

HOMES FOR EVERYBODY



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Plans and drawings by IA Group Architects

Disclaimer

At the time of printing all information contained in this publication was correct. The publication is intended for use as a design guide for people living in shared accommodation with varying abilities, but the design principles may be relevant to the broader community. It must be noted, however, that Government building regulations differ across private housing and Endeavour accommodation services. In the event that these designs are applied to a private dwelling, the Building Code of Australia (BCA), the Australian Standards and other relevant codes need be complied with.

This manual was compiled with both Universal design principles and current Australian Standards as the dominating principles. Notwithstanding compliance with the relevant codes (above), it may be more appropriate to consider 'non-standard' solutions in meeting the specific needs of an individual in a private dwelling.

In most circumstances, contributors have not appraised the completed manual before final print. The Homes for Everybody project team are entirely responsible for the information contained.

Contact:

The Endeavour Foundation
 Assets and Properties Department
 50 Southgate Avenue, Cannon Hill Queensland 4170
 Australia
 PO Box 3555 Tingalpa Queensland 4173 Australia

CONTENTS	ii
ACKNOWLEDGMENTS	iii-iv
HOMES FOR EVERYBODY	1
ADAPTABILITY	4
ACCESSIBILITY	5
EXTERIOR SPACES	7
ENTRANCE	8
STAIRS AND RAMPS	9
INTERNAL ACCESS	11
LIVING SPACES	12
KITCHENS	13
BATHROOMS	17
LAUNDRIES	19
BUILDING SERVICES	21
HOUSEKEEPING	25
SECURITY AND SAFETY	27
GLOSSARY	29
REFERENCES	31
CONTRIBUTORS	33

Message from the Minister for Disability Services



Hon. Lindy Nelson-Carr MP
Member for Mundingburra



Minister for Communities
Minister for Disability Services
Minister for Aboriginal and
Torres Strait Islander Partnerships,
Minister for Multicultural Affairs,
Seniors and Youth



Hon. Lindy Nelson-Carr MP

Minister's Foreword

The Bligh Government's vision for 2020 recognises the challenges ahead, and it sets clear targets to build strong, green, smart, healthy and fair communities for the future.

That's why I am so pleased to welcome you to the Endeavour Foundation's *Homes for Everybody* manual.

This design publication is all about improving the lives of people with a disability, by creating more liveable and accessible homes.

The Endeavour Foundation has added its own expertise in the field to develop this user-friendly guide which will be welcomed as a great contribution in an area where information is currently scarce.

It is also great to see such a wide range of input from individuals and organisations.

An important aspect of *Homes for Everybody* is its focus on providing designs which meet the needs of people who have a broad range of diverse physical and intellectual abilities.

I trust you will find this publication of much use.

My congratulations to the Endeavour Foundation and all those working tirelessly in the sector to enrich the lives of their fellow Queenslanders.

Hon Lindy Nelson-Carr MP
Minister for Multicultural Affairs, Seniors and Youth

Message from the Chair and Chief Executive Officer

We are pleased to be able to support the publication of Endeavour's Building Design Standards manual, Homes for Everybody.

Primarily targeted towards achieving better living and design standards in Endeavour residential services it will also be of wide value in all of the buildings used by people who have an intellectual disability, and those with physical disabilities. It brings together in one comprehensive manual extensive information regarding standards, design principles, compliance obligations, environmental sustainability and universal design.

This will help organisations like Endeavour to create, renew and maintain environments that best accommodate the service users' needs, emphasising liveability, convenience and safety for all within properties catering to those with an intellectual and physical disability.

Whilst there has been volumes of work done in the areas of physical disabilities and design requirements, to our knowledge there is no such publication within Australia that holistically addresses the service users physical design issues combined with intellectual disabilities.

The executive would like to thank all involved with this initiative both from within Endeavour Foundation and to all the external contributors and supporters of this manual. These people are appropriately acknowledged in this document.

No doubt, as is the case within Endeavour, right across Australia there are many properties that whilst still in sound condition and continuing to provide support for people with an intellectual disability, incorporate design principles and usefulness probably more reminiscent of past decades. Changes in community expectation, quality design, safety including Occupational Health and Safety, and general living amenity, are reflected within the contents of Homes for Everybody. We commend this manual to all who read and use it for the benefit of their service users and residential clients.



Shane Charles, Chair



Kelvin Spiller, CEO

A handwritten signature in black ink, appearing to read 'Shane Charles'.

Shane Charles, Chair

A handwritten signature in black ink, appearing to read 'Kelvin Spiller'.

Kelvin Spiller, CEO



HOMES FOR EVERYBODY DESIGN PRINCIPLES FOR PEOPLE WITH DIVERSE ABILITIES

The Homes for Everybody manual was produced to encourage and stimulate residential design practices within the Endeavour Foundation to achieve more livable homes for all. The original goal was to produce a simple internal resource to ensure building works were standardised for planned refurbishment works. During the course of the Homes for Everybody research it became evident that the information learnt would be of benefit to the larger Endeavour family who live in their own homes.

For this reason the original intention of producing a technical document has been altered to a user friendly guide for all.

Homes for Everybody will ensure consistent detail is produced across various accommodation buildings to address both current and future needs as service user's age increases, as well as provide guidance with simple language and illustrations to assist any interested people retain their independence at home.

PURPOSE OF HOMES FOR EVERYBODY

When Endeavour staff embarked on this journey of discovery they originally believed it would be as simple as locating an existing “standards manual” from another similar body, or organisation and alter the document to ensure it met Endeavour’s needs. Endeavour learnt that while many organisations have done excellent work in the area of design principles that meet the needs of people with various physical abilities, there was little written about the design complexities and challenges to meet the needs of people with various intellectual abilities. Endeavour’s unique and privileged knowledge gained over many years of working in the disability sector was utilised to develop this manual in consultation with many organisations who have done excellent work in the area of design principles.

At this point Endeavour would like to acknowledge the universal support and encouragement from the various individuals and organisations who have contributed to the Homes for Everybody manual. During the course of this research the generosity that exists within the sector came to the surface every time advice was requested. The majority of the content is in accordance with the Principles of Universal Design from the Center for Universal Design at the North Carolina State University. Organisations and individuals who have contributed are acknowledged in this manual.

RATIONALE OF HOMES FOR EVERYBODY

Universal Design is a term that encompasses three core elements: Accessibility, Adaptability and Visit-ability. The Homes for Everybody manual uses the three principles in any design related to Endeavour accommodation services. There has been a growing acceptance in recent years of the importance of meeting the needs of people with diverse physical and intellectual abilities, with attitudes changing from how to cater for someone with a disability, to the broader concept of how to cater for all people, irrespective of ability. As the population ages and societies’ attitudes change the need for family and friends to become the main carers will increase. Most people with a disability experience some restriction in their activities for daily living and the principles of Universal Design assist when applied in the home. Homes for Everybody incorporates various Economic, Engineering, Environmental, Gender, Cultural and Health and Safety requirements.

Homes for Everybody has been developed in conjunction with a specification document, entitled “Schedule of Internal Finishes, Fixtures and Fittings”, referencing sources for products and materials. The selections used in the schedule have been chosen for their ability to meet the design principles as well as: availability, value for money, user friendliness, quality and maintainability. In addition to the “Schedule of Internal Finishes” document, several comprehensive and integrated colour selection packages have been compiled that meet both current community expectations and maintenance criteria. Both of these documents have been kept separate from the Homes for Everybody manual as they will be regularly updated and improved as products and materials become available and community expectations change.



THE PRINCIPLES OF UNIVERSAL DESIGN

EQUITABLE USE: The design is useful and marketable to people with diverse abilities.

FLEXIBILITY IN USE: The design accommodates a wide range of individual preferences.

SIMPLE AND INTUITIVE USE: Use of design is easy to understand, regardless of the users experience, knowledge, language, skills, or current concentration level.

PERCEPTIBLE INFORMATION: The design communicates necessary information effectively to the user, regardless of ambient conditions or the users sensory ability.

TOLERANCE FOR ERROR: The design minimises hazards and the adverse consequences of accidental or unintended actions.

LOW PHYSICAL EFFORT: The design can be used efficiently and comfortably and with a minimum of fatigue.

SIZE AND SPACE FOR APPROACH AND USE: Appropriate size and space is provided for approach, reach, manipulation and use regardless of users body size, posture, or mobility.

THE CORE ELEMENTS OF UNIVERSAL DESIGN

ADAPTABILITY – addresses the future needs of the accommodation service and/or private home. Areas that initially may not be accessible but can be altered simply in the future. Adaptability incorporates the structural elements while anticipating the possibility of future access needs. Examples of Adaptability: Non load bearing walls in between door openings, (that can be removed if the need for wheelchair access is required), toilets and bathrooms with sufficient fixing materials built into wall spaces in appropriate locations (if hand rails are required in the future).

