

Home Modifications Booklet IV 2007

Kitchen

Spina Bifida and Hydrocephalus Queensland and Montrose Access

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October 2004

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October 2007

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Standards and government legislation are continually changing, as is the type of equipment available due to improvement in technology. Prices and contacts are current as at September 2007. Because costs change, prices are included as a guide only. Please use the contact numbers provided to obtain the most recent and up to date information.

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Acknowledgements

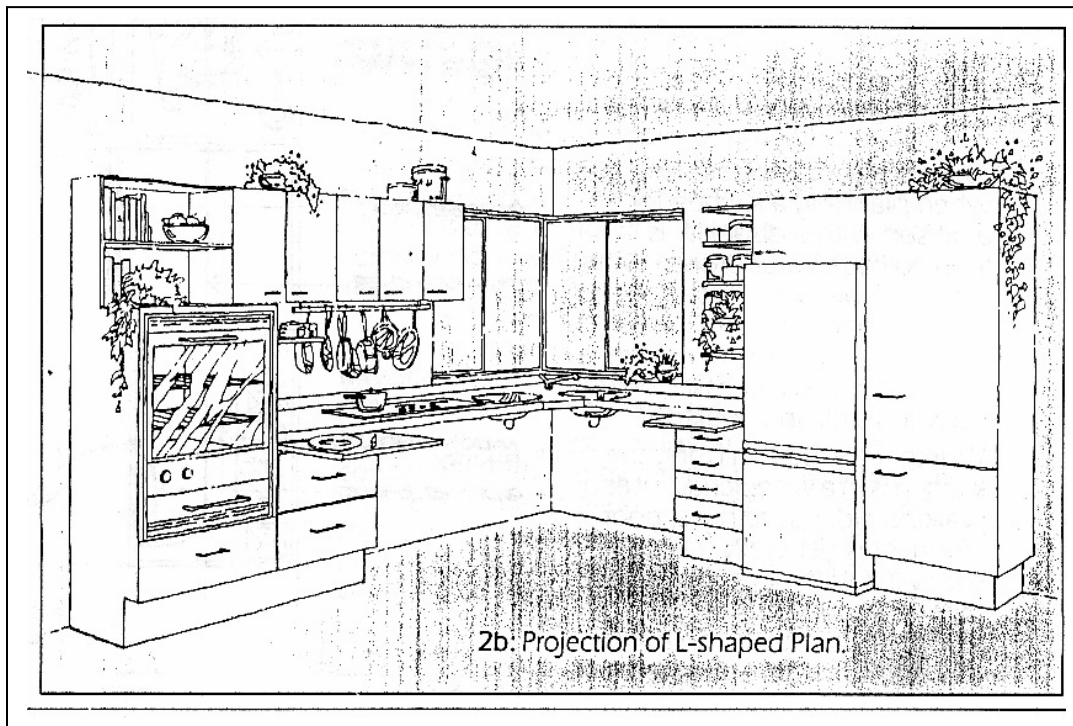
Originally devised by Mary Rydstrom

Linda Moylan and Belinda Harris, occupational therapy students from the University of Queensland completed this booklet in July 2004.

Table of Contents

KITCHEN	5
<i>Purpose</i>	5
<i>Design</i>	5
<i>Layout</i>	6
<i>Lighting</i>	7
<i>Flooring</i>	7
<i>Benches</i>	8
<i>Storage</i>	9
Drawers and cupboards	9
Mobile trolleys	10
Pantry	10
<i>Sink</i>	11
Waste disposal	11
Taps	12
<i>Appliances</i>	13
<i>Cooktops</i>	14
Electric cooktop:	14
Gas cooktop:	14
Layout	15
Controls	15
Installation	16
Kitchen extractor fan	16
Portable cooktops	16
<i>Wall oven</i>	17
Controls	17
Oven door	18
Shelves	18
Other available features	18
<i>Microwave</i>	19
<i>Refrigerator</i>	19
Shelves	20
Other features to consider	20
<i>Dishwasher</i>	21
<i>Additional kitchen equipment</i>	21
Non-slip matting	21
Jar and can openers	21
APPENDIX - KITCHEN	22
Appendix 1 - Suppliers	22

Kitchen



(Sourced from 'kitchen planning for people with disabilities' ILC NSW, 1987)

Kitchen

Purpose

The kitchen area requires particular attention to design detail to suit the accessibility needs of all home occupants. The kitchen is one of the most welcoming areas of the home. It is not simply an area in which food is prepared, but an area which people gather lured by the cooking aromas (Building commission, 2002). The following suggestions are to ensure the kitchen is welcoming and accessible to everyone, with a particular emphasis on people with wheelchair mobility needs. This section aims provide the reader with suggestions which might meet the family's needs now and as they change in the unforeseeable future

What to consider when modifying a kitchen

Design

Firstly, it is important to consider whether the wheelchair user requires full, partial or minimal access to the kitchen facilities. For example, a person may not have the physical abilities to prepare a meal or they may have someone complete meal preparation for them. Some people may only require partial access to the refrigerator and one bench for simple meal preparation and others may require full access to all kitchen facilities.

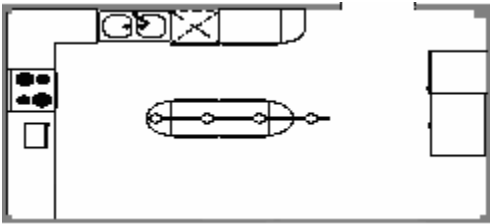
When designing a kitchen for a person who uses a wheelchair, consider the following dimensions:

- Height of knee space required to allow them to sit comfortably at a work bench, sink or the stove.
- Height of toe space to improve access to low cupboards and drawers.
- Maximum work bench height that can be reached.
- Persons reach range sideways, upwards and downwards to determine maximum shelf depth and heights.
- Circulation or turning space should be at least a 1500mm diameter circle. If this amount of space is not possible when renovating, consider installing slim-line cupboards with broader bench tops to allow space under the bench for wheelchair manoeuvring. Similarly, if deeper toe recesses are provided, a 1400mm diameter circle may be sufficient (Building commission, 2002).
- For wheelchair users, adequate knee space is necessary to permit access to the sink, workbenches and appliances. A minimum width of 750mm and height of 650mm is required for clearance of the knees. If a chair has armrests such as most power chairs,

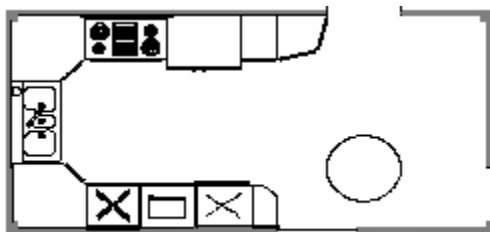
a minimum height of 750mm is required to manoeuvre the wheelchair under a bench or the sink (Building commission, 2002).

