

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 Australia on 26 May 1995 and published on 5 September 1995.

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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
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Housing Industry Association, Australia
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Australian Quadriplegic Association
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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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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.

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- 2 Disability Discrimination Act, Australia, 1992.
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- 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 Adaptable 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.)

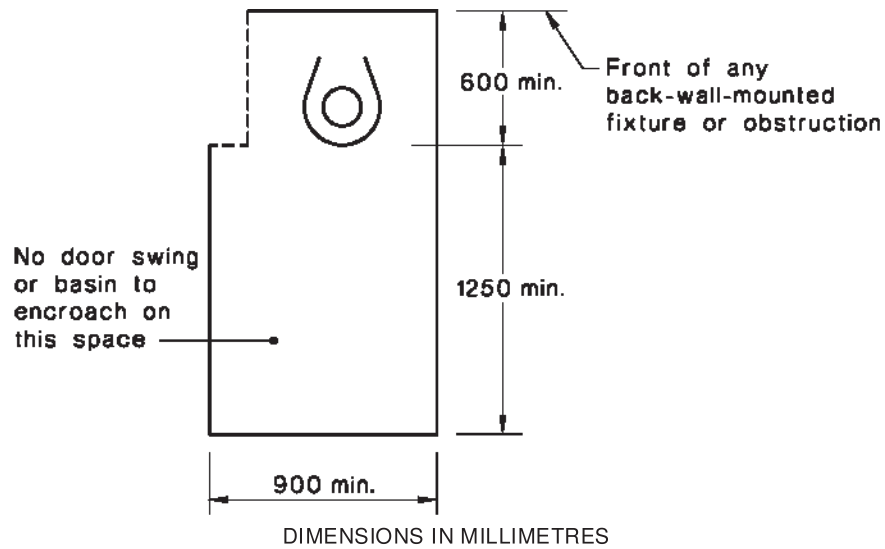
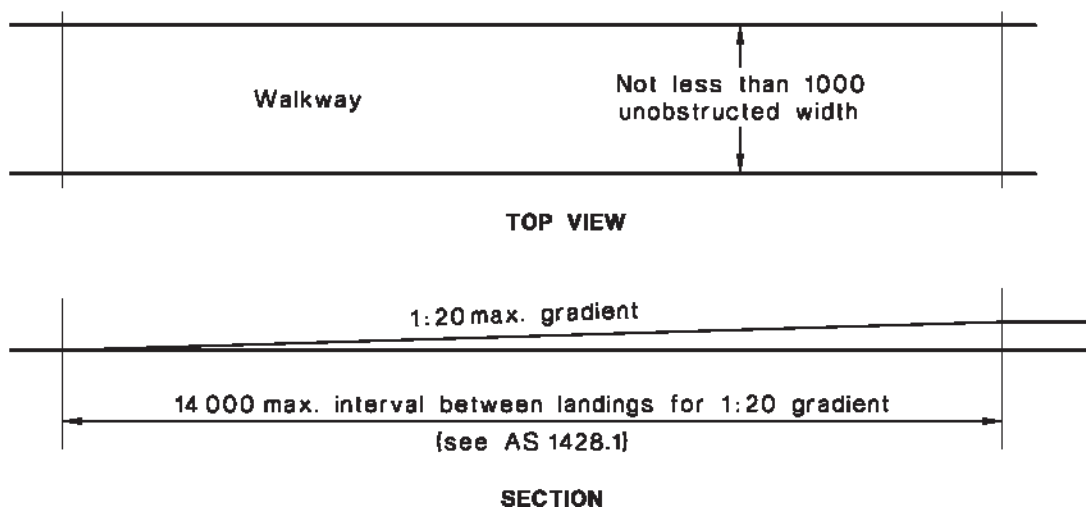


FIGURE 1.1 VISITABLE TOILET



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.