AS 4299—1995

Australian Standard®

Adaptable housing

This Australian Standard was prepared by Committee ME/64, Access for People with Disabilities. It was approved on behalf of the Council of Standards Australian on 26 May 1995 and published on 5 September 1995.

The following interests are represented on Committee ME/64:

Access Australia
ACROD, Australia
Aged Care Australia
Australian Building Codes Board
Australian Chamber of Manufacturers
Australian Construction Services—Department of Arts and Administrative Services
Australian National Council of and for the Blind
Building Owners and Managers Association of Australia
Council on the Ageing, Australia
Department of Housing, New South Wales
Disability Council of New South Wales
Disability Services Office, South Australia
Disable Persons Assembly, New Zealand
Housing Industry Association, Australia
Mobility Research Centre, New Zealand
National Committee, Independent Living Centres, Australia
Royal Australian Institute of Architects
Royal Melbourne Institute of Technology
South Australian Department of Housing and Construction
Telstra Corporation

Additional interests participating in preparation of Standard:

A.C.T. Public Works
Australian Quadriplegic Association
Department of Planning and Development, Victoria
Department of Planning, N.S.W.
Health Department of Western Australia
Illawarra Retirement Trust, Australia
Private architectural consultants
Royal New Zealand Foundation for the Blind

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Adaptable housing

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME/64 on Access for People with Disabilities and is the result of a consensus among representatives on the joint committee to produce it as an Australian Standard.

For more than 15 years Standards Australia has been involved with developing design standards for people with disabilities. AS 1428.1 was first published in 1977, followed by revisions in 1988 and 1993. Other parts of AS 1428 have followed—all relating to public buildings. AS 1428.2 describes enhanced requirements for fixtures and fittings, lighting and other aspects of building and facilities.

The series comprises:

AS		
1428		Design for access and mobility
1428.1	Part 1:	General requirements for access—Buildings
1428.2	Part 2:	Enhanced and additional requirements—Buildings and facilities
1428.3	Part 3:	Requirements for children and adolescents with physical disabilities
1428.4	Part 4:	Tactile ground surface indicators for the orientation of people with vision impairment
1428.1	Supp 1:	General requirements for access—Buildings—Commentary

AS 1428.1 has been called up by the Building Code of Australia as a means of compliance and because it is the only document available specifying design for people with disabilities, it has been relied on at times for designing accessible homes as well.

There has been, however, a growing concern that the above Standards are insufficient and inappropriate as housing standards. For example, the research for AS 1428.1 relates only to people between 18 and 60 years of age.

This document relates to residential, rather than to public buildings. It provides a more complete reference document and draws on the material contained in AS 1428.1 and AS 1428.2. To date no housing-specific research on access for people with disabilities has been carried out. Until such research is undertaken, AS 1428.1 and AS 1428.2 are considered to contain useful guidelines.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

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First published as AS 4299— 1995.

FOREWORD

Demographic trends are towards longer lifespans, with a higher proportion of older people in our community. With age, however, comes increasing risk of some form of disability. The ABS Survey *Disability, Ageing and Carers—1993* showed that 18% of the total Australian population had a disability. This percentage rose to 51% for people aged 60 or more years[1].

The Australian Disability Discrimination Act 1992 allows individuals to lay complaints if they think they have been unfairly treated because of their disabilities. The Act applies to buildings and accommodation; however, until tested, the implications for housing are unknown[2].

The concept of 'adaptable housing'

'Barrier-free' or 'accessible' design has traditionally been considered 'special'—separate from mainstream housing design. Custom-designed housing to suit persons with disabilities can therefore be expensive because it falls outside common building practices.

'Adaptable design' involves a move away from designing special accommodation for different community groups with different needs. It is design which avoids the personal and economic costs that accompany social dislocation.

Principles The principles of adaptable housing are as follows:

(a) *Adaptable housing design is good design for everyone* Adaptable housing is a benchmark or basis on which to develop the accommodation needs of users of all ages and abilities. Adaptable housing, by incorporating sensible design features often lacking in other housing, serves as a bonus to the owners and occupants.

(b) *Adaptable housing should be possible at relatively little extra initial cost* Later modification to adaptable housing will prove relatively easy to do at minimum inconvenience and minimum cost, and will more than offset the extra initial cost, thus encouraging the occupant to stay, rather than face the disruption and cost of shifting house. It will promote the economic and efficient use of building materials.

(b) *The concept will provide safer houses* Adaptable houses will have features, dimensions and materials designed for safety and ease of use.

(c) *Continuation of existing community and family networks* This Standard fits well with the current philosophy of independent living. People with disabilities and older people are now wanting, and being encouraged through the provision of support services, to stay in their own homes as long as possible, close to established support networks and familiar surroundings.

(d) *Suitability for people with any level of ability* If a house is built according to AS 1428.1 for a fictitious person, it may not be suited to a particular resident with particular needs (e.g. a person with a vision impairment may have very different requirements from a person who uses a wheelchair). The adaptable house must, in its adaptable features, suit any future occupant with any type of disability.

International examples

The concept of adaptable housing in Australia grew from developments in various overseas countries over the last 10 years. For example:

(a) The USA has included adaptable requirements for new multi-family dwellings in its Fair Housing Amendments Act 1988. The Act requires accessible common-use portions and features including—

  (i) appropriate door widths;

  (ii) accessible routes into and through the building;

(iii) accessible light switches, outlets and controls;

(iv) reinforcement in bathroom walls to allow later installation of grab-bars; and

(v) manoeuvring space in the kitchen and bathroom.

(b) In the UK, Goldsmith[3] introduced the concept of 'mobility housing' and took it further with 'Factor X housing' to incorporate 'visitability'. This allows people with disabilities to visit family and friends.

(c) The Netherlands through its Building Adaptable Housing experiment[4], developed detailed design requirements for adaptable housing.

(d) Scandinavian countries also incorporate requirements of adaptable housing in legislation. For example, some of Norway's 'Lifespan Dwelling'[5] features are included in building regulations. These are minimum door widths to kitchens, living rooms and bedrooms. There are also requirements for at least one storey in a block of flats to be accessible without steps.

(e) In New Zealand work on 'special' house design and facilities for pensioner housing was done by the Disabled Persons Assembly, and its predecessor organization, with local authorities on an ad-hoc basis over a number of years. Advice was offered to designers on a similar basis.

Benefits Certification of compliance with this Standard will have the following results:

(a) *Visitability* As more people with disabilities and older people live independently in the community, they are finding that one aspect of normal social life presently denied to them is the ability to visit family and friends at home. Houses that are or will become adaptable will mean more houses that are 'visitable'. Thus people with disabilities will be able to enter the front door without difficulty and at least be able to get to the living areas and be able to use the toilet.

(b) *Economy of life-cycle construction* Modifications to existing housing to suit the needs of people with disabilities are often costly. Corridors and doors may have to be widened, structural adjustments such as removing walls may be the only way to achieve a useable bathroom and steps may have to be replaced by ramps. If houses are initially built to suitable sizes and on suitable sites for access, costs of modifications can be minimized. Thus, adaptable design will promote the economic and efficient use of building materials.

(c) *Safety and ease of use* Adaptable design will make the dwelling safer and easier for people of all ages. For example, for families with young children, it will allow manoeuvrability for strollers and laundry trolleys. The level entry and door widths will facilitate movement of furniture. The avoidance of steps will reduce accidents. Adaptable design will also assist people with temporary disabilities.

(d) *Greater choice of housing type* Over a period, a larger proportion of housing stock (public and private, rental and owned) will be adaptable. The concept can be applied equally to all types of housing, from small flats or townhouses to large dwellings.

Houses which are designed to this Standard will not only achieve their stated purpose, but will have more flexibility and a wider market appeal.

Bibliography

1 AUSTRALIAN BUREAU OF STATISTICS, *Disability Ageing and Carers* 1993.

2 Disability Discrimination Act, Australia, 1992.

3 GOLDSMITH, S. The Gestation of 'X' Housing in *Design For Special Needs* Vol 39, 1986. pp 6-8.

4 NOLTE, E.A.H. *Building Adaptable Housing*, National Housing Council of The Netherlands, 1988.

5 LANGE, T. *Adapting the Built Environment to the Disabled — the situation in Norway*, Norwegian Building Research Institute, 1989.

STANDARDS AUSTRALIA

Australian Standard

Adapatable housing

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard presents the objectives and principles of adaptable housing. Its purpose is to provide guidelines on adaptable housing to those involved in designing or building new dwellings or renovations, including—

(a) project home developers;

(b) designers, builders, owners and users of private housing;

(c) developers and designers of specialised housing such as retirement villages; and

(d) public housing bodies.

Appendix A sets out essential and desirable features.

1.2 APPLICATION This Standard applies to planning and design of residential accommodation and is intended for reference by designers and specifiers in the preparation of their documentation and by members of the general public considering adaptable housing for their particular needs. This Standard may be referenced by contractual agreement as a means of assessing the level of adaptability of residential accommodation.

It is intended that housing units that comply with the range of essential features listed in Appendix A be certified as adaptable housing units by an independent, suitably qualified person as follows:

(a) **Adaptable house class A** All essential and desirable features incorporated.

(b) **Adaptable house class B** All essential, and minimum 50% of desirable features incorporated, including all those notated 'first priority'.

(c) **Adaptable house class C** All essential features.

NOTE: A feature is assessed in Appendix A as 'essential', 'first priority desirable' or 'desirable' depending on its importance to an occupant with a disability, and on the difference between initial and future costs of adaptation.

1.3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

1288 Glass in buildings—Selection and installation

1428 Design for access and mobility
1428.1 Part 1: General requirements for access—Buildings
1428.2 Part 2: Enhanced and additional requirements—Buildings and facilities

1680 Interior lighting
1680.1 Part 1: General principles and recommendations

2890 Parking facilities
2890.1 Part 1: Off-street car parking

AS
3727 Guide to residential pavements

3740 Waterproofing of wet areas within residential buildings

HB 46 Guide to residential fire safety

AS/NZS
3661 Slip resistance of pedestrian surfaces
3661.1 Part 1: Requirements

NZS
4121 Code of practice for access and use of buildings and facilities by disabled persons

1.4 DEFINITIONS For the purpose of this Standard, the definitions below apply.

1.4.1 Accessible—complying with the floor space requirements described in AS 1428.1 and able to be approached, entered and used by people with a disability, including those who rely upon a wheelchair.

1.4.2 Accessible housing unit—housing unit with features already in place to facilitate use by a person with a disability or progressive frailty.

NOTE: Accessible housing would typically incorporate features such as grabrails and fittings adequate for people with limited mobility. Some of these features which enhance independent living are described in AS 1428.1 and AS 1428.2.

1.4.3 Adaptable housing unit—housing unit which is designed and constructed to meet the performance requirements stated in Clause 2.2 and to include the essential features listed in Appendix A. An adaptable housing unit is designed in such a way that it can be modified easily in the future to become accessible to both occupants and visitors with disabilities or progressive frailties.

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

1.4.5 General purpose outlet (GPO)—electrical socket for general use.

1.4.6 Housing unit—a single residence or a part of a residence, containing living area and sleeping space, kitchen, toilet and bath or shower room. The term includes bed-sitter flats, detached and semi-detached houses, villa homes, townhouses and apartments in multi-storey blocks.

1.4.7 Ramp—an inclined accessway with a gradient steeper than 1 in 20 but not steeper than 1 in 14.

1.4.8 Shall—refers to an essential requirement.

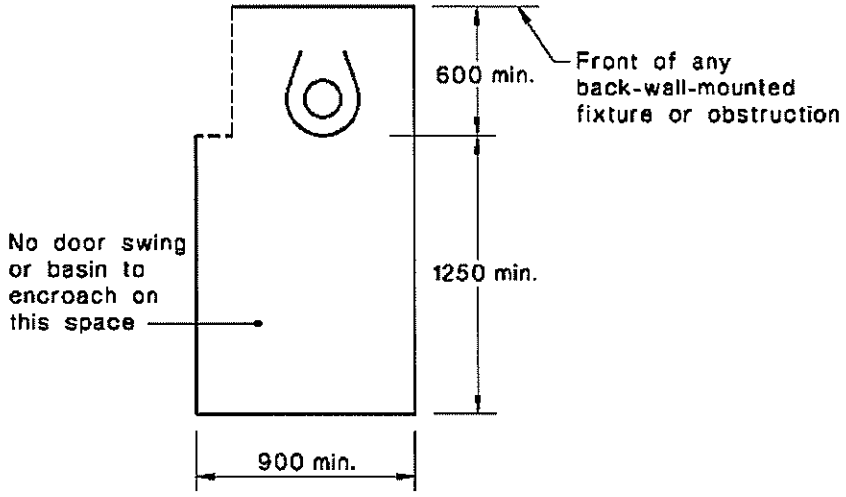
1.4.9 Should—refers to a desirable requirement.

1.4.10 Threshold—the sill of a doorway at the entrance to a house gradient not steeper than 1 in 8, located in, or instead of, a step other than a kerb.

1.4.11 Visitable housing unit—housing unit which has at least one wheelchair accessible entry with an accessible path of travel to the living area and to a toilet that is either accessible or visitable.

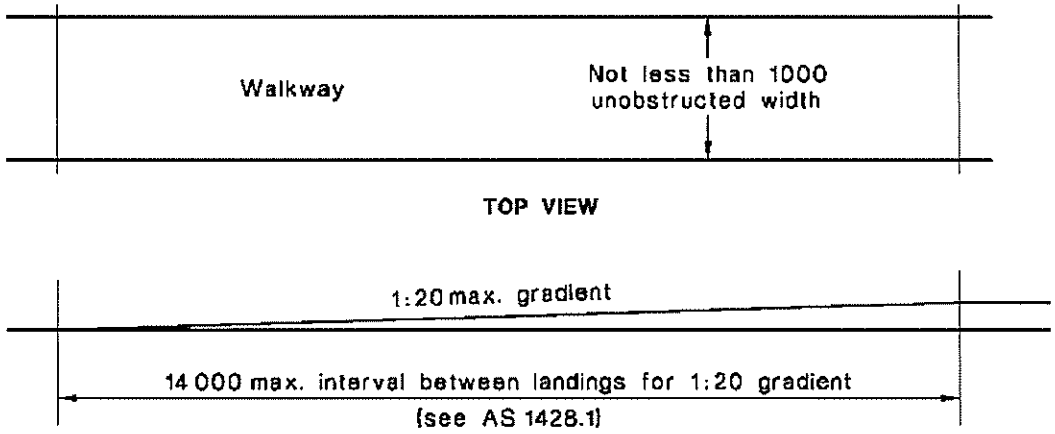
1.4.12 Visitable toilet—a toilet which has a space of minimum 1250 mm in front of the toilet × 900 mm wide clear of door swings and fixtures. (See Figure 1.1.)