ACCESSIBILITY – design intended to comply with Australian Standards and is applied through current regulations to commercial and institutional buildings. It addresses the access requirements to areas such as: ramps, lifts, car parks, sanitary facilities and entries. It is based on the premise that 80% to 90% of people can use the building. Public buildings are also required to comply with the Disability Discrimination Act 1992. (Refer to the chapter on 'Accessibility' for more detail).

VISIT-ABILITY – design that works on the principle that people with a disability can visit a home with the following: at least one entrance that can be accessed in a wheelchair, the hallways are wide enough for wheelchair navigation and at least one bathroom is large enough for a person using a wheelchair to enter and close the door.



Plywood fixed to framing behind sheet wall enables future installation of grab rails (as shown dashed)

Housing adaptable to accommodate future needs

ADAPTABILITY

Adaptability is a term used to describe a building structure that can be modified easily and cost effectively to meet different needs as peoples abilities change. Adaptability is of particular relevance in the private home as families increase or decrease in age. In-built adaptability can allow the family to remain in the home for longer with minor alterations made as the need arises. Adaptability design principles when applied to the Endeavour accommodation services provides a greater level of security and stability to the service users, as they experience ageing and behaviour related changes.

COMPLIANCE

All organisations have a responsibility under the Federal Disability Discrimination Act 1992 (DDA) to provide equitable access to goods and services and to premises used by the public. Premises are broadly defined and include all areas within a building. Whilst most private homes do not have to comply with the Act many of the Endeavour accommodation services have obligations to do so. The DDA provides uniform protection against unfair and unfavourable treatment for people with a disability and makes it unlawful to discriminate against a person who is an 'associate', such as a friend, carer or family member.

The DDA broadly defines disability and in relation to a person includes the following:

- Total or partial loss of the person's bodily or mental functions
- The presence in the body of organisms causing disease or illness
- The presence in the body of organisms capable of causing disease or illness
- The malfunction, malformation or disfigurement of a part of the person's body
- A disorder or malfunction that results in the person learning differently from a person without the disorder or malfunction
- A disorder, illness or disease that affects a person's thought processes, perception of reality, emotions or judgment or that results in disturbed behaviour

This broad definition means that everyone with a disability is protected. The DDA supports the principle that people with a disability have the same fundamental rights as the rest of the community. When a person with a disability wants to utilise premises, including all buildings, outdoor spaces, carparking areas, pathways and facilities then equitable and dignified access must be provided. The DDA requires that appropriate changes be made to provide access and a complaint can be made if access is not provided.

BUILDING CODE OF AUSTRALIA (BCA)

The Building Code of Australia, in conjunction with the DDA applies to new buildings and buildings undergoing significant refurbishment or alteration. Sections of the BCA require compliance with a range of access provisions.

AUSTRALIAN STANDARD 1428 2003, DESIGN FOR ACCESS AND MOBILITY SET

The AS 1428, Design for access and mobility series provides design requirements for buildings encompassing the specific needs of people with disabilities. It is important to ensure Australian Standards are considered in any refurbishment, development or changes to a premise given the comprehensive definitions and requirements of the DDA and BCA, as well as other relevant regulations relating to specific types of buildings.



Ramp to front entry provides appropriate access for people of all abilities

Standards Australia International 2001, Design for access and mobility – Part 1: General requirements for access – new Building work, 1428.1:2001.

This Standard specifies the design requirements applicable to new building work, excluding work to private residences, to provide access for people with disabilities. Particular attention is given to access ways, circulation spaces and consistent linkages suitable for use by those in wheelchairs as well as access to facilities for people with ambulatory or sensory disabilities.

Standards Australia International 1992, Design for access and mobility – Part 2: Enhanced and additional requirements – Buildings and facilities, 1428.2:1992.

This Standard sets out requirements for the design of buildings and facilities for access for people with disabilities. Where appropriate, these requirements are enhanced from the minimum requirements of Part 1. This Standard also includes requirements for items which are not covered in Part 1, and is intended to be used in conjunction with Part 1.

Standards Australia International 1992, Design for access and mobility – Part 3: Requirements for children and adolescents with physical disabilities, 1428.3:1992.

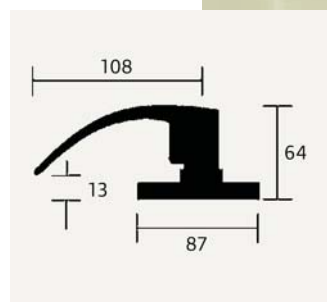
This Standard specifies the design requirements applicable to new building work, excluding work to private residences. This standard sets out requirements for facilities specifically intended for use by children and adolescents with physical disabilities. Details on four age ranges (from 3 to 18 years of age) and disability groups are provided.

Standards Australia International 2002, Design for access and mobility – Part 4: Tactile indicators, 1428.4:2001.

This Standard sets out requirements for new building work, for the design and application of tactile indicators, to ensure safe and dignified mobility of people who are blind or vision impaired.

Australian Standards should be referred to for further detailed information regarding the requirements for each of the Key Access Elements, as listed below:

- Car parking
- Change and shower facilities
- Colour contrast
- Entrances
- Exits
- Floor surfaces
- Hearing augmentation
- Internal walkways and corridors
- Kerb ramps
- Kitchens
- Landscaping elements
- Lifts
- Pathways
- Ramps
- Signage and directions
- Stairs
- Swimming pools
- Tactile ground surface indicators
- Toilets



Access by a single downward action lever handle.



7 EXTERIOR SPACES

ACCESSIBILITY

Accessible homes are ideally single floor construction, situated on level land. Sloping sites can be adapted by either levelling the site itself or by architectural techniques such as ramps, elevated outdoor living spaces and easily navigated pathways connecting the functional and recreational areas of the home. The vehicle parking area and the entrance to the house should be at the same level. On a sloping site this may be achieved by setting the house to the rear of the site allowing for the driveway to take up the greatest gradient at the front of the site, hence making the car do the climbing. The driveway should be no steeper than 1:20 if it is intended to double as the pedestrian access. It should also be designed to have good visibility to allow for a vehicle to be turned around easily on the site. The car parking space should be close to the house with a level, covered area to the entrance large enough to allow for car doors to be fully opened without hitting walls or posts.

Mobility aids or wheelchairs are to be easily manoeuvrable from the car to the entrance.

Access between the home and other outdoor spaces such as patios, clothes lines, sheds and the garden all need careful consideration to ensure maximum enjoyment by all home users. Pathways should ideally be a minimum of 1200 millimetres in width and have a maximum gradient of 1:20. A maximum cross fall of 1:40 will prevent water ponding on the surface. The path must be constructed on a suitably compacted sub-base and finished with a slip resistant surface. Joints should be finished flush and all adjoining surfaces need to be level to allow safe use of mobility aids and wheelchairs. In areas where this is not achievable then a barrier such as a handrail may be necessary. If a pathway exceeds 1:20 gradient, it is then classified as a ramp and is required to have a handrail.



Covered carport

Provide adequate lighting

Secure storage

Ramped driveway with level access and minimal distance from carport to house

Provide sufficient manoeuvring space around car and entry

THE ENTRANCE

Good entrances incorporate the following design attributes:

- Sufficient manoeuvring space
- Convenient proximity to the car space
- All weather shelter
- Good lighting
- Visibility from within the house
- An intercom or door buzzer to announce visitors
- A minimum fall to the floor surface to prevent water ponding

Accessibility and The Entrance:

The entrance should welcome all people to the home and to achieve this it must be accessible. On a flat site a level entry can easily be created, contrary to typical building practices. Floors are commonly placed at a level above the ground creating an access issue as any step greater than 3 millimetres reduces access. This practice should be avoided.

Adaptability and The Entrance:

Height changes at thresholds on level sites can be easily addressed by architectural solutions such as ramps or alternative joinery. On sloping sites where the height differences are greater it may be possible to utilise bridges or decks linked to adjoining ramps, or raised landscaping with appropriately graded paths. Any of the above solutions must be considered carefully to avoid possible breaches to sub floor ventilation, termite protection or water penetration.

Visit- ability and The Entrance:

The entrance should be more than just a level threshold. It should be sheltered from the weather and supply a measure of security for the occupants, as well as usability for visitors of all abilities.



