PRACTICAL GUIDE TO

universal home design

CONVENIENCE, EASE, AND LIVABILITY

REMODELING

BUILDING

BUYING A HOME

This booklet is provided by the Iowa Program for Assistive Technology,
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Iowa's University Center for Excellence on Disabilities.

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This document is available free online at this website:
www.iowaat.org

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universal home design

DESIGN FOR EASY LIVING

Universal design is the idea of making things comfortable and convenient for as many different people at as many stages of life as possible.

These common-sense features can make your home a more pleasant place to live right now, and avoid unnecessary hassles and expensive changes in the future.

Room by room, this checklist can help you consider your options and increase the ease and flexibility of your home. Many of the guidelines may seem like obvious, common-sense ideas. In fact, they are likely to become standard in the future, just as we now take for granted the basic safety and energy efficiency features that were forward-thinking in their time.

Who is your home built for?

Traditionally, many homes were tailored for an imaginary "average" person – a healthy, fit, young man of average height. Universal design uses simple, proven ideas to make any home more comfortable for a wide range of people:

- Families with young children
- People who want to stay in their homes as they grow older
- People who want to simplify their housekeeping
- People who are taller or shorter than average
- People who use wheelchairs or walkers

UNIVERSAL DESIGN ADDS...

FLEXIBILITY
Easier to adapt the home as your own lifestyle changes, or as others live in the home.

SIMPLICITY
Makes everyday life simpler in many ways – housekeeping, storage, entertaining, seasonal maintenance.

STYLE AND INDIVIDUALITY
Universal design can be both beautiful and comfortable.

SAFETY
Eliminates common causes of home accidents.

WAYS TO USE THIS GUIDE

REMODELING

Work with a contractor who understands the importance of the features in this checklist and is experienced in applying them to different homes.
Many of the features marked as "Essentials" are much cheaper to do "while you're at it" than as a separate project later when the need is pressing. They also address some of the biggest inconveniences or barriers in many homes.

Look for the ★ throughout the checklist.
Consider these features when you have an immediate need to adapt your home with limited resources. Most of these features are relatively modest in cost and require no major structural changes.

BUILDING A HOME

Make sure your home plan includes at least the "Essentials" listed for each area of the home. Be firm about things that will be important in the long run, even if they require some adjustments and creative thinking during the planning stage.

BUYING OR RENTING A HOME

Use this checklist to walk through any home you are considering. If you are buying, seek knowledgeable advice about what it would cost to provide at least the "Essentials" listed for each area of the home. Let your real estate agent and home inspector know that these features are important to you.

A WORD ABOUT COST

In new construction, many universal design features require little or no added cost. In a remodeling project, much depends on the structure and layout of your current home. You should seek knowledgeable advice about the cost of each feature, and set your priorities according to the immediate and future benefits – particularly if you hope to continue living in your home in your later years.

Most people who incorporate universal design into their homes say that the real payback is being able to live the lifestyle they want. An increase in resale value is not an immediate certainty. However, population trends indicate that the market for these features will grow in the future.

TOP 3 TROUBLE SPOTS

Three places in the average home cause the most everyday barriers and inconveniences:

- THE ENTRANCE
- THE BATHROOM
- THE KITCHEN

Pay special attention to the basic design of those areas when you are remodeling, building, or buying a home.

MORE HOME DESIGN RESOURCES

Iowa COMPASS
1-800-779-2001
1-877-686-0032 (TTY)
www.iowacompass.org
This *free* Iowa (only) service can refer you to contractors in your area that have been trained in universal design and accessibility. Iowa COMPASS has information about funding options for assistive technology or home modifications. It also offers information about available assistive technology devices to make living in your home easier or safer.

Center for Universal Design
North Carolina State University
School of Design
Box 8613
Raleigh, NC 27695-8613
1-800-647-6777
www.ncsu.edu/ncsu/design/cud
This national resource center offers publications and resources on accessible, adaptable, and universal design.

Home Modification Action Project
National Center for Supportive Housing and Home Modifications
Andrus Gerontological Center
University of Southern California
Los Angeles, CA 90089-0191
213-740-1364
www.homemods.org
This national resource center offers publications and resources on remodeling for home accessibility.

American Association of Retired Persons (AARP)
601 E St. NW
Washington, DC 20049
1-800-424-3410
www.aarp.org
The national seniors' advocacy organization offers printed materials and web resources on home accessibility and universal design (including a virtual home tour at *www.aarp.org/universalhome*).

Iowa Finance Authority
100 East Grant Avenue, Suite 250
Des Moines, IA 50309
1-800-432-7230
1-515-242-4864 (TTY)
www.ifahome.com
This website provides information on first-time homeownership programs: ***FirstHome*** provides below-market interest rate mortgages and ***FirstHome Plus*** provides grants to pay for closing costs, down payment and required repairs.