Layout

Efficient kitchens are usually designed around a work triangle. The refrigerator, cook-top and sink form an important 'work triangle'. When designing a new kitchen, begin by considering the kitchen's three primary fittings and their optimal location to enhance meal preparation. Incorporate these work areas into a kitchen arranged in an 'L' or 'U' shape to allow for sufficient access and circulation space.



L shaped kitchen: The dishwasher is located next to the sink (light x mark) and the refrigerator/freezer is located on the right side of the drawing (opposite the cooktop). A microwave is located next to the oven. L-shaped kitchens make good use of corner space



U Shaped Kitchen: The refrigerator/freezer is located next to the cooktop. The dishwasher is located in the lower left portion of the drawing (dark x mark) and the built-in wall oven is located on the bottom right portion of the drawing (light x mark). A microwave is placed on the counter in between the dishwasher and oven. U-shaped kitchens have extra storage facilities but may compromise the circulation space required for a

(WSU rehabilitation Engineering Accessible kitchen website)

- With either layout avoid placing equipment in the corners, as this limits the approach that a person can access the equipment from a wheelchair (Building Commission, 2002).
- Its best to design a kitchen to maximise access to the dining and waste disposal areas of the home is optimal. .
- To minimise the opportunity for collisions place the pantry and fridge near the entry of the kitchen and the stove, oven and sink away from the entry (Department of Housing, 2004). Some other important factors to consider when designing the layout include: frequency of use of items, ability to slide items and reducing distances required to travel (Hunter, 1992).
- To ensure safety it is suggested to place a fire extinguisher and a fire blanket near the cooktop, as this is where most kitchen fires originate.

Lighting

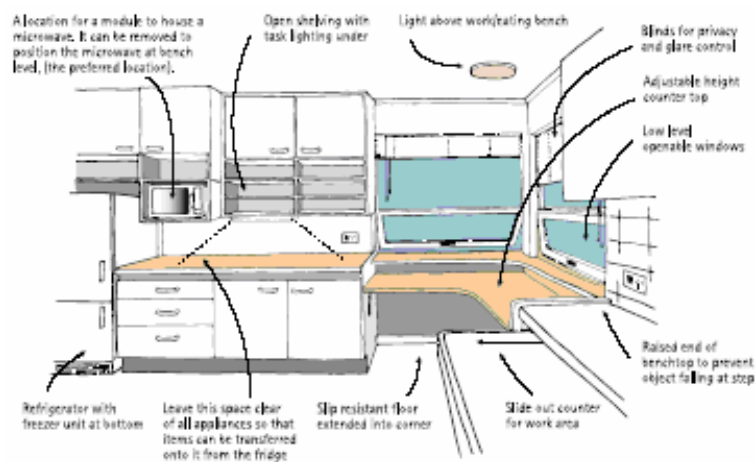
- A well-lit kitchen is easier to work in and clean. Install a number of lights, especially in front or above major work surfaces to prevent shadows from occurring i.e. stove and sink (Building commission, 2002).
- Replace normal light bulbs with higher output bulbs, to increase illumination. Illumination for general kitchen use may be 200-250, however for task lighting may increase to 300-350.
- Avoid using highly reflective or polished floors or benches to eliminate glare.
- When designing the kitchen consider the location of the windows to maximise natural light and take advantage of any views present (Hunter, 1992).

Flooring

- The kitchen is a frequently used area of the home and the flooring must be durable, resistant to grease and easy to keep clean.
- Recommended floor coverings for the kitchen include slip-resistive when wet surfaces which comply with the requirements of AS/NZS 4586. Please refer to the flooring section in internal access for more information.

Benches

- Ensure there is adequate counter space adjacent to each of the work areas (stove/oven, fridge and sink).
- If possible, maintain unbroken work surfaces which are heat resistant. This is particularly important between the sink and cooktop to allow users to slide heavy or hot objects along the bench.
- A standard bench height of 900mm might be too high to be used comfortably by a person in a wheelchair. A lower bench height of 800-850mm might be more suitable, however it may hinder access for ambulant users.
- When benches need to be used by multiple users, consider a compromised height of 850mm depending on the measurements of the other family members in the home. Or an alternative is to retain the standard bench height and install work surfaces at different heights. For example, pullout and retractable work boards on runners or adjustable height work benches at heights between 650 - 800mm (Building commission, 2002). This will provide food preparation areas to a person in a wheelchair and maintain knee spaces to allow access beneath benches and food preparation areas.
- The preferred bench depth is 600mm unless a person has limited reach or there are space restrictions. A bench depth should not exceed an individual's reach to ensure they can grasp all objects and clean the entire surface (Building commission, 2002).



HEIGHT ADJUSTING AND PULL OUT BENCHES

(Master Builders Association, 2001)

Storage

Adequate storage space is essential. Suitable cupboards, shelving and appliance storage in the kitchen can make working in this area much quicker and easier. Standard counters limit storage for wheelchair users and a significant amount of storage space may be lost when moving cupboards to increase knee space under work counters, especially the sink.

Drawers and cupboards

- A significant amount of storage space may be lost when moving cupboards to increase knee space under work counters, especially the sink. To increase the amount of kitchen storage, fit doors with storage baskets attached to knee space areas. This can also serve to improve the appearance of knee space areas by hiding plumbing and wiring.
- Drawers are more useful than shelves as the user can see all items stored.
- Storage drawers should be mounted on easy-glide runners with stoppers for easy use and to prevent the drawer opening too far.
- Deep drawers are particularly useful near the cooktop for storage of heavy pots and pans.
- It is recommended that storage should be no more than 600mm deep and 500 - 1000mm above floor level.
- Store frequently used items between knee and shoulder height (Building commission, 2002).
- Narrow or shallow shelving fitted above bench height does not interfere with the use of the bench and can be used for storage of small items such as mugs.
- Where possible, avoid placing storage in corners as it is difficult to access even with revolving shelves (Building commission, 2002). Corner units or cupboards should have bifolding doors with pullout semi-circular storage, revolving shelves or a swing out semi-circular carousel. This involves ½ round basket shelves that swing out with the door and slide further out of a track.
- Pullout wire baskets are light to use and fit in most cupboards.
- For the rarely used items in hard to reach places a long-handled pick-up stick or timber rod with a hook at the end can be used to reach the items you want (Over 100 ways to improve access into the home, 2007).