Level thresholds are essential for easier access

Clear house number and good lighting at entry



Colour contrasting doors with adjacent surfaces assists with visibility



1200mm Minimum

Provide handrail to one or both sides where necessary

Slip resistant finish with maximum camber, or cross fall of 1:40.
Ensure surface joints are flush

STAIRS AND RAMPS

High density living will become more common as the population increases and demand on the land and infrastructure intensify. This will inevitably lead to a greater percentage of the general population living in apartments or multi storey housing on small lots. Accordingly, accommodation preferences for people with varying levels of ability will be greatly reduced. Universal principles avoid the use of use stairs, however the practical restraints of multi-level buildings may make this unavoidable. Designers need to consider safe alternative solutions to enable living in multi-level buildings a possibility for people of all abilities.

The Building Code of Australia regulates the requirements for stairs and Australian Standards should be accessed when designing or renovating. The information provided in Homes For Everybody must always be checked against the current Building Code.

STAIRS

Stair case dimensions should be designed and located to ensure that a stair lift is able to be fitted in the future. A straight flight design, with a middle landing for respite is ideal for both ease of use and for retro-fitting of a stair lift.

Staircases should be well lit and provide a landing at the top and bottom with no doors that obstruct the landings. A handrail must be fitted to at least one side, however people with a preferred hand will require a handrail on both sides. Handrails should be easy to grip and extend 300 millimetres beyond the end of the stairs, with a downward sloping end to indicate to the visually impaired that there are no more steps. Treads should have a slip resistant surface. Tread width and riser height must be consistent for the full extent of the stair. The use of colour contrasting between the riser, tread and nosing assist persons with a vision impairment.

The width of the stair will vary, depending on the buildings constraints. The most common is 1000 millimetres and if a stair lift is to be fitted at a later stage, at least 1200 millimetres is required.

RAMPS

Ramps or inclined walkways offer the easiest means of access in buildings with less than one storey.

Design of ramps should incorporate the following:

- A handrail on both sides
- A second handrail set at mid height to assist people of short stature, children or people in wheelchairs
- Have the lowest reasonable gradient. The gradient is regulated by the BCA (currently the gradient is 1:14)
- A horizontal respite landing every 9 metres, or at every change in direction



Tactile indicators assist with safe and dignified mobility of people who are vision impaired

11 INTERNAL ACCESS

INTERNAL ACCESS

Internal circulation and access should be designed to balance the aesthetic and functional components of the home.

Internal Access and Accessibility:

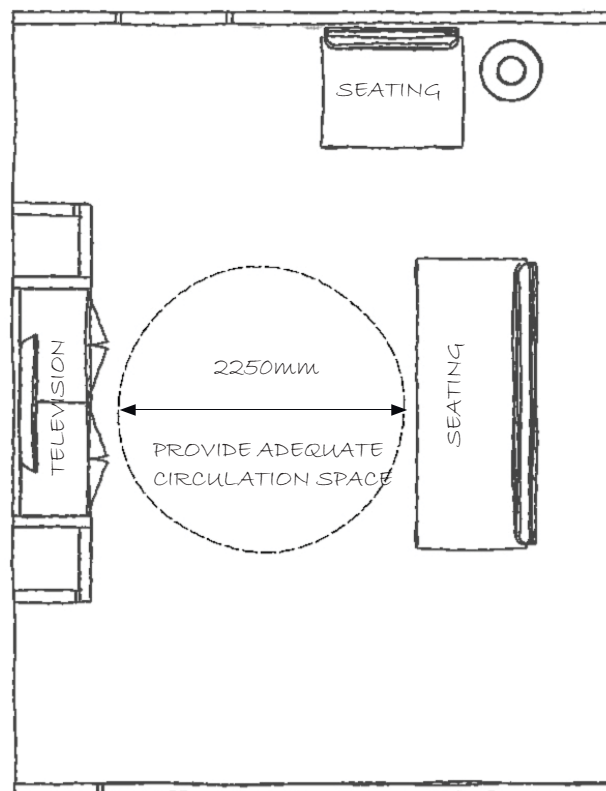
Functional spaces such as laundries, clothes lines, kitchens and car spaces need to be linked by corridors or open plan spaces of suitable proportions to allow for easy access and interaction, without creating an institutional appearance. Narrow hallways and corridors can be difficult for people with a mobility aid to navigate. Open plan is the ideal design with generous spaces to allow for easy manoeuvring, especially through door ways and between furniture. Ideally corridors should be at least 1200mm wide, with the relationship between corridor width and the turning circle of a wheelchair critical at corners or room entrances.

Internal Access and Adaptability:

In situations where wide corridors can not be achieved, then the door opening size should be increased accordingly to allow for wheelchair access.

Internal Access and Visit-ability:

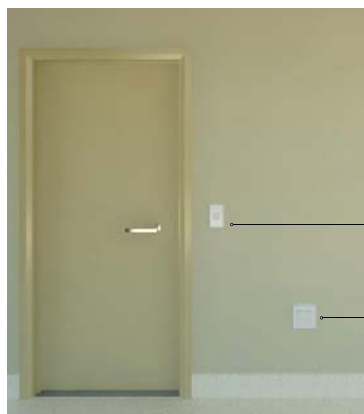
Careful placement of furniture to ensure it does not encroach upon manoeuvrability and circulation space will increase access and benefit both home users and visitors who may have a specific requirement.



Adequate Room lighting to assist visibility

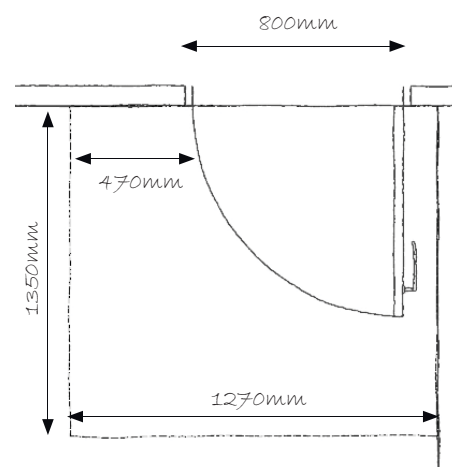
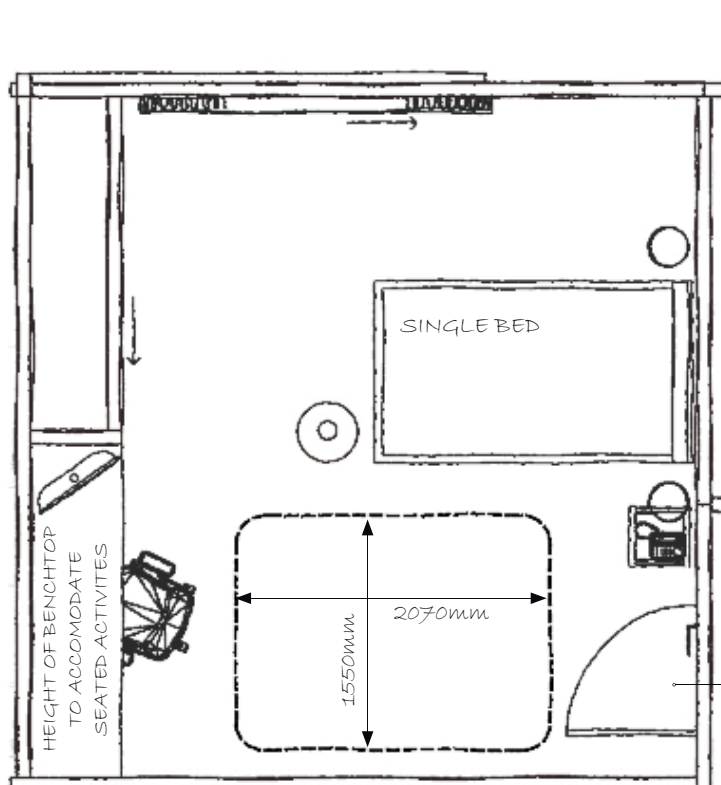


Living areas designed for circulation



Large rocker type light switch located at door adjacent to lever handle

Provide an adequate number of power points to reduce use of extension cords



Circulation space at doorway

13 KITCHENS

THE KITCHEN

The kitchen can be the most social area of the home, as comforting tastes and aromas offer a welcoming environment for people to gather and share their days experiences. Good kitchen design needs to address accessibility and integration of work areas with conveniently placed storage and preparation modules. The fixtures, fittings and controls should be easy to operate by people with various abilities and be considerate of the future changing needs of the home user.