Iowa Program for Assistive Technology (IPAT)
1-800-779-2001
www.iowaat.org
This Iowa (only) program provides training for consumers, service providers and contractors about: assistive technology; and universal design and/or accessibility for housing and home modifications. It also has a set of brochures about tips for living independently including assistive technology available on line at *www.iowaat.org*

SITE PLANNING AND LANDSCAPING

ESSENTIALS:

- ☐ Main floor at ground level, ideally with no steps or ramps needed to enter. At a minimum, one entrance should be at ground level.
- ☐ Maintenance-free exterior and trim.
- ☐ Level walkways with little or no slope. Any slope should be very gradual – no more than 1 inch of rise per 20 inches of walkway.
- ☐ Trees, shrubs, and plants that require little maintenance (raking, pruning, watering, mowing).
- ☐ All walkways at least 36 inches wide.

WORTH CONSIDERING:

- ☐ Passive or active solar heating. Example: Plenty of south-facing windows to capture sunlight in winter.
- ☐ Garden planters at convenient heights, and raised beds for flowers and vegetables.
- ☐ South-facing walkways (and ramps, if any) to encourage snow melt.

GENERAL FLOOR PLAN

ESSENTIALS:

- ☐ Kitchen, bath, laundry, and at least one sleeping room (no smaller than 12 feet by 12 feet) on the main floor. The sleeping room can be used for different purposes at different times: den, office, playroom, etc.
- ☐ Open floor plan (avoid long, narrow hallways; consider larger open areas without sharp boundaries between rooms, such as a kitchen/dining/family room area).

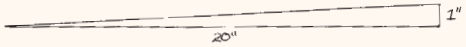
WORTH CONSIDERING:

- ☐ Weight of the building resting on external walls of the home, avoiding "load-bearing" inside walls. This allows walls between rooms to be moved much more easily and inexpensively to change the layout.
- ☐ Closets "stacked" over each other in a multi-story home, to allow for future installation of an elevator or lift (allow at least 60 inches by 60 inches for

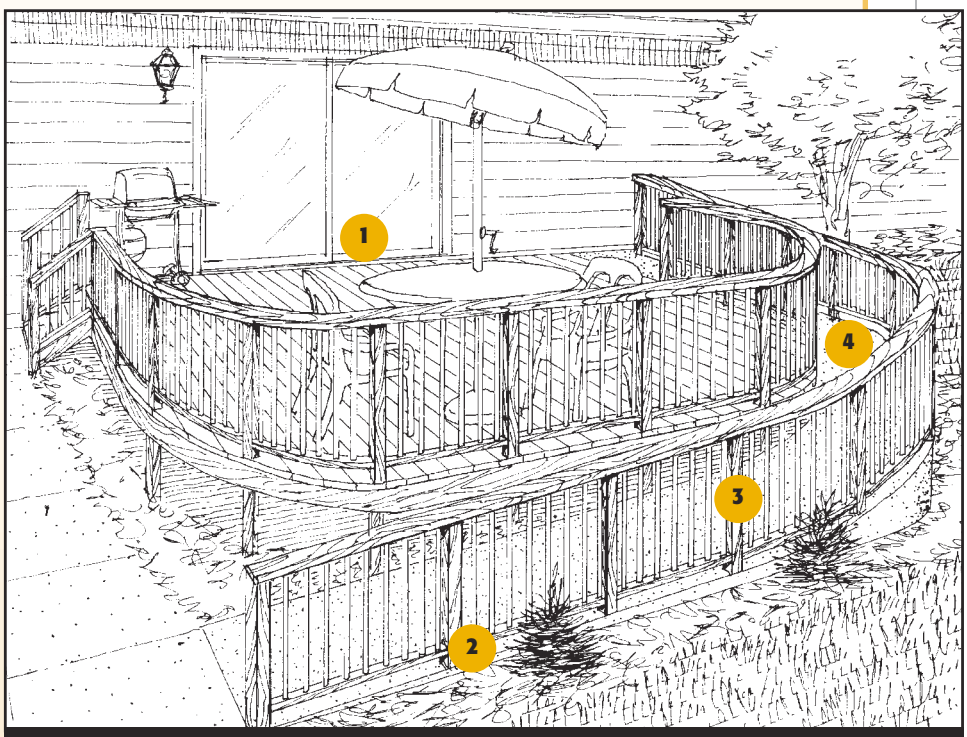
STEP UP TO A STEP-FREE ENTRY

Outdoor steps can be not just a fall waiting to happen, but also a daily hassle for yourself and your visitors, especially in wintry weather. Full basements are common in our part of the country, however, and that typically means the first floor is 18 to 36 inches above the ground. Stairs at the front door and back door have been the usual way to handle that.

