause 7.2 &amp; 7.3</td>
</tr>
<tr>
<td>Strip in luminance contrast applied across the full width of the path of travel.</td>
<td></td>
</tr>
<tr>
<td>Restrictions on the set back of strip and for the application of the strip down the face of the riser.</td>
<td></td>
</tr>
<tr>
<td>If the strip is affixed to the surface of the tread, it is to meet requirements of a ‘change in level’.</td>
<td></td>
</tr>
</tbody>
</table>
### Handrails:
- Meet design requirements.
- Installed on both sides.
- Set back from cross pedestrian traffic.
- Correct handrail terminations.

**AS1428.1**
- Clause 11.2 & 12
- Figures 26 (A) - (D)
- Figures 28 & 29

### Warning style TGSIs
- Installed at the top and base of stairs and on landings where handrails are discontinuous.
- To be manufactured and installed to meet design requirements of AS1428.4.1.

**AS1428.1**
- Clause 11.1 (h)
- Figures 26 (A) & (B)

**AS1428.4.1**
- Clause 2.1, 2.2 & 2.3
- Figure 2.2 (A) & (B)
- Figure 23 (A)

### Head height obstruction:
- If a head height hazard less than 2000mm clearance is created by the underside of stairs an architectural solution or enclosing the area is required to ensure no pedestrian contact with the overhead hazard.
- If the hazard remains, the installation of a handrail with kerbs or kerb rails, to act as a barrier is required.
- In the absence of one of the above, the application of warning TGSIs as a treatment, will be necessary.

**AS1428.1**
- Clause 2.6
- Figure 2.6 (A) & (B)

### Fire isolated stairways:
- Required to have a warning strip on the tread at the nosing, in luminance contrast to the background.

**Access Code**
- Clause D3.3 (a) (iii)

**AS1428.1**
- Clause 11.1 (f) & (g)
These stairs may be a barrier to a person with a vision impairment:

- Frameless glass balustrades and translucent glass block risers can make stair navigation difficult.
- Insufficient luminance contrast of TGSIs at bottom.

- Insufficient space in the stairwell to extend the handrails past the bottom riser without protruding into the circulation space, becoming a hazard to passing pedestrian traffic.
- Open risers can be disorienting and should not be used.
- Nosings are slip resistant.
- Nosings do not have the required luminance contrast.

- Under-stair space is open. This creates a head height obstruction, particularly for a person who is blind and uses a long cane to navigate their environment.
- Design would be improved by enclosing the under-stair space or installing a ground level barrier (e.g. planter box or seating) that is detectable by a long cane.

- This retrofitted handrail has been extended to prevent pedestrians walking into the stair soffit.
**Stairs continued**

- In this retrofit, the risers have been enclosed, a handrail that meets the requirements of AS1428.1, and slip resistant nosings have been installed.
- The handrail extends for more than 300mm horizontally.

- Steps have been built against a sloping footpath, creating what is known as ‘disappearing stairs’. These are a particular hazard to vision impaired people, who may enter the steps unintentionally. This is a design that should not be used.

- Stair nosing with a warning strip on the tread – in good *luminance contrast*.

Well designed stairs and handrails with the following:
- Colour contrasting tread nosing
  Warning style *TGSIs* set back 300mm from the top step.
- Handrails extending horizontally for 300mm past the top step and turning under 180°.
Entraines

ACCESS PRINCIPLES

Design requirements generally:
- **New buildings**: Ensure approach from the boundary, the associated accessible car parking and adjacent or associated approach to the building and main entrance are accessible to all people. It is a contemporary *Universal Design* expectation to provide a level approach and entrance, rather than steps and ramps. This can have implications at the concept stage when determining the site and orientation of a building.

Approach:
- **Compliance**: Ensure the approaches to all entrances meet the design principles for *Siting and Approaches to Buildings* (p25) and provisions of the Access Code.
- **Public access points**: Ensure doors or gates from the exterior of a structure to the inside are accessible to people with disabilities. This can be achieved by:
  - *Circulation space* that enables an approach.
  - A level threshold and level circulation space, and
  - An easy method of moving through a door or gate way.
- **Properties**: Provide the main access point to all buildings with visually clear distinguishing features and covering for weather protection.

Design:
- **Door width**: Minimum clear open width 850mm measured between the face of the open door and the closest edge of the door jamb on the latch side (cover strip, wind mould, astragal or the like).
- **Double doors or multiple doors**: Active leaf to provide minimum 850mm clear open width.
- **Luminance contrast**: Good luminance between doorways and the surrounds assists *Way Finding*.
- **Glazing**: Framing in luminance contrast or hazard markings on full glazing (door, side lights, glazed walls or panels) alerts a person with a vision impairment of a doorway or an opening.

Automatic:
- **Requirement**: Install at the main entrance of all buildings to ensure *universal access* for all people.
- **Prohibition**: Do not use revolving doors.
- **Enhancement for a person with vision impairment**:
  - **Auditory cue**: On door opening. Additional auditory cues may be required if the door action is very quite and/or there are other background sounds, (e.g. passing pedestrian or vehicular traffic).
  - **Opening speed**: Fast, to enable a person to pass through without altering their stride.
  - **Tactile and visual cues**: Provide at the door (e.g. inset mat or change in floor surface and colour, colour of frame in contrast to the surrounds).

Weight and closing:
- **Manual swing doors**:
  - **Operation**: Must be light to operate. Desirable force approx. 20 Newtons.
External doors: Choose appropriate closer according to door size and external conditions. Adjustable delayed action multi-sized door closers etc., recommended.

- **Closing speed:** Slow to enable sufficient time for a person using a *wheeled mobility aid* to pass through the door without risk of being hit by the door.

Mats:
- **Inset mats:** Must meet the requirements for an *accessible path of travel* and not create uneven surfaces.

Controls:
- **Location and visibility:** Door activating devices, door bells and security controls must be easily visible, light to operate and located at a suitable height and distance from an internal corner.

## Key features – Mandatory

<table>
<thead>
<tr>
<th>Feature</th>
<th>Access Code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Principal pedestrian entrances</strong> to be accessible and link to an <em>accessway</em> that meet design requirements.</td>
<td>Access Code Clause D3.2</td>
</tr>
<tr>
<td><strong>See the section in this document that addresses doors, circulation space and door furniture.</strong></td>
<td></td>
</tr>
<tr>
<td>Where there is more than one pedestrian entrance to the building:</td>
<td>Access Code Clause D3.2 (2)</td>
</tr>
<tr>
<td>• Meet requirements for provision of access through the specified entrances.</td>
<td></td>
</tr>
<tr>
<td><strong>Multiple doorways:</strong></td>
<td>Access Code Clause D3.2 (3) &amp; (4)</td>
</tr>
<tr>
<td>• Meet requirements for provision of accessible doorways.</td>
<td></td>
</tr>
<tr>
<td><strong>Design:</strong></td>
<td>Access Code Clause D3.2 (5) AS1428.1 Clause 13.2 Figure 30</td>
</tr>
<tr>
<td>• Meet design requirements with a clear open door width of 850mm for single doors and the active leaf of double doors or doors with multiple leaves.</td>
<td></td>
</tr>
<tr>
<td><strong>Circulation space:</strong></td>
<td>AS1428.1 Clause 13.3 Figures 31 &amp; 32</td>
</tr>
<tr>
<td>• All entrances to have <em>circulation space</em> around the doorway that meets approach requirements.</td>
<td></td>
</tr>
<tr>
<td>• The <em>circulation space</em> around doors to be level.</td>
<td>AS1428.1 Clause 13.3.1</td>
</tr>
<tr>
<td><strong>Identification:</strong></td>
<td>Access Code Clause D3.12 AS1428.1 Clause 13.1</td>
</tr>
<tr>
<td>• Hazard markings on glazed entrances to meet requirements.</td>
<td></td>
</tr>
<tr>
<td>• Doorways to provide 30% <em>luminance contrast</em> to the adjacent surfaces.</td>
<td></td>
</tr>
<tr>
<td><strong>Controls:</strong></td>
<td>AS1428.1 Clause 13.5</td>
</tr>
<tr>
<td>• Meet design and performance requirements.</td>
<td></td>
</tr>
</tbody>
</table>
• Fully glazed doors and sidelights are hazardous to people with low vision. The location of the door is difficult to ascertain and sidelights / fully glazed walls can be mistaken for the door.

• Visual warning strips should be in luminance contrast to the surrounding floor and wall surfaces, in both directions of travel: a wide, solid block of colour, across the full width of the fully glazed door (and associated sidelights).

  A warning strip has been installed on this glazed door, but it does not provide sufficient luminance contrast to the background (wall and floor surface behind the door).

• Fully framed door provides a visual cue as to the location of the entrance.
Doors, circulation space and door furniture

ACCESS PRINCIPLES

Identification:
• Good luminance contrast assists with Way Finding for a person with low vision or vision impairment.
• The use of strong colour contrast between the doorway and the surrounds assists a person identify doorways along an accessible path of travel.
• Similarly ‘paint out’ service doors, so that they are not easily identifiable.

Doorways:
• Minimum of 850mm clear open width, whether a single door or the active leaf of a double door or a door with multiple leaves.

Circulation space:
• Required at every doorway, gate or entry way, along an accessible path of travel.
• Level (1:40), with no excessive gradient or crossfall.
• Required on both sides of the door (hinged or sliding) – allowing access in both directions.