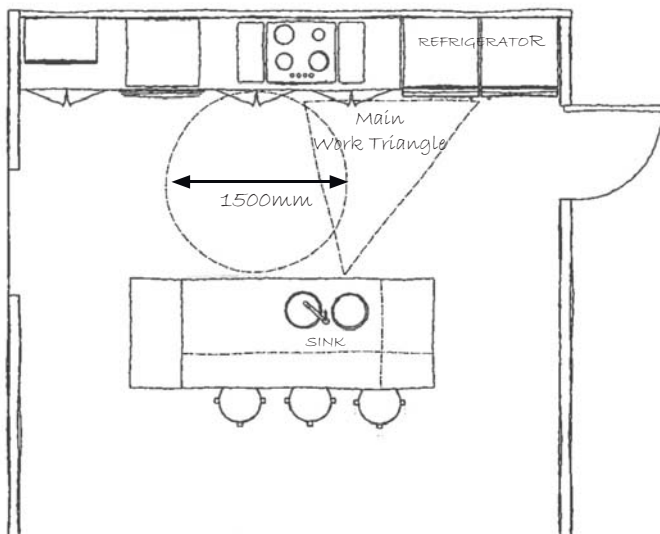
Key design elements

- Entry and exit locations
- Ease of movement between work areas
- Work surface heights and accessibility
- Appropriate storage, fixtures, fittings and controls
- Visibility
- Safety and tolerance for error
- Natural and artificial light

Layout principles

To enhance the social integration theme and maximise the benefits of easy movement between the food preparation and dining area the open planned kitchen/meals combination is highly recommended. Whilst design of Endeavour kitchens shall take into account the specific and specialised needs of people with a disability, the work triangle principle is relevant and essential. The work triangle refers to the functional relationship between the three key components of stove, refrigerator and sink. When any of the designs are combined with adjacent meal areas they will deliver varying advantages or disadvantages, which should be considered against the specific needs of the home users. The following diagrams illustrate three different layouts that are consistent with the work triangle principle and demonstrate the various pros and cons.



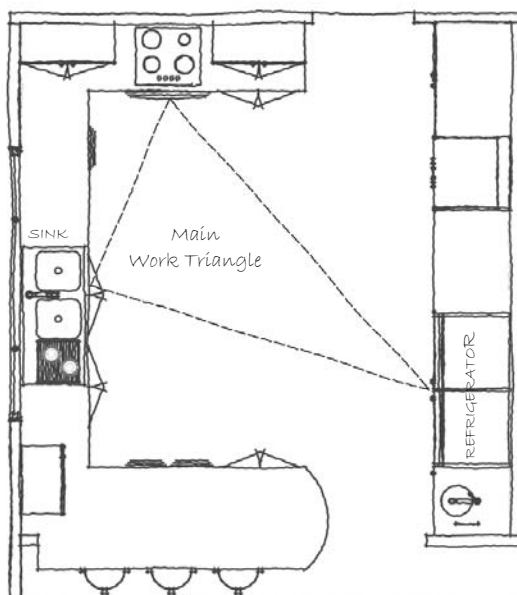


Galley Design Advantages

- Good use of storage and work space, as inaccessible corners are minimised
- Encourages social interaction
- High level of manoeuvrability
- Has multiple entry and exit points

Galley Design Disadvantages

- May become a through traffic area
- Will require heavy objects to be lifted between work areas

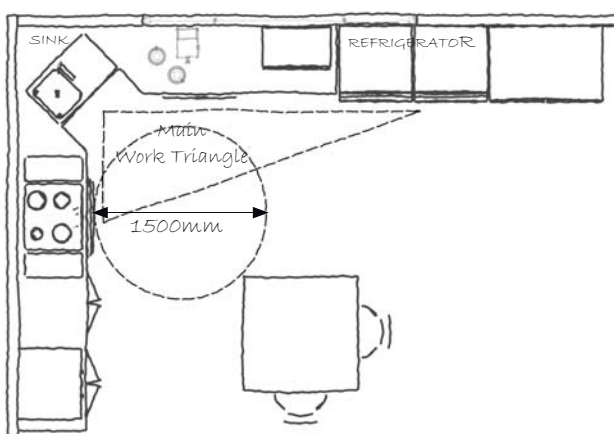


U-Shape Design Advantages

- Can encourage a high level of social interaction
- Good manoeuvrability and work triangle
- Avoids through traffic
- Increases useful bench and cupboard space

U-Shape Design Disadvantages

- Inaccessible corners are increased
- Non continuous bench spaces will increase the need to lift heavy objects
- Single entry and exit point



L-Shape Design Advantages

- Allows for good social interaction
- Allows easy access between preparation and dining areas
- Dining tables can be used as work spaces
- Provides good manoeuvrability
- Continuous work benches allow for safe movements of heavy objects
- Will avoid household through traffic
- Has multiple entry and exit points

15 KITCHENS

Sink depth
limited to
150mm



Shelving in
cupboards above
bench not to exceed
450mm depth

Cooktop
elements glow
or change colour
when turned on
and located flush
with adjacent work
surface

Provision of a
number of under
bench sliding
drawers in lieu
of cupboards is
preferred for ease of
access

Accessibility and the Kitchen

Many of the design solutions that allow for greater accessibility to wheelchair users can create adverse effects for the non wheelchair user. Careful consideration of the kitchen design must be given to the overall household and the effect of design on all home users.

Whilst universal accessibility principles can be applied, not all solutions will suit all people. In households that are shared by people with various levels of ability it is important to understand the needs of all occupants and establish a clear design brief before any planning should take place. This design brief should evaluate how the occupants intend to use the kitchen. For example, do all home users need access to prepare meals, or is it intended that assistance will be provided. Design should therefore focus on providing the users with an appropriate level of access.

A 1500mm diameter manoeuvring space for a person in a wheelchair is preferred. In situations where this is not achievable the following will assist to increase accessibility:

- Use of slim-line cupboards with wider bench-tops
- Well positioned knee spaces
- Adequate skirting height for clearance of foot rests
- Low level draws



Cooktops installed
with corresponding
knee space below.

Demonstrates
modified kitchen
for a specific user



The following design principles should be adopted in Endeavour accommodation services. The principles have been chosen as they all aid the accessibility for people with mobility difficulties whilst not creating any undue inconvenience for other home users.

Ovens: Placed at bench top height with side opening doors, adjacent to open bench space. It is not recommended to install ovens wider than 600mm. The optimum oven size is 600mm wide and where the needs of the household require greater capacity, multiple ovens are recommended rather than one large oven. Large commercial type stoves should only be considered when it has been determined that they will be used by suitably competent persons.

Microwaves: Placed on, or at bench top height with adjacent bench space.

Cook tops: Electric ceramic 800mm width with easy to operate controls that are located at the front. Elements glow or change colour when hot. The cooktop should be positioned so as to allow for a minimum 500mm clear work space either side.

Dishwashers: Draw type, installed below the sink drainer.

Sinks: A two bowl sink fitted with a single mixer tap, with large lever type handle. It is important to limit the depth of the sink to no more than 150mm, to reduce the likelihood of musculoskeletal related injuries.

Pantries: Where space allows a wheel-in pantry is preferred. This type of pantry can also be fitted with an appliance shelf, allowing suitable access for a person in a wheelchair. Where space does not allow for a wheel-in pantry, pull out pantries are an effective alternative.

Work benches: An area of work bench that is conveniently located within the “work triangle” should have knee space available and set at a height to allow for people in a wheelchair access for food preparation. The intent is for this area to be convenient for use in the seated position for either food preparation or casual dining.

Under bench draws: Below bench tops, the use of draw space rather than cupboards with doors allow access to people in wheelchairs, and is convenient for all other home users.

Fridge/Freezers: Chest type freezers are not suitable as they encourage awkward bending and lifting. Side by side models offer the most accessibility, however, if a single door type fridge/freezer is to be used then it should be a bottom mounted model with the freezer at the base.