1.4.13 Walkway—any accessway with a gradient not steeper than 1 in 20. (See Figure 1.2.)



DIMENSIONS IN MILLIMETRES

FIGURE 1.1 VISITABLE TOILET



DIMENSIONS IN MILLIMETRES

FIGURE 1.2 WALKWAY

SECTION 2 OBJECTIVES AND PERFORMANCE REQUIREMENTS

2.1 OBJECTIVES The objectives for adaptable housing are as follows:

(a) That housing be designed and constructed or altered in a way which satisfies the performance requirements for adaptable housing enumerated in Clause 2.2 below.

(b) That housing is designed in such a way that later alterations to suit individual requirements will be achievable at minimal extra initial cost.

(c) That housing be designed in such a way that it will easily adapt to suit the widest possible range of lifetime needs. This will include the needs of people with physical disabilities (including people who use wheelchairs, people with disabilities who are ambulant, and people with manipulatory disabilities); people with sensory disability (vision, hearing) and people with intellectual disability.

(d) The initial design will allow for visitability through an accessible path of travel to the living room and toilet.

2.2 PERFORMANCE REQUIREMENTS Adaptable housing units shall be designed and constructed to meet the following requirements:

(a) **Visitability** To be visitable by people who use wheelchairs, in that there must be at least one wheelchair accessible entry and path of travel to the living area and to a toilet that is either accessible or visitable.

(b) **Avoidance of level changes** To have no steps and to avoid level changes where possible.

(c) **Manoeuvrability** This shall include the following:

(i) To provide space sufficient to manoeuvre a wheelchair within a living area, the kitchen and an accessible path of travel linking these areas.

NOTE: Although not required for visitability, the kitchen is included as an initial spatial requirement for manoeuvrability, as there is significant expense involved in changing the kitchen layout at a later date.

(ii) To provide space sufficient to manoeuvre a wheelchair within a bedroom, a bathroom and a toilet *or* to provide a design and details whereby *after* adaptation there will be sufficient space to manoeuvre a wheelchair within these facilities and an accessible path of travel linking these facilities to the entry, living and kitchen areas.

(d) **Ease of adaptation** If the design for adaptation requires further demolition of walls then these walls shall be non load-bearing and free of electrical and plumbing services.

(e) **Ease of reach** To provide electrical controls, taps, and some shelves and cupboards at levels to suit people who use wheelchairs.

(f) **Future laundry facilities** To provide laundry facilities that after adaptation will be accessible to people who use wheelchairs. Those laundry facilities may be external to the adaptable housing unit, providing a wheelchair accessible path of travel is available from the adaptable housing unit to the laundry facilities.

NOTES:

1 There are no set design solutions, but a huge variety of ways of adapting a design to meet these criteria is possible. Designers are encouraged to use imaginative design within these broad parameters. An example of an adaptable house design is shown in Appendix B.

2 The most demanding scenario for the design for circulation within housing units is for an occupant in a wheelchair. The manoeuvring of wheelchairs imposes the greatest circulation space requirements within housing units. For this reason circulation requirements are generally based on the requirements for people who use wheelchairs as in AS 1428.1 or AS 1428.2.

3 Design to accommodate wheelchair use will also assist people with prams, trolleys and other wheeled equipment.

2.3 POTENTIAL FOR ADAPTATION To obtain certification as an adaptable housing unit, 'as built' drawings showing the housing unit in its pre-adaptation and post-adaptation stages shall be provided. A description of how the adaptation is to be achieved shall also be provided.

SECTION 3 SITING

3.1 SCOPE This Section provides guidance on choosing a site, both in respect of its relationship with external facilities, and the location of the housing unit on the development or allotment.

3.2 SITING

3.2.1 Site location When selecting a site for lifetime accommodation, the following factors should be considered:

(a) Community facilities.

(b) Transport.

(c) Roads and footpaths.

(d) Location in relation to busy roads.

3.2.2 Site gradient When choosing a site, the external circulation and use of open areas should be considered. A level or gently sloping site of up to 1:14 maximum gradient may prove more economical to develop and easier to move around in. This Standard does not preclude the selection of steeper sites provided the finished development provides wheelchair access to facilities external from the dwelling.

3.3 ACCESS WITHIN THE SITE

3.3.1 General The development shall be suitable for people with varying degrees of mobility so that, as a minimum, access for people with disabilities is available to at least one entry to the adaptable housing unit.

Consideration should be given to the following:

(a) Provision of on-site turning area for vehicles.

(b) Access for emergency vehicles.

(c) Visibility of street names and numbers. See also Clause 3.9.

(d) Driveway location with regard to residents' safety and security.

3.3.2 Accessible pathway An accessible path of travel from the street frontage carparking area or drop-off point shall be provided to all adaptable housing units. As a minimum, this accessible path shall comply with AS 1428.1 and shall be continuous, slip-resistant, hard-surfaced and shall not incorporate any step, stairway or other impediment which would prevent it from being safely negotiated by people with disabilities. It is advisable for walkways to be provided with passing areas, as specified in AS 1428.2.

Where ramps are essential, an alternative route using steps with a greater going to suit users of walking frames may be considered, as specified in AS 1428.2.

It is recommended that any paths and walkways additional to the above accessible pathway be continuous, slip-resistant, hard-surfaced with gradients complying with AS 1428.1.

3.3.3 Residential developments In addition to the requirements in Clause 3.3.1, where housing units are within a residential development, consideration should be given to the following:

(a) Access for people with disabilities should be available to all common use facilities including carpark, letterbox area, laundry and clothes drying area, garbage disposal area and at least part of the garden.

(b) Street names showing house numbers should be provided at each intersection.

(c) Pedestrian networks in residential developments shall be separate to vehicular access. Where adjacent they shall be distinguished by use of colour and texture.

NOTE: Grass verges are not suitable as part of the accessible pathway.

3.4 BUILDING LOCATION Where the housing unit is part of a residential estate development, it is desirable for buildings to be sited so that residents can enjoy a reasonable balance between neighbourhood security and privacy.

3.5 LANDSCAPING When considering landscaping, both on a private allotment and within a residential development, attention shall be given to the following:

(a) Paths and walkways to the entrance of the adaptable housing unit (see Section 3.3.2) shall be continuous, hard surfaced and shall comply with AS 1428.1. A gravel surface, for example, would not be suitable. The surface shall be slip-resistant in accordance with the requirements of AS/NZS 3661.1. Paths should not be located beneath trees with heavy leaf fall.

Consideration should be given to drainage of the pathways, with all grates and gullies located to the side. Grates and gullies should not have a grid which is parallel to the direction of travel.

Where segmental pavements are used they shall comply with AS 3727.

(b) Accessibility of private gardens or allotments to the owners.

(c) The effects of plant selection on security, natural lighting maintenance, and ease of circulation to, and movement around, the adaptable housing unit.

3.6 SECURITY

3.6.1 External lighting An even degree of light shall be provided along the main accessible pathways referred to in Clause 3.3.2. Lighting should be at a low level to reduce glare. A minimum lighting level of 50 lux at ground level shall be provided. Light fittings should light up the surface for one metre on each side of the path.

3.6.2 Line of sight There should be a clear line of sight from a well-lit vehicular drop-off point to a safe pedestrian entry point.

3.7 CAR PARKING

3.7.1 General Private car parking spaces shall be large enough to enable a person with a wheelchair to get in and out of both the car and the parking space. A car parking space width of 3.8 m minimum is necessary to enable a driver to alight, open the passenger side door, and assist a person with a disability into a wheelchair, or for a side-loading ramp. A 3.8 m, minimum width is also required for a driver with a disability to unload a wheelchair and to alight. A roof to the car parking space is desirable.

NOTE: If it is required to unload the wheelchair within the garage, an internal vertical clearance of 2.5 m is necessary to operate a car roof wheelchair unit.

3.7.2 Garages and carports Garages and carports shall have minimum internal dimensions of 6.0 m × 3.8 m. A 2.5 m internal vertical clearance is desirable. A garage may be reduced if a hardsurfaced level outside space of minimum dimensions 5.4 m × 3.8 m is provided as a sheltered carpark, or can be provided in the future. Provision for a power-operated roller door is desirable.

NOTE: A level surface includes surfaces with a gradient of up to 1:40.

3.7.3 Residential estate developments One car parking space per adaptable unit shall have minimum dimensions specified in Clause 3.7.2 and should otherwise comply with the requirements of AS 2890.1 for parking for people with disabilities.

Surface car parking spaces should be convenient to the front door of the housing unit, rather than in a separate car park and should be covered. Access to the adaptable housing unit should also be covered.

Multistorey car parking should be in accordance with AS 1428.2 in terms of clearances.

3.8 LETTERBOXES Letterboxes shall comply with Australia/New Zealand Post regulations.

Where letterboxes are centrally located in residential estate developments they should be adjacent to the street entry. Letterboxes and parcel racks should be lockable.

The letterbox area should allow for a future roof to be constructed and be in a well-lit location.

External letterboxes shall be located on a hard standing area connected to an accessible pathway to the adaptable housing unit.

3.9 SIGNAGE After adaptation, signage shall comply with the following:

(a) Be presented in large print (70–80 mm height) letters and raised 6–8 mm from background.

(b) Be of sanserif type—upper face case preferred—light colour (e.g. white/yellow) against a dark background.

(c) Be positioned 1500–1650 mm from ground height.

(d) Be placed centrally on the door or letterbox.

(e) Be well lit with matt or non-reflecting finish.

(f) In residential estates where there are separate male/female toilets, standard male/female graphic figures should be used for toilet doors—raised from background with a raised letter 'M' or 'F' below.

SECTION 4 DESIGN OF THE HOUSING UNIT

4.1 SCOPE This Section provides information and guidance on those features which are essential in an adaptable housing unit and those features which are desirable.

4.2 FLOOR LEVEL There shall be a level floor throughout, unless split levels are used where—

(a) there is scope to include a ramp to comply with AS 1428.1; or

(b) all essential features are located on one level.

NOTE: Essential features include at least entry, living area and toilet.

4.3 ENTRANCES, DOORWAYS AND CIRCULATION SPACES

4.3.1 Accessible entrance At least one accessible entry door complying with AS 1428.2 shall be provided.

NOTES:

1 Entry doors should preferably have a porch or some other form of protection from the weather (see AS 1428.2).

2 Consideration should be given to features like a shelf on which to rest parcels while opening the door.

4.3.2 Landing Where the accessible entry door is exposed to the weather, it shall be provided with a landing outside the door with a maximum fall of 1:40 and a low threshold at the entry door to exclude water. The threshold shall allow for the smooth transition of a wheelchair (see Figure 4.1). The landing shall be of sufficient area to enable wheelchair manoeuvrability.

NOTES:

1 An area of 1550 mm diameter generally satisfies this requirement.

2 Typical design solutions for low thresholds are given in Appendix C.

4.3.3 Doors Doors throughout shall have a minimum clear opening of 820 mm, except where otherwise described.

NOTES:

1 A hinged door leaf of 870 mm width will satisfy this requirement and will accommodate over 80% of people who use wheelchairs.

2 Consideration may be given to using a door leaf of 920 mm width.

Doors shall be adequately weatherproofed.

4.3.4 Door handles and hardware The door handle and related hardware shall be of the type that allows the door to be unlocked and opened with one hand.

NOTE: Lever handles are preferred because doorknobs do not provide an adequate grip for people with hand impairments.

Door lever handles and hardware shall be not less than 900 mm nor more than 1100 mm above the plane of the finished floor and shall be in accordance with AS 1428.1.

All lockable external doors in the housing unit should be keyed alike, including any garage doors, storeroom door and the like.

NOTE: Deadlocks, although secure, can cause problems in times of emergency. Security locks which do not deadlock from the inside are preferred.

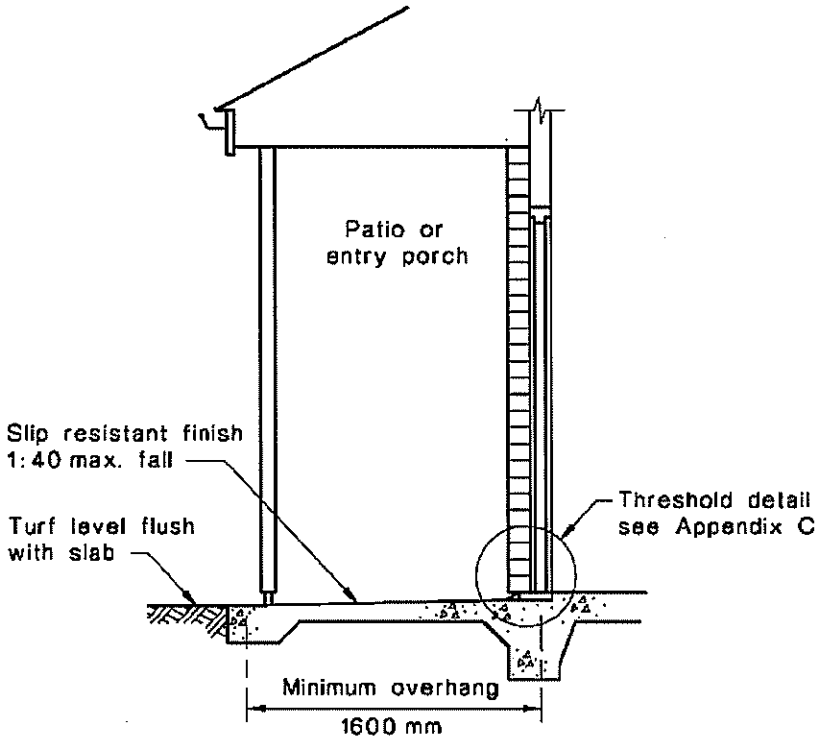


FIGURE 4.1 ENTRY LANDING

4.3.5 Security External doors should provide both security and ventilation, bearing in mind that some wheelchair users may experience difficulty with door/security screen combinations. A single door incorporating a screened security section which can be opened for ventilation is preferable to a separate door/security door combination. Provision should be made for future installation of such a single door.