Mobile trolleys

- A useful option for storing frequently used items
- The top can be used as a work surface or alternatively, the trolley can be used as a means of transporting items eg when setting the table
- Can be fitted with wire basket drawers or shelves. Be careful not to overload the drawers with heavy items as the trolley may overbalance when the drawers are opened
- When the trolley is not in use, it can be stored underneath a bench. (Building commission, 2002).

Pantry

Pantries need to be spacious and easily accessed from the cooking area of the kitchen. There are a number of options for pantries including:



- Walk in or wheel-in (a wheel-in pantry must have the flooring continuous with the kitchen floor)
- Installation of a lazy susan (a rotating shelf)
- Pull-out pantry. Pull out pantry need to be fitted with heavy-duty extension runners. It must be noted they require reasonable strength to pull out.
- Shallow shelved pantry with adjustable shelves.

(Smartpack: you've got it made, 2007)

- Full ('U' shaped) shelving is recommended with shallow half doors with 170° hinges. Stepped shelves elevate the rear rows and make items stored there easier to find.

Cupboard and pantry doors

Doors can be removed to enable easy access to cupboard contents.

- If doors are preferred it is best to use hinges that allow the door to open to 170°, as doors that only open to 90° may restrict access. Another option is to install 'disappearing' doors that slide back out of view when opened (Hunter, 1992).
- Magnetic or press release door catches can be useful.
- Door handles should be easy to grip. On high level cupboards the door handles should be fixed at the bottom. Similarly, low level cupboards and drawers should have handles fixed at the top. Refer to the Door Handles section previously discussed in internal access for more information.

Sink

- The sink should be centrally located and positioned close to the front edge of the bench for ease of access to taps. It can be placed in a corner for good use of space. Regardless of the sink location, ensure adequate bench space at preferably the same height as the sink (Building commission, 2002).
- A standard kitchen sink height might be too high. For sinks being used by multiple users, a compromise sink height may be determined or alternatively, an adjustable sink could be installed. Manually adjustable sinks that are fixed in place with bolts or mechanically adjusting sinks are available.
- To improve access, remove the cupboards and shelves from beneath the sink to create knee space, aim for at least 800mm wide. Plumbing and waste disposal should be redirected where possible and the underside of the sink should be covered with a panel or insulation to prevent the risk of burns and scalds. Exposed pipes should be insulated or made from PVC (Building commission, 2002).
- Install a sink with a shallow bowl (150mm maximum) if possible. This will reduce unnecessary reaching into a deeper sink. If this is not practical, a large plastic bowl mounted on a block of wood may be useful. (Independent Living Centre NSW, 1987).

Waste disposal

- Electric in-sink disposal units are a useful way to reduce the amount of rubbish that has to be carried to an outdoor garbage area. Consideration needs to be given to the amount of knee space required as these devices occupy space under the kitchen sink.
- Alternatively, a small bin that is separate to the main waste bin can be used for organic food wastes to be later distributed throughout the garden as compost.

Taps

- The faucet for the kitchen sink should be easy to operate to assist people with limited hand dexterity.



A single lever ceramic disk mixer tap that controls both the water temperature and the rate of flow is recommended. As rotating taps can be difficult to operate with a weak hand grip.

(Enware Australia Pty Limited, 2007)

- Taps with retractable (pullout) hose fittings are useful for filling pans or jugs on an adjacent bench. The entire tap and hose unit must be installed.
- Taps can be mounted to the side of the sink for easier access (Building commission, 2002).
- An instant boiling water tap can also be installed for convenience purposes.



Removable tap turner

A removable tap turner might help with turning a standard tap

See tap section in bathroom information for further details.

(Over a 100 ways to improve accessing your home, 2007)

Appliances

When choosing major appliances and equipment, consider the following features:

- **Height:** Can shelves, handles and controls be easily reached?
- **Width:** Does the appliance fit in the allotted space?
- **Door opening:** Which side does the door open? Does it hinder access?
- **Location and type of controls:** Where are they positioned on the appliance? Are they easy to use?
- **Cleaning:** Is it self-cleaning? How easy is it to remove component parts for cleaning?
- **Energy:** Is the appliance energy efficient? What are the running costs?
- **Noise:** How much noise does the appliance make?
- **Warranty:** What is the length and conditions of warranty?
- **Safety features:** Are there basic or additional features? Child proof locks?

In the 'other helpful sources' section in kitchen appendix there are some helpful resources which test and provide valuable advice on products on behalf of consumers

Cooktops

- Installation of a separate cooktop unit and wall oven instead of a conventional stove allows for better access for wheelchair users and can be installed at an appropriate height.
- Freestanding stoves with the oven under the cooktop are not easily accessible and are not recommended.

Electric cooktop:

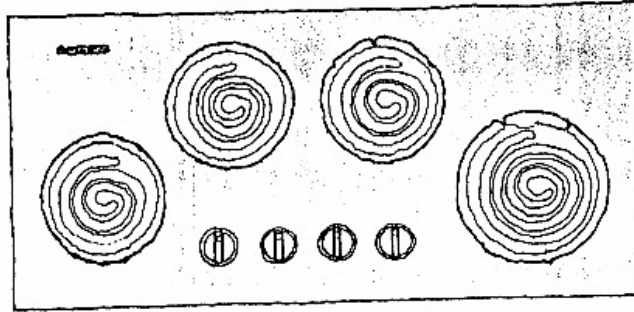
- Radiant coil: Heats quickly, often easier to determine when the element is ON. May be difficult to clean, although some models come with removable spill bowls and elements for cleaning purposes.
- Solid sealed: Easier to clean than radiant coil but retains heat once element is turned off.
- Ceramic glass: Elements are located under the ceramic glass surface. This is easier to clean and allows pots to slide easily across the surface. Consider the durability when sliding pots.
- Induction elements: Electric induction elements provide best cooktop performance, safe and efficient. Unlike other electric elements, induction elements provide the precise temperature control of gas burners for gourmet cooks. Turning the dial down, the heat energy to the pan immediately decreases. Magnetic waves have no effect on skin or anything other than iron or steel. If the pan is accidentally removed from the cooktop by a child, no more heat is produced.