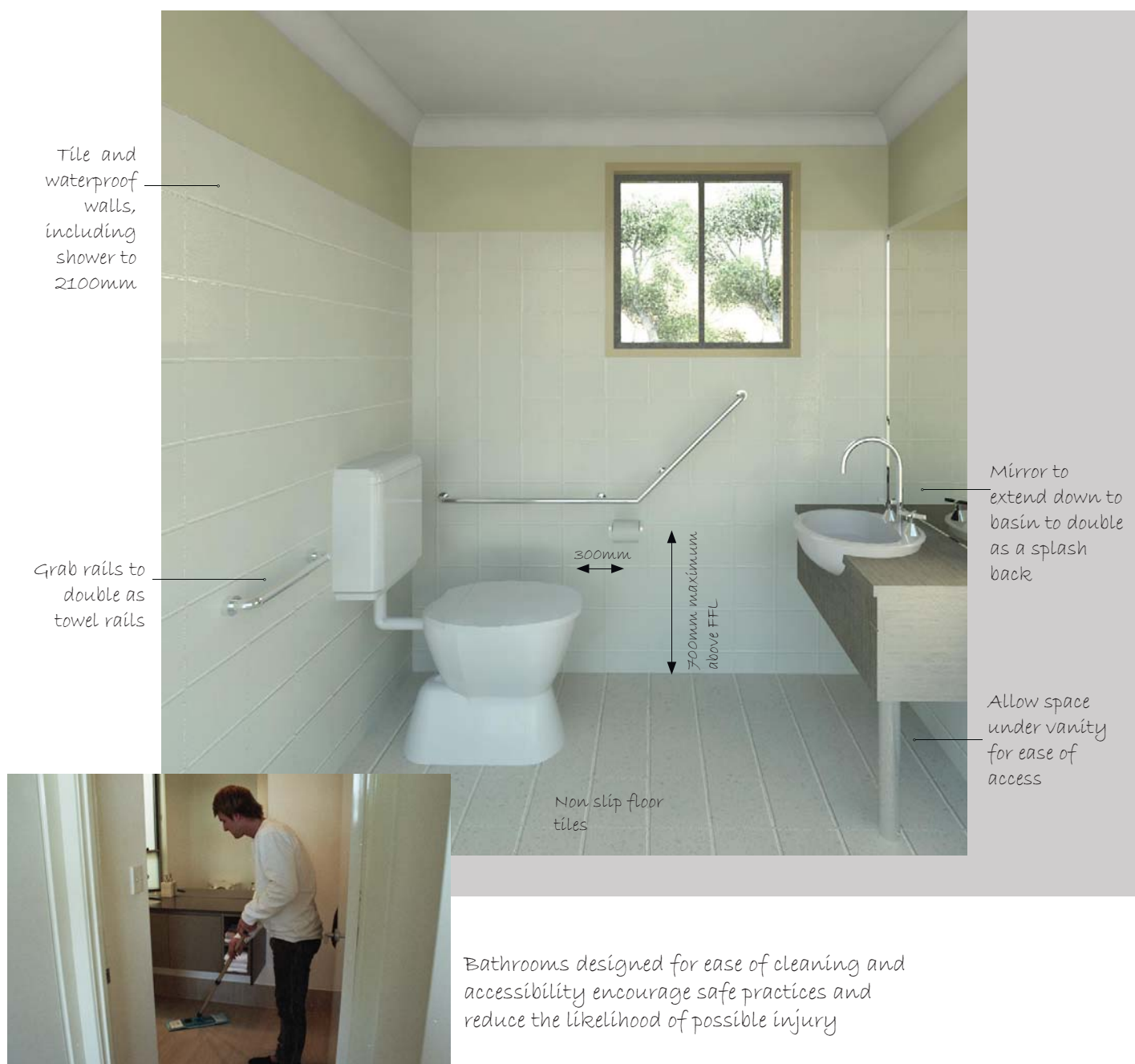
Power and light switches: The placement of all switches and power points needs to be considered for safe access from the wheelchair position. Large rocker type switches of a contrasting colour to the surrounding wall facilitates ease of use.

Provision of a separate hand washing facility may be appropriate and is recommended to be in close proximity to food handling areas. The facility should include paper towel and liquid soap dispensers

17 BATHROOMS

BATHROOMS

The bathroom can be the most utilised area in the home. Statistically, it also represents the area most associated with accidental injury. Slips and falls are most likely to occur in the “wet areas” of the home. Specialised equipment is often required in bathrooms in order to cater for the specific and changing needs of an individual with a disability. However the utility of this area must also be appropriate for other household members. Although safety is a primary concern in the design of such areas, where possible, aesthetics should also be considered.



Due consideration to the principles of universal design will contribute to the liveability of the bathroom and in the long term to cost effective modification if needed in the future.

Accessibility and the Bathroom: A fully accessible bathroom will necessarily have some disadvantages, the most common being the 'institutional' appearance and additional safety issues. As previously stated, safety consideration must be of primary importance. Water escaping from the shower throughout the rest of the room increases the likelihood of accidental injury. In order to combat this, a shower screen may easily be fitted over a level floor surface that can be removed later and replaced with a shower curtain. In this way, risk of injury is reduced and a more desirable appearance is achieved.

Adaptability and the Bathroom: This principle should guide design in order that future requirements may be easily integrated into the initial or 'universal' design structure or building plan. Certain requirements may not easily be modified after initial construction so should be allowed for at the time of the original construction or major alteration. As mobility becomes a challenge, the most likely modification to the bathroom will be the need for easy wheelchair or mobility aid access. For example, manoeuvring space and non trip / slip floors represent the most common and likely need. When building new houses or remodelling these areas, it is preferable to build suitable fixing into the structure which allows for cost effective retrofitting as needs arise. For example it is not advisable to fit handrails into the bathroom if not currently required as they can distract significantly from the homely atmosphere and aesthetics of the environment. Such physical supports may create to an institutionalised appearance.

Visit-ability and the Bathroom: This principle states that people with a disability can visit a home in such a way that at least one entrance point to the bathroom facilities can be easily accessed. The bathroom and surrounding entrance points should be large enough to access the area in a wheelchair (or other mobility aid), allowing for adequate manoeuvrability and full functional use of the amenities.

Capstan Style Taps
Bathroom and Laundry



Lever Mixer
Kitchen Only



Occupational therapist to recommend individual shower chair with adequate load capacity

Strip floor waste to maximise water run-off and minimise the likelihood of slip related injury

19 LAUNDRIES

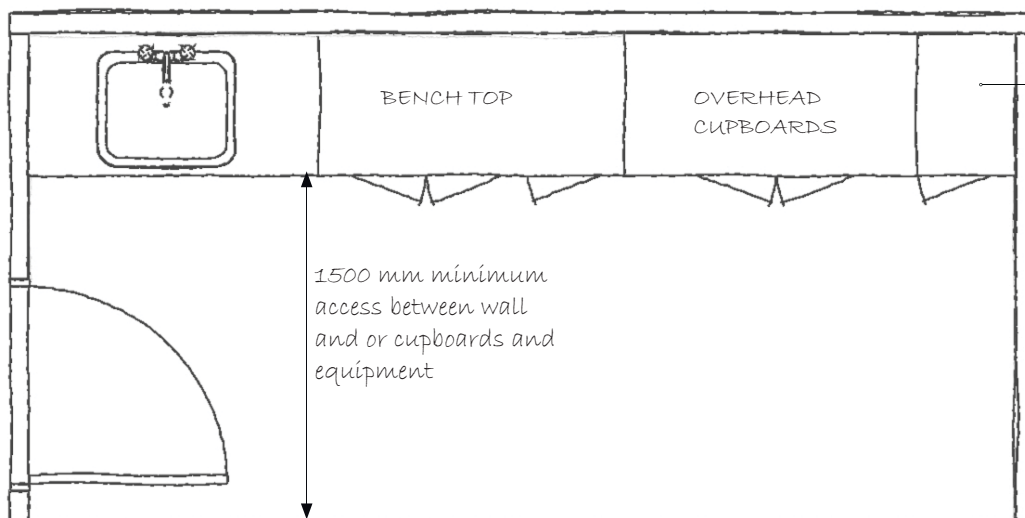
locate laundry on an external wall with natural light and ventilation

Access to external areas from laundry

Maximum tub depth 210mm with space under for seated activities

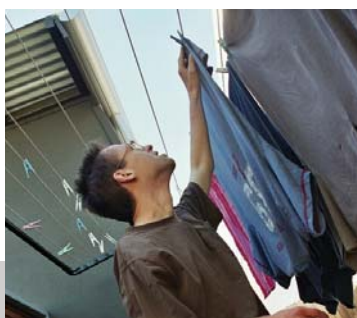


Washing machine and dryer with front mounted controls. Raise on plinth to approximately 900mm above ffl to the inner drum centre line



LAUNDRIES

Laundries traditionally tend to be too small for accessible use. This is largely attributed to the space being used as an entry and exit point as well as a functional laundry. A fully accessible laundry in new buildings is easily achieved by designing the appropriate space for both operating and through traffic. In existing buildings where space is restricted careful use of fittings and fixtures should be considered.



Laundries should allow for appropriate access to an open workbench area for people who use a wheelchair, or prefer to be seated during laundry tasks. This will encourage active participation and can be achieved through minimal modifications.

Pull out ironing boards: Reduce the amount of space required to store the device, as well as provide users with an alternative to the traditional portable ironing boards which can be considered awkward and difficult to manoeuvre for some.