Lighting should be positioned so that a person outside the door is illuminated.

4.3.6 Circulation spaces Circulation spaces shall be capable of modification to comply with AS 1428.1 as a minimum, and preferably with AS 1428.2.

NOTE: The final modified stage of the housing unit needs to have been confirmed at the design stage, particularly if the removal or relocation of walls, baths and associated plumbing and drainage is involved. See Clause 2.3.

4.3.7 Internal corridors Internal corridors shall have a minimum width of 1000 mm. After adaptation, circulation spaces at doorways shall comply with AS 1428.1.

4.4 SANITARY FACILITIES

4.4.1 General All sanitary facilities and components shall be adaptable, at minimum cost, to potentially comply with AS 1428.1 as a minimum, and preferably with AS 1428.2.

NOTE: The required circulation spaces at doors and around WC pans, washbasins and showers shall be able to be provided without major plumbing changes. The WC pan should either be located in the after-adaptation location initially or be fitted with a P trap. In addition, items like toilet paper dispensers and WC flushing controls shall comply with AS 1428.1. Because of the difficulty in moving some of these items after they have been initially installed, it is desirable that they should comply with AS 1428.1 from the outset. For example, see Figure 4.2.

For an example of accessible combined sanitary facilities, see Appendix D.

4.4.2 Floor surface Floor surfaces shall be slip-resistant to comply with AS/NZS 3661.1.

4.4.3 Toilet Each housing unit shall be provided with either a visitable toilet or an accessible toilet.

Where a separate toilet and bathroom are used with the intention of future unification, the WC pan shall initially be positioned at the correct distance from any fixed walls. Refer to Figure 4.3.

NOTE: For ease of plumbing modifications, this would normally mean the rear wall on which the cistern is mounted and the side wall on which the grabrails will be fixed. Although the cistern can be moved relatively easily, it is advisable to initially install it to comply with AS 1428.1, as would be the case with the WC pan (see Figure 4.3).

A recessed paper holder should be provided.

4.4.4 Bathroom The recommendations for the bathroom are as follows:

(a) *General* Various possibilities are available in the bathroom for later adaptation, e.g. removal of the bath and replacement with a shower suitable for use by people with disabilities.

(b) *Automatic control of water temperature* Hot water systems shall be installed to deliver hot water at a maximum of 50° Celsius at the outlet of all sanitary fixtures used for personal hygiene purposes.

NOTE: This may be achieved by fitting a thermostatic mixing valve during modifications, to the outlet. Such a valve regulates water pressure and temperature to provide a safe, predetermined flow of hot water.

(c) *Tap sets* Tap sets throughout shall have capstan or lever handles.

(d) *Wall cabinet* The bathroom should include a wall cabinet with a light above. A double GPO shall be located adjacent to the mirror.

(e) *Bath* Where a bath is provided it should be able to be adapted to comply with AS 1428.2 for grabrail fixings.

NOTE: It is not desirable to have a shower over a bath.

(f) *Shower compartment* A shower shall be provided. The shower compartment shall be a minimum size of 1160 × 1100 mm. The soap holder shall be recessed. The position of the shower head and taps shall be such that the clearances and heights required by AS 1428.1 are achieved.

The shower area shall be waterproofed to comply with AS 3740. The shower waste should be minimum 80 mm diameter.

Any waterproofing system used in the shower compartment shall be such that it can be extended to suit the larger, hobless configuration as required by AS 1428.1.

NOTES:

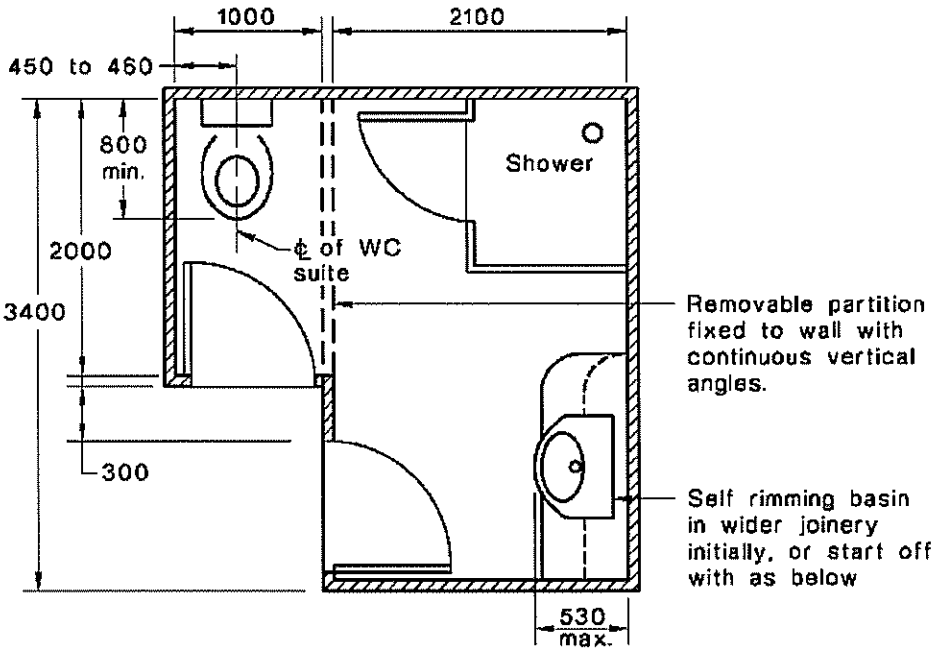
1 A system which is integral with a hob would not be suitable, as the hob would require removal on modification.

2 To achieve a finished hobless shower floor a set-down in the substrate may be required. See AS 3740.

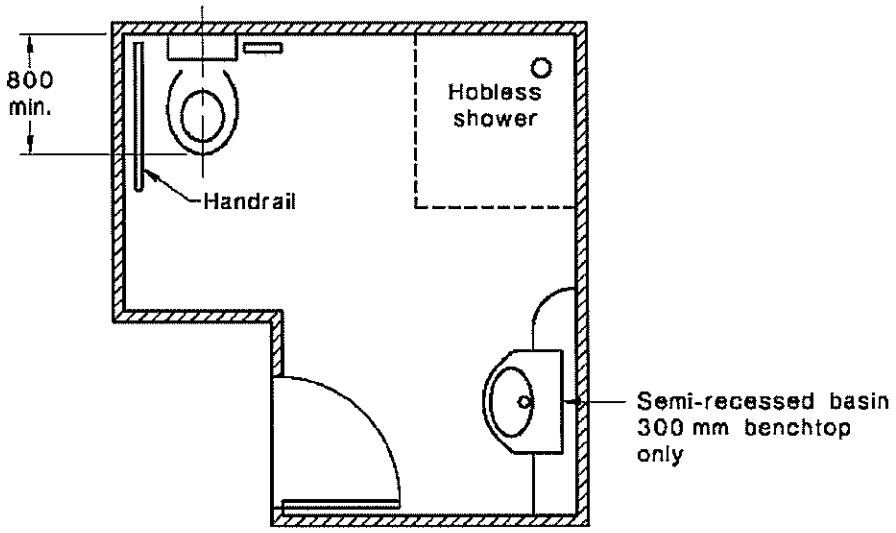
The floor shall be sloped down to the shower waste to avoid ponding of water.

(g) *Washbasin* The washbasin shall be located such that circulation spaces to adjacent doors, WC pans and other components, and knee clearances are either provided in accordance with AS 1428.1 or will be able to be provided at adaptation.

NOTE: The required knee clearances are shown in Figure 4.4.



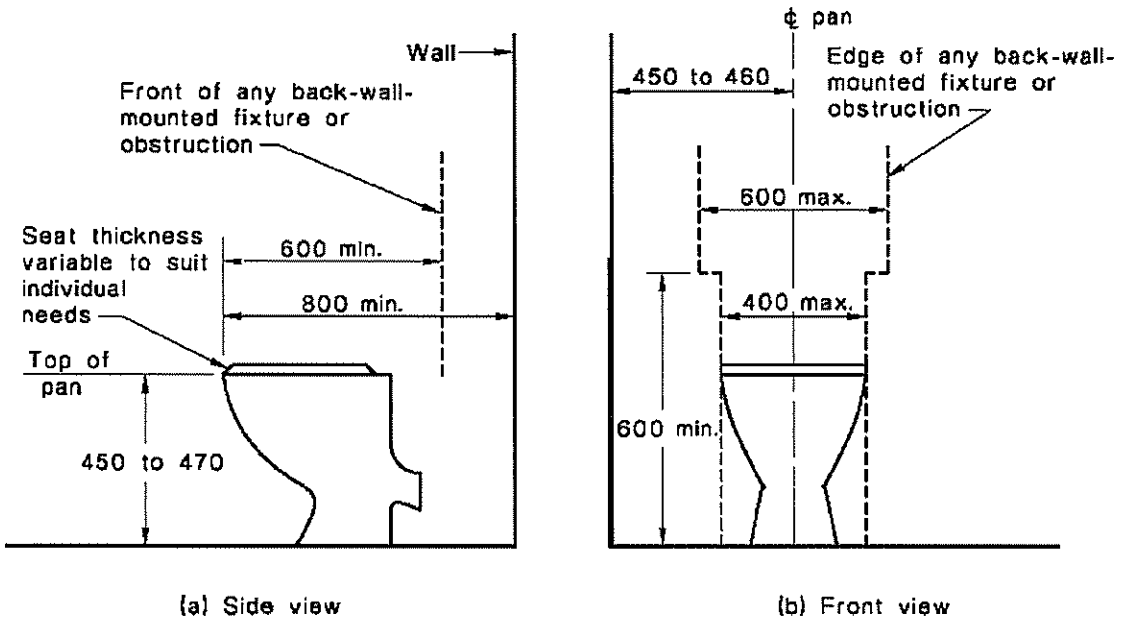
(a) Before adaptation



(b) After adaptation

DIMENSIONS IN MILLIMETRES

FIGURE 4.2 EXAMPLE OF BATHROOM BEFORE AND AFTER ADAPTATION



NOTES:

1 For the purpose of dimensioning, the front of the WC pan has been taken as the datum plane.

2 The dimension of 800 mm from the front of the WC pan to the wall is a critical dimension.

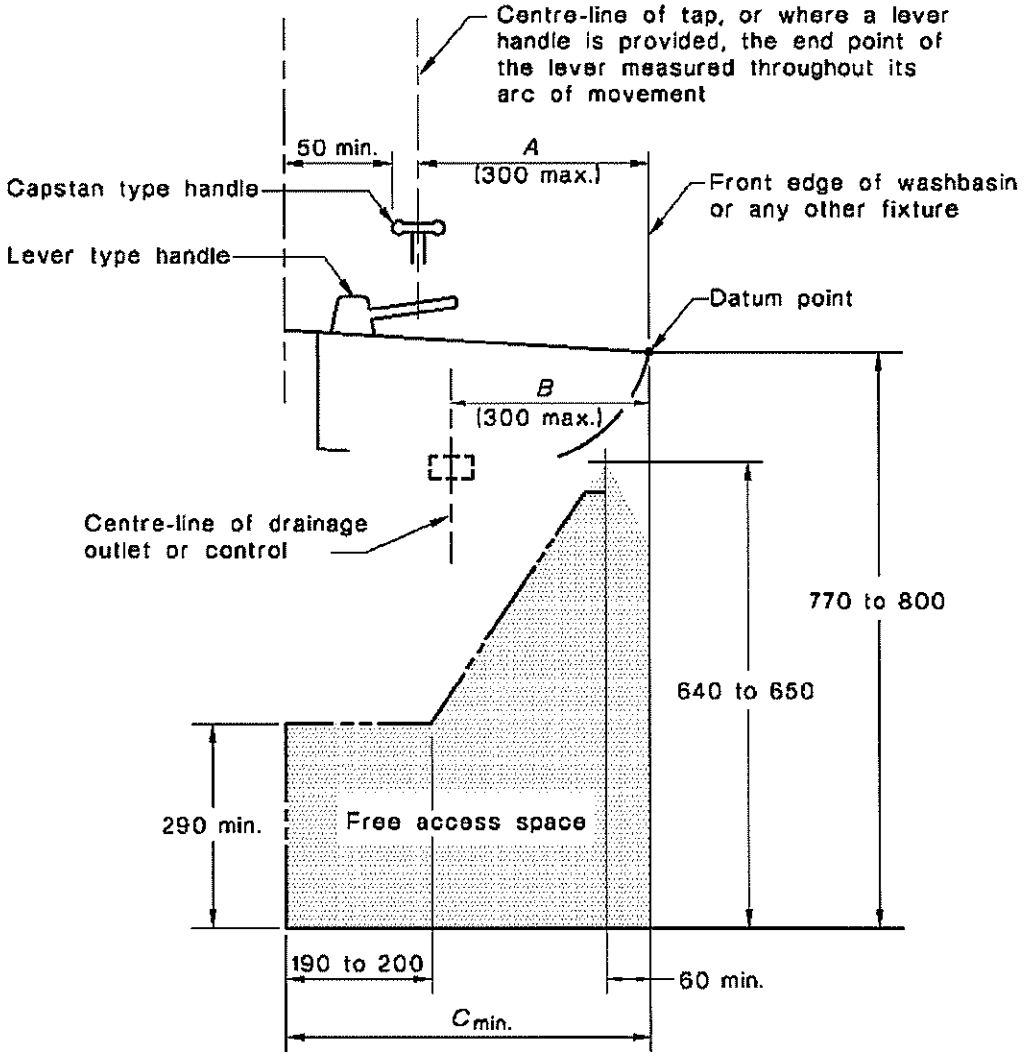
3 A back support at 600 mm from the front of the pan is important. This supports people who are paralysed from the chest down. The back support may be a cistern or a continuous grab rail and toilet lid.