If you're building a new home, you can avoid the problem through one or more design techniques: Take advantage of any natural slope in the land to make at least one of the doors at ground level. Weigh the costs and benefits of digging a deeper basement so the first floor is at or near ground level. Consider the landscaping solution of grading the yard to create a slope or "berm" of earth leading up to the door, on which you can place a straight or gently curved walkway. (Be sure the slope is very gradual – ideally no more than 1 inch of rise for each 20 inches of walkway.)



If you're remodeling or buying a home, a wooden or concrete ramp is the most common and sometimes most cost-effective solution. You can also integrate a ramp into a deck or a careful landscaping plan. Depending on circumstances, building up a slope or "berm" of earth to create a new walkway to an existing home may be a good alternative. Mechanical lifting equipment is another option, but it can take a beating in our climate and will not help during a power outage.



1 Wide, step-free entry with low, beveled threshold
2 Gap between rail and ramp floor, for easier sweeping and shoveling
3 Gently sloping ramp, at least 36 inches wide
4 For wheelchair accessibility, avoid a curved ramp. Instead, use straight ramp sections and provide a large, level landing area for turning the corner

ENTRANCE

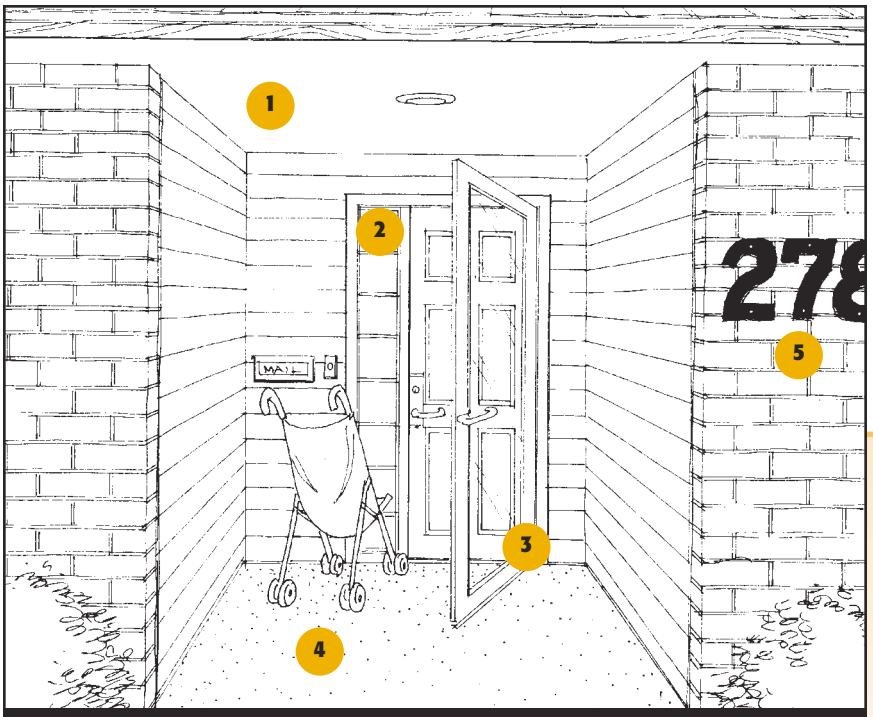
ESSENTIALS:

- ☐ Door at least 36 inches wide, to allow for a 34-inch clear opening when the door is open at a right angle.
- ☐ No split-level entry.
- ☐ Porch floor, stoop, or landing at the same level as the floor inside the home (no step up or step down to enter home).
- ★ Door locks that are easy to operate, such as keyless locks with a remote control or keypad.
- ★ Lever-style door handles (not round doorknobs).
- ★ Peepholes at heights for adults, children, and people using a wheelchair; or sidelights (tall, narrow window along one or both sides of the door).
- ★ Good lighting both inside and outside the entrance.
- ★ No raised threshold – much easier for strollers, wheelchairs, rolling luggage, etc., and reduces the risk of tripping.
- ★ A roof, canopy, or awning to protect the entrance from rain and snow (essential when you have no raised threshold under the door).
- ☐ Ample landing space both outside and inside the entry door (5 feet by 5 feet for the outside landing). The outside landing should be set off to the side (on the handle edge of the door) to be out of the way of the door swing.