Gas cooktop:

- These are available with continuous or individual trivets. It is easier to slide pots across a continuous trivet cooktop surfaces. Additionally, for easy sliding of pots there are gas cooking tops which are recessed below the bench level so the tops of the trivets are level with the work top.
- Gas cooktops are generally cheaper to run than electric. Consider the ease of ignition via press button, gas gun, automatic or push and turn dial.
- Gas appliances reach a high cooking temperature quickly and use a naked flame, which increases the risk of fire. They also cool quickly and are less likely to burn if touched.
- Cooktops should be level with adjacent work surfaces and generally positioned away from high traffic areas.

Layout

- A staggered or half moon layout avoids the need to reach over other elements to access rear elements. Power points must not be located in a position that requires any user to reach across a hotplate.



(Independent Living centre NSW, 1987)

Controls

The location and type of the cooktop controls is also important.

- Control knobs should be situated across the front or the side of the cooktop to avoid the need to reach over or between hot elements. It must be noted that if the controls are located at the front of the cook-top, they can present a danger to children.
- Controls should be large and easy to manipulate with a cross bar and central markings.
- They should click in the OFF position and have a pilot light to indicate ON.



If the hotplate controls are too small to grasp, a 'contour turner' can be used to help with turning the control by placing it over the top of the hotplate controls.

(Over a 100 ways to improve accessing your home, 2007)

Installation

- Install the cooktop in a bench-top as close to the sink as possible to enable the easy transfer of heavy dishes to and from the sink.
- Knee space underneath the cooktop enables a wheelchair user to get as close as possible, although the underside must be insulated to prevent burns of the lower limbs.
- A small mirror on a handle or wall mounted angle mirror allows for easy checking of saucepan contents from a seated position.
- Recommend choosing a cooktop which has a lip to protect wheelchair users from spilling hot liquids onto their lap.
- A small protective guard rail in front of the cooking top, might be appropriate to prevent accidental reaching across hot elements and to minimise the risk of cooking containers being knocked off the cooking top (Hunter, 1992)

Kitchen extractor fan

Exhaust fans are important to prevent the accumulation of smells and moisture. They are usually located in a hood above the cooktop and contain task lighting.

- The switch for the extractor fan should be located preferably under the bench or at an easily accessible location (Building Commission, 2002).
- Set the height for the extractor fan high enough so that people aren't bumping their heads as they inspect pots, yet low enough to be able to access the filter to clean it.

Portable cooktops

Portable cooktops are also available as a cheap option if a cooktop is unsafe to access. Portable hotplates can be located at a height suitable for the user.



Available in single and dual types with solid plates, thermostat control and power ON indicator lamp.

(Lifetec Queensland, 2007)

Wall oven

A range of ovens are available with different methods of heating, sizing and finishes. For example:

Convection: Convection ovens circulate air throughout the cooking chamber in order to increase heat transfer to foods and reduce cooking times. Convection ovens are relatively easy to use, small, portable and reasonably priced.

Conventional: A standard oven with no fan and an exposed element on the bottom. Some may have a top element for browning or grilling. These are sometimes difficult to clean if the bottom element is not hinged.

Fan forced: The heating element is located at the back of the oven around a fan. This fan circulates heat quickly and evenly, saving time and energy.

Multifunction: This allows you to use the oven with or without a fan and using a combination of fan and elements. Generally these types of ovens have the grill inside the oven, not separate.

Grill: It can be separate (below the oven) or in the oven. Note whether a handle is supplied on the grill tray. Ensure the back of the grill tray is accessible once it is pulled forward, to prevent burns to the top of the hands. When the grill is located inside the oven, the grill tray handle may become hot when the oven is in use.

- The height of the wall oven should be such that the middle shelf is at the same height as the adjacent workbench or surface.
- A heat-resistant counter should be located near the wall unit to provide a rest for hot items from the oven.
- Avoid placing the ovens next to the refrigerator.
- For closer access have a knee space area beside the oven (on the side from which the door opens).

Controls

Oven controls should be positioned for ease of use and viewing. For a person in a wheelchair, this will usually be at the bottom of the oven. Large, easy to grasp knobs with central crossbars are easiest to operate. Touch controls and electronic programming are additional options.

Oven door

It is recommended that doors have a large clear window to allow the user to inspect the food without having to open the oven (Building Commission, 2002).

- A side-opening door improves access. Left and right opening doors are available and the choice will depend on the layout of the kitchen. Aim for side opening doors which open back to 170 degrees. The lowest edge of the door should clear the armrests of a wheelchair (760mm).
- Drop down and slide under doors are also available. Drop down doors have the advantage of a surface for temporary placement of hot containers, and also protect against accidental spillages (especially for a person in a wheelchair) (Hunter, 1992).
- Large D-handles are easiest to use to open the oven, especially as most ovens have a seal.

Shelves

- Internal oven shelves should be pullout, non-tip and have stoppers to prevent them from falling out of the oven.
- A sturdy, pullout and heat-resistant shelf directly under the side-opening oven are useful to place hot dishes directly onto.

Other available features

- Some of these features include electronic programming, rotisserie, roast probe food thermometer, self cleaning ability (catalytic vitreous coating), eye level grill, audio temperature indicator and a built in exhaust system.
- A self-cleaning oven may reduce the need for awkward positions and excessive housework for a person in a wheelchair.



(Lifetec Queensland, 2007)

Microwave

They are light and portable and can be easily accessed with the side-opening door (Building Commission, 2002). Preparation and cleaning time are minimised, providing a useful appliance for people with a variety of difficulties in strength, energy, movement, sensation and memory.

- Microwaves should be located at a height that enables the controls and turntable to be easily accessible. Allow knee space at the side on which the door opens for closer access if possible.
- Dial controls might be the most suitable, as they are easy to read and use.
- Allow bench space in front of the microwave by placing the appliance in the corner. This is so dishes can be slid out of the microwave and onto the bench.
- Plastic microwave cookware is easier to lift and carry than heavier traditional cookware, although heatproof mitts should be worn when carrying hot items.

Refrigerator

Many regular household refrigerators are adequate for use by wheelchair users, although some are more suitable than others due to the height and position of the freezer compartment.