Automatic doors:
• Level circulation space required at automatic doors, that is, a ramp without a landing up to an automatic door is not acceptable.
• There are space concessions on the size of the landing, dependant on the angle of approach.
• Sufficient space is required from the face of a sliding door or arc of a swing door, for the installation of a push button to operate a power door.

Airlock or foyer doors
• Successive doors: Requirement for sufficient space between doors allowing a person to close a door behind themselves and open the next door.

Door handles:
• Design: In keeping with the Principles of Universal Design, use controls that:
  – can be operated with one hand, and
  – are large and easy to grip and operate without the hand slipping off.
• Type: D or lever, these provide adequate grip, rather than a knob or finger access. Can be operated with less fine motor control, an elbow or arm. Also convenient for students or staff carrying books.
• Sliding doors: D handle required (recessed handles are not acceptable), installed so that the handle is no closer than 60mm from the door jamb or door stop, when the door is open or closed. The required 850mm clear open width also needs to be preserved.
• Force: Light and easy to open and hold open.
• Height: Installed 900 – 1100mm.
## Key features – Mandatory

<table>
<thead>
<tr>
<th>Feature</th>
<th>Requirement</th>
<th>Standard / Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Luminance contrast:</strong></td>
<td>Doorways to be clearly identified.</td>
<td>AS1428.1 Clause 13.1</td>
</tr>
<tr>
<td><strong>Doorway:</strong></td>
<td>850mm minimum clear open width.</td>
<td>AS1428.1 Clause 13.2</td>
</tr>
<tr>
<td><strong>Circulation space:</strong></td>
<td>Meet design requirements.</td>
<td>AS1428.1 Clause 13.3</td>
</tr>
<tr>
<td></td>
<td>Additional circulation space requirements for surface mounted sliding doors.</td>
<td>AS1428.1 Clause 13.3.3.3</td>
</tr>
<tr>
<td></td>
<td>Circulation space concessions for automatic doors.</td>
<td>AS1428.1 Clause 13.3.4</td>
</tr>
<tr>
<td></td>
<td>Location and style of push button for power operated doors to meet requirements.</td>
<td>AS1428.1 Clause 13.5.3 (e) Clause 13.5.4</td>
</tr>
<tr>
<td><strong>Airlock or foyer doors:</strong></td>
<td>Meet layout requirements for successive doors.</td>
<td>AS1428.1 Clause 13.4</td>
</tr>
<tr>
<td><strong>Door handles:</strong></td>
<td>Meet design and installation requirements for lever or D handles.</td>
<td>AS1428.1 Clause 13.5</td>
</tr>
<tr>
<td></td>
<td>D handles required on sliding doors.</td>
<td>AS1428.1 Clause 13.5.3 (a) &amp; (d) Figure 35(A) &amp; (B) Figure 37</td>
</tr>
<tr>
<td></td>
<td>Clearance requirements to be met.</td>
<td></td>
</tr>
<tr>
<td><strong>Force:</strong></td>
<td>Meet performance requirements.</td>
<td>AS1428.1 Clause 13.5.2 (e)</td>
</tr>
</tbody>
</table>

✔ These lever and D handles are large and easy to grip, as is the large locking snib.

✔ The lever handle is in colour contrast to the background surface.
Accessways – corridors

ACCESS PRINCIPLES

Design considerations:
In addition to the design considerations of accessways:

- **Passing spaces** and **turning spaces**:
  - In a building, the provision of *passing spaces*, where a direct line of sight is not available, eliminates the necessity for a wheelchair user to reverse up an *accessway* where another pedestrian who is a mobility device user is encountered. Where required, passing spaces are provided at a maximum interval of 20 metres.
  - In a building, *turning spaces* are required where the accessway does not continue (for example there is no intersecting corridor) and at 20 metre intervals along the accessway.
  - Corridors can be designed to incorporate *passing spaces* that also serve as *turning spaces*.
  - Where corridors intersect, at the end of corridors or where a turning space is required, spatial requirements for the degree of turn necessary are clearly defined.

- **Doorways**: Where a doorway is located at the end or off the side of a corridor, doorway circulation spaces are required, whether the door is in-swinging, out-swinging or the pedestrian is approaching from the hinge or latch side or potentially either. These circulation spaces are not required at service doors or to enter spaces that would be considered inappropriate due to the particular purpose for which the area is used.

- **Surface**: For people who are mobility device users, firm surfaces are easier to traverse than carpets. Any use of carpet must meet design requirements to minimise softness or flexibility. Any abutment of surfaces to minimise risk of tripping and provide a smooth transition.

Key features – Mandatory

**Accessway**:
- Meet *accessway* design requirements for height, width, surface, passing and turning spaces, circulation spaces, construction tolerances and treatment for glazing.

**Circulation spaces**:
- Meet design and space requirements.
- Used in combination to allow access through doorways / gates, in both directions.
- Gradient and crossfall no steeper than 1:40.

AS1428.1 Clause 13.3.1
Reception desks and counters

ACCESS PRINCIPLES

Requirement: Ensure reception, enquiry, sales and service counters all meet the needs of people with disabilities including people using wheelchairs and people who are of small stature.

Reason:
• **Principle:** A person approaching the counter needs to be visible by staff and be able to undertake tasks equitably and in a dignified manner. This may include completing paperwork, collecting a meal tray or engaging with the staff member in conversation.

*Circulation space:* Provide sufficient space for a *wheelchair* user to approach front on.

Design:
• **Wheelchair access:** Provide space underneath that is wide enough to accommodate a *wheelchair* and deep enough to accommodate the person’s knees and *wheelchair footplates*.
• **Visibility:** Provide good visibility (eye contact) and lighting to meet the needs of people who have a hearing impairment. This is important to assist people who rely on lip reading or facial expression as conversation cues.
• **Acoustics:** Ensure good acoustics that will assist people with a hearing impairment.

Screened reception:
• Where a reception area (or ticket booth) is screened from the public and a sound amplification system is installed a hearing augmentation system is also required.
• Locate speech holes or a vertical gap (ideal) to enable communication between staff and customers who are standing, seated or of small stature.
• **Counter location:** Incorporate features from the following list into the design of the counter to cue people to its location:
  – **Entrance proximity:** Position the reception counter close enough to the front entrance to allow people to be greeted soon after they enter the building.
  – **Other key amenities:** Locate within close proximity of the counter.
  – **Location cues:** A floor surface leading from the entry to the reception that is different from the surrounding floor surface, in either colour and/or texture (e.g. low pile carpet set in vinyl).
  – **Visibility cues:** Use colour contrasting materials for the horizontal and vertical surfaces of the desk, in *luminance contrast* to the surrounding surfaces.
• **Wide Counter:** Provision of a lowered section that meets requirements is acceptable.
• **Shiny and reflective surfaces:** Avoid shiny or reflective counter surfaces. These cause glare and may impede the functioning of a person with low vision.
### Key features – Mandatory

**Design:**
- Meet design requirements for people using *wheelchairs*:
  - Be 830 – 870mm high.
  - At least 900mm long.
  - Minimum knee clearance: underneath 800mm wide for a height of 700mm.

**Circulation space:**
- 1540mm by 2070mm in front of the counter. This is to accommodate a *wheelchair* user making a 180 degree turn.

**Screened reception:**
- If there is an inbuilt sound amplification system, a hearing augmentation system is also required.

**Lighting:**
- Area to be well lit.

### Key features – Towards best practice

**Luminance contrast:**
- 30% to the background.

- A lowered counter has been provided that will enable a *wheelchair user* to approach and undertake tasks such as complete paper work.
- A glass window can be swung open to facilitate communication between staff and customer.
- The white counter is in good luminance contrast to the surrounding floor surface and wall surfaces and provides a visual cue to people with a vision impairment.
- Contrasting horizontal and vertical surfaces.
- Counter is lowered and accommodates *wheelchair footplates*, for the full length rather than having a lowered section.
- A glass window is slid open during office hours.
- In this building the counter, stairs and lift are located in relative close proximity.
Switches and controls

Definition: In this context controls include light switches, general power outlets (GPOs), appliance controls, wall mounted temperature controls, key pads, swipe card readers and the like.

ACCESS PRINCIPLES

Design:
• **Principle:** In keeping with the *Principles of Universal Design*, use controls that:
  - can be operated with one hand, and
  - are large and easy to grip. Small controls require fine motor skills to operate, e.g. a small pinch, twist or turn.

• **Easy to use controls:** Rockers or toggle switches and lever door handles are easy to use for all people and can be operated by an arm or elbow. They are also convenient for students or staff carrying books.

Controls:
• **Intuitive control:** Ensure a logical design and layout within the room based on the activities performed in that space. e.g. have light switches by the door.

• **Multiple control:** Include two-way light switches if there is more than one entrance to a room.

• **Accessibility:** Keep free from obstruction by furniture (e.g. reaching over a table) and ensure they are located a minimum 500mm from an internal corner.

Identification:
• **Visibility:** Provide 30% **luminance contrast** between a control and the background to assist people with low vision.

  For example, bright red / yellow emergency buttons on a white wall. Black control pads on a light background for lift facilities.

• **Lighting:** Use spot or task lighting to highlight particular controls or facilities.

