

# Safety and Security

Good building design can help achieve a safer and secure living environment. These design features can be incorporated upfront in the design and construction phase or through ongoing modification and maintenance. This fact sheet should be read in conjunction with 3.2 The Adaptable House, 3.3 The Healthy Home and 3.5 Bushfires.

## SAFETY

Most accidents occur in the home. The design of a house, construction methods, materials, finishes, appliances and maintenance all influence home safety. This section provides an overview of safety issues relating to:

- > Kitchens.
- > Bathrooms.
- > Fittings (doors, windows and hot water systems).
- > Outdoor areas.
- > Fire risk prevention.

## Kitchen safety

The majority of domestic accidents occur in the kitchen and bathroom.

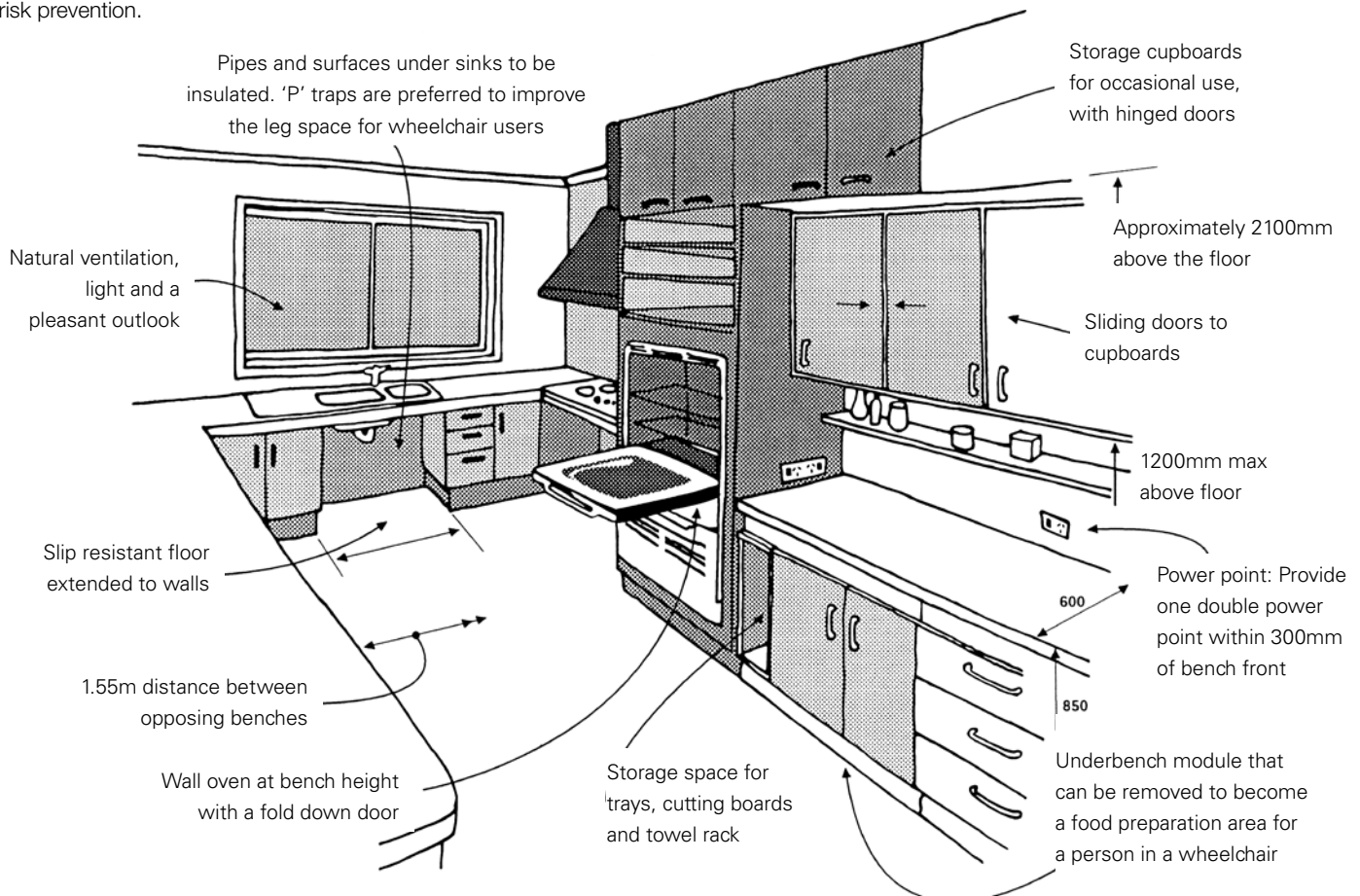
Apply the following general design tips to reduce the likelihood of accidents:

- > Design for unobstructed access to the work triangle (the area containing the stove, sink and refrigerator).
- > Eliminate or reduce cross traffic through the work triangle.
- > Protect hot plates with a guardrail or deep setback and use fire resistant finishes adjacent to and above the cook top.
- > Round-off bench edges and corners.
- > Design heatproof benchtops or inserts either side of oven and grill for rapid set down of hot dishes and trays.