There are different styles of refrigerators available:

- One/two doors with freezer at top
 - One/two doors with freezer at bottom
 - Two doors with freezer and fridge side by side
 - Small bar fridge
 - Single door freezer
- Compact side by side refrigerator and freezer units are a good option as they offer the most accessibility to fridge and freezer space at a central level.
 - When space is limited, a one /two door refrigerator with a freezer at the bottom might be the most accessible option. The freezer compartment that is comprised of drawer units is located at the bottom making access easier to both compartments. The disadvantage of this arrangement is that the upper racks of the refrigerator might become inaccessible to a person in a wheelchair (Hunter, 1992).
 - A small bar sized fridge can be purchased for the storage of frequently used cold foodstuffs such as milk, margarine, cold meats and condiments.

Shelves

- The interior of the refrigerator should be easily accessed with good visibility of the contents of drawers and baskets.
- Shelves and storage drawers should be pullout, non-tip and at eye level that are easy to adjust.
- Consider placing a turntable or lazy Susan on shelves to improve access to foodstuffs located deep in the refrigerator.
- Handles should be large and designed to be easily grasped. A vertically oriented, open handle is easier to grasp than horizontal or recessed handles.
- If there is an interior light, consider the ease of changing the light bulb.

Other features to consider

- Automatic defrost or frost-free fridge-freezers prevent awkward postures to clean the fridge.
- Allow space alongside the fridge-freezer on the side from which the door opens for easier access.
- The holding capacity (usually given in cubic litres) that your household will require.
- Inquire about the quality of the door seal and the refrigerators insulation capability.

Dishwasher

The dishwasher is a convenient appliance that is designed to be a labour saving device by eliminating the need to do the dishes by hand. The dishes are placed in the dishwasher and then removed and put away after the cycle is finished.

- Most dishwasher controls are accessible to people with mobility difficulties.
- Consider the ease of adding detergent and rinse aid to dispensers and choose one with large, easy to manipulate or push button controls.
- The food filter should also be easily accessed for cleaning purposes.
- The dishwasher should be located close to the kitchen sink and waste disposal.
- The lower the bench height, the more need to consider the pull-out draw dishwasher. A drawer dishwasher can be installed at an appropriate height such as 800mm above floor level for easy access. Alternatively, small bench top models may be built in at any suitable height or located on a bench.
- If a dishwashers is not appropriate, a draining rack on the sink maybe a useful option (Hunter, 1992)

Additional kitchen equipment

Non-slip matting

Anti-slip material used under bowls, crockery, and food preparation boards. Keep in mind that these items contain latex. Available in rolls and sold by the metre.

Jar and can openers

Can be mounted on the underside of a cupboard or shelf for ease of opening jars and cans.

Appendix - Kitchen

Appendix 1 - Suppliers

Benches

These designs can be produced and installed by a cabinetmaker. See Yellow Pages for cabinetmakers in your local area.

Pantry

- Pull out pantry accessible from either side with five height adjustable basket shelves. The price ranges from: \$435-\$443. Draw runners for pullout surfaces start at \$5.
- Pull-out wire baskets- A variety of brands are available from major department stores including Target and K-Mart. See White Pages for your nearest store location.

Cooktops

Chef stocks a range of cooktops including, one of which is ceramic glass element with staggered layout and controls at the front or side. Prices vary significantly depending on styles. Prices range from \$99-\$299, available from Harvey Norman. Check White Pages for store locations

Available from Chef Ph: 1300 363 640. Website: www.chefappliances.com.au

There is a display centre in Brisbane or alternatively, Chef products are retailed through electrical appliance and department stores.

Wallovens

St George Side opening Electrical Oven has 180-degree hinges, with either a left or right opening door. It is both fan forced and conventional cooking with push button electronic controls. Prices from \$3699-\$4799. Available from Kleenmaid, Ph: 3847 5011

Chef stocks a range of upright, wall and bench top units with some side-opening doors. Ph: 1300 363 640 for local retailers

Microwave

There are various brands of microwaves that can be purchased from electrical sections of major department stores, or electrical stores such as Harvey Norman, Chandlers and the Good Guys. Prices start from \$100. Check the White Pages for local stores.

Dishwashers

Dishwashers are available from electrical sections of major department stores or from electrical stores such as including Chandlers, Retravision and Myers. See White Pages for local stores.

Assistive Devices

For long-handled pick-up stick, timber rod with a hook or for other helpful devices contact your local Lifetec Centre

Other helpful sources:

- **Hafele Australia** stocks innovative storage solutions for kitchens. The company has a wide range of products including pull-out tables to add more bench space, convenient storage systems, built-in waste bins, kitchen railing systems to keep frequently used kitchen utensils close to hand and swing-up fittings to conceal appliances. Items can be purchased online from www.hafele.com.au or to order a catalogue, contact the Queensland Head Office.

12 Selhurst Street
Coopers Plains
Queensland, 4108
Telephone: (07) 3344 1533
Fax: (07) 3344 1770
Email: qld@hafele.com.au

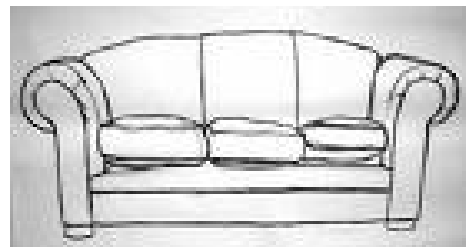
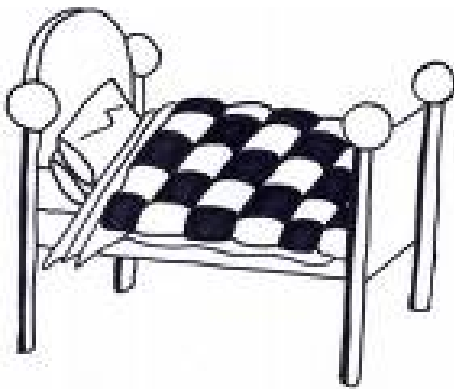
- **Choice**
There are organisations that test, assess and compare products on behalf of consumers. One large and reputable company is the Australian Consumers' Association. They publish a magazine, "Choice" which contains many product reviews and comparisons of appliances. Copies of Choice magazine are available in local libraries around the State or their website.

Website: www.choice.com.au - access is free for Choice magazine subscribers, however access for individual product reports have to be purchased for a small fee.