DIMENSIONS IN MILLIMETRES

FIGURE 4.3 LOCATION OF WC PAN

(h) *Grabrails* If grabrails or shower seats are required by the initial occupant of the housing unit they shall be installed in accordance with AS 1428.1 or to suit the occupant. Grabrails for baths if required by the initial occupant, shall be installed in accordance with AS 1428.2, or to suit the occupant.

If grabrails or a shower seat are not initially required, provision for grabrails shall be made in the modified configurations as required by AS 1428.1.



NOTE: The dimensions of the unobstructed space beneath the washbasin are critical dimensions.

DIMENSIONS IN MILLIMETRES

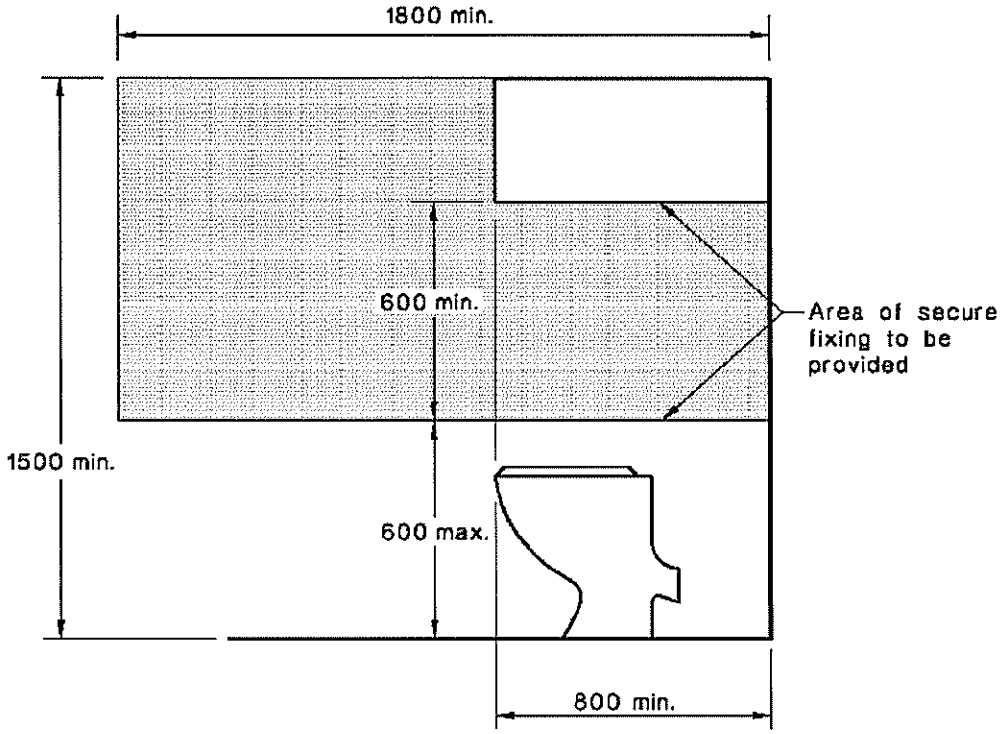
FIGURE 4.4 WASHBASIN CLEARANCES

Where framed walls are used, strengthened areas for secure fixing shall be provided as shown in Figures 4.5 to 4.7. The strengthened areas shall be adequate to support the loads imposed through the grabrails.

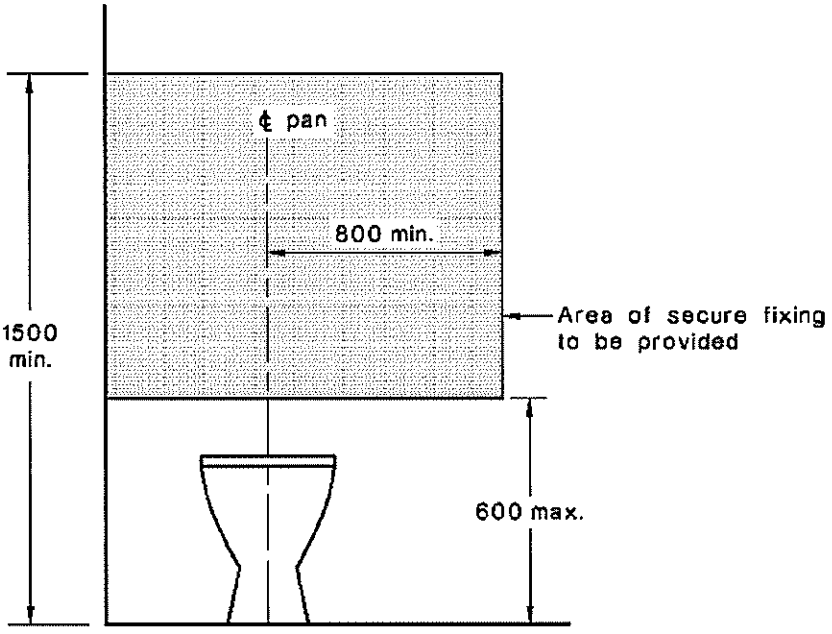
NOTES:

1 12 mm structural plywood or similar may be deemed to provide adequate strengthening.

2 The loading requirements for grabrails are contained in AS 1428.1.



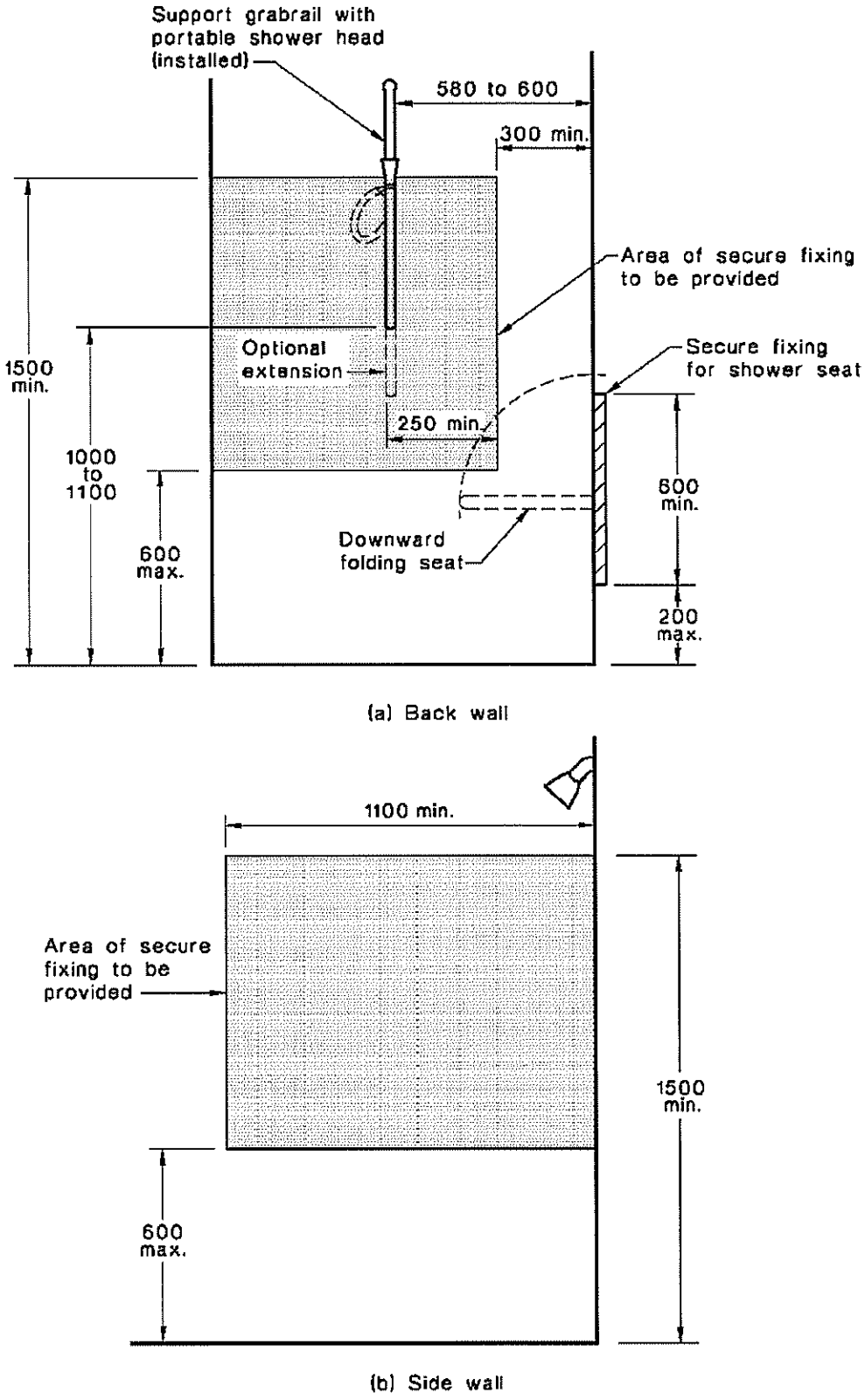
(a) Side view



(b) Front view

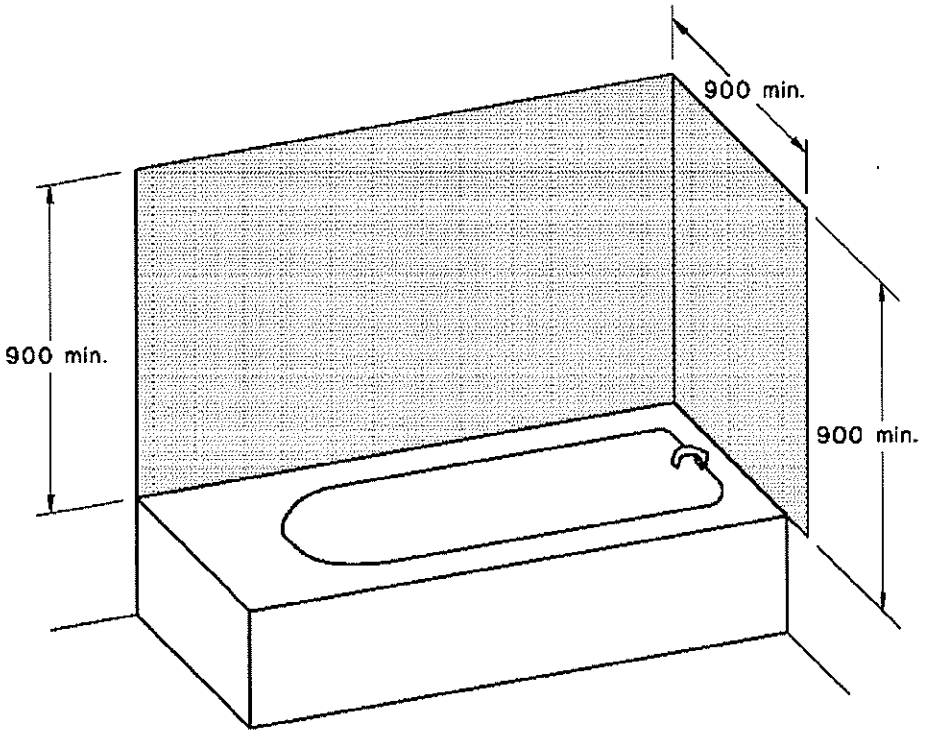
DIMENSIONS IN MILLIMETRES

FIGURE 4.5 REINFORCED AREAS FOR SUBSEQUENT INSTALLATION OF GRABRAILS IN TOILETS



DIMENSIONS IN MILLIMETRES

FIGURE 4.6 REINFORCED AREAS FOR SUBSEQUENT INSTALLATION OF GRABRAILS IN SHOWER COMPARTMENTS



DIMENSIONS IN MILLIMETRES

FIGURE 4.7 REINFORCED AREAS FOR SUBSEQUENT INSTALLATION OF GRABRAILS AT BATHS

4.5 KITCHEN AREAS

4.5.1 General The potential configuration of the kitchen area after adaptation shall be demonstrated prior to certification. The final configuration of the kitchen after adaptation shall be shown to comply with Clause 4.5.3.

4.5.2 Circulation prior to adaptation Minimum clearances in front of appliances and between opposing base cabinets shall be provided at the outset. A minimum clear floor space of 1500 mm × 820 mm that allows either a forward or parallel approach by a person in a wheelchair shall be provided at the sink and all appliances in the kitchen. In addition, a minimum clearance of 1550 mm shall be maintained between all opposing base cabinets, appliances and walls to allow for a 180° turn by a person in a wheelchair. For further guidance see AS 1428.2.

NOTE: A 2.7 m width between walls will enable 1550 mm clearance between cupboards to both walls.