**Key features – Mandatory**

<table>
<thead>
<tr>
<th>Design:</th>
<th>AS1428.2 Clause 23.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switches and controls on an accessible path of travel must be easy to grip or operate, not requiring a tight grip, pinching or twisting.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of switches and controls (not GPOs):</th>
<th>AS1428.1 Clause 14.1 Figure 37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Located 900 – 1100mm high, the preferred height is 1000mm.</td>
<td></td>
</tr>
<tr>
<td>Located 500mm away from an internal corner, except where on the architrave on the latch side.</td>
<td></td>
</tr>
</tbody>
</table>
Switches and controls continued

- Controls are all aligning at door handle height, an ideal 1000mm above the finished floor level.

- A rocker switch which is easy for all to use. The plate is in good colour contrast to the wall behind.

- Could be further improved by having the switch in colour contrast to the plate.
## ACCESS PRINCIPLES

**Requirement:** There are some mandatory requirements set down in the Premises Standard for both the design and application of signage that is required to meet the needs of people with disabilities.

The following information applies to such signage and for information regarding other informative or directional signage, refer to the UWA Signage Manual.

Signage is required in the university’s public buildings:
- to identify all sanitary facilities;
- to identify facilities with hearing augmentation;
- to direct people to accessible entrances (from entrances that are not accessible); and
- to direct people to the accessible sanitary facility if it is not located with other male and female toilets.

**Format:** Minimum mandatory requirements include:

**Symbols:**
- The use of *internationally recognised symbols* is imperative (rather than a derivation of these) as they do not rely on an individual’s interpretation of the symbol, or the person having an understanding of written English.
- When a symbol is used, explanatory text about the symbol is not required, for example ‘accessible’ or ‘hearing loop installed’.
- Examples of symbols include – the male and / or female symbol, the *international symbol of access*, the *international symbol for deafness* and the ambulant toilet symbol.

**Text:**
- Used to describe and clarify and used in conjunction with symbol(s). For example – male, female, staff, visitor, unisex, ambulant, toilet, theatre entrance etc.

**Braille:**
- Braille is required to fully describe the text and symbols.
- The Braille and tactile component of the text and symbols is necessary to inform people who are blind or have low vision to the location of the appropriate toilet or building entrance.

**Location:**
- On the wall on the latch side of an entrance door (e.g. to the toilet cubicle) or if there is insufficient space they may be placed on the door.
- Positioning signs consistently provides predictability.
- Locating signs on the face of the door can make them difficult to locate, when the door is open, or be hazardous to the person attempting to read the sign.

**Design:**
- All statutory signage to meet the following requirements:
  - **Luminance contrast:** Sign to be in *luminance contrast* to the wall, and the text and symbols to be in *luminance contrast* to the sign.
  - **Tactility:** All text and symbols to be able to be read tactually. It is important the sign is installed at the correct height to ensure it can be read by a person relying on the information provided by the raised elements of the sign (text, symbol and Braille).
### Signage continued

**Readability:** Text to be in Title Case which is generally easier to read than ALL CAPITALS. Use a sanserif font (e.g. Helvetica or Arial).

**Glare:** Matt or low sheen surface to ensure the sign does not produce glare or reflect light to maximise readability for people with vision impairment.

**Braille:** a medium which allows a non-sighted person to read text by touch. Grade 1 Braille must be specified, this is a direct substitution of normal print letters for letters from the Braille alphabet.

### Key features – Mandatory

**Statutory signage:**
- to meet the necessary design and installation requirements.
- have the required symbol and text raised and in luminance contrast.
- where internationally recognised symbols are used, to meet requirements.
- have the text in Title Case and use a sanserif font.
- where required include Braille that fully describes what is represented by the symbol(s) and raised text.

<table>
<thead>
<tr>
<th>Access Code</th>
<th>Part D4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AS1428.1</strong></td>
<td>Clause 8.1 (a) (ii)</td>
</tr>
<tr>
<td><strong>Clause 8.1 (d)</strong></td>
<td>Clause 8.2</td>
</tr>
</tbody>
</table>

**Male and Female Sanitary facilities:**
To meet the requirements for statutory signage and have the following unique features:
- The male or female symbol.
- Text e.g. Female Toilet.
- Braille.

<table>
<thead>
<tr>
<th>Access Code</th>
<th>Clause D3.6 (a) (i)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AS1428.1</strong></td>
<td>Clause 8.1</td>
</tr>
<tr>
<td><strong>Clause 8.1</strong></td>
<td>Figure 9 (b) &amp; Notes</td>
</tr>
</tbody>
</table>

**Unisex accessible toilet:**
To meet the requirements for statutory signage and have the following unique features:
- Male and female symbols without a line between the figures to indicate unisex.
- International symbol of access.
- Text including LH or RH (e.g. Unisex Toilet RH).
- Braille.

<table>
<thead>
<tr>
<th>Access Code</th>
<th>Clause D 3.6 (c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clause D 3.6 (f)</strong></td>
<td><strong>AS1428.1</strong></td>
</tr>
<tr>
<td><strong>Clause 8.1</strong></td>
<td><strong>Figure 9 (a) &amp; Notes</strong></td>
</tr>
</tbody>
</table>

**Directional signage to the unisex accessible toilet:**
- International symbol of access and an arrow to direct people to the accessible toilet if it is not located where the bank of sanitary facilities is located.

<table>
<thead>
<tr>
<th>Access Code</th>
<th>Clause D3.6 (f)</th>
</tr>
</thead>
</table>

**Ambulant accessible toilet:**
- The male or female ambulant accessible symbol.
- Text describing the facility.
- Braille.
- Installed on the cubicle door.

<table>
<thead>
<tr>
<th>Access Code</th>
<th>Clause D 3.6 (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AS1428.1</strong></td>
<td><strong>Figure 9(c)</strong></td>
</tr>
</tbody>
</table>
### Signage continued

<table>
<thead>
<tr>
<th><strong>Airlock / entrance doors:</strong></th>
<th><strong>AS1428.1</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identify using raised text, Braille and visual symbols to identify each sanitary facility within.</td>
<td>Figure 9(c)</td>
</tr>
<tr>
<td>• Where the male and female toilets are separate – place a dividing line between the male and female symbols.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Space with a hearing augmentation system:</strong></th>
<th><strong>Access Code</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• International symbol for deafness.</td>
<td>Clause D3.6 (a) (ii)</td>
</tr>
<tr>
<td>• Identify the system specifications (type, area covered, location of receivers if being used).</td>
<td>Clause D 3.6 (b)</td>
</tr>
<tr>
<td>• Braille.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Accessible pedestrian entrance:</strong></th>
<th><strong>Access Code</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Directional signage to the accessible pedestrian entrance from a pedestrian entrance that is not accessible.</td>
<td>Clause D3.6 (e)</td>
</tr>
<tr>
<td>• International symbol of access.</td>
<td></td>
</tr>
</tbody>
</table>

- The use of **internationally recognised symbols** is imperative as they do not rely on an individual’s interpretation of the symbol.

---

**Unisex accessible toilet**

- Male and female symbols to indicate the facility is unisex.
- **International symbol of access** to indicate the facility is accessible.
- This sign should be prefixed with the text ‘Unisex’ i.e. ‘Unisex Toilet LH’
- The Braille should read ‘Unisex accessible toilet RH’
- The use of LH or RH is to indicate whether the toilet has the grab rails on the left or right side of the toilet pan, when seated on the pan.
- There is a requirement where more than one unisex accessible toilet is provided (e.g. on different storeys) that there is an equitable distribution of left and right hand transfer toilets, to meet the variety of functional needs of people with disabilities.
Directional signage to unisex accessible toilet

- Internationally recognised access symbol and information in Braille and raised tactile text.
- In good luminance contrast.
- The arrow directs people to the accessible toilet.

Ambulant accessible toilet facility

- Symbol representing a male or female ambulant toilet.
- Minimum text and Braille to read ‘Female Ambulant Toilet’.
- Sign to be located on the face of the toilet cubicle door.

Directional signage to an accessible entrance from an entrance that is not accessible:

- *International symbol of access* and an arrow.
- *Contemporary language:* There is no requirement for the use of text however if text is required ensure contemporary language is used, for example ‘accessible entrance’ or ‘ramp’, not ‘disabled entrance’.
- The Braille component is not mandatory on this directional sign.
Unisex accessible toilets

ACCESS PRINCIPLES

Definition: Designated as unisex if carers of the opposite sex can assist without having to move through a single sex facility.

Abbreviation: Referred to in this section by the abbreviation UAT.

Planning:
- Size: Design to provide sufficient circulation space around the door to enter and exit, the toilet pan and the hand basin.
- Fittings and fixtures: Position to allow for limited reach range and ease of use.
- Individual solution: May be required in some instances to meet the needs of a specific staff member or student.

Location:
- Grouping: Locate where easy to find, close to key amenities (e.g. foyers and waiting areas) and grouped with other male and female toilets.
- Access: Locate directly off main thoroughfares, without an airlock and without the need to traverse a single sex toilet entrance.
- Privacy: Be sensitive to the location so that the toilet location meets the above principles while still providing a level of privacy to the entrance.
- Multi-level buildings: Provide one UAT on each level, where other male and female amenities are provided. Provide left and right hand configurations on alternating floors.
- ‘Staff use’ toilets: Where other staff have access to a toilet that is designated as ‘staff use only’, also provide a UAT. Staff should not be expected to use visitor or public UAT’s.
- New UATs in retrofits: If it is not possible to provide a UAT on each level of a multi-level building, give priority to common use areas where demand is likely to be greatest, e.g. at main entrances, near meeting rooms or cafes.
  Where people are required to travel between levels to a UAT, locate the toilet adjacent to the accessible path of travel (i.e. next to the lift), without the need to travel additional significant distances.
- Remote location: Should it be necessary to locate the UAT away from other toilets or away from common facilities, clear directional signage is mandatory.