- **Energex Energy Institute**
The Energex Energy Institute does not sell appliances but they provide valuable advice and information on appliance selection. They have a large database on electrical appliances and can search on key features that may be relevant for individuals. Ph: 1300 360 209.

Website: www.energexinstitute.com

Bedroom, Lounge and Dining Room



Bedroom

Bedrooms are a place where people can sleep, relax, feel comfortable and safe. A spacious room with adequate lighting and well-placed furniture is important. Bedrooms are ideal if they are in close proximity to a bathroom and make the most of natural lighting and ventilation.

Space

The ideal size of a bedroom really depends on the number of occupants, the level of disability and the furniture and fixtures planned to go into the room. For ease of transfer, 1000mm to 1200mm is the recommend space allowance next to the bed for a standing transfer (Hunter, 1992). If a person is unable to stand, 1400mm is recommended for a lateral transfer (Hunter, 1992). Consider from which side the person prefers to transfer to and remember to allow adequate room for a wheelchair to turn. The ideal circulation space for **most** wheelchairs in the bedroom is:

90 degree pivot turn.....	1550 x 1550mm to 1750 x 1750mm
180 degree pivot turn.....	1550 x 2100mm to 1750 x 2300mm
360 degree pivot turn.....	2250 diameter to 2450mm diameter

(Hunter, 1992)

Having the bedroom attached to an en-suite bathroom is ideal, so that it is easy to move between the bed, toilet and shower.

Bed and mattress

People spend approximately one third of their lives in bed so it is very important to select the correct bed to ensure your health and well-being. Allowing at least 1200mm clearance at the side of the bed should allow enough room for bed making.

It is often easier to transfer between the bed and a wheelchair if the bed is a little higher than standard. If necessary, the bed can be raised without expense by placing bricks or phone books under the legs. Alternatively, organisations such as TADQ (refer to section two) can custom build bed raisers for the cost of materials only.

Beds

There are many different types of beds available for purchase such as non-adjustable, manually operated and electrically adjustable beds. Some beds can be very expensive and one alternative may be to hire a bed or any additional equipment required. With any bed, safe access and operation of the bed must be taken into account.

Some people require more assistance than others, and an electric bed assists an individual to sit up, as well as raises the bed to allow carers to work at an appropriate height.

Electric beds have a hand held control attached to an electric motor. The bed can be adjusted for height (referred to as Hi Lo), tilt, backrest angle, leg-rest height and a knee break (a knee break prevents an individual sliding forward and provides support for a person with contracted hips and knees). Some important factors to remember when selecting an electric bed are to ensure the bed has sufficient room underneath for a hoist and for the controls to be easily operated and accessed by people with weak hands. It is also important to consider the amount of room needed to turn over without the threat of falling out, and some people may prefer to have a double bed or king single. A larger bed is also preferable to using bed-rails to prevent falls.

Bed Transfer Equipment

Some people may experience difficulty getting in and out of bed, or repositioning themselves in bed. The following are a variety of devices that can assist individuals to transfer or reposition independently, as well as aids to assist carers to reposition an individual in bed.

Bed equipment

- A **Bed Ladder** attaches to the foot of the bed and allows the user to pull up from a lying position by pulling up on each rung on the ladder.
- A **bed stick** provides an anchor point for people to grasp to assist them to turn in bed. These devices are placed between the mattress and the bed platform. Care must be taken to ensure that the device is properly fitted and secured.
- A **self help pole**, which is often known as a monkey pole, consists of a metal pole at the head of the bed with a chain and triangular handle which hangs above the user's head. These poles can be helpful when a person needs to lift themselves up from the surface of the bed. Some people find them difficult to use, as they require substantial upper body strength.

Mattresses

It is important to trial different mattresses for comfort and pressure care. Your occupational therapist will be able to help you with decisions regarding bedding and mattresses.

Please refer to the Life Tec Qld website for more information on beds and bed equipment at www.lifetec.org.au

Continence aids for bedding

Waterproof bedding and protectors are available. Disposable bed pads and mattress covers can be purchased as well as reusable aids made from polyester with water-resistant backing. These may enable a more comfortable nights sleep and reduce the time

required to clean the bed linen. A **Kylie sheet** has two layers of fabric and allows moisture to pass through the top layer to a second absorbent layer while the top layer remains dry. Available from: Medical and Surgical Requisites.

Wardrobe

Wardrobe designs to be considered for ease of access are built in wardrobes with sliding doors and walk-in or wheel-in where possible. If this is not possible, ensuring there is no lip will allow a person in a wheelchair to wheel-in as close as possible. The ideal height for rails to hang clothes on depends on the individual's height, mobility and if they use a wheelchair or not. As a general guide, to ensure accessibility from a wheelchair the following heights may be suitable:

- from a forward approach 360mm to 1120mm and
- from a side approach 230mm to 1350mm (AS1428.2, 1992)

Where possible, create open shelving for easy access. The preferred maximum height above the floor for shelves is 1250mm for a person in a wheelchair, however this may change due to individuals characteristics (Hunter, 1992). Where drawers already exist, ensure they slide easily and do not slide all the way out.

Lighting

Lighting is best if it is a combination of both natural light and artificial light. This will improve visibility for tasks such as reading in bed, working at a desk and searching for clothes in cupboards and the wardrobe. Task lights are recommended to increase illumination.

Floor coverings

Appropriate floor coverings include non-slip vinyl or tiles, timber floors or low pile carpet without an underlay. It is important that carpet is glued down well and loose rugs are removed as they provide a hazard for both ambulant people and wheelchair users. Please refer to the flooring section for more detailed information.

Mirrors

Mirrors may be mounted at a lower than standard height to suit an individual using a wheelchair. Alternatively, a full length freestanding mirror may be appropriate. These are available from department stores or furniture stores. A mirror placed on a dressing table and tilted slightly downwards may also be adequate.

Power points and light switches

Please refer to the power point and light switch section for information. A touch lamp beside the bed may be useful as an easily operated light source.

Communication Devices

It is ideal to place a telephone, as well as other communications such as an intercom, emergency call or remote controls next to the bed for easy access. They can be placed on the bedside table or mounted on the bed or wall next to the bed.