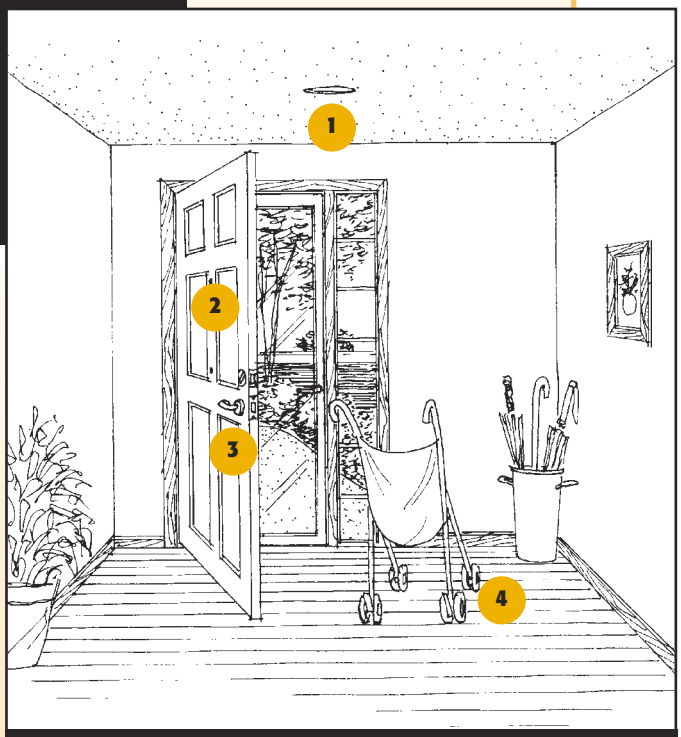
WORTH CONSIDERING:

- ☐ Lighted doorbell.
- ☐ Intercom system (can be connected to your regular telephone or to a special speaker).
- ☐ Handy shelf outside the door (such as on the porch railing) to set down items while you open the door.
- ☐ House number in large, simple, color-contrast lettering easily visible from the sidewalk and street.
- ☐ Push-button power door (works great when your hands are full).

★ = *When you have an immediate need, limited resources, and limited time (requires no structural changes)*



1 Entrance protected from weather (important when door has no raised threshold)
2 Sidelight made of high-impact glass (for security)
3 Step-free entry
4 Ample side space to avoid the swing of the door
5 House number clearly visible from the street



1 Well-lit entry, both inside and outside
2 Door at least 36 inches wide, allowing a 34-inch clear opening
3 Lever-style door handles
4 Ample side space to avoid the swing of the door

KITCHEN

ESSENTIALS:

★ Enough clear counter space to set down dishes next to all appliances and cupboards.

☐ Plenty of open floor space to maneuver around the kitchen.

★ Anti-scald faucet with a single lever (not two knobs or two handles to turn on and off).

☐ Counters and other work surfaces at two or more different heights. (See "Counters at the right height for the job," page 9.)

☐ Rounded corners, not sharp edges, on counters.

☐ Open space under the sink to allow for a seated user (be sure to insulate pipes to avoid burns), with flooring material laid all the way to the wall under the sink.

☐ Raised platform under dishwasher to reduce bending and kneeling. Storage can be incorporated in the platform. Dishwasher height should be determined by the comfort levels of those who use it most, and by what makes sense in the kitchen work flow.

★ Appliance controls that are easy to read, easy to reach, and can be operated by touch as well as sight.

★ Easy access to kitchen storage (pull-out shelves, lazy susans in corner cupboards, adjustable-height cupboards).

★ Good task lighting over sink, stove, and other work areas.

WORTH CONSIDERING:

☐ Pullout work boards in strategic locations, such as near the oven, refrigerator, and microwave.