Front loading washing machines: Easy to access and operate for the majority of both seated and non-seated users. If installed at an appropriate height with the centre drum line located at 900mm, front loaders can effectively decrease the amount of bending, reaching and lifting required.

Tap hardware (washing machines): Taps positioned to side of washer for maximum accessibility. No more than 1500mm from finished floor level.

Laundry Tubs: An in-built cupboard underneath prevents some users from accessing the facilities. An easy way to avoid this issue is to install a drop in bench flushline laundry tub, with a maximum depth of 210mm. The tub depth is particularly important for persons who may be seated during activities, as well as to reduce the risk of musculoskeletal injuries associated with bending and lifting.

Tap hardware (Laundry Tub): Reachable within 300mm from front of bench to handle. Taps positioned above trough with a maximum height 1500mm above finished floor level.

Clothes line access: Access to the clothesline via an accessible path with an appropriate slip resistant surface will reduce travel distance and likelihood of accidents.

Clothes line: Fit clothes line at an appropriate height for the users of the accommodation. Folding frame clothes lines offer the best flexibility and use of available space.

Height of bench and space under to accommodate seated activities



BUILDING SERVICES

Building services refer to the fittings and equipment which provide amenities: including heating, cooling, lighting, plumbing and communications expected by today's standards. Designers need to consider the Australian Codes and Regulations whilst meeting individual needs and expectations.

A well planned and built home should act as an environmental filter, providing shelter that controls the elements to create a comfortable internal environment. The World Health Organisation recommends a minimum indoor temperature of 18 degrees Celsius. Below 16 degrees Celsius increases the risk of respiratory problems and below 12 degrees Celsius increases the risk of cardiovascular strain.

Inactive people or people with circulatory problems may require the room temperature to be 2 to 3 degrees higher to feel comfortable and some elderly persons may experience discomfort in the heat. It is important to understand these differences when considering what type of heating, cooling and ventilation systems best suit your needs.

For either heating or cooling, consistent and evenly distributed air-flow is vital. To achieve this, ceiling fans may be required to redirect warm air, (collected at ceiling height) to circulate throughout the room.

Good insulation to the ceiling, wall cavities and under timber floors is essential for efficient temperature control. Windows are also a major source of heat loss and should be fitted with heavy drapes.

Heating and cooling systems vary greatly and have different strengths and weaknesses. For this reason it is important to assess the options against the building type, local climatic conditions and the occupants needs.

Our experience at Endeavour has shown that the most effective temperature control device is the reverse cycle split system air conditioner. This system offers both heating and cooling in one unit and flexibility for individual comfort and control. Another benefit of reverse cycle air conditioners is safety when compared to other heating systems. Ducted systems, although having the ability to be zoned, do not offer the same level of individual control.



LIGHTING

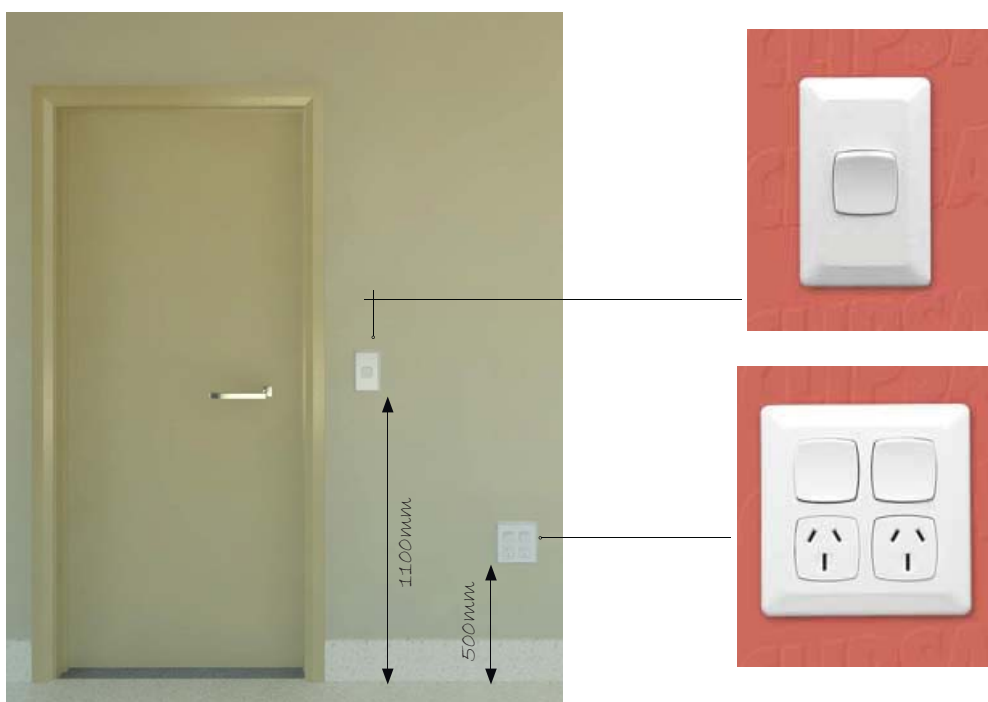
Adequate lighting, fitted with energy efficient bulbs, is important for safety and can contribute to the ambiance of the home. Some people may require brighter lighting for optimal visibility, particularly those who are aging. There are three main types of lighting, task, decorative and background. Task lighting illuminates specific areas for activities and should be at a level that supplies visual clarity. Decorative lighting should be used to highlight features, or as a feature itself to set the mood of the home or the garden. Background lighting is the ambient light in the room. Dimmer switches can be useful for background lighting as they can be adjusted to suit different occasions.

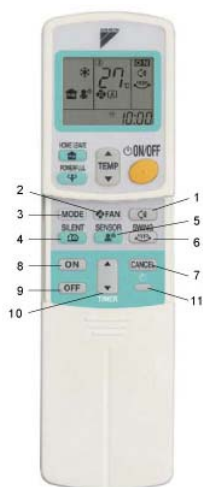
LIGHT SWITCHES

Large rocker type switches are preferred. Consideration should be given to using the illuminated style of switch, as they can be more easily located in the dark. Switches should be placed at a height of 1100mm above the floor, consistent with door handle heights. Where possible they should be at the entrances to rooms and on the same side of the door as the handle. It is not recommended to have more than two switches on one plate as this can create confusion. Sensor or proximity switching in areas such as, halls, stairs or the entrance may be appropriate and should be considered along with two-way switches as they offer security, safety and convenience. Two-way switches are useful in the bedroom with one switch placed close to the bed for ease of use.

POWER OUTLETS

Commonly, the location of power outlets can be an issue due to their placement in hard to reach areas, as well as insufficient outlets for modern day appliance dependence. An inadequate number of switches may encourage the use of extension cords which can become trip hazards. Adaptors have the potential to overload the circuit and therefore a considered approach to both the number and position of outlets is imperative. It is preferred to locate outlets on the front of work benches or 500mm out from a corner and no more than 100mm above the bench top, allowing people in wheelchairs to reach the outlet easily. Wall outlets not related to work benches should be placed at a consistent height of 500mm and at least 500mm away from internal corners.





COMMUNICATIONS

Communication systems and devices change rapidly and regular reviews are valuable to determine what systems are available that can offer the most comfort and assistance. It is advisable to prewire for the unknown at the time of construction, as it is sometimes not practical or cost effective to retro fit later. The following devices should be considered:

- Cordless or mobile phones that can be used from anywhere within the home. They can be supported with a fixed key pad or hands free phone that is conveniently located to allow use by people who may have difficulty holding a phone in one hand and dialling with the other
- Answering machines can be helpful for people that may not be able to move quickly
- Fax machines, as they offer an alternative for people with a hearing impairment
- Communication outlets in bedrooms should be close to the bed, and should be of sufficient cable size and wired back to a central point, to allow for a variety of uses in the future such as telephone, intercom, security and computers

HOT WATER SYSTEMS

The supply temperature of hot water is regulated by Australian plumbing standards, that specify the maximum temperature at the delivery point in bathroom outlets to 50 degrees Celsius in the home and 45 degrees Celsius in aged care or supported accommodation. The standard specifies the laundry and kitchen are optional. These temperature controls can only be achieved by the use of inline temperature limiting valves and not by using the thermostat setting on the water storage unit. Stored hot water must always be kept at a minimum of 60 degrees Celsius to prevent bacterial growth. Hot water storage units should be well insulated to reduce energy costs. The type, size and brand of hot water unit is best determined considering the homes specific circumstances, taking into account the number of occupants, their collective usage patterns and the most economical energy source available at that location.