Appendix - Bedroom

Supplier

Medical and Surgical Requisites

3 Fulcrum St

Richlands QLD 4077

Phone number: (07) 3217 0966

Fax number: (07) 3375 1171

Website: <http://www.medsurg.com.au>

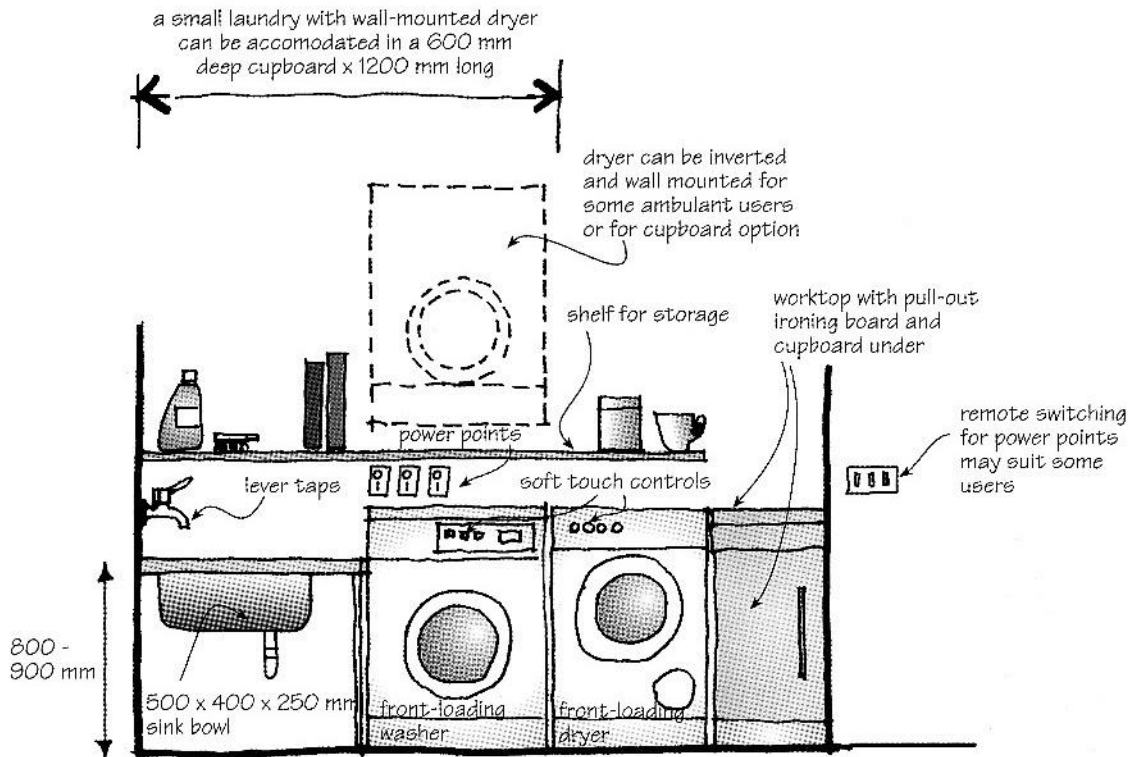
Lounge and Dining Areas

This area may be used as the family room or sitting room where the television is located. These rooms generally accommodate a high amount of traffic and it is important to consider whether the area is functional, accessible and comfortable. An open plan lounge dining area is most accessible as it allows additional space for circulation of the wheelchair.

The dining room table of approximately 760mm above floor level should be sufficient to allow adequate clearance for wheelchair arms. This height may need to be higher for power chairs. The height of tables can be cheaply adjusted where necessary by placing bricks or phone books under the legs of the table. Ensure the table maintains stability.

See flooring section for recommended floor coverings in the lounge / dining area.

Laundry



(Master Builders Association, 2001)

Laundry

Purpose

The laundry is typically a confined and tightly furnished area of the home where the washing machine, dryer, laundry tub, ironing board and storage units are located. This area is a workspace that requires consideration to wheelchair access for easy operation of washing equipment (Building Commission, 2002). This section presents ideas which could be incorporated into the designing of the laundry to enable a person with a particular disability to optimally access and use the laundry.

What to consider when modifying a laundry

Location and Layout

- The minimum amount of space that is required for wheelchair manoeuvring is at least 1500mm diameter.
- The laundry work surfaces and sink should be at an appropriate bench height with adequate knee space underneath to facilitate the use of all work surfaces and washing equipment.
- Wet washing is very heavy and bulky so design the laundry to minimise the need to move washing over large distances. For example, place the laundry trough next to the washing machine and place the drier next to or above the washing machine.
- If using an external clothesline, it is useful to have a doorway which gives direct access to the clothesline from the laundry. Ensure all paths to the clothesline are wheelchair accessible and wide enough to push a small wheeled laundry basket. See *pathways* section in external access for more information.

Washing machine

Front loading washing machines are preferred to top loading machines. Front loading machines use less water and less electricity than top loading machines; they also wash the clothes more gently than do top loading machines.

- Front loaders can be mounted at a convenient height. Clothes can be pulled straight from a front loading washing machine into a basket on the floor. If the machine is placed on a raised surface (i.e. plinth), ensure the machine can not fall off as it vibrates by installing a surface lip along the length of the bench top.
- Allow space on both sides of a front loading washing machine. On the side that the door opens for closer access and on the other side for space to open the door fully. It is easier to access a machine with a larger, wide opening door.
- A small top loading washing machine may be accessible if it has a small bowl. This may be an option if a front loading machine is not affordable.
- Taps should be positioned to the side of the machine for access.
- A machine with a fast spin cycle means drier clothes that are lighter to lift and hang out to dry. However, they may be more creased and require more ironing.
- When purchasing a new washing machine, seek information regarding the machine's ability to remove dirt, the water efficiency as well as the running costs and program time.

Clothes dryer

Clothes dryers are very convenient appliances to have at home and prove to be extremely useful in wet weather.

- Standard dryers are front loading with the controls located at the front. Many people prefer to use a clothes dryer rather than hang clothes out to dry on a clothesline.
- For effective use of space mount the clothes dryer on top of the front loading washing machine.
- Clothes dryers can be positioned upside down to improve the access to the control panel (Building Commission, 2002).
- Easy wide-opening doors with large handles and simple to use controls should all be considered when purchasing a dryer. Other factors to consider include the dryer's energy efficiency. Very few dryers are energy efficient and have energy star ratings above two stars.
- Dual washing machines and dryers can be purchased for instances where there is limited space or people have difficulty lifting heavy, wet clothes. However, these machines are a reasonably expensive option.