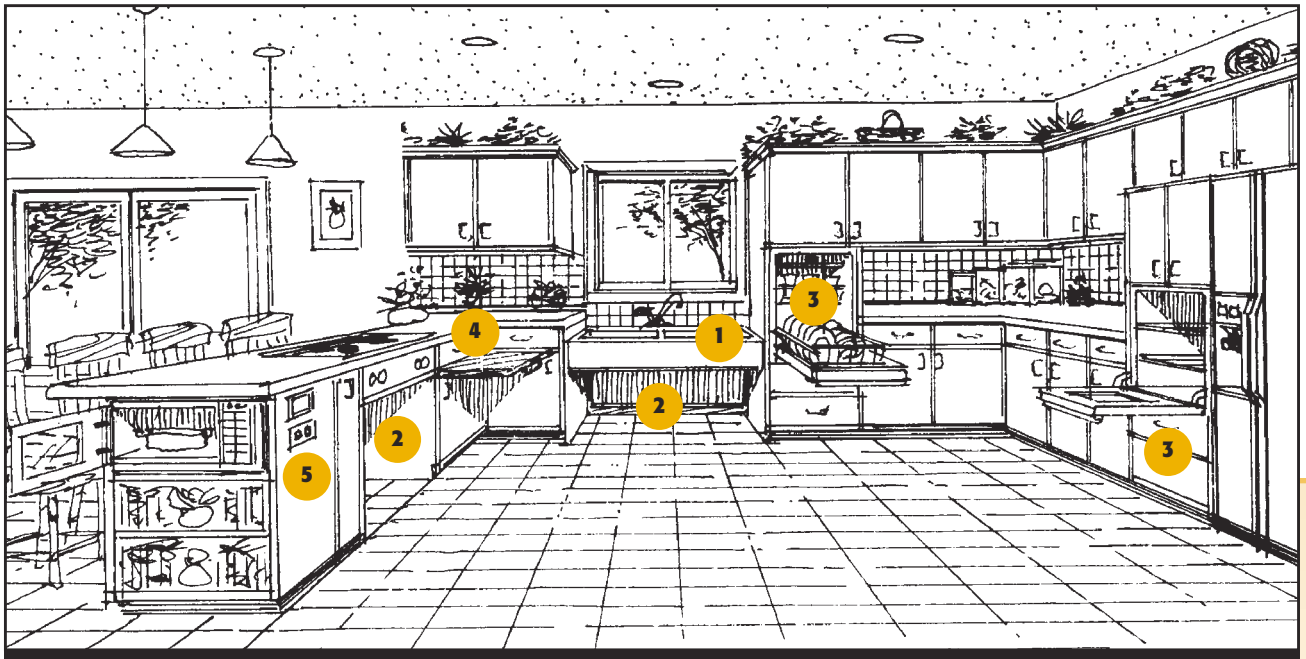
☐ Pantry-type closet with rollout shelving.

☐ Sink with the drain placed toward the back, rather than in the middle, so that the pipes below the sink are less in the way for storage or for a seated user.

☐ Some electrical switches and outlets placed at front edge of lower cabinets (just under counter) for easier access. (Be sure to use childproof outlets.)

☐ Stove or cooktop with controls in the front.

☐ Extra outlets for small appliances, electronics, etc.



1 "Power sink" that raises and lowers
2 Space under stove and sink for seated users
3 Raised oven and dishwasher with storage below
4 Pullout workboard
5 Some switches and outlets at the outside edge of counter

WORTH CONSIDERING (CONTINUED):

- ☐ "Power sink" that raises or lowers at the push of a button. (Be sure the wall covering and floor covering extend to accommodate the full range of the sink's upper and lower settings.)
- ☐ Color-contrast edging on the front edge of counters, to avoid spills and bumps for people with lower vision.
- ☐ Built-in storage space for recyclable materials, easy to access and remove.
- ☐ Spring-loaded switch for the garbage disposal, so that it must be held in the "on" position to operate (safety feature).
- ☐ Side-by-side refrigerator-freezer.

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COUNTERS AT THE RIGHT HEIGHT FOR THE JOB

Providing kitchen work surfaces at two or more different heights is handy not only for people of different sizes who are standing or seated, but also for different kinds of tasks. When you need heavy leverage, such as cutting a watermelon, you want a lower work surface. When you are doing closer, more detailed work, you want it higher.

One counter section at least 30 inches wide should accommodate a seated person (the surface about 28 inches to 32 inches above the floor), with open knee space below.

★ Alternatively, install pullout work boards at varying heights, in locations convenient for food preparation or for setting heavy items you take out of the oven, refrigerator, dishwasher, etc. A kitchen drawer could be converted to a work surface by fitting a cutting board on it.

BATHROOM

ESSENTIALS:

- ☐ Door 36 inches wide, to allow for a 34-inch clear opening when the door is open at a right angle.
- ☐ Ample floor space for maneuvering between bathroom fixtures. Allow at least 30 inches by 48 inches of clear floor space among the fixtures; 60 inches by 60 inches is ideal. (If your shower entrance has no raised threshold, the shower floor can provide part of the clear maneuvering space.)
- ☐ Walk-in shower with little or no threshold or lip to step over – ideally no more than 1/2 inch, and beveled to provide a tiny "ramp" rather than a tripping obstacle. Slope the shower floor a maximum of 1/8 inch per foot. (Alternatively, design a bathroom closet that can be converted to a walk-in shower, or place the tub in such a way that it can later be replaced with a walk-in shower.)
- ☐ Shower size: Minimum 36 by 36 inches; for a roll-in shower, allow 36 inches by 60 inches.
- ★ Adjustable-height, handheld showerhead, with controls that are conveniently placed and easy to operate.
- ☐ Properly reinforced grab bars in the bath and shower, and at least reinforced walls to allow for grab bars near the toilet. (See "Getting a grip on grab bars," page 11.)
- ★ Anti-scald faucet with a single-lever handle, for both the sink and the tub or shower.
- ☐ Clearance under the sink to allow for a seated user, with flooring material extended into the open area under the sink. (Be sure to insulate pipes to prevent burns.)
- ☐ Rounded corners, not sharp edges, on bathroom counters.
- ★ Toilet seat height appropriate for the household – 17 to 19 inches high for middle-age and older people, lower for children.
- ★ Mirror(s) placed for both standing and sitting, such as a full-length or tilting mirror.
- ★ Good-quality, non-glare lighting.