4.5.3 Circulation after adaptation Circulation spaces at doors shall comply with AS 1428.1.

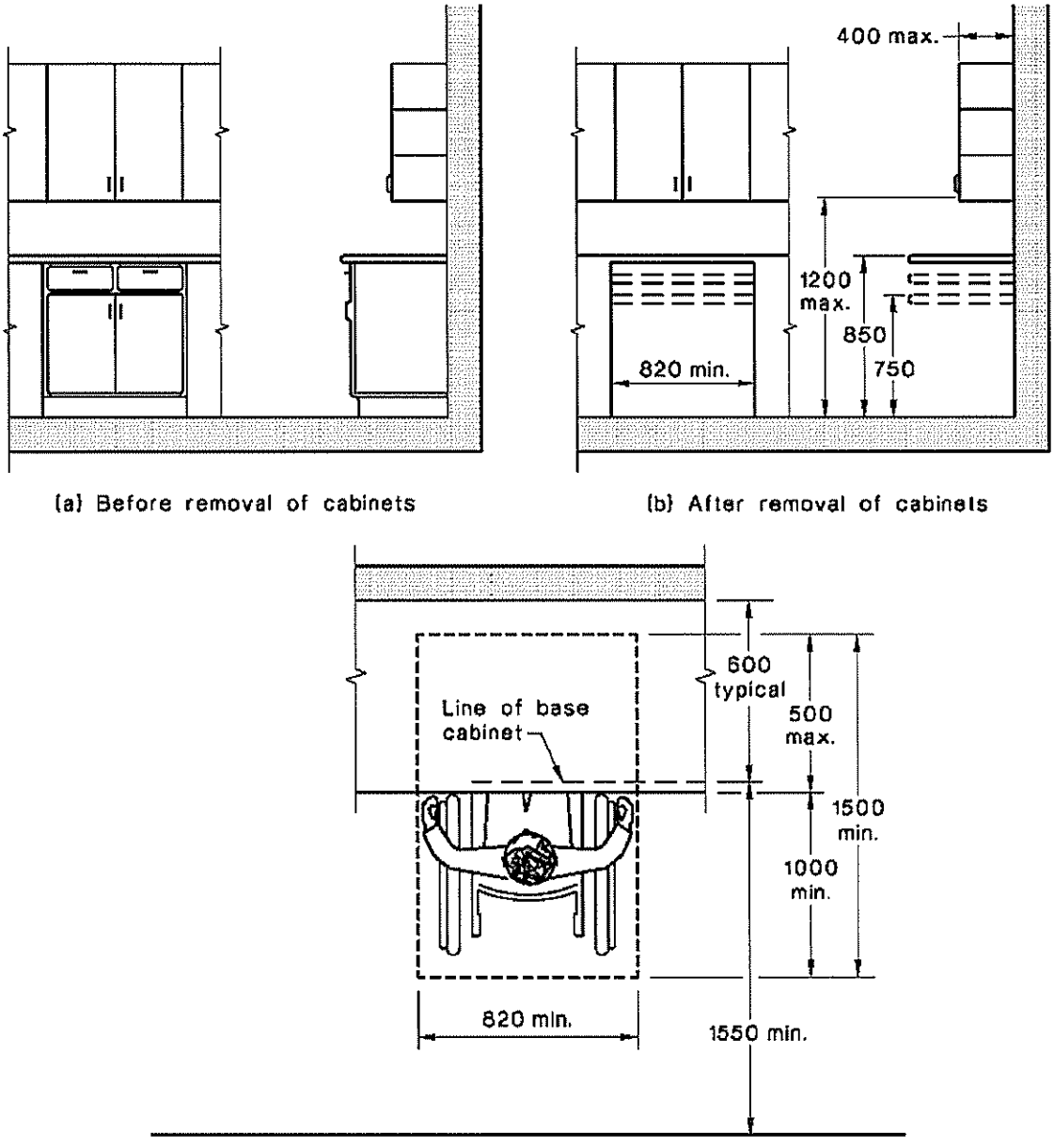
4.5.4 Floor surfaces The floor surface shall be slip-resistant to comply with AS/NZS 3661.1.

4.5.5 Work surfaces At least one section of the work surface, not less than 800 mm in length, should comply with the following:

(a) The work surface should be adjustable or replaceable as a unit at variable heights within the range 750 mm to 850 mm above the finished floor surface. (See Figure 4.8(b).)

(b) Base cabinets, if provided, should be removable over the full 800 mm length of the work surface. The finished floor shall extend under the work surface to the wall.

(c) The required clear floor space of 1500 mm × 820 mm should allow a forward approach to the work surface. No more than 500 mm of this clear floor space should extend beneath the work surface. (See Figure 4.8(c).)



(a) Before removal of cabinets

(b) After removal of cabinets

(c) Clear floor space under work surface

DIMENSIONS IN MILLIMETRES

FIGURE 4.8 WORK SURFACES

(d) There should be no sharp, abrasive or heat-transferring surfaces or corners protruding into travel paths under the work surface, sink or cooktop.

(e) A refrigerator shall be located adjacent to a work surface.

An example of a kitchen before adaptation and after adaptation is shown in Figures E1 and E2, in Appendix E.

4.5.6 Sinks The sink and an adjacent work surface which shall be a minimum of 800 mm in length, and may be the work surface referred to under Clause 4.5.5, shall comply with the following:

(a) The sink and surrounding work surface shall be adjustable or replaceable as a unit at variable heights within the range 750 mm to 850 mm above the finished floor surface (see Figure 4.9).

(b) Where sinks are installed to be adjustable in height, plumbing shall be installed to accept supply and drainage connections for sinks remounted at any height referred to in Item (a).

(c) The maximum depth of the bowl of the sink should be 150 mm. This would only apply to the main bowl of a double bowl sink.

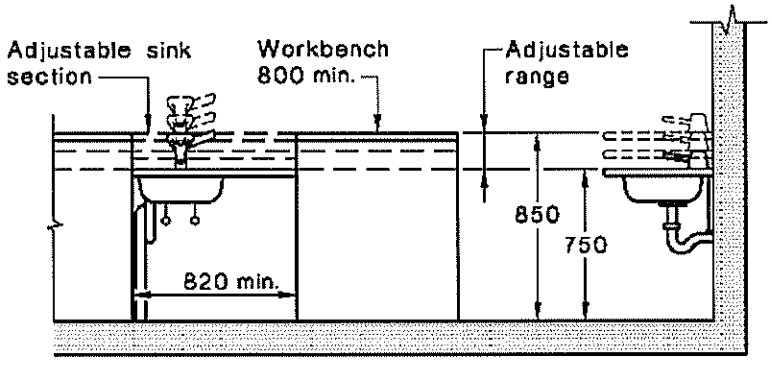
(d) The required clear floor space of 1500 mm × 820 mm should allow a forward approach to the sink. No more than 500 mm of this clear floor space should extend beneath the sink.

NOTE: The design should allow for removal of any cabinets under the sink and adjacent work surface to provide the required knee space. The finished floor should extend under the sink to the wall. There should be no sharp or abrasive surfaces under the sink and all exposed hot water pipes and surfaces should be insulated or otherwise covered.

(e) Taps shall comply with AS 1428.1 (see also AS 1428.2). See Figure 4.4 of this Standard. Taps or their operating handles shall be within 300 mm of the front of the sink to allow for ease of operation.

(f) Hot water systems shall be installed to deliver hot water at a maximum of 50°C at the hot water outlet.

NOTE: This may be achieved by fitting a thermostatic mixing valve, during modifications, to the outlet. Such a valve regulates water pressure and temperature to provide a safe, predetermined flow of hot water.



DIMENSIONS IN MILLIMETRES

FIGURE 4.9 SINKS AFTER MODIFICATION

4.5.7 Cooktops Circulation spaces and clearances shall be as for sinks (see Clause 4.5.6).

Cooktops shall have controls which do not require reaching over the hotplates to adjust them. Controls shall have raised cross-bars for ease of grip.

Cooktops shall have an adjacent work surface of 800 mm minimum length at the same height.

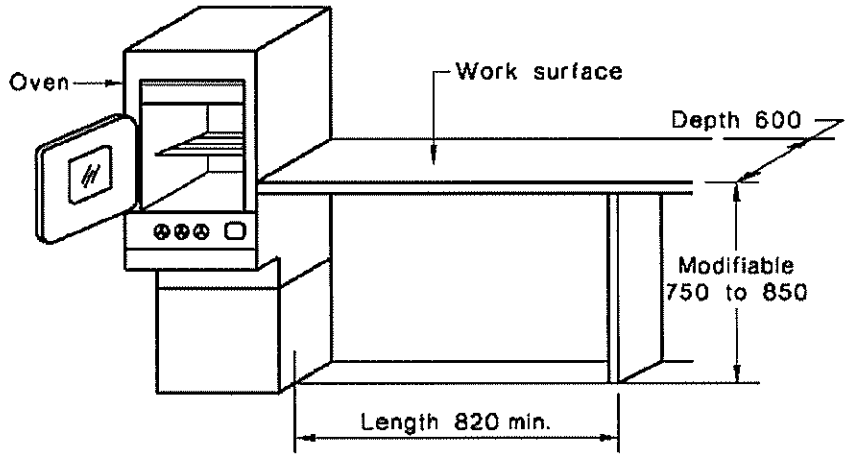
Cooktops should be provided with isolating switches or gas stop valves which can be easily and safely operated while the cooktop is in use.

4.5.8 Ovens Ovens shall be located adjacent to a work surface in accordance with Clause 4.5.5 (see Figure 4.10). Where the oven door is hinged, the clear work surface shall be on the opposite side to the hinge.

NOTES:

1 Consideration should be given to the initial position of the oven to obviate the need for future adjustment.

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



DIMENSIONS IN MILLIMETRES

FIGURE 4.10 OVENS

4.5.9 Microwave ovens Provision shall be made for a microwave shelf to be installed or replaced at any height between 750 mm and 1200 mm above the floor.

4.5.10 Storage Adequate storage shall be provided. Cabinets, drawers and shelf storage areas should be as follows:

(a) Depth of shelving up to 800 mm above the floor should not exceed 600 mm; shelving from 800 mm up to 1500 mm should not exceed 450 mm depth, shelving above 1500 mm from the floor should not exceed 300 mm depth. Shelving should be adjustable.

(b) At least one shelf of all cabinets and storage shelves mounted above a work surface should have a maximum depth of 400 mm and be located no higher than 1200 mm above the floor level.

(c) Door pulls or handles for wall cabinets shall be capable of operation without a firm grip and should be installed within 150 mm of the bottom edge of cabinet doors. For base cabinets, door pulls or handles should be installed within 150 mm of the top edge of the doors. Minimum 50 mm clearance shall be provided between the handle and any obstruction.

NOTES:

1 D handles or similar are preferred.

2 Overhead cupboards should not be located over cooktops, corner benches, sinks or tubs.

(d) Full height cupboards including general, linen or pantry cupboards shall be built without false floors. Shelving shall be adjustable and removable.

4.5.11 Power outlets General purpose outlets shall be located to comply with AS 1428.1. At least one double general purpose outlet shall be located with a horizontally accessible reach over a work surface at a maximum of 300 mm from the front of the work surface.

The GPO for the refrigerator shall be easily reachable when the refrigerator is in its operating position.

4.5.12 Floor covering See Clause 4.9.

4.6 BEDROOMS

4.6.1 Bedroom areas At least one bedroom shall be capable of accommodating a queen size bed and a wardrobe and the circulation space requirements of AS 1428.2 clear of wardrobe fixtures.

4.6.2 Window sills Sleeping area window sills should be at a maximum 600 mm above floor level.

NOTE: This is to facilitate an outlook through the window by those people who may be confined to bed for extended periods.

Full height glazed panels or door units where provided shall have a transom at 600 to 730 mm above floor. The glazing shall be of safety glazing materials in accordance with AS 1288.

4.6.3 Power outlets A minimum of two double socket general purpose outlets shall be provided on the wall of the bedroom where the bedhead is likely to be located. GPOs should be provided to opposite walls in the main bedroom. These should be approximately 1800 mm apart. Height to be in accordance with Clause 4.11.1.

4.6.4 Light switches Two-way light switches should be provided, one located near the planned bed position. Height to be in accordance with Clause 4.11.1.

4.6.5 Telephone A telephone outlet should be provided in each bedroom next to the bed on the side closest to the door.

4.6.6 Television outlet A television outlet should be provided in each bedroom on the opposite wall to the bedhead, adjacent to the double GPO.

4.6.7 Sliding doors to wardrobe Wardrobe sliding doors are desirable, with a full length mirror on the most accessible door.

4.7 LIVING AREAS

4.7.1 Circulation space Provision shall be made for circulation space to enable a 360° wheelchair turn after the furniture has been placed.

NOTE: An area of 2250 mm minimum diameter after the furniture has been placed will satisfy this requirement.

4.7.2 Windows Living area window sills should be at a maximum 730 mm above floor level.

Full height glazed panels or door units where provided shall have a transom at 600 to 730 mm above floor. The glazing shall be of safety glazing materials in accordance with AS 1288.

4.7.3 Power outlets A minimum of four double GPOs should be provided in the living room. Height to be in accordance with Clause 4.11.1.

NOTE: Power outlets are relevant for maximizing potential layouts of television sets, etc. which are important to those people with disabilities who may be shut in.

4.7.4 Telephone A telephone outlet shall be provided in the living-dining area. This should be adjacent to a GPO.

4.7.5 Television outlets Two television outlets should be provided in the living area; one location to enable viewing from dining and kitchen. Locate television outlets adjacent to GPOs.

4.7.6 Security screens Exterior doors and windows should have the capability for fitting security screens.

4.8 LAUNDRY AREAS If a separate room is used for a laundry, circulation spaces at doors shall be in accordance with AS 1428.1. Provision for adequate circulation space shall be made in front of or beside appliances and under or adjacent to the tub to enable people who use wheelchairs to use all the facilities.

NOTES:

1 An area of 1550 mm diameter will satisfy this requirement.

2 For a work surface height of 870 mm a tub of maximum depth 210 mm is necessary to allow knee space underneath. Where a full depth laundry tub is provided knee space shall be provided beside it.

In addition:

(a) There shall be a clothes drying facility. Where a clothes line is provided, an accessible path of travel shall be provided to the clothes line.

(b) Taps should be set in such a position that neither front-loaded nor top-loaded washing machines are precluded.

(c) Taps should be positioned at the side of the laundry tub for ease of access.

(d) Hot water systems shall be installed to deliver hot water at a maximum of 50° Celsius at the hot water outlet.

NOTE: This may be achieved by fitting a thermostatic mixing valve, during modifications, to the outlet. Such a valve regulates water pressure and temperature to provide a safe, predetermined flow of hot water.

(e) Provision shall be made for an automatic washing machine.