Clothesline

Outdoor clothes lines and hoists need to be either set at an appropriate height or be adjustable for accessibility. The recommended clothesline height is between 1100mm to 1600mm above ground level (AS4299), however this height is adjustable to meet the person who is not ambulant.

There are currently three styles of clotheslines available:

- Paralines/Paraline Duo
- Retractable lines eg. Extendaline (suitable for small spaces)
- Rotary clothesline

A concrete broom finished slab or alternative flat surface should be provided underneath a clothesline area for wheelchair accessibility (Disability Service Unit, 1994).

Laundry tub

- Laundry tubs are wall mounted and made of stainless steel. Most laundry troughs have a built-in cupboard underneath however this might need to be removed to allow for adequate knee space.
- Insulate the underneath surface to protect the lower limb from burns.

Taps

- Taps should be mounted at the side of the laundry tub rather than behind to provide easier access. Where this is not possible, a space 800mm in width between the tubs and the back wall may enable a person in a wheelchair to access the taps on the back wall.
- See kitchen and bathroom section for detailed information.

Ironing equipment

- Portable ironing boards are relatively cheap and are height adjustable. However, these boards are difficult to put up.
- Wall mounted ironing boards can be installed inside a cupboard or recess within a wall and are easy to use. Generally they are height adjustable and can be set between the heights of 600mm and 820mm. If it is not height adjustable, a likely height for ambulant users may be 800mm and wheelchair users 650mm (Hunter, 1992).

Appendix - Laundry

Suppliers

Washing Machine:

Most major appliance and department stores have a large range of washing machines. Check Choice Magazine.

Clothes dryer

Clothes dryers vary in price and are available from most major appliance and department stores. See White Pages for store locations.

Clothesline

Most hardware stores will have a large range of clotheslines. Some suppliers whose products have been accepted by the department of housing are:

- Hills Industries Limited 07 3212 9527
- Sunni Household Products 07 5592 2442
- Space Saver Clotheslines 07 5575 9224

Conclusion

This resource booklet contains information to assist families to build wheelchair accessible homes. The information may also be useful to builders and trade contractors when working with clients who experience access or mobility difficulties in their homes.

References

- Australian Standard. (2001). AS1428.1-2001: Design for access and mobility Part 1: General requirements for access – New building work.
- Australian Standard. (1992). AS 1428.2-1992: Design for access and mobility - Enhanced and additional requirements - Buildings and facilities.
- Australian Standard. (1992). AS 1428.3-1992: Design for access and mobility - Requirements for children and adolescents with physical disabilities.
- Australian Standard. (2000). AS/NZS 3000 – 2000 Amendment 3-2003.
- Building Commission Victoria. (2002). *Welcome: Design Ideas for Accessible Homes*. Imprenta: Victoria.
- Cardell Manufacturing Custom Made Shower Curtain. (2007). Retrieved September 23, 2007, from http://www.lifetec.org.au/home/search_results.asp#16/335/32
- Con-serv: Comfort Rail with Champagne Handpiece. Retrieved September 24, 2007, from <http://www.con-serv.com.au/en/bathroom-handheldshowers-indexview.asp?pagehist=Bathroom%20%E2%80%A2Handheld%20Showers%20%E2%80%A2Slide%20Rail%20Kits%20%E2%80%A2Comfort&id=HS%20014%20C>
- Department of Housing. (2007). *Over a 100 ways to improve accessing your home, 2007*. Retrieved 28 September, 2007, from <http://www.housing.qld.gov.au/design/homeaccess/publications/tips/index.htm>
- Department of Housing. (2004). *Smart Housing: Design Objectives*. Queensland Government: QLD.
- Disability modifications: stepless shower base. Retrieved September 23, 2007, http://www.disabilitymodifications.com.au/stepless_showerbase.htm
- Disability Modifications: Australian Ramp System. Retrieved September 23, 2007 from: <http://www.disabilitymodifications.com.au/>
- Disability Service Unit. (2004). *Completing Home Modification Reports – A guide for occupational therapists*. Queensland Government: QLD.
- Ewings Lever Handle Set. (2007). Retrieved 1 October, 2007, from http://www.lifetec.org.au/home/search_results.asp#16/346/6472

Enware Australia Pty Limited. (2007). *Tapware*. Retrieved 28 September, 2007, from www.enware.com.au/tapware/tapware_slm.htm

Gibson, A. (Ed.). Independent Living Centre NSW (1994). *Bathroom Planning for People with Disabilities*. NSW: Occupational Therapy staff of the Independent Living Centre NSW (Inc.).

Hunter, R. (1992). *More accessible housing for independent living*. McPherson's Printing Pty Ltd: Victoria

Invacare Tub Transfer Benches. (2007). Retrieved 14 September, 2007, from http://www.lifetec.org.au/home/search_results.asp#1/2/5030

ILC South Australia: Attendant propelled mobile shower chair (k care). Retrieved 14 September, 2007, from <http://www.ilc.asn.au/equipment/item.php?id=402>

Independent Living Centre NSW, (1987). *Kitchen planning for people with disabilities*. NSW: Occupational Therapy staff of the Independent Living Centre NSW (Inc.).

The Independent Living Centre, NSW. Lever door handle. Retrieved 14 September, 2007, from <http://www.ilcaustralia.org/home/nsw.asp>

LifeTec Queensland. Retrieved 14 September, 2007 from: <http://www.lifetec.org.au/home/default.asp>

Kewco Products Pty.Ltd.Kewco shower screen. Retrieved 25 September, 2007, from <http://www.kewco.com.au/products.htm>

Master Builders Association. (2001) *Housing for life*. Retrieved 14 October, 2007 from www.mba.org.au/public/doc.php?id=102

Medeci Bath Board. (2007). Retrieved 14 September, 2007, from http://www.lifetec.org.au/home/search_results.asp#1/2/1173

Orlando Scooter Rentals. Wheelchair. Retrieved 14 September, 2007, from <http://www.orlandoscooterrentals.us>

The WSU rehabilitation engineering accessible kitchen. (2003) Retrieved 13 September, 2007, from www.cs.wright.edu/bie/rehabengr/kitchens/kitchen.htm

Smartpack: you've got it made. (2007). Retrieved 28 September, 2007, from www.smartpackkit.com.au/