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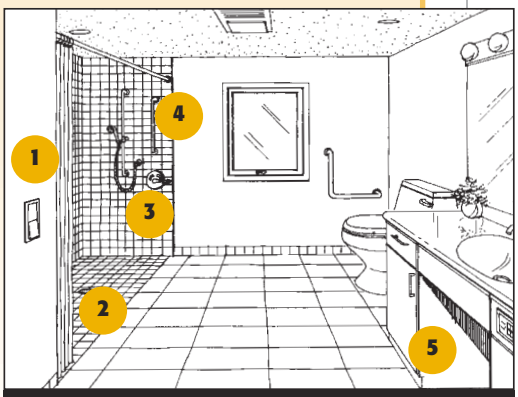
GETTING A GRIP ON GRAB BARS

Grab bars are an essential safety feature as well as a handy ergonomic feature. Now they're practically a designer accessory too, judging from the fast-growing selection of colors and styles. They make good towel bars and they're there when you need them for balance.



1 Rocker-style light switch
2 No "lip" to step over at shower entrance
3 Shower control easy to reach while standing or sitting
4 Grab bars: Placement can vary according to your needs
5 Space under sink to accommodate a seated user

Three factors ensure that your grab bars will "be there for you" when you reach for them:

- ☐ How big around is it? The typical diameter is 1 1/2 inches; 1 1/4 inches may work better for people with smaller hands (children, many women) and for people who don't have a strong grip.
- ☐ How far does it stick out from the wall? The grab bar should be designed to leave at most 1 1/2 inches of clear space between the wall and the inside edge of the grab bar.
- ☐ What is it attached to? A grab bar that's not properly installed can pull away from the wall and let you down just when you need it most.

The following method allows for sturdy attachment and also for easy repositioning, as changing needs may call for grab bars of different heights or lengths:

Reinforce the walls near the toilet and shower or bath by installing 3/4 inch plywood panels. Notch the plywood into the wall studs to provide a flat wall surface, then install wall covering (drywall, tile, etc.) over the plywood.

WORTH CONSIDERING:

- ☐ Shower seat or platform, either built in or freestanding (handy for washing feet and shaving legs, as well as for people with limited strength or mobility).
- ☐ Pocket (sliding) door to save the "swing space" needed for a hinged door.
- ☐ Telephone jack in the bathroom, to call for help in case of a fall.
- ☐ Rollout or pullout storage shelves in cabinets, to minimize kneeling and bending.
- ☐ Bathroom counters at two different heights, or an adjustable-height surface.
- ☐ Bathroom sink with a side-mounted faucet, easier for children and many others to reach.
- ☐ Adjustable-height "power sink," or two sinks at different heights.
- ☐ Sink with the drain placed toward the back, rather than in the middle, so that the pipes below the sink are less in the way for storage or for a seated user.
- ☐ Heat lamp (for comfort), usually installed in the ceiling.

LAUNDRY

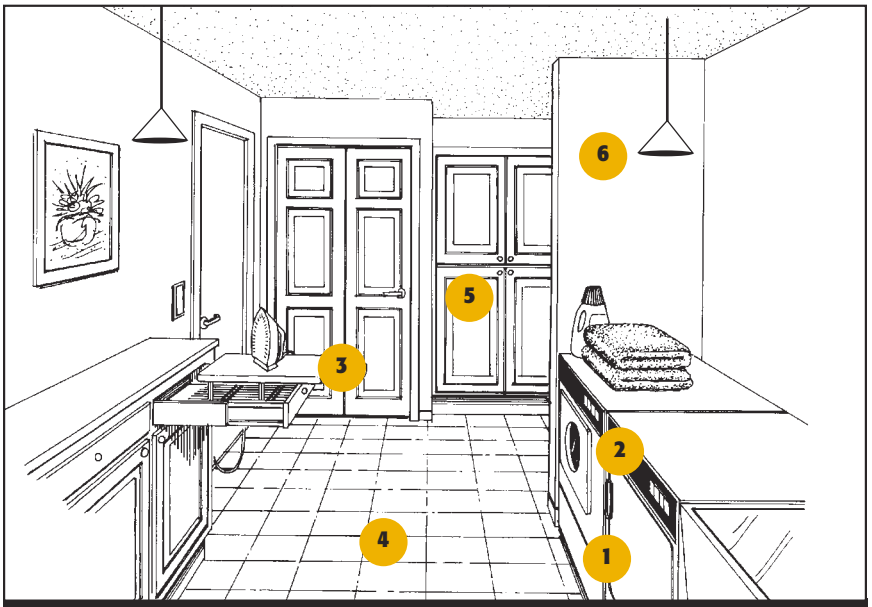
ESSENTIALS:

- ☐ Laundry area on main floor, near the bathroom and bedrooms. (If laundry is in the basement initially, make provisions that would allow relocating it to the main floor – an easily adaptable space with electrical and plumbing connections.)
- ★ Good task lighting in the laundry work area.
- ★ Appliance controls that are easy to reach and operate, ideally at the front of the appliance.

WORTH CONSIDERING:

- ☐ Front-loading washer and dryer, placed on raised platforms to reduce bending and kneeling.
- ☐ Stacked washer-dryer.
- ☐ Portable washer on main floor (can attach to kitchen sink).
- ☐ Folding table, attached to the wall, that lies flat when not in use.

★ = *When you have an immediate need, limited resources, and limited time (requires no structural changes)*



1 Washer and dryer on raised platforms
2 Controls easy to reach
3 Fold-out ironing board
4 Nonslip flooring (even when wet)
5 Storage at various heights
6 Good task lighting

BEDROOMS

ESSENTIALS:

- ☐ Doors 36 inches wide, to allow for a 34-inch clear opening.
- ☐ Ample maneuvering space after all furniture is in the room – at least 36 inches on both sides of the bed, and ideally 60 inches on one side of the bed.
- ★ Light switches reachable from the bedside and the door, and located about 36 inches to 40 inches above the floor.
- ★ Telephone jack near the bed.
- ★ Extra electrical outlets near the bed (for medical equipment or rechargeable items, for example), placed 18 inches to 24 inches above the floor.
- ★ Closet rods reachable from a seated or standing position, or adjustable-height rods.

LIVING AND DINING AREAS

ESSENTIALS:

- ☐ Large enough to accommodate normal furnishings and allow easy maneuvering around them.
- ☐ Easy passage from kitchen to dining area.
- ☐ Avoid changes in floor levels or floor material (such as vinyl to carpet) to prevent tripping while carrying food and drink.

WORTH CONSIDERING:

- ☐ Extra electrical outlets to accommodate possible future needs, such as new home technology.

CLOSETS AND STORAGE

ESSENTIALS:

- ★ Heights and layout easily accessible for all household members.
- ★ Well-lit, with a switch located outside the storage area.
- ★ Adjustable-height shelving and closet rods.
- ★ Doors and handles that are easy to operate. (Avoid bi-fold or accordion-type doors.)

GARAGE

ESSENTIALS:

- ☐ Ample room for maneuvering strollers, lawn mowers, bicycles, wheelchairs, etc. around the vehicle(s). Provide at least a 3-foot clear path around and between all vehicles.
- ☐ Paved driveway.
- ☐ Easy pathway from garage to home entrance (no steps to climb, all walkways at least 36 inches wide).

WORTH CONSIDERING:

- ☐ Garage attached to home with a direct (no-step) entrance to home.
- ☐ Garage door tall enough to accommodate higher vehicles (such as a van with a chairlift) – an extra 18 to 24 inches compared to most standard doors.
- ☐ Sheltered walkway to the house, protected from rain and snow.

DOORWAYS AND HALLWAYS

ESSENTIALS:

- ☐ Wide, spacious hallways and doorways for moving furniture as well as for maneuvering a wheelchair or walker.
- ☐ Hallways at least 36 inches wide; 42 inches is recommended.
- ☐ All doors 36 inches wide to allow for a 34-inch clear opening when the door is open 90 degrees.
- ★ Lever-type door handles (not round doorknobs).

WORTH CONSIDERING:

- ☐ Pocket (sliding) doors instead of swing doors, wherever possible.
- ☐ "Swing-clear" hinges that add a little more maneuvering room by moving the door completely out of the doorway.

★ = *When you have an immediate need, limited resources, and limited time (requires no structural changes)*

FLOORS

ESSENTIALS:

- ☐ Single level – no sunken floors or split levels.
- ☐ No change of levels between rooms. If there must be a threshold between two different flooring surfaces, make it very low and beveled.
- ★ If there must be a step up or down, mark it well with a highly visible, color-contrast material at the edge.
- ☐ Nonslip flooring throughout the house, especially in the bathroom, kitchen, and laundry.
- ☐ Carpeting that is sturdy, low-pile, and tightly woven (such as berber style).
- ★ Eliminate throw rugs, to minimize the risk of tripping.