(f) Provision should be made for a clothes drier mounted at a suitable height.

NOTE: A floor-mounted drier is preferable.

(g) A double GPO shall be provided as a minimum.

(h) A shelf should be provided at maximum 1200 mm above floor.

4.9 FLOORS

4.9.1 Floor surfaces including bathrooms, laundries, toilets and all external paved surfaces shall be slip-resistant to comply with AS/NZS 3661.1.

4.9.2 The design shall be such that, after modification, the following are possible:

(a) If changes in level are unavoidable, these should be highlighted by changes in texture and colour and a handrail provided on both sides.

(b) If carpets are installed they should have a short pile.

NOTE: A very firm underlay to prepared substrate is preferred since otherwise wheelchair manoeuvrability is unwieldy.

(c) The floor surface throughout the adaptable housing unit shall be easily cleanable.

(d) Consideration should be given to the fire hazard indices of carpets.

(e) Bold patterned floor surfaces should be avoided as these can be confused with changes of level by people with vision impairment.

4.10 LIGHTING An even degree of light particularly along paths of travel shall be available throughout the building (i.e. more than one single light bulb may be required in each room). Provide a level of maintenance illuminance to comply with AS 1680.1.

NOTE: A level of illumination of 150 lux would be suitable in most instances. This level allows for lip reading by people with impaired hearing. (See AS 1428.2).

The lighting and power reticulation shall be such that recommended lux levels for people with visual impairment may be achieved without rewiring. Provision shall be made for the recommended illumination levels for different rooms for people with visual impairment are shown in Table 4.1.

TABLE 4.1

RECOMMENDED ILLUMINATION LEVELS FOR PEOPLE WITH VISION IMPAIRMENT

Area	Illumination level (Lux)	
	General	For people with vision impairment
Entries and passages	50–150	300
Steps, stairs and ramps NOTE: The higher level of illumination on steps and stairs is required for safety reasons	50–160	350
Living areas	110–200	300–350
Kitchens — general — task lighting	160 240	300 550–600
Laundries — general — task lighting	100 250	300 550–600
Toilets	80	300–350
Bathrooms — general — task lighting	100 200	300–350 550–600
Bedrooms	50–150	300
Garages — general — task lighting	50 200	300 550–600

Where illumination levels in a given area need to be varied from time to time, a dimmer switch should be installed.

Lighting should be designed for non-glare, with an easy-to-change or long-life light source.

Wherever possible, natural lighting should be provided in laundries and hallways.

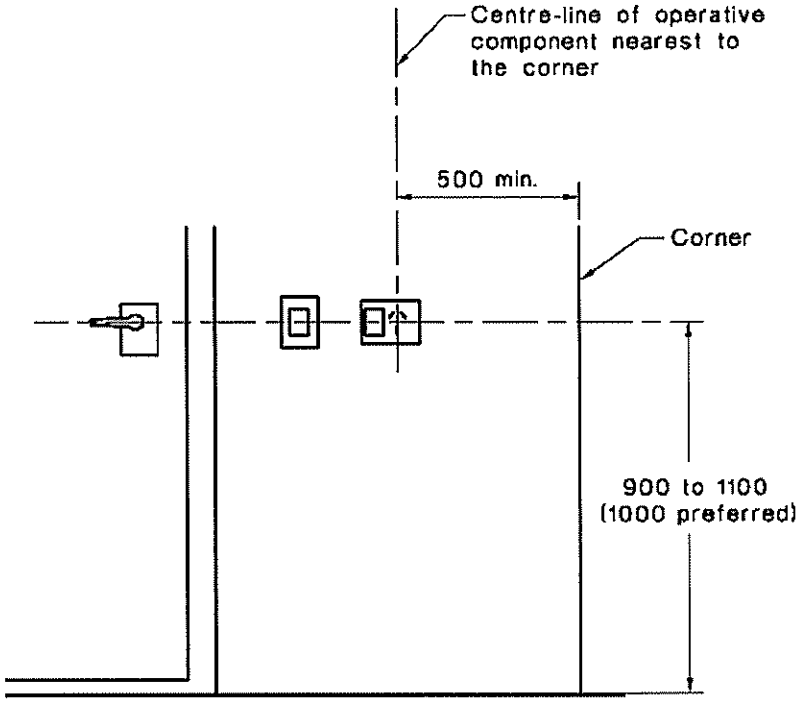
4.11 ANCILLARY ITEMS

4.11.1 Switches and power points These shall be as follows:

(a) *Switches* Light switches shall be located at a height not less than 900 mm nor more than 1100 mm above the finished floor and in line with the door handles. Switches shall be located adjacent to door handles where practical. Two-way switching is preferred.

NOTE: Rocker action, toggle or push pad switches with a recommended width of 35 mm are preferred. For people with severe finger or hand disabilities, these allow convenient operation by arm or elbow.

(b) *Power outlets* Except as elsewhere described, GPOs shall be located at a height of not less than 600 mm, with a preferred height of 1000 mm, above the finished floor and in line with the door handles. GPOs shall be located not less than 500 mm horizontally from internal corners. (See Figure 4.11.)



DIMENSIONS IN MILLIMETRES

FIGURE 4.11 HEIGHTS FOR SWITCHES, GENERAL PURPOSE OUTLETS AND DOOR HANDLES

4.11.2 Electrical distribution board The electrical distribution board should be located inside the housing unit and be accessible.

4.11.3 Additional telephone outlets The main living area should be prewired for a second outlet.

4.11.4 Windows Operating controls should be located in an accessible position.

4.11.5 Linen storage A linen storage cupboard of minimum 600 mm width, with adjustable shelving should be provided.

4.11.6 External areas Provision should be made for the following facilities which may be required after adaptation:

(a) *Garbage* Garbage storage area which is accessible from the housing unit and which is connected to an accessible path leading to an off-site disposal point.

(b) *Wheelchair storage* Secure, weather-protected outside storage facilities for wheelchairs.

(c) *Charging facilities* Secure facilities for recharging wheelchair batteries along with an external, weatherproof GPO.

NOTE: Some wheelchair batteries emit hazardous fumes while being recharged and therefore require a well-ventilated recharging location.

(d) *Guide dog accommodation* Paling fence minimum 1500 mm height with grassed area for toileting and provision for doggy door entrance on door nearest to grassed area.

4.11.7 Fire safety items For guidance on fire protection items such as fire blankets and related measures, e.g. emergency procedures, see HB 46.

APPENDIX A
SCHEDULE OF FEATURES FOR ADAPTABLE HOUSING
(Normative)

This schedule is a list of essential features to be incorporated into a housing unit for it to be termed an 'Adaptable House'. A higher level of 'Adaptable House' classification may be achieved by incorporating some or all of the desirable elements.

It is intended that this schedule be also used as a checklist to record the features incorporated.

CLASSIFICATION LEVELS

Adaptable house class A All essential and all desirable features incorporated.

Adaptable house class B All essential and 50% desirable features incorporated, including all those notated 'first priority'.

Adaptable house class C All essential features incorporated.

Item No.	Room/Item	Clause No.	Essential		First priority desirable		Desirable	
			Required feature	Certified by	Proposed feature	Certified by	Proposed feature	Certified by
	DRAWINGS							
1	Provision of drawings showing the housing unit in its pre-adaptation and post-adaptation stages	2.3	✓					
	SITING							
2	A level or gently sloping site with up to 1:14 gradient	3.2.2			✓			
3	A continuous accessible path of travel from street frontage and vehicle parking to entry complying with AS 1428.1	3.3.2	✓					
4	Additional paths and walkways to be continuous, slip-resistant and hard-surfaced with gradients complying with AS 1428.1	3.3.2					✓	
5	Within a residential estate development, common use facilities to be accessible	3.3.3			✓			
6	Within a residential estate development, street names with house numbers at each intersection	3.3.3					✓	
7	Within a residential estate development, internal roadways to be separate from pedestrian walkways	3.3.3			✓			
	SECURITY							
8	Pathway lighting shall be positioned at low height to avoid glare and to provide min. 50 lux at ground level	3.6.1			✓			
9	Clear line of sight from a well-lit vehicle drop-off point to safe pedestrian entry point	3.6.2			✓			

Item No.	Room/Item	Clause No.	Essential		First priority desirable		Desirable	
			Required feature	Certified by	Proposed feature	Certified by	Proposed feature	Certified by
	LETTERBOXES IN ESTATE DEVELOPMENTS							
10	Within residential estate developments, letterboxes centrally located adjacent to street entry. Lockable	3.8			✓			
11	Letterboxes to be on hard standing area connected to accessible pathway	3.8	✓					
12	Letterbox area roofed and in a well lit location	3.8			✓			
13	Parcel rack included with letterboxes	3.8			✓			
	PRIVATE CAR ACCOMMODATION							
14	Carparking space or garage min. area 6.0 m × 3.8 m	3.7.2	✓					
15	Roof to car parking space	3.7.1			✓			
16	Internal clearance of garage or carport 2.5 m min.	3.7.2					✓	
17	Provision for power-operated roller door to garage	3.7.2					✓	
18	Covered access to dwelling unit	3.7.3			✓			
19	Illumination level min. 50 lux	4.10			✓			
	ACCESSIBLE ENTRY							
20	Accessible entry	4.3.1	✓					
21	Entry protected by porch or similar	4.3.1					✓	
22	Accessible entry to be level (i.e. max. 1:40 slope)	4.3.2	✓					
23	Threshold to be low-level	4.3.2	✓					
24	Landing to enable wheelchair manoeuvrability	4.3.2	✓					
25	Accessible entry door to have 850 mm min. clearance	4.3.1	✓					
26	Weatherproofed entry door	4.3.3					✓	
27	Door lever handles and hardware to AS 1428.1	4.3.4	✓					
28	Provision for combined door/security door	4.3.5			✓			
29	Potential min. illumination level 300 lux	4.10			✓			
	EXTERIOR: GENERAL							
30	All external doors to be keyed alike	4.3.4					✓	
31	Provision for security screen to exterior opening or sliding windows and doors	4.7.6			✓			
	INTERIOR: GENERAL							
32	Internal doors to have 820 mm min. clearance	4.3.3	✓					
33	Internal corridors min. width of 1000 mm	4.3.7	✓					
34	Provision for compliance with AS 1428.1 for door approaches	4.3.7	✓					
35	Window sills at max. 730 mm above floor level to living and 600 mm above floor level to bedroom areas	4.7.2. and 4.6.2					✓	

Item No.	Room/Item	Clause No.	Essential		First priority desirable		Desirable	
			Required feature	Certified by	Proposed feature	Certified by	Proposed feature	Certified by
	LIVING ROOM & DINING ROOM							
36	Provision for circulation space of min. 2250 mm diameter	4.7.1	✓					
37	Minimum 4 double GPOs	4.7.3			✓			
38	Telephone adjacent to GPO	4.7.4	✓					
39	Telephone outlet location between kitchen and living space, adjacent to GPO	4.7.4					✓	
40	Two TV antenna outlets adjacent to GPO (positioned so viewing from dining and kitchen is achievable)	4.7.5			✓			
41	Potential illumination level min. 300 lux	4.10	✓					
	KITCHEN							
42	Minimum width 2.7 m (1550 mm clear between benches)	4.5.2	✓					
43	Provision for circulation at doors to comply with AS 1428.1	4.5.1	✓					
44	Provision for benches planned to include at least one worksurface of 800 mm length, adjustable in height from 750 mm to 850 mm or replaceable. Refer to Figure 4.8	4.5.5	✓					
45	Refrigerator adjacent to work surface	4.5.5	✓					
46	Kitchen sink adjustable to heights from 750 mm to 850 mm or replaceable	4.5.6	✓					
47	Kitchen sink bowl max. 150 mm deep	4.5.6	✓					
48	Tap set capstan or lever handles or lever mixer	4.5.6(e)	✓					
49	Tap set located within 300 mm of front of sink	4.5.6(e)	✓					
50	Installation of thermostatic mixing valve	4.5.6(f)			✓			
51	Cooktops to include either front or side controls with raised cross bars	4.5.7	✓					
52	Cooktops to include isolating switch	4.5.7	✓					
53	Worksurface min. 800 mm length adjacent to cooktop at same height	4.5.7	✓					
54	Oven located adjacent to an adjustable height or replaceable work surface	4.5.8	✓					
55	Provision for microwave oven at height of 750 mm–1200 mm above floor	4.5.9					✓	
56	Central light with second light over sink. Potential illumination level min. 300 lux with 550 lux over work surfaces	4.10			✓			
57	Adjustable shelving: depth 600 mm max. up to 800 mm above floor; depth 450 mm max. from 800 to 1500 mm above floor; depth 300 mm max. above 1500 mm	4.5.10					✓	

Item No.	Room/Item	Clause No.	Essential		First priority desirable		Desirable	
			Required feature	Certified by	Proposed feature	Certified by	Proposed feature	Certified by
58	Locate handles towards the top of below bench cupboards and towards the bottom of overhead cupboards. Provide 'D' pull handles	4.5.10			✓			
59	GPOs to comply with AS 1428.1. At least one double GPO within 300 mm of front of worksurface	4.5.11	✓					
60	GPO for refrigerator to be easily reachable when the refrigerator is in its operating position	4.5.11	✓					
61	Slip-resistant floor surface	4.5.4	✓					
	MAIN BEDROOM							
62	At least one bedroom of area sufficient to accommodate queen size bed and wardrobe and circulation space requirements of AS 1428.2	4.6.1	✓					
63	Two double GPOs on wall where bedhead is likely to be	4.6.3			✓			
64	Minimum of one GPO on opposite wall	4.6.3					✓	
65	Telephone outlet next to bed on the side closest to door (with GPO adjacent to telephone outlet)	4.6.5			✓			
66	TV antenna point and double GPO on opposite wall to bedhead	4.6.6			✓			
67	2-way light switches, one located above bed. 1000 mm high above floor	4.6.4			✓			
68	Potential illumination level 300 lux	4.10			✓			
69	Sliding doors on wardrobe with full length mirror	4.6.7					✓	
	OTHER BEDROOMS							
70	Two double GPOs on one wall. Minimum of one GPO on opposite wall	4.6.3			✓			
71	Two-way light switch	4.6.4			✓			
72	Telephone outlet next to double GPO	4.6.5			✓			
73	TV antenna point adjacent to one GPO	4.6.6			✓			
74	Potential illumination level 300 lux	4.10			✓			
	BATHROOM							
75	Provision for bathroom area to comply with AS 1428.1	4.4.1	✓					
76	Slip-resistant floor surface	4.4.2	✓					
77	Shower recess-no hob. Minimum size 1160 × 1100 to comply with AS 1428.1. (Refer Figures 4.6 and 4.7)	4.4.4(f)	✓					
78	Shower area waterproofed to AS 3740 with floor to fall to waste	4.4.4(f)	✓					
79	Recessed soap holder	4.4.4(f)	✓					
80	Shower taps positioned for easy reach to access side of shower sliding track	4.4.4(f)	✓					
81	Shower waste min. 80 mm diameter	4.4.4(f)					✓	