Identification: Well signed, including the international symbol of access, brailled and tactile information and left or right hand (LH/RH) toilet transfer.

Doors:
- Swing: Outward opening doors are preferred, as they provide a more spacious toilet compartment. However, an outward opening door may present a hazard to passing pedestrian flow, so the location must be carefully considered.
- Sliding doors: Have some merit in terms of the circulation space required around them. However, sliding doors can inadvertently impede access for people with disabilities:
- **Recessed handles:** Avoid. Although commonly specified to enable the sliding door to be opened fully to achieve the required clear open width, recessed handles are difficult for people with poor grip or reduced coordination to use.
- **D handles:** May be specified without consideration of the minimum clearance around the handle, which can result in injury or prevent access.
- **Alignment:** Can be difficult to achieve a reliable locking system. Often small locking snibs are used.
- **Privacy:** Can be compromised where the door abuts the jamb if door seals are not specified.

**Pan:**
- **Set out:** So that a *wheelchair* can be parked alongside the pan to enable a side transfer.
- **Proprietary items:** ‘Disabled pans’ are commercially available to have the correct set out and height when installed correctly. Cistern flush buttons that are large, easy to press with a tactile surface are also commercially available.
- **Back rest:** Commercially available – to provide support to the user while seated on the toilet pan.

**Grab rails:**
- **Fixing:** Walls must be strong enough to accommodate *grab rails* when significant force is applied. Some wall structures, including ‘fastwall’, will require a method of reinforcing.

**Basin:**
- **Requirement:** Include a wash basin within each UAT, enabling privacy to complete self care tasks, such as managing catheters.
- **Shelf:** Provide a shelf to enable essential personal care items to be hygienically placed within easy reach.
- **Basin accessories:** Place paper towel, hand drier and soap dispenser within reach of the basin.

**Flooring:**
- **Material:** Must be both impervious and slip resistant without affecting the ability to clean the floor.

**Emergency:**
- **Call buttons:** Where fitted, a suitable and reliable staff response must be in place.

**Baby change:**
- **Provision:** A change table within a UAT is acceptable under the following circumstances:
  - **Universal use:** Any folding baby change meets the needs of people with disabilities.
  - **Space:** The change table, when in the folded-up position, must not encroach into the required UAT *circulation space*.
  - **Location and use:** The facility is not in a location that is dominated by parents changing babies where there is the possibility of preventing, or considerably delaying vacancy, for people with disabilities.
Unisex accessible toilets continued

At construction:

- Toilet grab rails: While correctly documented, they are often installed incorrectly:
  - Wall mounting bracket: The location obstructs the hand from moving along the upper surface. A bracket fitted to the underside of the grab rail will provide an upper 270 degrees for the hand to move along.
  - Length: The rail is too short and does not extend to 50 – 60mm from the rear wall.
  - Installation: Upside down or back to front.

- Knee and footplate clearance: The hand basin waste pipe obstructs the under basin space. Ideally the pipe should have a P-trap fitted through the wall, and at a minimum should be installed outside the unobstructed space required beneath the wash basin.

- The pan: Often set more or less than the 800mm ± 10mm required.
  - More: The circulation space in front of the pan may be compromised, or for a person requiring a forward transfer the rear rail is out of reach.
  - Less: There may be insufficient space to accommodate the length of a wheelchair to enable an independent sideways wheelchair transfer.

Key features – Mandatory

Location:
- Provide accessible toilets in accessible parts of the building / parts of the building required to be accessible.
- Must be able to enter the accessible toilet without crossing an area reserved for one sex only.
- Where two or more accessible toilets are provided – left and right hand facilities must be evenly distributed.

Access Code
Clause F2.4 (a) (f) (g)
Table F2.4 (a)

Design:
- Meet design requirements for all fittings and fixtures.
- Meet the circulation space requirements for pan, basin and doorway.

Access Code
AS1428.1
Clause 15.2, 15.3.1, 15.4, 15.6
Clause 17
Figures 38 – 43 & 52
Figures 44(A) & (B) & 46

Identification – accessible toilet
- Includes the international symbol of access and Braille and tactile equivalent information.
- Identify whether the toilet is left or right hand.

Access Code
AS1428.1
Clause D3.6 (a) (i)
Clause D3.6 (c)
Specifications D4.2 – D4.6

Identification – directional
- If the toilet is located away from the bank of male and female toilets, provide directional signage to the accessible toilet.
- Sign to include international symbol of access.

Access Code
AS1428.1
Clause D3.6 (f)
AS1428.1
Clause 8.2.1
### Baby change tables
- Meet requirements for height
- Locate, when in the folded up position, out of circulation space.

### Door
- See the *Doors, circulation space & door furniture* section of this document.
- In addition, meet requirements for toilet doors.
- Allowable encroachment of basin into hinged and sliding door circulation space requirements.

### Floor surface:
- Slip resistant.
  *A slip resisting rating of R10 is recommended.*

### Key features – Towards best practice

<table>
<thead>
<tr>
<th>Feature</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automatic and semi automatic doors:</strong></td>
<td>Provide to enable easy access by people of all ages and abilities.</td>
</tr>
<tr>
<td><strong>Taps:</strong></td>
<td>Provide an automated system. Automatic taps enable a person with very minimal hand function to wash their hands.</td>
</tr>
<tr>
<td><strong>Emergency:</strong></td>
<td>Provide an emergency call bell that can be reached from the toilet pan or from the floor and ensure there is a suitable response plan.</td>
</tr>
<tr>
<td><strong>Install:</strong></td>
<td>Install an emergency warning system to meet the needs of people who are deaf or have hearing impairment.</td>
</tr>
<tr>
<td><strong>Pan:</strong></td>
<td>Install a toilet seat that has reinforced lateral support. People transferring from wheelchairs will generally place greater than average shear force on seat fittings and fixtures.</td>
</tr>
<tr>
<td><strong>Cistern:</strong></td>
<td>Where a concealed cistern is used a continuous <a href="#">grab rail</a> along the rear and side walls to be provided. A continuous <a href="#">handrail</a> provides additional support and assistance when transferring onto and off a toilet.</td>
</tr>
</tbody>
</table>

---

*AS1428.1 Clause 15.2.8.2*

*AS1428.1 Clause 13.3.1*

*AS1428.1 Clause 15.2.9*

*AS1428.1 Figures 51(A) & (B)*

*AS1428.1 Clause 14.2*

• A pivot hinge set used with an inward opening pivot door. This allows a door to be swung inward or outward in the case of an emergency. Note the retractable door stop.

• A lever handle has been used.

• The toilet is identified by the access symbol.

• A recessed handle can be difficult to grip and can ‘disappear’ behind the wall when the door is opened fully. Recessed handles should not be used.

• A D handle has been used on this sliding door, which ordinarily provides a good grip. However, in this situation the door can be opened fully and the clearance around the handle has been eliminated.
Unisex accessible toilets continued

- A toilet with a correctly installed grab rail, designed so a person can push themselves up from the horizontal component or pull themselves forward using the vertical component.
- A higher ‘disabled pan’ has been installed and set with the front 800mm from the rear wall. The seat is slightly contoured to provide support.
- While difficult to see in this photo, the cistern has easy to use, raised flush buttons that have a tactile upper surface to indicate full and half flush.
- This toilet would be improved by lowering the toilet paper holder to no higher than 700mm AFL where it can be reached by a person sitting.
- Backrest required to all newly constructed accessible toilets.

- Basin has been well installed with the required clear access space underneath to accommodate wheelchair footplates and knee access.
  It also includes:
  - A lever tap.
  - Soap and paper dispenser within easy reach of the person seated at the basin, and
  - Mirror is low so that a person can be seen, should they be sitting.
Unisex accessible toilets continued

- This toilet provides a ‘left hand transfer’ – that is the grab rails are on the left side of the toilet pan.

- This toilet will be identified with signage that includes ‘LH’ to indicate it is designed for a left hand transfer.

- This toilet has a proprietary backrest installed, to provide support to the person seated on the pan.

- A shelf enables personal care items to be placed in reach of the person using the pan or basin.
Unisex accessible toilets continued

- A horizontally aligned baby change table places the handle lower than a vertically oriented change table, to enhance access for a parent who is also a wheelchair user or of small stature.

- Hand dryers that blow air in a diffuse manner are easier to use than a hand dryer that blows air in a sheet requiring hands to be moved through the sheet of air, or requires the hands to be placed within a wall recess or aperture.
ACCESS PRINCIPLES

Definition: Designated as unisex to enable carers of the opposite sex to assist without the necessity to move through a single sex facility.

Planning:
- **Size**: Design to provide sufficient *circulation space* around the door, the toilet pan, the hand basin and the designated shower space.
- **Fittings and fixtures**: Position to allow for limited reach range and designed to be easy to use.

Location:
- **Grouping**: Locate with male and female facilities, providing equitable amenities.

Design:
- **Sanitary fittings**: Principles of design for toilet, hand basin and associated fittings and fixtures are the same as for a UAT.
- **Mixed facilities**: Not permitted: Accessible toilet and an inaccessible shower (i.e. with a hob and / or shower screen) in the same room.
- **Individual solutions**: May be required to meet the needs of a specific staff members or students. This could include the use of a height adjustable portable shower chair with or without armrests.