AUTOMATED CONTROL

Building automation technology is developing quickly and becoming more economical as devices gain wider acceptance. The broad and varied applications of automated control systems are complex and are constantly being improved and expanded, therefore it is not appropriate to give specific advice in this document. It is recommended that automated control be considered as part of any future planning, as there are advantages for both lifestyle enhancement and energy savings are high. Currently they offer the ability to operate almost any electronically controlled device remotely, or by pre-determined settings. They also offer a degree of increased safety as they can monitor appliances not in use and switch off appliances automatically.



FIRE SERVICES

Fire safety equipment and procedures are an essential part of maintaining a safe living environment. The exact requirements and components of managing fire safety vary greatly from house to house depending on many factors, as required by the Building Fire and Rescue Service Act 1990, the Building Fire Safety Regulation 2008 and Building Code of Australia 90 and 96.

Irrespective of the current Regulation, the ability of the occupant should be considered and assessed in order to develop a site specific fire safety plan. For example an audible alarm will not be suitable if the occupant has a hearing impairment, likewise people with a vision impairment may need alternative tactile assistance to locate safe exit points in the event of an emergency.

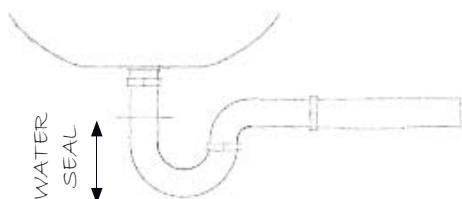
Further advice and assistance on this complex matter should be provided by those who have the knowledge and competency. Internal staff should seek this assistance from either the Endeavour Workplace Health and Safety Manager, or the Fire Safety Equipment Manager.

For assistance in the private home, the Queensland Fire and Rescue Service (QFRS), a division of the Queensland Government Department of Emergency Services and the primary provider of fire and rescue services throughout Queensland have the expertise to provide quality advice.

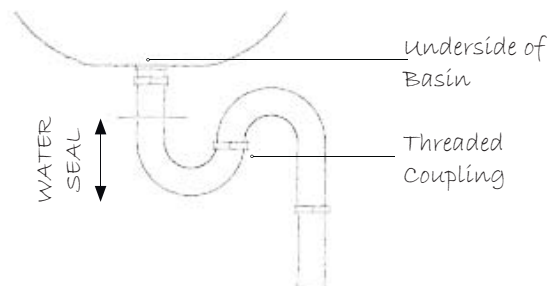
The QFRS has been extremely supportive to Endeavour, offering valuable advice whenever consultation has been needed.

PLUMBING SERVICES

For the toilet and basin install a 'P' trap, instead of an 'S' trap, as this allows for easy relocation of the services and therefore greater flexibility to the space. Waste from the 'P' trap is flushed through the wall, whereas waste from the 'S' trap is connected to a point in the floor. If the basin or toilet need to be relocated to adapt the space for the clients needs, then a 'P' trap will best accommodate future modifications. An additional benefit of the 'P' trap for basins is that they provide better legroom for people in a wheelchair.



'P' TRAP



'S' TRAP

HOUSEKEEPING

Good housekeeping is essential and will extend the useful life of the building if performed correctly. Good housekeeping will also improve the appearance of a home and increase the amenity to the user. The designer should consider material selection and landscaping that will reduce the overall housekeeping demands. The aim for designers is to ensure that the need for special skills and abilities to perform daily maintenance is kept to a minimum.

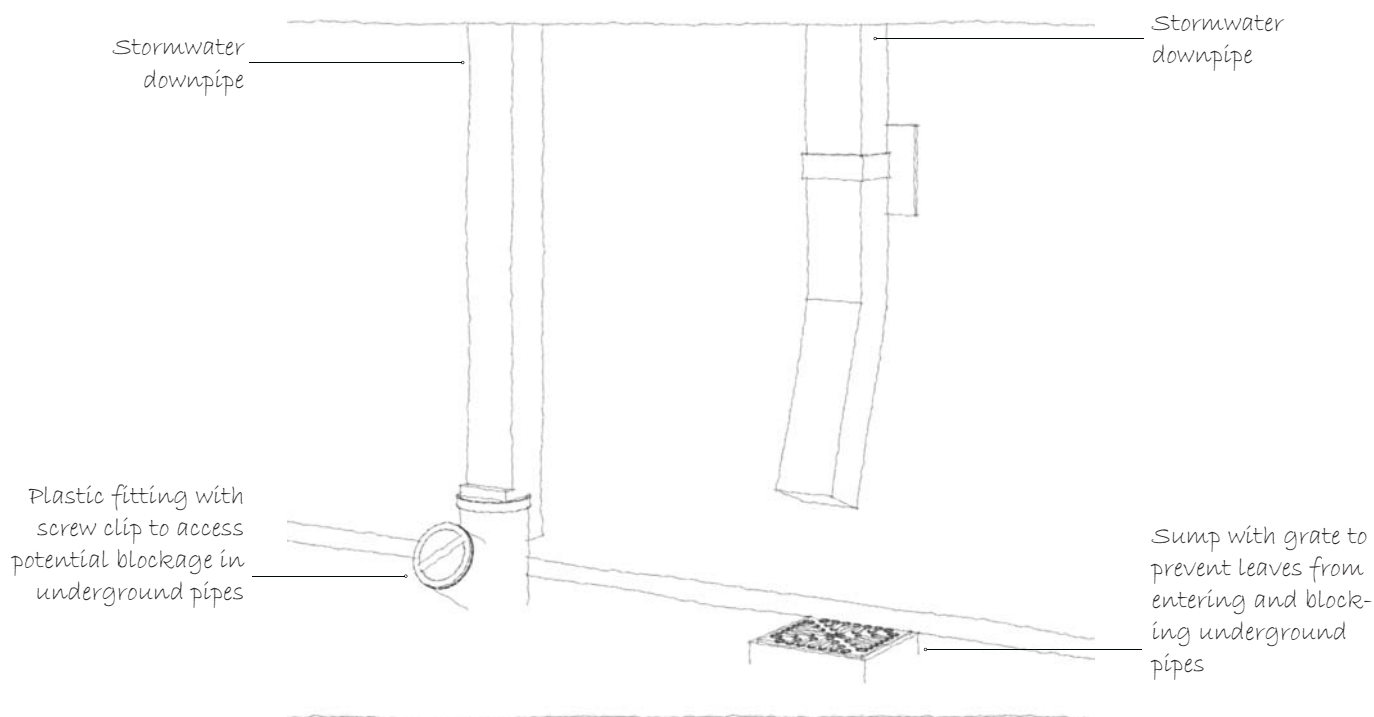
ESSENTIAL DESIGN CONSIDERATIONS

- Select quality, durable products that offer a longer life expectancy
- Avoid light fittings that are located in areas that require tall ladders to access. Consider the use of wall mounted lights and movable lamps
- Use compact fluorescent and energy efficient light fittings in accordance with the legislation
- Avoid the use of carpets in high traffic areas, preference should be given to easy to clean surfaces such as linoleum, strip timber, ceramic or cork tiles
- Avoid the use of timber in exposed areas, where possible use pre-coloured metal to windows, gutters, downpipes, fascias, pergolas and carports
- Locate windows so as they can be cleaned without the need to use specialised cleaning equipment
- Install leaf catchers to down pipes or cut downpipes short of the ground with a sump installed below to prevent leaf litter and debris entering drains
- Avoid large trees close to house footings or paths where tree roots can cause structural damage
- Utilise low maintenance and water wise gardening principles with plants selected for their suitability to the local environment

ESSENTIAL MAINTENANCE

- Regular pruning and garden maintenance
- Keep garden beds away from the house to allow for good visual inspection to the perimeter of the home
- Clean gutters and valleys at regular intervals, especially before storm seasons, to prevent water entering the roof spaces
- Clean paths and paving surfaces in shaded areas of mould and loose debris to prevent the risk of slipping
- Keep wet area floors dry to prevent slip hazards and also protect against rotting of fixtures and structural components. This is especially important in accessible showers that have level floors and shower curtains, as the containment of water within the shower area is more difficult
- Understand and instigate a suitable cleaning program for all air filters within the home, such as: air-conditioners, rangehoods and clothes dryers





Provide suitable and easy access to storm water drain and protection from blockage to reduce maintenance issues



Choosing to use more water efficient products in the home, will save water and reduce water and energy bills



Stand alone bedside unit linked to a vibrating pillow pad to waken an individual from their sleep during an alarm situation



SECURITY

Designing or installing security measures should be tailored to the individual home user. Every person has a different approach to both personal and property risk. For some people a high level of built-in security fittings may make them feel restricted or even claustrophobic whilst other people demand the same measures just to feel safe in their own home. As well as the emotional considerations the designer must also take into account the abilities of the occupant and how those abilities may effect the safe and practical operation of any security equipment or fittings.