Item No.	Room/Item	Clause No.	Essential		First priority desirable		Desirable	
			Required feature	Certified by	Proposed feature	Certified by	Proposed feature	Certified by
82	Provision for adjustable, detachable hand held shower rose mounted on a slider grabrail or fixed hook (plumbing and wall-strengthening provision)	4.4.4(h)	✓					
83	Provision for grabrail in shower (Refer to Figure 4.7) to comply with AS 1428.1	4.4.4(h)	✓					
84	Provision for additional grabrail	4.4.4(h)			✓			
85	Provision for folding seat in shower to comply with AS 1428.1	4.4.4(h)					✓	
86	Tap sets to be capstan or lever handles with single outlet	4.4.4(c)	✓					
87	Installation of thermostatic mixing valve	4.4.4(b)			✓			
88	Provision for washbasin with clearances to comply with AS 1428.1	4.4.4(g)	✓					
89	Wall cabinet with light over or similar	4.4.4(d)			✓			
90	Double GPO beside mirror	4.4.4(d)	✓					
91	Potential illumination level 300 lux generally with 600 lux task lighting	4.10			✓			
	TOILET							
92	Provision of either 'visitable toilet' or accessible toilet	4.4.3	✓					
93	Provision to comply with AS 1428.1	4.4.1	✓					
94	Location of WC pan at correct distance from fixed walls	4.4.3	✓					
95	Provision for grab rail zone. (Refer Figure 4.6)	4.4.4(h)	✓					
96	Slip resistant floor surface. (Vitreous tiles or similar)	4.4.2	✓					
97	Recessed toilet roll holder	4.4.3					✓	
	LAUNDRY							
98	Circulation at doors to comply with AS 1428.1	4.8	✓					
99	Provision for adequate circulation space in front of or beside appliances (min. 1550 mm depth)	4.8	✓					
100	Provision for automatic washing machine	4.8(e)	✓					
101	Provision for drier	4.8(f)			✓			
102	Where clothes line is provided, an accessible path of travel to this	4.8(a)	✓					
103	Installation of thermostatic mixing valve	4.8(d)			✓			
104	Taps positioned at side of tub	4.8(c)					✓	
105	Double GPO	4.8(g)	✓					
106	Provision of shelf for soaps and similar, 1200 mm max. height	4.8(h)					✓	
107	Potential illumination level 300 lux generally with 550 lux task lighting	4.10			✓			
108	Slip-resistant floor surface	4.9.1	✓					

Item No.	Room/Item	Clause No.	Essential		First priority desirable		Desirable	
			Required feature	Certified by	Proposed feature	Certified by	Proposed feature	Certified by
	STORAGE							
109	Linen cupboard min. 600 mm wide with adjustable shelving	4.11.5			✓			
	DOOR LOCKS							
110	Door hardware operable with one hand, located 900–1100 mm above floor	4.3.4	✓					
	FLOOR COVERINGS							
111	Slip resistant surfaces — balconies and external paved areas. (Vitreous tile or similar)	4.9.1			✓			
	ANCILLARY ITEMS							
112	Switches located 900–1100 mm above floor in line with door handles	4.11.1			✓			
113	GPOs located not less than 600 mm above floor	4.11.1			✓			
114	Electrical distribution board located inside housing unit	4.11.2					✓	
115	Window controls located in an accessible position	4.11.4					✓	
	GARBAGE							
116	Provision for bin in an accessible location	4.11.6			✓			
117	Provision for external wheelchair storage	4.11.6					✓	
118	Provision for external battery charging facility	4.11.6					✓	
119	Guide dog accommodation	4.11.6					✓	

IMPLEMENTATION The Table indicates essential/desirable categories and the level required of the feature noted. All essential items are pre-checked in the 'essential' features column. The independent certifier must initial the second column to confirm the item has been incorporated into the building.

The developer/builder shall indicate which 'first priority desirable' and 'desirable' features are intended to be incorporated in the 'adaptable house' by checking the relevant boxes. The independent certifier must initial the second column to confirm the item has been incorporated into the building.

Upon addition of the number of 'first priority desirable' and 'desirable' features provided, and conversion to a percentage of the total possible desirable features, the classification level can be ascertained.

The certifier should sign the checklist as to the class of adaptable housing achieved.

No. of desirable features incorporated ☐

Add number of first priority desirable features ☐

Total ☐ = ☐ % of 64 possible desirable features

NOTE: Minimum 50% must be achieved for class B certification; 100% must be achieved for class A certification.

Adaptable house class C achieved . . . . . .
Certifier

Adaptable house class B achieved . . . . . .
Certifier

Adaptable house class A achieved . . . . . .
Certifier

ADAPTABLE HOUSE CLASSIFICATION ☐

APPENDIX B
EXAMPLE OF ADAPTABLE HOUSE PLAN
(Informative)

An example of a floor plan that may result from compliance with the requirements of this Standard is shown below. For required spatial dimensions refer to the relevant Clauses.

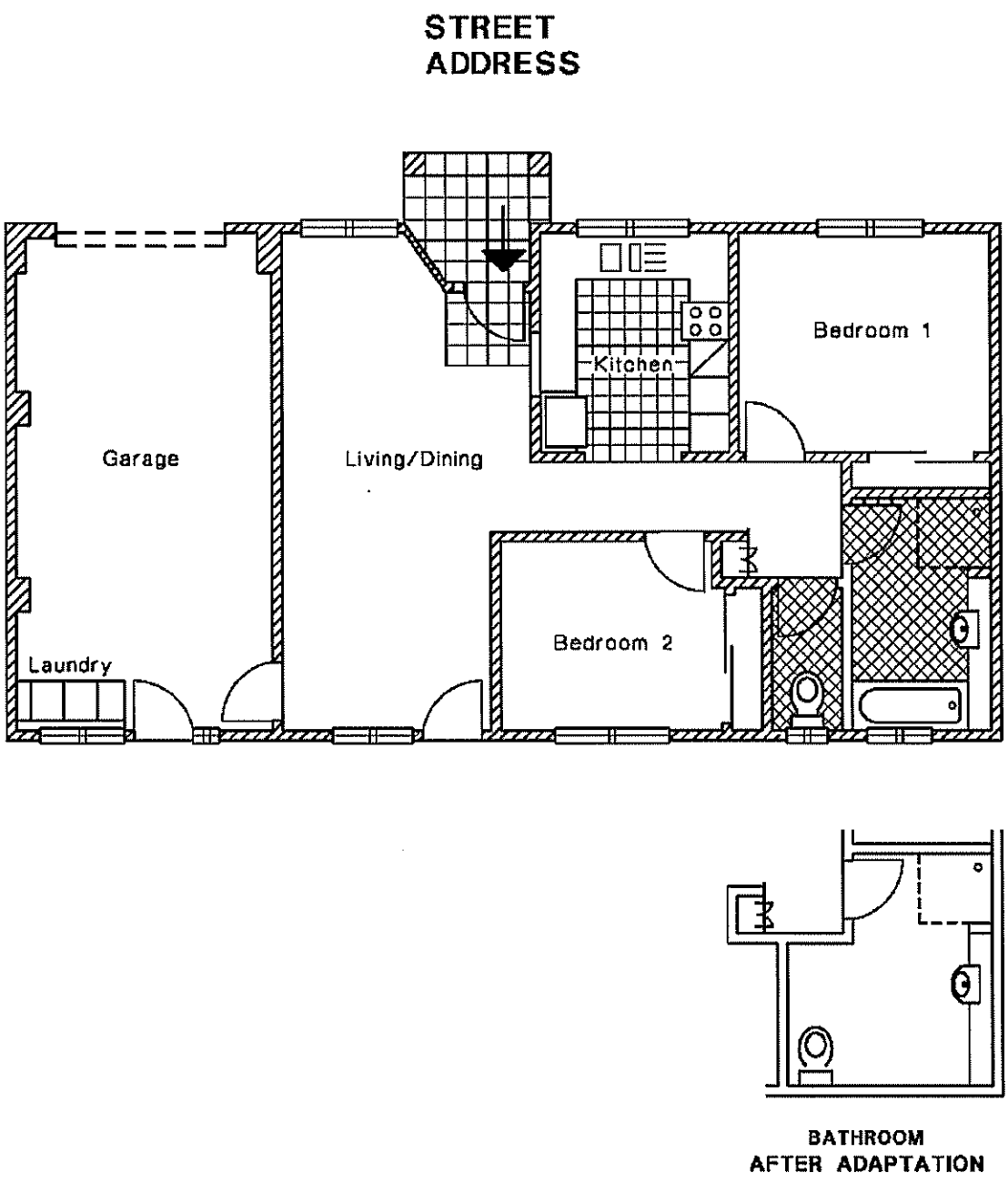
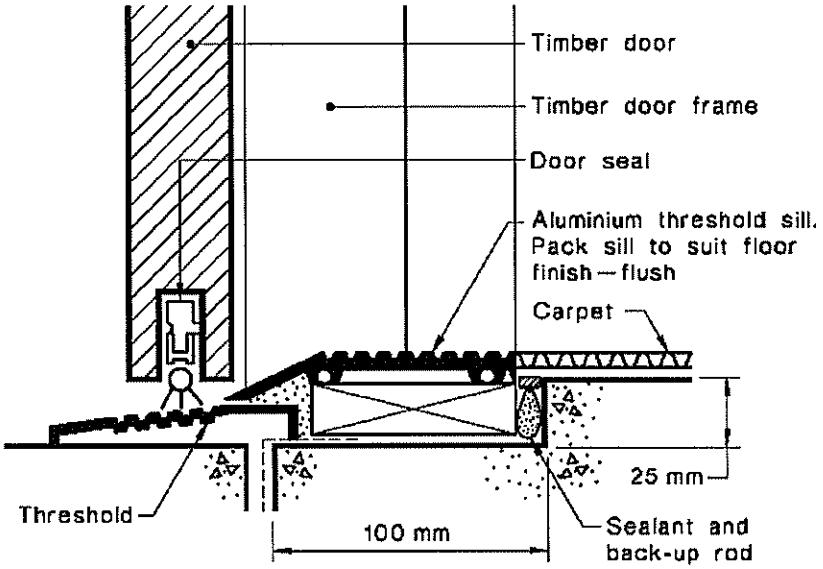


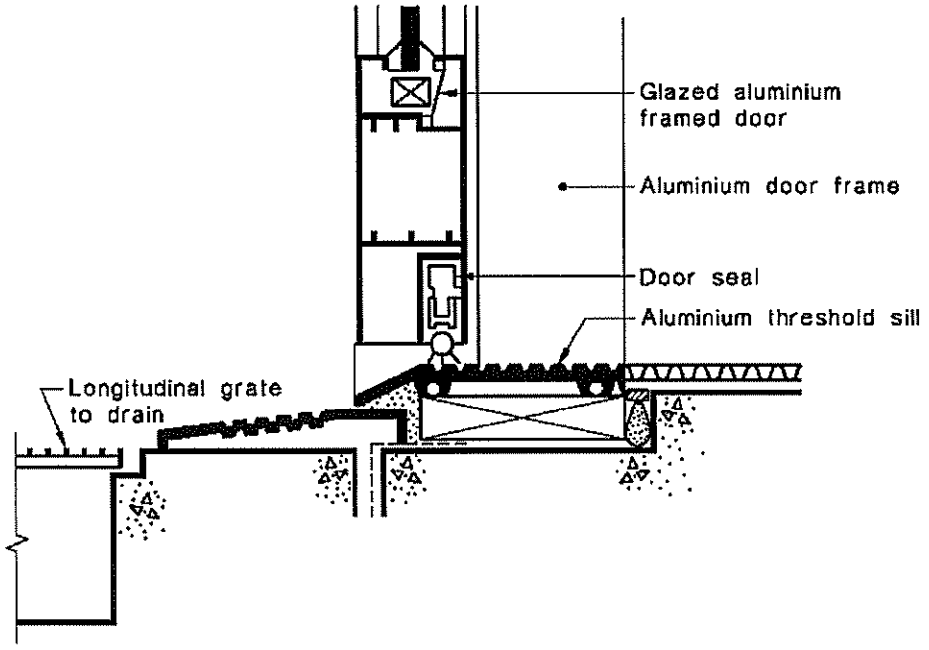
FIGURE B1 EXAMPLE OF ADAPTABLE HOUSE DESIGN

APPENDIX C
WEATHERPROOFING OF EXTERNAL DOORS
(Informative)

This Appendix shows examples of details for excluding water at thresholds.