- > Locate microwave ovens above the eye level of children or at back of a bench to prevent them gazing into it. Have the microwave checked regularly for microwave leakage.

## Bathroom safety

- > Use slip resistant flooring and avoid steps.
- > Provide handles and bars near baths, in showers and adjacent to toilets for elderly and disabled users.
- > Design and install child resistant cabinets for medicines and hazardous substances.
- > Comply with Australian Standards that specify minimum distances between water sources (baths, basins, tubs) and power points.



- > Comply with the BCA requirements for outward opening of sanitary WC doors or install sliding doors or use hinges that permit doors to be removed from the outside. Many heart attacks occur in WCs with the victim blocking inward opening doors.
- > Ensure that privacy locks on bathroom doors can be opened from the outside in the case of an emergency.
- > Provide a night light or movement sensitive light switch in the passage for safe access to the toilet at night.

## Fittings

### Hot water

- > Instantaneous hot water systems should have their thermostats set at 50°C or less to help prevent scalding.
- > Hot water storage systems should be set to at 60°C to inhibit growth of harmful bacteria such as legionella. Incorporate a fail-safe mixing valve on both the bath and shower to avoid scalding. [See: 6.5 Hot Water Service]
- > Install a tempering valve or an outlet shut-off valve in your existing system to reduce the flow of water to a trickle if it's too hot. When cold water is added and the temperature becomes safe, the valve opens and the flow returns to normal. This can prevent accidents if you have small children or elderly people in your home.

### Doors

- > Install self-closing (but not self-locking) screen doors at external entrances.
- > Internal door handles should be one metre from the floor so young children cannot open them.

- > Consider latch rather than knob type handles for ease of use by weak or disabled people.

### Floors, stairs and ramps

- > Use ramps instead of stairs where possible.
- > Observe optimum rise to run ratios for stairs as shown in the figure below.
- > Ensure that stair rails and balustrades comply with BCA minimum standards. Balustrades with maximum 125mm gap between balusters must be provided where finished floor level is higher than one metre above the ground level.
- > Avoid changes of level within the house and between the house and the outside. Where changes of level are necessary, ensure that they are clearly visible with colour change in floor covering.

## Use non-slip, impact absorbing floor surfaces where possible, especially on stairs or ramps and in wet areas.

### Windows

- > Design windows with easy access for opening, closing and cleaning. Windows should comply with requirements of the Australian Standard 1926.1-1993 in situations where the window provides access from a building to a swimming pool area.
- > In areas of a building that have a high potential for human impact grade A safety glazing should be used. Glazing in high human impact areas should be marked to make it readily visible according with section 3.6.4.6 of the BCA.
- > Ensure that all new glazing complies with relevant Australian standards and bears a manufacturer's stamp certifying compliance.

### Wiring and electrical

- > Carefully plan the provision of power outlets. Insist on an electrical layout plan. It will save you later inconvenience and may save your life.
- > Install earth leakage devices and circuit breakers to all power outlets.
- > Provide adequate power points and circuits. This eliminates the need for power boards, which can overload circuitry. It also reduces the need for cords to trail across walkways, where they can trip or electrocute.
- > Ensure that the switchboard can be easily accessed at night. Safety switches should be used on indoor and outdoor circuits.

### Heaters

- > Ensure fan heaters have a safety switch to cut power off if the fan stops or heater overheats.
- > Never leave a heater unattended.
- > Position the heater to avoid intake blockage or material falling on it.
- > Pets may lie close to heaters and accidentally knock bedding, mats and other materials onto the heater.

### Ceiling fans

Position ceiling fans at least 2.4m above floor level to reduce risk of injury.

## Outdoor safety

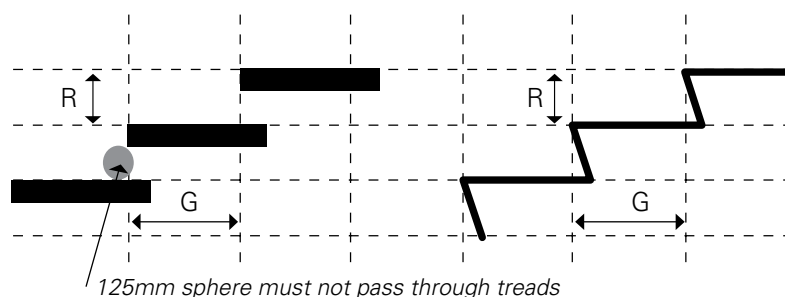
- > Plant light coloured plants along the edges of paths to make them clearer at night.
- > Provide solar powered or movement sensitive outdoor lighting along paths, especially near steps or bends. Use energy efficient lighting. [See: 6.3 Lighting]
- > Provide safety fencing around pools and ponds in accordance with BCA and state regulations to prevent access by unsupervised children.

## Fire risk and prevention

- > Use fire resistant materials, linings and finishes, particularly in kitchens.
- > Install smoke alarms and regularly ensure that batteries are fitted correctly and still charged.
- > Equip the home with fire extinguishers.
- > Consider installing a domestic sprinkler system.