Security advice must be balanced carefully against accessibility, livability and competing legislation or regulation. A good example of this is the common recommendation to fit dead locks and security doors to all external entrances. In certain classified accommodation these measures are not allowed as they contravene Fire Safety standards. But perhaps even more importantly they could be extremely difficult, if not impossible for occupants to operate depending on their level of ability. Another example of a commonly used and excepted security device is security screens fitted to windows. Once again on the surface an excellent security measure but viewed against the less likely but potentially deadly advent of fire this measure may eliminate a valuable means of escape, especially on bedroom windows.

It is vital that security measures for new construction or renovation takes into account both the legislative requirements and the specific needs to the occupants for that site. Endeavour is required to seek appropriate advice and direction from the Work Place Health and Safety Manager.

STANDARD SECURITY PRACTICE

- Locks should be fitted to all external doors and windows
- Exit door locks should have quick release lever handles fitted to the internal side of the door that allows for easy exit.
- All locks should be keyed alike
- Handles and locks should be fitted at a maximum height of 1100mm above floor level
- All door and window frames to be adaptable and have provision for future fitting of security screens
- Ensure a well lit, clear line of sight between the vehicle drop off space and the entrance to the house
- Provide a clear viewing panel in, or adjacent to the front entry door
- Pre-wire all bedrooms for future fitting of communication devices, such as:
 - phones
 - intercoms
 - alarms
 - computers

SAFETY

The design and the use of appropriate fixtures, fittings and materials can reduce the risk of accidental injury in and around the home. The designers objective is to provide the safest possible home environment without compromising the livability for both the occupant and their visitors.

EXTERNAL PATHS, WALKWAYS, RAMPS AND PAVED AREAS SAFETY REQUIREMENTS:

- Slip resistant floor surfaces
- Appropriate gradients
- Constructed on a firm base
- Suitably dimensioned for wheelchair or walking frame use
- Kept free of leaves and mould
- Be fitted with handrails if the adjustment surface is not level, or users may benefit

KITCHENS, BATHROOMS, LAUNDRIES AND TOILETS SAFETY REQUIREMENTS:

- Slip resistant floor surfaces
- Floor levels free of trip hazards
- Appropriate fixtures to suit the abilities of the occupants
- Colour contrasted to aid the visually impaired
- Temperature limiting devices that control the hot water to a maximum of 50 degrees Celsius (kitchens and laundries optional)
- Door entry hardware that gives privacy to the occupant, while allowing for access in the event of an emergency
- Grab rails in showers, outside baths and in toilets to suit the current occupant, or provision for easy future fitting as conditions change
- Good manoeuvring, circulation space for those with reduced mobility



Security devices such as security screens fitted to windows and alarms must be balanced against accessibility and usability of the occupant

Access/Accessible-	Means that a person with a disability is, without assistance able to approach, enter, pass to and from and make use of an area and its facilities
Adaptable housing-	Housing that looks like traditional housing but has features designed and constructed for easy modification to suit the needs of any occupant as their needs change
Ambulatory-	Able to walk with or without the artificial aids, such as crutches a cane or a walker
Assistive devices-	Compensatory equipment used to overcome a physical or sensory disability including hand held, electronic and prosthetic aids
Assisted living-	Residential units that provide accommodation and offer the option of medical assistance to residents
Automation systems-	Devices that automatically control systems such as temperature, lighting and water heating within the home
Capstan Tap Handle-	A common tap handle comprising of four prongs in the shape of a cross.
Circulation space-	Rooms such as corridors, passageways and hallways that provide routes to other rooms. Space inside a room that allows access to other parts of a room
Crossfall-	Slight gradient across a footpath to drain off surface water
Cutting and filling-	The method of providing a flat area of land by cutting into the slope at the upper end and using the excavated material to fill at the lower end
Designer-	A person who specialises in designing architectural interiors and their furnishings
Disability-	The loss or reduction of functional ability and activity that is consequent upon impairment (World Health Organization)
Discrimination-	Differential treatment or practice either intentional or otherwise that can occur through action, policy, procedure or practice
Fixtures-	Items of furniture or equipment which are fixed in place with screws or other fixing devices
Gradient-	The rate of change in level of a ramp expressed as a ratio of height per length
Hob-	The low step around the shower area that prevents water flowing across the room
Intergrate/Intergration-	To include everyone. The process of making public or private facilities, services and programs open and available to everyone in the community
Knee space-	The space left vacant for knees under a table or bench
Mobility Disability-	Congenital, disease or injury related conditions that result in impaired motion or mobility

Person with a disability-	A person with a physical, visual, hearing, cognitive, mental, intellectual, emotional or learning impairment that limits a major life activity. A person with a disability has a loss or reduction of functional ability
Physical impairment-	A physiological disorder or condition, which deviates from the body norm and may or may not be disabling
Ramp-	An accessway with a slope steeper than 1:20. The maximum gradient of a ramp suitable for a person in a wheelchair is 1:14
Rocker Switches-	Rocker action, toggle or push pad switches, with a recommended width of 35mm. For people with finger or hand impairments, these will allow ease of use
Sensory impairment-Slip Resistant-	Condition which effects the senses including vision, hearing and touch. Any surface that provides traction for a wheelchair or a person walking, in both wet and dry conditions. For wet conditions AS 1428.1 suggests, concrete with abrasive or texture finish, bituminous concrete, natural stone, paving bricks with abrasive finishes or slip resistant tiles. For dry locations AS 1428.1 suggests, all materials suitable for wet areas, short pile carpet or smooth flooring materials without high gloss finishes
Solar heat gain-Stair risers-	Heat gained from the natural warmth of the sun The vertical component of stairs, should be enclosed. AS 1428.2 recommends a maximum height of 165mm
Stair treads-	The part of the step on which we walk. AS 1428.2 recommends a depth of between 275-300mm and a slip resistant surface
Stair nosing-	The point where the horizontal and vertical front edges of the steps meet. There should be a 50 to 70mm strip of contrasting colour or texture on the tread to assist people with a vision impairment
Step ramp-Tactile-	This spans one step and is similar to a kerb ramp in all its requirements. Relating to the sense of touch
Threshold Ramps-	This is a small ramp at a doorway. Its maximum gradient is 1:8 over a maximum distance of 450mm or a maximum rise of 56mm
Turning space-Universal design-	Room to manoeuvre a wheelchair or vehicle through 360 degrees Product, environment, building design and construction that aims to accommodate the functional needs of everyone; including children, adults and older adults with or without disabilities. The word universal is often seen coupled to specific design environments or products such as universal kitchen or universal bathroom design
User friendly-Wheelchair footprint-	Easy to use Footprint is the floor space a stationery wheelchair takes up. The width includes space for hands on the push rims of a manual wheelchair. The A90 footprint is 1300mm x 800mm and refers to the space taken up by a wheelchair which size is in the 90th percentile of all wheelchairs. AS1428.2 is based on A90 and AS1428.1 is based on the smaller A80 footprint of 1250mm x 740mm

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 Disability Services Regulation 2006
 Disability Discrimination Act 1992
 Food Safety Standards
 Fire Safety Regulation 2008
 Code MP 2.1
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Queensland Government

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- Epilepsy Queensland
- Alzheimer's Australia
- Kidsafe
- Lifetec
- Youngcare
- Anam Cara Wesley Mission
- Allamanda autistic adult accommodation association
- Department of Housing Child Safety and Disability Services Unit
- Department Ageing Disability and Home Care
- Department of Health and Ageing NSW
- Department of Human Services Victoria
- Workplace Education WEPL
- Bunning's Toowoomba
- Clearline Plumbing
- Andrews Light-Up

- Easy Track Australia PTY LTD / The Curtain Place
- Carolyn Carson
- Tamzyn Davey
- Department of Employment and Industrial Relations Workplace Health and Safety
- Department of Housing
- Queensland Dept of Public Works Housing Portfolio
- Queensland Fire and Rescue Service
- Workcover Authority Worksafe building commission Victoria
- Master Builders Association of the ACT
- Building Codes Queensland
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- Endeavour Disability Services
- IHC New Zealand Inc
- University of Nottingham
- Independent Living Centre NSW
- IA Group
- Bosch Home Appliances
- Comkitchen
- Harvey Norman Commercial Qld

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92 Old Eltham Road Lower Plenty 3093
T (03) 9431 3472 F (03) 9431 3046
www.accessinstituteaustralia.com.au
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