Flooring:
- **Drainage**: Efficiency within the shower area is essential and can be achieved by ensuring gradients comply with AS1428.1, i.e. 1:60 / 80 in the shower recess and 1:80 / 100 grade for the remainder of the room.

  Shower drainage can be enhanced by installing a waste outlet that is 80mm in diameter and has horizontal grilles.
- **Shower curtain**: Floor length, either self supporting or with weights secured in the base to help control spray and draughts.
- **Surface**: Slip resistant without affecting the ability to clean the floor.

Shower:
- **Shower head**: Portable on a sliding rail that is easy to slide and easy to remove from the shower head support. The fitting must be stable and able to be positioned at various heights and angles between sitting and standing heights.
- **Taps**: Position where they can be easily reached without getting wet from the shower.

Identification:
- **Signage**: Clear and directional if it is necessary to locate the facility away from other toilet / shower / change facilities.
## Accessible change rooms (combined shower/toilet) continued

### Key features – Mandatory

<table>
<thead>
<tr>
<th>Design:</th>
<th>AS1428.1</th>
</tr>
</thead>
</table>
| Where more than one universally accessible toilet and shower facility is provided within a building or two are provided in close proximity, at least one should be of the opposite hand.  
  This will suit the needs of people who require a left and/or right hand toilet and shower transfer options. | Clause 15.5.1 (c) |
| Universally accessible toilet and shower facilities to meet design requirements. | AS1428.1          |
| See previous section on Unisex accessible toilets.                     | Clause 15.5       |
| Figures 47-49                                                          | Figs 47-49        |
| Circulation space:                                                     | AS1428.1          |
| Particular attention must be paid to the correct installation of toilet and shower grab rails, hand basin pipes, the toilet pan set out and circulation spaces provided around the fold down shower seat. | Figure 50         |
| Floor surface:                                                         | An Introductory Guide to the Slip Resistance of Pedestrian Surface Materials |
| Slip resistant.                                                        |                   |
| A slip resisting rating of R10 is recommended.                         |                   |

### Key features – Towards best practice

<table>
<thead>
<tr>
<th>Doors:</th>
<th>AS1428.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic and semi automatic doors will enable easy access by people of all ages and abilities.</td>
<td>Clause 15.1(c)</td>
</tr>
<tr>
<td>Emergency:</td>
<td></td>
</tr>
</tbody>
</table>
| Provide two emergency call bells. One that can be reached from the toilet pan and the other from shower recess.  
  Provide at a height that can be reached from the floor.  
  Ensure there is a suitable response plan.                         | AS1428.2          |
| Provide an emergency warning system to meet the needs of people who are deaf or have hearing impairment. | Clause 18.2       |
| Grab rails:                                                           |                   |
| Extend the vertical shower support grab rail to adjoin the mandatory horizontal grab rail below. | AS1428.2          |
| Figure 14                                                             |                   |
| Where there is a two sided shower recess, with the toilet adjacent to the shower recess, provide a continuous grab rail from the rear of the toilet cistern into the shower recess.  
  A continuous handrail provides additional support and assistance when transferring onto and off a toilet and shower seat. | AS1428.2          |
| Figure 14                                                             |                   |
The sliding shower head support rail and the towel rail to be **grab rail** strength. This will enable these rails to be used as additional support if required.

**N.B.** Vertical or horizontal **grab rails** over the shower seat as shown in AS1428.2 figure 12(d)(ii) or 13 should **not** be included as they can prevent a sideways transfer onto and off the shower seat.

- A level access shower recess with wall mounted shower seat, grab rails and grab rail strength sliding rail onto which the hand held shower hose is attached.

- A small shelf has been provided within the recess. Water drainage would be improved with a centrally located waste in the shower recess to ensure water does not drain to the remainder of the bathroom.

- In addition, a shower curtain weighted at the base will contain water spray.

- A similar design, with overlapping toilet and shower circulation spaces, and includes a centrally located waste in shower recess.
Toilets for people with ambulant disabilities

ACCESS PRINCIPLES

Design considerations:

Provision:
- Toilet designed to meet the needs of people with an ambulant disability.
- Smaller in space with less ‘features’ than a unisex accessible toilet.
- In addition to a unisex accessible toilet.

Location:
- In each bank of toilets where there is more than one toilet.

Design:
- Required circulation space around the entrance door to the bank of toilets and cubicle door to accommodate a walking frame or the like.
- Minimum clear open door width, 700mm.
- In use indicator with a large snib catch (if installed), coat hook and assistive / supportive grab rails.
- Identified with correct signage.

Key features – Mandatory

<table>
<thead>
<tr>
<th>Provision</th>
<th>Access Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Required at each bank of toilets where there is one or more toilets.</td>
<td>Clause F2.4 (C)</td>
</tr>
<tr>
<td>Design:</td>
<td>AS1428.1</td>
</tr>
<tr>
<td>• Meet design requirements.</td>
<td>Clause 16</td>
</tr>
<tr>
<td>• Identified by signage on the toilet door.</td>
<td>Clause 8</td>
</tr>
<tr>
<td></td>
<td>Figures 53 (A) &amp; (B)</td>
</tr>
<tr>
<td>Grab rails:</td>
<td>AS1428.1</td>
</tr>
<tr>
<td>• Grab rails are to be constructed according to requirements.</td>
<td>Clause 17</td>
</tr>
<tr>
<td>Successive doors to ambulant toilets</td>
<td>AS1428.1</td>
</tr>
<tr>
<td>• Meet design requirements for the successive doors to an ambulant toilet.</td>
<td>Figure 34 (in part)</td>
</tr>
</tbody>
</table>
Lifts, lifting platforms and stair lifts

ACCESS PRINCIPLES

Planning:
• **Multi level buildings:** Provide lift access to all floors.

• **Specific requirements:** Sufficient *circulation space* and reach ranges for people using *wheelchairs*, and information formats that meet the needs of people with sensory disabilities.

Location:
• **Preferred:** A central location or close to major access stairs.

• **Non-central location:** Provide clear, easy to read directional signage along the *path of travel* at each point where directional decision making must be made.

• **Retrofitted lifts:**
  - **Ideally:** Provide in a central location close to common public facilities and other means of vertical access, such as stairs.
  - **In reality:** Locate lift as close to the ideal location as practical.
  - **Travel distance:** Ensure staff, students and visitors are not required to travel long circuitous distances to access the lift.

Design:
• **Compliance standard:** To the *Access Code*.

• **Wall and ceiling surfaces:** Matt finish to reduce glare and reflection.

• **Lighting levels:** Within the lift car should match those outside it.

Controls:
• **Principle:** Predictability in lifts, such as the position and design of controls, will assist people who have vision impairment.

• **Visibility:** In *luminance contrast* to the background with clear large contrasting numbers and symbols. Silver information on a silver background is very difficult for many people to read.

• **Floor identification:** Place raised or tactile numbers (minimum height 100mm) on the lift shaft wall’s lift door reveal. When placed close enough to the door, a passenger can reach out to identify the number of the floor without needing to leave the lift carriage.

Door:
• **Opening times:** May require an *individual solution* by being adjusted to meet the individual needs of students or staff regularly using a particular lift.

*Circulation space*:
• **Design generally:** The *path of travel* from a lift to a major facility (e.g. teaching space) on each level must meet the requirements for *accessways*.
Lifts, lifting platforms and stair lifts continued

- **Power scooters:** Used by some people with physical disabilities moving longer distances around the campus.
  - **Car size:** Capable of including an average to larger style scooter. Generally scooters are larger than wheelchairs and it is expected that lifts must be able to carry both.

**Low Rise Lifting Platforms**

**Compliance:**
- Permitted to install where the device complies with AS1735.14 and where the rise is no greater than 1000mm.
- There are specific requirements on a safety features such as passenger protection systems and emergency communication as well as platform size, provision of doors and clear door opening dimensions.

**Usage:**
- Could be installed in certain circumstances where all other means of vertical access have been explored in detail.
- May be more appropriate for specific retrofit situations.
- Will require prior consultation with UWA.
- To be kept unlocked (available for use) at all times that a building is open to students, staff or the public.
- Where possible request two sets of controls to enhance accessing controls.
- A ‘walkthrough style’ is preferred as it does not generally require the user to ‘back’ in or out.
- Ensure that there is sufficient circulation space at the top and base to enable a wheelchair user to open the door(s) as well as enter and exit the platform.

**Wheelchair Stair Lifts**

**Compliance:**
- Permitted to install where the device complies with AS1735.7 only where it is not possible to install any another type of passenger lift. Other limitations take into account public use of the building, number of people accommodated in the building, height to be travelled and encroachment of the device into the stairway.
- The platform size must be a minimum of 810mm wide by 1200mm long.