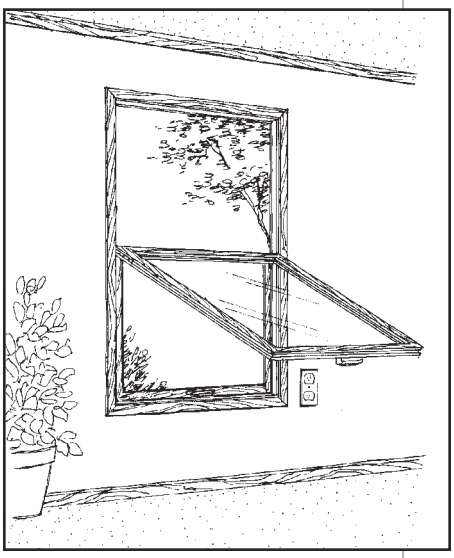
WORTH CONSIDERING:

- ☐ For wheelchairs, carpeting should be continuously glued to the floor, ideally with no padding.
- ☐ For wheelchairs, highly durable flooring (stone or ceramic tile) holds up best.

WINDOWS

ESSENTIALS:

- ☐ Energy-efficient windows that are easy to open, close, and lock, and require little strength to use. (Crank handles are a good choice.)
- ☐ Placement at a height that allows people to see outdoors while seated or standing – with the windowsills about 24 inches to 30 inches above the floor.



WORTH CONSIDERING:

- ☐ Tilt-in windows that allow easy cleaning of both sides.
- ☐ Screens that are lightweight and simple to remove and replace, ideally from the inside.

STAIRS

ESSENTIALS:

★ Sturdy handrails on both sides of all stairways, whether inside or outside of the home. For round rails, the usual size is 1¼ to 1½ inches in diameter.

☐ Stair treads deep enough for the entire foot – at least 8 inches, but 10 to 11 inches is better.

☐ Stair rise no higher than 7 inches from one step to the next; a smaller rise is even better.

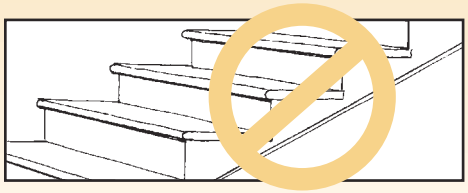
★ No carpeting on stairs, to reduce the risk of slipping. If carpeting is installed, use a tight weave and no padding.

★ No open risers (open spaces between each step)

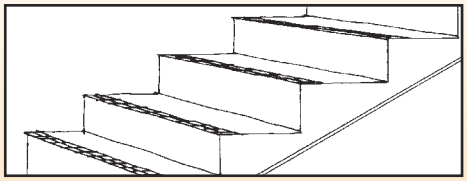
☐ Steps with no "nosing" (in other words, the tread should not extend out beyond the riser) to minimize the risk of tripping.

★ All stairways well lit, with a light switch at the top and bottom. (Light switches about 36 inches to 40 inches above the floor.)

★ Anti-slip strips on front edge of steps, in color-contrast material.



Avoid stair treads that stick out beyond the riser, causing a trip hazard.



WORTH CONSIDERING:

☐ Straight, continuous stairway, with no turns or curves, for cheaper and easier installation of a chairlift if needed later.

☐ Stairway at least 4 feet wide to allow for a future chairlift.

★ = *When you have an immediate need, limited resources, and limited time (requires no structural changes)*

ELECTRICAL OUTLETS AND CONTROLS

ESSENTIALS:

★ Light switches placed about 36 inches to 40 inches above the floor.
★ Large rocker-style switches that are easy to turn on and off.
★ Electrical outlets placed about 18 inches to 24 inches above the floor, to minimize the need for bending down.
★ Thermostat and other controls placed about 48 inches above the floor.
★ Thermostat and control panels that are easy to read and simple to operate (check accessible equipment stores or web sites).
★ Telephone, cable, and modem jacks placed about 18 inches above the floor.
☐ Circuit breaker panel on the main floor and easy to access, perhaps in the laundry area.

WORTH CONSIDERING:

☐ Lighted switches that are visible in the dark.
☐ Slide plates on outlets, to childproof the outlet when not in use.
☐ Motion-activated lighting that automatically turns on when someone enters the room.
☐ Switched outlets so that floor lamps and table lamps can be turned on and off with a wall switch.
☐ Plenty of electrical outlets for current or future equipment (placed 18 inches to 24 inches above the floor).
☐ Programmable thermostat to save energy at night or when you are not at home.
☐ "Zoned" heating and cooling, with separate thermostats for different parts of the house, to conserve energy while keeping the temperature comfortable where you are.
☐ Visible and audible alarms on smoke detectors and carbon monoxide detectors.