### STAIR RISER AND GOING DIMENSIONS (mm)

Stair type	Riser (R) (see figure below)		Going (G) (see figure below)		Slope relationship (2R+G)	
	MAX	MIN	MAX	MIN	MAX	MIN
Stairs (other than spiral)	190	115	355	240	700	550
Spiral	220	140	370	210	680	590



## House fires can often be prevented through careful design and maintenance.

> Favour furnishings and floor coverings with fire retardant properties. Ratings are available for many items and include flammability indexes, spread of flame indexes and smoke generated indexes. Various construction systems have fire ratings that determine how long they will withstand a fire and retain structural integrity. Ask your local council for full details.

## SECURITY

The view that crime prevention and security is only a matter for law enforcement agencies is no longer true. Individuals, neighbourhoods, local authorities and planners can all play a role in reducing the incidence and fear of crime.

Appropriate design of individual dwellings and their relationship to one another and to the surrounding neighbourhood can all play a part in preventing crime. This approach is often referred to as 'crime prevention through environmental design' and there is a lot of evidence based research to show that it works.

## Many burglaries are opportunist crimes. A burglar only needs to spot an open window or an unlocked door or gate to make their move.

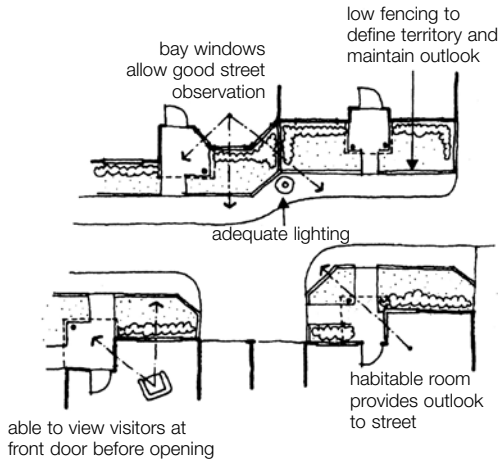
The principles for crime prevention through design for individuals and neighbourhoods include the following:

### Territoriality

Outdoor spaces should be designed to foster a stronger sense of ownership and communality. In apartments, for example, residents need to feel that public spaces such as halls and elevators belong to them.

### Natural surveillance

Surveillance should be a part of the normal and routine activities of individuals and neighbourhoods. It can be enhanced by positioning windows for clear sightlines so streets, footpaths and play areas can be watched.



### Target hardening

Improve building security standards. Locks and security screens should be installed to deter thieves. Doors, windows and halls should be made more secure, and the quality of exterior doors, door frames, hinges and locks must be high. Exterior lighting and alarm systems can add to security.

### Access control

Use real or perceived barriers to discourage intruders. Real barriers include a picket fence, a brick wall or a hedge. Perceived barriers can be created by a flower garden or a change in level or design between the public space of a footpath and private front yard.

(The above has been adapted from Geason and Wilson, 1989).

See also the quick tips below:

- > Install an intruder alarm system according to the Australian Standard (AS 2201.1, Intruder alarm systems Part 1: Systems installed in client's premises).
- > Display security system notices prominently.
- > Select a security system with low standby power consumption. Many systems use excessive electrical energy over a year. [See: 6.1 Energy Use Introduction]
- > Design or modify your home to eliminate dark corners, narrow pedestrian walkways and hidden recesses.
- > Design balconies and windows to maximise natural observation of vehicle and pedestrian movement.
- > Ensure that perimeter doors and windows are of solid construction and fitted with quality deadlocking devices.
- > Glass should be reinforced with shatter resistant material to prevent entry.
- > Ensure that skylights and roofing tiles can not be easily removed from the outside.

- > Fit the main entry doors with viewing ports to allow identification of visitors.
- > Direct infrared activated security lights toward likely access/egress areas to illuminate potential offenders.
- > Avoid or modify trees, carports and lattices that can act as 'ladders' to upper storeys.
- > Ensure that external storage areas, laundries, letterboxes and communal areas are well lit and observable from inside.
- > Clearly delineate property boundaries using gardens, distinctive paving, lawn strips, ramps and fences.
- > Fences and walls should be low and/or open to improve observation and maximise sunlight. Vegetation should not obscure building entrances, windows and other vulnerable areas.
- > Ensure that entrances are clearly private and well illuminated.
- > Install sensor lighting or timed lighting that can be controlled from within the dwelling.
- > Join or establish Community Safe House programs in your area.
- > Provide pleasant, well-defined pedestrian routes overlooked by neighbouring houses and employ traffic calming measures to slow cars and encourage pedestrian activity where possible. [See: 2.3 Streetscape; 2.6 Transport]
- > Set buildings back from the verge to create a perception of semi-private space.
- > Encourage casual use of public and semi-private open spaces during evening hours so they can be 'animated' with legitimate activities.

### ADDITIONAL READING

Geason, S. and Wilson, P., (1989), *Designing Out Crime: Crime Prevention Through Environmental Design*, Australian Institute of Criminology, Canberra.

SA Department of Justice, Crime Prevention through Environmental Design  
www.cpu.sa.gov.au/cpted.html

UK Association of Police Offices – Crime Prevention Initiative, Secured by Design  
www.securedbydesign.com

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