**Usage:**
- Considered to be a cumbersome and undignified access solution and could only be installed in certain circumstances where all other means of vertical access have been examined in detail. The rationale for use of this mechanism must be thoroughly investigated, documented and include a dignified management regime.
- May be more appropriate for specific retrofit situations.
- Will require prior consultation with UWA
- To be kept unlocked (available for use) at all times that a building is open to the students, staff or the public.
- Ensure that there is sufficient circulation space at the top and base of stairs for the wheelchair platform to ‘park’ and to allow a wheelchair user to enter and exit the stairway platform lift.
### Key features – Mandatory

<table>
<thead>
<tr>
<th>Path of travel:</th>
<th>See accessway section</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Meet design requirements of an accessway.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provision:</th>
<th>Access Code</th>
</tr>
</thead>
</table>
| • The Access Code clearly defines the style of passenger lift acceptable for use with some styles being subject to limitations. | Clause E3.6(a)  
Table E3.6(a) |

<table>
<thead>
<tr>
<th>Design:</th>
<th>Access Code</th>
</tr>
</thead>
</table>
| • The features of each type of lift required to meet the needs of a person with a disability is specified. | Clause E3.6(b)  
Table E3.6(b) |
| • Where a lift is fully enclosed the use of a constant pressure device is not acceptable. | Clause E3.6(C) |
Learning areas

Description: Can be as simple as a classroom with movable furniture, a tiered lecture theatre or a more complex environment designed for practical learning, such as a chemical laboratory or simulated work area.

ACCESS PRINCIPLES

Design:
• General principle: Ensure:
  – That classrooms, labs and fieldwork sites are accessible to individuals with a wide range of physical abilities.
  – Equipment and activities minimise sustained physical effort, provide options for operation, and accommodate right and left-handed students as well as those with a range of physical ability.
  – The safety of all students.
• Access generally: Required to all areas of all classrooms.
• Lecture podiums and raised platforms: Access for all is required.
• Circulation space:
  – Requirement: Provide sufficient to all learning areas to allow access to all parts of the room for people using mobility aids. Moveable furniture increases the flexibility in different class room situations.

Seating:
• Tiered seating: Ensure there are equitable lines of sight for all attendees. It is not acceptable for wheelchair spaces to be provided in the ‘free space’ at the front of a theatre only or at the back behind fixed seating.
• Fixed seating:
  – Increased flexibility: Can be obtained by designing in sections of ‘removable seats’.
  – Design: To meet the needs of people with ambulatory disability.

Presentation equipment:
• Accessibility: Ensure access to presentation equipment (e.g. white boards etc.) meets the reach range needs of all.
  Reach ranges for people sitting and standing depending on the approach and action required to operate, are generally between 700 – 1200mm above floor level.
• Switches and controls: On built-in presentation equipment, large and easy to operate. Levers require less effort and a larger grip than smaller pinch or twist style controls.

Hearing augmentation:
• Installed AV equipment: Where provided, make provision for students with hearing impairment. Identify the space with the international symbol for deafness, according to requirements.
Learning areas continued

- ‘Phonic Ear Easy Listener Portable FM System’: The University has a system available for hire comprising:
  - a transmitter (worn by lecturer), and
  - a receiver unit (used by student)
that amplifies and delivers sound to the listener. As these units are available for student loan, the installation of audio loops in lecture theatres may not be required. However, designers must consult with user groups as new lecture theatres are designed and developed, particularly where public lectures may be held.

Vision:
- **Internal Way Finding**: Use materials that are in **luminance contrast** to assist people who have low vision find their way within the learning environment and locate key facilities such as desks and chairs.
- **Reflective Surfaces**: Avoid their use (e.g. on desks) as any glare caused may impede the functioning of some people with vision impairment.

Laboratory design:
- **Design guidelines**: Information on accessible laboratory design is available in Accessible Scientific Laboratory Design (2000) by Jaye Johnson, on behalf of The University of Western Australia.
- **Common use facilities**: Ensure things that will be used by everyone in a laboratory (e.g. stand alone sinks, storage systems and taps) are accessible to all.

Individual solutions:
- **Criteria for implementation**: Where a design for a person with a disability could be a safety risk or preclude convenient access for other students, e.g. the safety requirements in chemical laboratories may make it impossible to design knee space or a height adjustable requirement for a **wheelchair** user.
- **Individual needs in complex task areas**: Can be very specific. It may be more cost effective to adapt a work station to meet the specific needs of an individual when required. Consult with the user.

Possible adaptations must be discussed with experienced staff for consideration in the design stage as this will minimise future costs and where possible ‘design out’ future technical constraints.

<table>
<thead>
<tr>
<th>Key features – Mandatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet design requirements for:</td>
</tr>
<tr>
<td>• <em>Accessways</em></td>
</tr>
<tr>
<td>• <em>Doors and circulation space</em></td>
</tr>
<tr>
<td>• <em>Wheelchair seating spaces</em>:</td>
</tr>
<tr>
<td>• Meet the design requirements for position of spaces.</td>
</tr>
</tbody>
</table>

**Access Code**
- Clause D3.9 and Table D3-9
- AS1428.1
  - Clause 18.1, 18.2 and 18.3
  - Figure 54
Learning areas continued

Hearing augmentation:
• When required a system suitable for people with hearing impairment must be installed or made available and identified with the international symbol for deafness.

Podium/stage:
• Access to podium and stage areas to meet the requirements of people with mobility impairment.

Seating:
• Meet the needs of people with ambulatory disabilities.

Desks:
• Meet design requirements for wheelchair users.

Key features – Towards best practice

Lines of sight:
• Seating suitable for people using wheelchairs to be provided at the front, back and centrally in lecture theatres.

Desks:
• Provide one adjustable height bench or desk in technical classrooms and laboratories.

Access Code
Clause D3.6 (a) (i) and (b)
Clause D3.7

AS1428.2
Clause 26.2

AS1428.2
Clause 27.2

AS1428.2
Clause 24.1

✔ Where hearing augmentation has been provided, appropriate signage is also required.

✔ Lever action tap ware can be used by everyone.
Cafes and dining areas

ACCESS PRINCIPLES

General
• **Overriding principle:** All internal areas within a building must be accessible to people with disabilities by provision of a clear *continuous accessible path of travel* to and within each level.

• **Universal access:** Ensure required *circulation spaces* to accommodate *mobility device* users are provided to all cafes and dining areas, counters, the servery and all seating areas, including alfresco.

Counters and displays:
• **Food displays:** Visible to people both seated and standing.
• **Self serve facilities:** Accessible to people both seated and standing.
• **Reflective surfaces:** Avoid using. These can produce glare which impedes the functioning of some people with a vision impairment.

Queuing barriers:
• **Design for people using mobility devices:** Ensure there is enough space to move through the barrier and approach the counter in the same manner as everybody else.

• **Design for blind and vision impaired people:** Ensure barriers do not pose a hazard.

Furnishings:
• **Seating areas:** Moveable chairs and tables enable flexibility of use.

• **Outdoor dining areas:**
  – **Shade:** Provide shade and avoid the use of materials that will reflect light or absorb heat.
  – **Acoustics:** Sound absorbing materials within large dining areas will assist people with a hearing impairment.

**Key features – Mandatory**

**Doors:**
• Meet design requirements for width and weight to meet requirements for *accessways* to cafe doors and door *circulation spaces.*

**Path of travel:**
• Unobstructed *path of travel* 1200mm wide.
  
  A width of 1200mm will enable a *wheelchair* user to manoeuvre through the cafe.

**Counters:**
• Meet design requirements.

**Circulation space** 2070mm by 1540mm is required in front of the counter.
  
  This is to accommodate a *wheelchair* user making a 180 degree turn.
Cafes and dining areas **continued**

<table>
<thead>
<tr>
<th>Lighting:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Area to be well lit.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Furnishings:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Seating to meet the needs of people with ambulatory disability.</td>
<td>AS1428.2 Clause 27.2 and Figure 32</td>
</tr>
<tr>
<td>• Tables to be suitable for use by people in wheelchairs.</td>
<td>AS1428.2 Clause 24.1</td>
</tr>
</tbody>
</table>

**Key features – Towards best practice**

<table>
<thead>
<tr>
<th>Counters:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Be in 30% <em>luminance contrast</em> to the background.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seating and tables:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Be in 30% <em>luminance contrast</em> to the background.</td>
<td></td>
</tr>
</tbody>
</table>

✔ • Tables and chairs are aligned to create an *accessible path of travel*.  

✔ • Fixed bench style tables and seats.  
  • A moveable bench seat enables wheelchair access.
Residential accommodation

ACCESS PRINCIPLES

Design principle:
• Requirement: Provide accessible bedrooms, communal accessible bathrooms and accessible emergency exits all within close proximity to each other.

Rationale:
• University housing: An important element of a university education for many students. For students with disabilities, living on or near campus can facilitate access to academic programs and campus activities.
• Student expectation: To be included in all day to day activities. Buildings and facilities must therefore be designed on an inclusive model.

Individual solutions:
• Specific needs: In some instances, adaptations or individual solutions may be required. These alterations are more easily achieved when circulation spaces are generous.

Bedrooms:
• Design: Ensure the following elements are provided:
  - A clear continuous accessible path of travel: Provide from communal facilities to accessible bedrooms. Ensure corridors and entrance doors are wide and that the circulation space around the entrance door is spacious and meets requirements previously addressed.
  - Door locking system: Operated with one hand and is easy to use.
  - Bedroom size: Ensure sufficient circulation space around the bed for a wheelchair user to manoeuvre to the side of and transfer onto and off the bed.
  - Mobility equipment: Provide extra storage and circulation space.
  - Floor surface: Hard and slip resistant. This facilitates manoeuvrability of wheelchairs in smaller spaces (i.e. a bedroom).
  - Controls (e.g. air-conditioning and light switches): Provide large, easy to operate controls located within reach range for a person using a wheelchair.
  - Wardrobe:
    - Door: Ensure there is sufficient circulation space for a wheelchair user to approach and open the door. A sliding door that provides a wide opening is acceptable.
    - Low hanging space: Required. Can be achieved with a simple height adjustment mechanism such as side slots that allow the hanging rail to be moved.
  - Shelving: Height adjustable. Can meet the storage requirements of a range of students.
  - Bench or desk: Must enable a student using a wheelchair to access the desk and work in an ergonomically correct position.
  - Power, telephone and television outlets: In easy reach of a wheelchair user.
  - Windows:
    - Sill heights: Low enough for a person using a wheelchair to appreciate a view.
    - Controls (blind, curtain, sash): Large, easy to use and within reach.
Residential accommodation continued

Bathrooms:
- **Compliance**: Comply with the principles for Combined Shower and Toilet Facilities outlined above. In addition, provide storage and bench space appropriate to a domestic situation.
- **Shower seat**: The folding seat required in AS1428.1 may not meet the needs of all students and an *individual solution*, such as commercially available height adjustable shower chair or stool, may provide the solution.