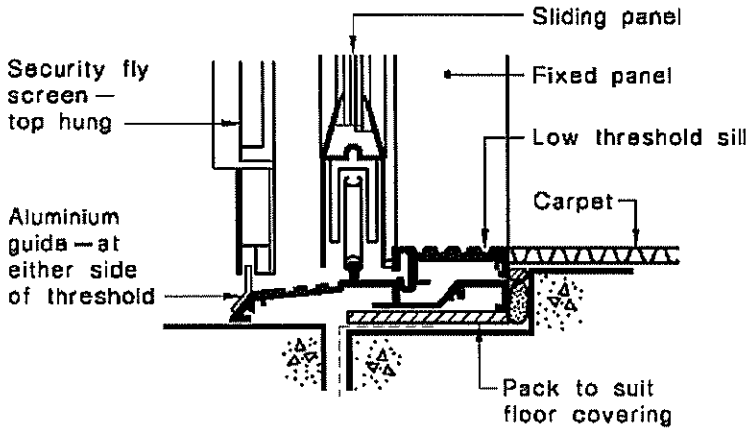


(a) Timber door



(b) Aluminium-framed door

FIGURE C1 (in part) EXAMPLES OF WEATHERPROOFING OF EXTERNAL DOORS



NOTE: Vitrified nosing tile may be used to in lieu of aluminium threshold; also may be used to take sliding door detail when packed higher, down to external patio slab level.

(c) Aluminium framed sliding door

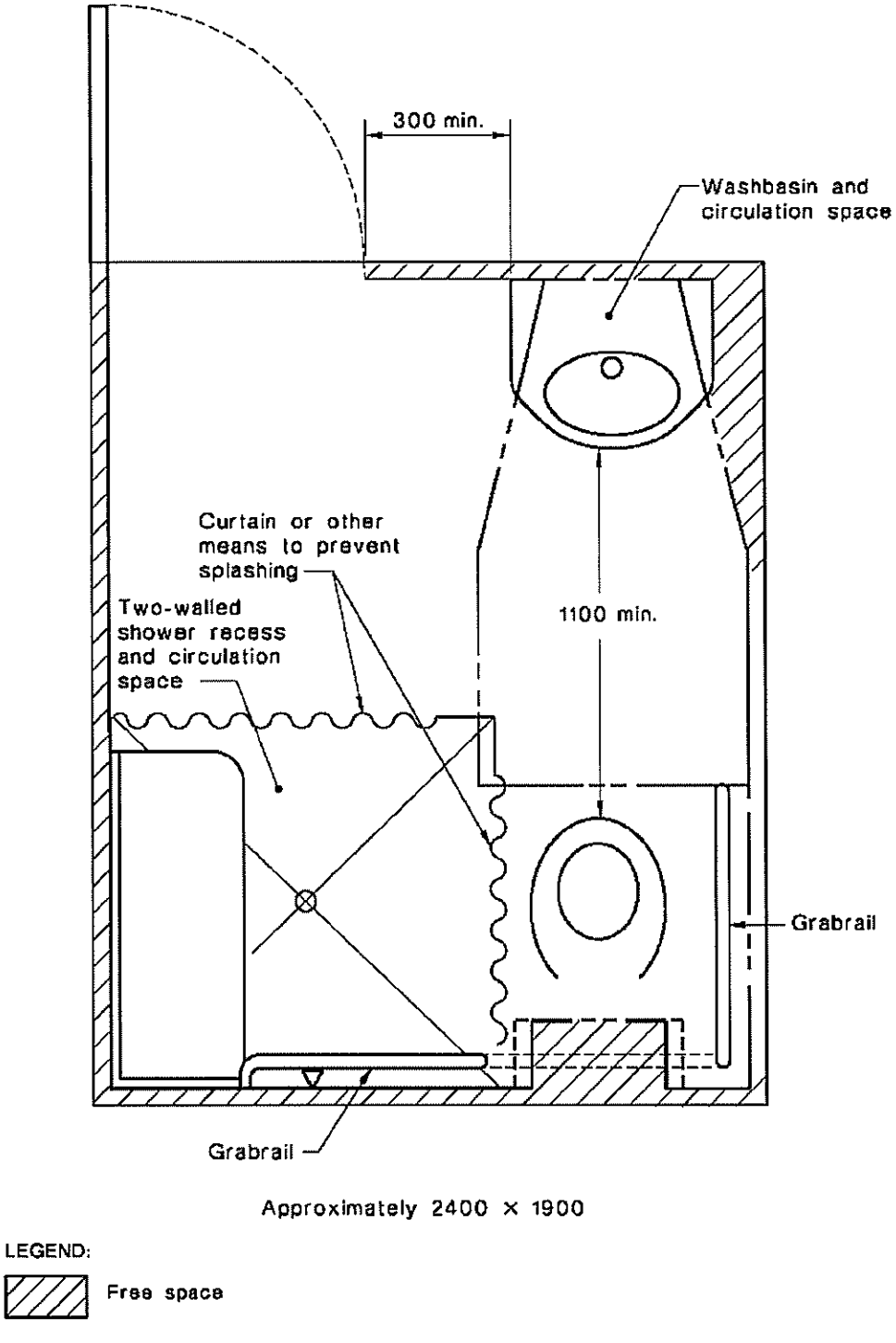
(i) Inward swinging (ii) Outward swinging

(d) Timber door sill options

NOTE: Minimum overhang 1600 mm must be observed.

FIGURE C1 (in part) EXAMPLES OF WEATHERPROOFING EXTERNAL DOORS

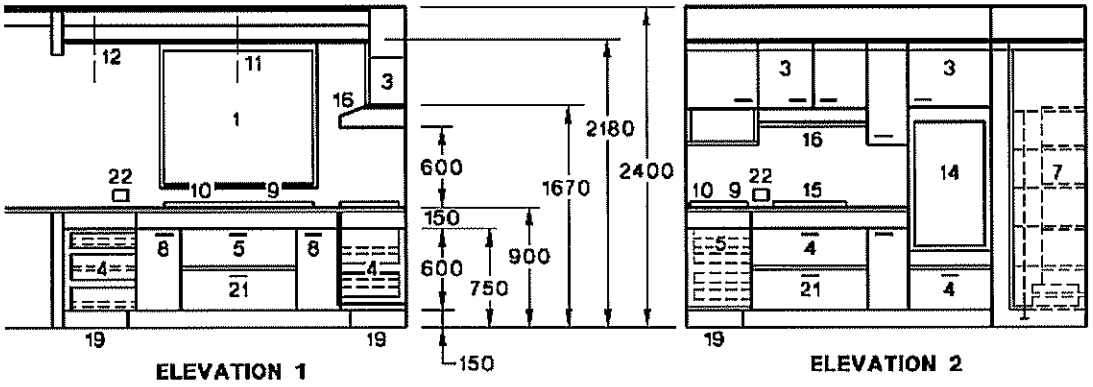
APPENDIX D
EXAMPLE OF ACCESSIBLE COMBINED SANITARY FACILITIES
(Informative)

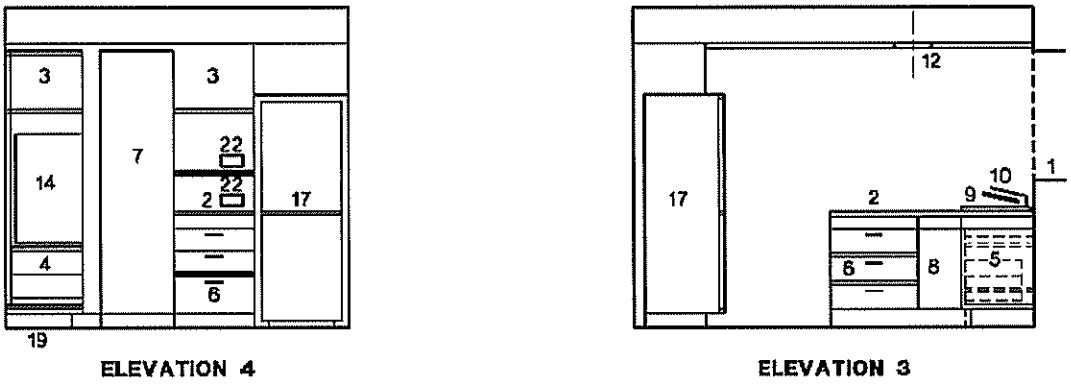


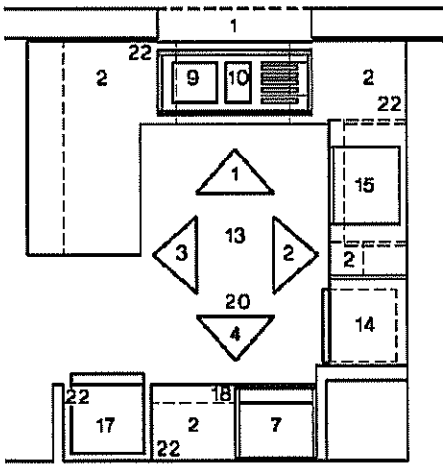
DIMENSIONS IN MILLIMETERS

FIGURE D1 EXAMPLE OF COMBINED SANITARY FACILITIES

APPENDIX E
KITCHEN AREA LAYOUT
(Informative)





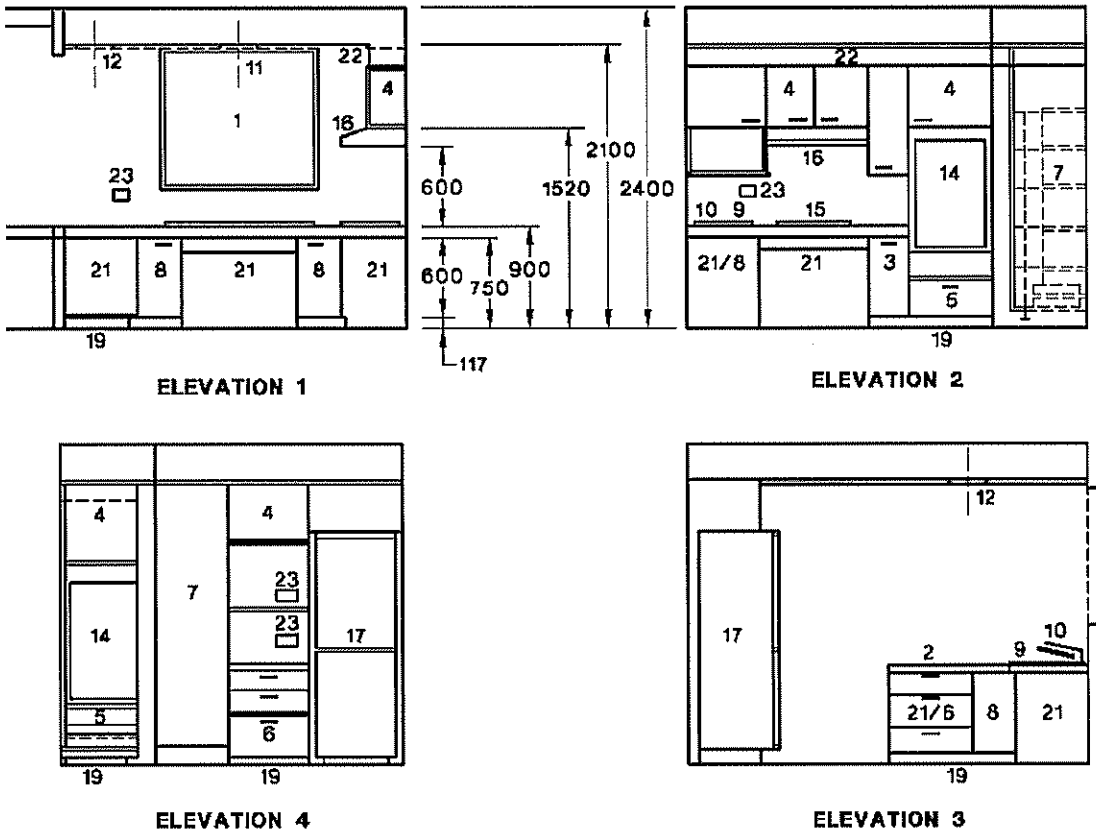


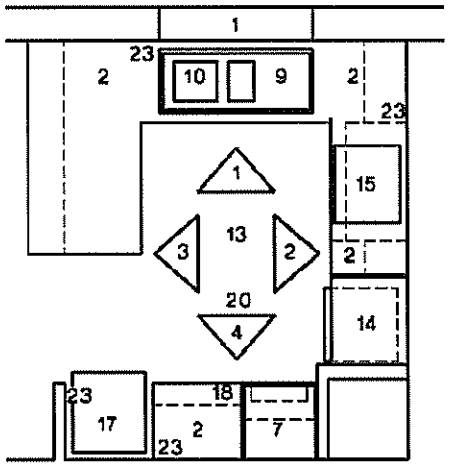
KITCHEN:

KEY	ITEM DESCRIPTION
1	Window
2	Benchtops, 150 mm height adjustment
3	Adjustable overhead cupboards
4	Pot drawers
5	Wire basket drawers
6	Crockery drawers
7	Pull-out pantry/pantry with door racks
8	Corner cupboard with lazy susan
9	Sink
10	Lever mixer tap
11	Over sink light
12	Over bench light
13	Centre room light
14	Wall oven
15	Hot plate
16	Rangehood
17	Refrigerator
18	Fire blanket
19	Adjustable 150 mm high plinth
20	Vinyl floor
21	Open below bench space/removable cupboards
22	GPO (power outlet)

DIMENSIONS IN MILLIMETERS

FIGURE E1 EXAMPLE OF KITCHEN LAYOUT — BEFORE ADAPTATION





KITCHEN:

KEY	ITEM DESCRIPTION
1	Window
2	Benchtops, 150 mm height adjustment
3	Cupboard and drawers with 'D' pull handles
4	Adjustable overhead cupboards
5	Pot drawers
6	Crockery drawers
7	Pull-out pantry/pantry with door racks
8	Corner cupboard with lazy susan
9	Sink
10	Lever mixer tap
11	Over sink light
12	Over bench light
13	Centre room light
14	Wall oven
15	Hot plate
16	Rangehood
17	Refrigerator
18	Fire blanket
19	Adjustable 150 mm high plinth
20	Vinyl floor
21	Open below bench space/removable cupboards
22	Face infill panel
23	GPO (power outlet)

DIMENSIONS IN MILLIMETRES

FIGURE E2 EXAMPLE OF KITCHEN LAYOUT — AFTER ADAPTATION

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