Communal kitchens:
- **Circulation space**: Design in sufficient *circulation space* at entrances and within a kitchen to allow a *wheelchair* user to enter, move through and turn around to exit if necessary.
- **Universally accessible facilities**: Designing a kitchen space that meets the needs of people who are both standing and sitting is a particular challenge.

However, it is inappropriate to design a ‘special’ kitchen for people using *wheelchairs*. Given the individuality of all people, any universal solution may not meet the individual needs of all people. In some situations *individual solutions* may be required.

- **Principles**: The following principles will allow most people using *mobility aids* to prepare a snack or simple meal:
  - **Bench height**: 850mm will meet the needs of most users and enable a wheelchair user to prepare a snack with a side bench approach.
  - **Bench corners**: Rounded.
  - **Visibility**: *Luminance contrast* between bench tops, cupboard fronts and floors (horizontal and vertical surfaces) will enhance access for people with low vision.
  - **Sink**: Shallow so that a person who is sitting can reach the bottom.
  - **Taps**: Lever action that can be reached from a sitting position.
  - **Stove**:
    - **Controls**: Large high *luminance contrast* lever style at the front.
    - **Set down space**: Provide bench space adjacent the opening door.
  - **Microwave oven**: Locate within easy reach with bench space adjacent to the opening door.
  - **Refrigerator**: Provide bench space adjacent to the opening door(s).
  - **Drawers**: Provide easy access to the back, for people using *wheelchairs*.
  - **Shelving**: Open and height adjustable.
  - **Drawer and cupboard handles**: ‘D’ style.
  - **Knee/foot plate access**: Provide to one work surface.
  - **Task lighting**: Provide glare free over work areas.

Communal laundries:
- **Circulation space**: Design in sufficient *circulation space* at entrances and within the laundry to allow a *wheelchair* user to enter, move through the laundry and turn around to exit where necessary.
- **Principles**: Access in a laundry can be achieved by providing:
  - **Washing machine**: At least one front loader with sufficient *circulation space* to approach, load and operate.
  - **Clothes dryer**: Front loading that can be accessed from a seated position.
  - **Shelving**: Adjustable storage that can meet the needs of all students.
Residential accommodation continued

- **GPO**: Within easy reach range of all.
- **Sink**: Shallow that can be used by a *wheelchair* user. It is not practical to provide access to a deep laundry tub.
- **Ironing**: Best addressed by an *individual solution*.

**Emergency egress:**
- **From living areas**: Achieved by a combination of building design and evacuation procedures.
- **Paths of travel**: Egress away from bedrooms must be accessible, i.e. wider doors with level access and sufficient *circulation space*, doors that are light to operate with lever controls and wide flat paths leading away from the building.

Emergency egress from sleeping areas is best managed if bedrooms are on ground level, in close proximity to an accessible emergency exit with an accessible *path of travel* to a safe area away from the building.

- **Warning systems and alarms**: Must suit the needs of people with both hearing and vision impairment.

**Key features – Mandatory**

<table>
<thead>
<tr>
<th>Bedroom:</th>
<th>AS1428.2 Clause 24.3</th>
</tr>
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</table>
| - **Circulation spaces** around beds must meet the requirements.  
  1200mm space around each bed is required to allow manoeuvrability and bed transfer space. | |
| - Design of storage systems to meet the design guidelines.  
  Space in front of 800mm x 1300mm with hanging height at 1350mm. | AS1428.2 Clause 23.2 |
| - Location and design of controls in all rooms to meet the requirements. | AS1428.1 Clause 14 |
| - Design of desks to meet the guidelines.  
  Provide knee access and at least 900mm long. | AS1428.2 Clause 24.1 |

<table>
<thead>
<tr>
<th>Bathroom:</th>
<th>AS1428.1 Clause 15.3.2</th>
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</table>
| - Meet *Circulation space* requirements of **AS1428.1**.  
  - Utilise the features for a ‘single occupancy unit’. | See section on combined sanitary facilities. |

<table>
<thead>
<tr>
<th>Kitchen:</th>
<th>AS1428.2 Figure 25</th>
</tr>
</thead>
</table>
| - **Circulation space** to meet guidelines.  
  1500mm space between benches or alternatively 1200mm with a kick plate 290mm high and 200mm deep. | |

<table>
<thead>
<tr>
<th>Laundries:</th>
<th>AS1428.2 Appendix A14 and A15, Clause 6.2</th>
</tr>
</thead>
</table>
| - Design to meet guidelines.  
  Front loading washing machines and driers with 1500mm *circulation space* in front. | |
Key features – Towards best practice

- Provide additional storage space for mobility aids.
- Kitchen designs to meet the guidelines for work levels and preparation areas.
  Space next to cook top, provision for seating and clear knee space under part of the bench, colour contrast in kitchen benches, etc.
- Provide a 150mm deep sink in the kitchen.
- Provide audible and visual alarms in living and sleeping areas.

AS1428.2 Appendix A

AS1428.2 Appendix A5

AS1428.2 Clause 18.2.1

Kitchen layout includes the following design features:

✔ Bench space adjacent the oven that enables items to be moved from oven to bench.
✔ Under bench access for wheelchair users to sink and cook top.
✔ A pull out pantry that enables side access, with reach to items in the rear of the pantry.
✔ Good circulation space.
✔ D handles for easy grip.

This kitchen has accessible features:

✔ Deep kick plates that increase the already generous circulation space available in this kitchen.
✔ Some open shelf storage.
✔ A lowered microwave.
✔ Under bench oven with front controls.
Emergency egress

ACCESS PRINCIPLES

Background:

• Compliance standards: Currently there are no specific statutory requirements regarding emergency egress for people with disabilities.

The Advisory Notes on Access to Premises (Clause 5.21) notes that:

‘all users should be provided with a means of egress from premises to a place of safety’

and that

‘people with disabilities should be provided with the same level of protection as other premises users or building occupants’. [5]

• Principles of Universal Design: Compliance requires that emergency egress must meet the needs of all people, including people with physical, cognitive or sensory disabilities.

• Managing emergency egress: Cannot be managed entirely by the building fabric and needs to be coupled with emergency egress procedures and policies.

The Advisory Notes on Access to Premises states ‘Management practices concerning egress for people with a disability are a vital part of achieving protection’.

• Individual solution: May be required to meet the needs of staff or students. Could include the development of an individualised evacuation plan or the use of an alternate warning device, such as a vibratory alarm.

Design:

• Egress from the ground floor: Requires an accessible path of travel to a safe environment. This includes:
  
  – Doors:
    – Width: Minimum 850mm clear access with a level threshold.
    – Circulation space: Sufficient at the doorway.
    – Operation: Light, with lever controls.
  
  – External path: Wide flat paths leading away from the building to a safe location.

• Egress from upper floors:
  
  – Place of refuge: Currently considered as a way of protecting people with disabilities pending evacuation. Places of refuge may be a fire rated lift, or a fire isolated lift lobby or stairwell.
  
  – Identification: Must display the access symbol and be clearly marked.
  
  – Location: Set back from evacuation route so as to not impede evacuation of others from the same floor or floors above.
  
  – Size: To accommodate at least one wheelchair footprint (800mm wide and 1300mm long). However, consultation between designers and user groups should take place as new multi level buildings are designed and developed.

• Emergency exit stairs: Provide handrails on both sides and stair nosings in luminance contrast.

• Emergency warning systems: Warning systems and alarms must suit the needs of people with hearing or vision loss. Include both audible and visual warning alarms in bedrooms (accommodation) and toilets.

Emergency egress continued

Key features – Mandatory

*Circulation space:*
- Meet requirements of *accessways*.
- Provide a *wheelchair accessible* safe haven on each level of all new multi level buildings.

See section on *accessways*

Key features – Towards best practice

*Warnings:*
- Provide audible and visual alarms in living and sleeping areas of accommodation facilities and all toilets. Individual solutions may be required in other locations to meet the needs of students or staff.

✔ Both an audible and visual flashing alarm have been installed in this toilet to alert a person who is hearing or visually impaired of an emergency situation.
Appendix 1

Legislation, codes, standards and guidelines

Disability (Access to Premises – Buildings) Standards 2010 (Premises Standard)

The Premises Standard has been developed by the Attorney General’s department under the Disability Discrimination Act (1992) (DDA), in the same way that the Disability Standard for Education, 2005 and Disability Standards for Accessible Public Transport, 2002 (Transport Standard) have been written.

The purpose of the Premises Standard is to:

- provide a set of provisions that detail what needs to be done to provide access for people with a disability in a non discriminatory manner;
- bring together access requirements under the DDA with building law;
- improve previous provisions for access for people with disabilities that was detailed in the BCA pre 1 May 2011.

Schedule 1 of the Premises Standard forms the Access Code. The Access Code is incorporated into the BCA (from 1 May 2011), harmonising the DDA with the BCA and providing greater certainty to the building industry, as compliance with the Premises Standard means the intent of the DDA is met as far as the built environment is governed by the BCA.

The Premises Standard contains two parts. The first six parts set out the legal application of the Premises Standard and the second part, Schedule 1 is the Access Code, which provides the technical requirement of the Premises Standard.

The Access Code sets out the Performance Requirements that must be met and the Deemed-to-Satisfy Provisions, which, if met, ensure compliance with the Performance Requirements. It is imperative that designers have a comprehensive understanding of the Premises Standard and it components to ensure the many facets of the Access Code are encompassed when designing for a new build or undertaking a refurbishment.

The Australian Standards referenced in the Access Code that provide the ‘how to’ of designing an environment accessible for people with disabilities are:

- AS1428.1 2009 General requirements for access – New building work;
- AS/NZ 1428.4.1 2009 Means to assist the orientation of people with vision impairment – Tactile ground surface indicators;
- AS1735 Parts 1, 2, 3, 7, 8, 12, 14, 15 and 16 – Lifts, escalators and moving walks;

Where the Access Code does not apply or is silent, ie where access requirements are beyond the scope of the Premises Standard, complaints of unlawful discrimination can continue to be made under DDA legislation. This could include such things as public counters, drinking fountains and public seating.

The Access Code is referenced through the UWA Building and Campus Access Guidelines where Performance Requirements are required to be met.
Appendix 1 – Legislation, codes, standards and guidelines

AS1428.1 2009 Design for access and mobility Part 1: General requirements for access – New building work

AS1428.1 2009 is an Access Code referenced technical document that provides a set of minimal design standards for the built environment. The Standard addresses aspects of access to and within a building which are regulated under the Building Code of Australia (BCA). It is generally accepted that provision of facilities that meet this Standard will be suitable for 80% of wheelchair designs and the level of function of 80% of wheelchair users. The exception to this are:

- New unisex accessible toilets designed to AS1428.1 2009;
- Accessways, at the location where there is a turn greater than 60°; and
- At doorways, including door width and circulation space; where the Standard relates to the 90th percentile dimensions.

AS1428.1 relates only to the building structure and the access path to the building. Where the Standard does not detail provisions for existing buildings, some classes of buildings, the building fit-out or the external environment, then the intent of the DDA still applies.

Where the Australian Standards do not apply it is generally expected that technical details in this Standard are used as a guide to meet minimum design details in all design and construction.

AS1428.1 is referenced through the UWA Building and Campus Access Guidelines because it is a referenced document within the Access Code. Compliance with the technical detail of AS1428.1 is required in order to meet the Performance Requirements of the Access Code.

AS1428.2 Design for Access and Mobility Part 2: Enhanced and additional requirements – Buildings and facilities

Published in 1992, the intent of this standard was twofold. Firstly to provide additional information not covered in AS1428.1 and secondly to give enhanced requirements to provide a higher level of access for people with disabilities. With the publishing of the Access Code (2010) and associated referenced standards such AS1428.1 (2009) many elements of this Standard have been incorporated into the new documents. Aspects of this Standard that are referenced in the UWA Building and Campus Access Guidelines are generally based around issues of dimensioning for fixtures and fittings.

The anthropometric data in this standard provides information on dimensions and reach ranges etc, that should be used as a guideline when designing or locating fittings and fixtures such as benches, storage shelves or controls.

AS1428.2 is referenced in the UWA Building and Campus Access Guidelines where anthropometric data, provided in this standard, can be applied to fittings or fixtures where there is no specific information supplied in other codes or standards.


AS2890.6, a revision of AS2890.1, was published in 2009 and is referenced in the Access Code. This Standard specifies requirements for angled and parallel parking bays, associated pedestrian areas, undercover parking requirements and access controlled entries associated with off-street parking.

AS2890.6 2009 is referenced in the UWA Building and Campus Access Guidelines to provide complete information regarding open air and undercover accessible parking bays.
AS/NZ 1428.4.1 2009 Means to assist the orientation of people with vision impairment – Tactile ground surface indicators

AS1428.4.1 sets out requirements for the design and application of tactile indicators to ensure safe and dignified access for people who are blind or vision impaired.

The Access Code generally requires warning style Tactile Ground Surface Indicators (TGSI) applications at the top and bottom of ramps and steps. Provisions are also made for the application of TGSI at flush transitions and to provide warning of overhead obstruction as a ‘last resort’ where alternate architectural solutions cannot be found. All other applications of warning indicators and all applications of directional indicators should be carefully considered through consultation with a person who understands how these navigational cues can form part of a Way Finding system and assist in orientating a person who is blind or vision impaired.

Parts of AS1428.4.1 require compliance because they are referenced in the Access Code. AS1428.4.1 is referenced in The UWA Building and Campus Access Guidelines when the technical information is considered to be best practice in Australia or where they will assist in Way Finding for people who are blind or vision impaired.

Draft AS2890.6 200X Parking Facilities Part 6: Off-street parking for people with disabilities

Draft AS2890.6 200X, a revision of AS2890.1, was drafted in 2002 and at the time of writing this document had not been released as an Australian Standard. It has an expanded section (Section 6) specifying requirements for parking spaces and access for people with disabilities. It is not known when this standard will be finally issued.

Draft AS2890.6 200X is referenced within the UWA Building and Campus Access Guidelines when it provides more contemporary, complete or additional information, not available in the present AS2890.1. Note that not all draft information is included in the UWA Building and Campus Access Guidelines and when the standard is ratified, parking information in this document will need to be reviewed.


AS1735.12 sets out the requirements for facilities in passenger lifts that are specifically designed to assist a person with a disability. Most technical details within this standard are now referenced within the BCA and are therefore standard in new passenger lifts.

In circumstances where there are retrofit constraints it may be an acceptable alternative to install a lift or lifting platform, designed to the specification of AS1735.14, Low rise platforms for passengers, or AS1735:16, Lifts for people with limited mobility – Restricted use – Automatically controlled.

AS1428.4 (2002) Tactile Indicators

AS1428.4 sets out requirements for the design and application of tactile indicators to ensure safe and dignified mobility for people who are blind or vision impaired.

The BCA generally requires warning style Tactile Ground Surface Indicators (TGSI) applications at the top and bottom of ramps and steps. All other applications of warning indicators and all
Appendix 1 – Legislation, codes, standards and guidelines continued

applications of directional indicators should be carefully considered through consultation with a person who understands how these navigational cues assist in orientating a person who is blind or vision impaired.

Parts of AS1428.4 require compliance because they are referenced under Clause D.3 of the current BCA. AS1428.4 is referenced in the UWA Building and Campus Access Guidelines when the technical information is considered to be best practice in Australia or where they will assist in Way Finding for people who are blind or vision impaired.

Disability Standards for Access to Premises (Buildings) (anticipated 2010) (Premises Standard)
This draft Premises Standard document (not an Australian Standard) has been developed by the Attorney General’s department under the Disability Discrimination Act 1992, in the same way that the Disability Standard for Education, 2005 and Disability Standards for Accessible Public Transport 2002 (Transport Standard) have been written.

The Premises Standard has been written in such a way that it will become an integral part of the Building Code of Australia and attempts to ensure that detailed technical requirements in the BCA and the Australian Standards on Access and Mobility are consistent with the requirements of the DDA. It is not known when this standard will be finally issued or whether there will be significant changes to the draft document issued in 2004.

UWA Signage Manual
The purpose of the UWA Signage Manual is to provide tools and processes for the development and implementation of all University signage to ensure that the delivery of services to internal and external customers is enhanced through the appropriate use of campus signage. The manual has been developed with a view to progressively upgrade all signage across the University using the Standards documented in the manual.

Although the UWA Building and Campus Access Guidelines do not include a section on signage, reference is made to the UWA Signage Manual when signage is considered to be an integral part of a design.

Vision Australia Fact Sheet on ‘Accessible Design for Public Buildings’
This fact sheet provides good practice information for designing public buildings. It is freely available at www.visionaustralia.org.au/info.aspx?page=721

AS/NZ 4586 (1999) Slip Resistance classification of new pedestrian surface materials, and

These two complementary documents provide information on the requirement for slip resistant surfaces in all internal environments.

AS/NZ 4586 is a technical document on the various methods of measuring slip resistance and a means of demonstrating compliance. The Introductory Guide Handbook has been referenced in the UWA Building and Campus Access Guidelines as it provides practical easy to understand information for selecting pedestrian surface materials in a range of situations.
Appendix 1 – Legislation, codes, standards and guidelines continued

Accessible Scientific Laboratory Design
Jaye Johnson, Disability Consultant, for The University of Western Australia, 2000.
This booklet was developed to identify barriers for people with disabilities and provide a resource for those designing and modifying laboratories at UWA.
Difficulties had been reported by both staff and students when working in scientific laboratories. This publication includes surveys that identify specific barriers, for students and staff.
The Accessible Scientific Laboratory Design booklet provides excellent background reading for all involved in modification or design of laboratories and has been referenced in the UWA Building and Campus Access Guidelines where it provides additional information to the Australian Standards on Access and Mobility.