



Model Accessible Home

General Design Considerations

The type and severity of any physical limitation is highly variable from person to person. Conditions may be partial or complete, permanent or temporary. Agility, balance, cognitive processes, coordination, fine or gross motor skills, hearing, reaction time, sensation, sight, stamina, and/or strength may be affected. One impairment or function altering condition may very well affect the performance of other even seemingly unrelated, body activities. (Hands, wrists, elbows, shoulders, and arms are extremely important facets of walking to persons using crutches.) For every specific diagnosis there is considerable variation in one's ability to perform/accomplish any task. Even the most subtle of differences can be significant to personal independence. Therefore, environmental design, particularly of a home, must be individualized.

When designing a barrier-free home, a number of factors should be taken into consideration:

1. The disabling condition and accompanying physical limitation(s).
2. The capabilities and abilities.
3. The types of activities to be accommodated.
4. All family members.
5. Budget.
6. Future expectations and desires.

Total understanding of the person for whom the home is being designed is vital. Not only current, but also projected functioning capabilities and desires must be taken into account. Considering the age of the resident and typical life passages, will allow for sensible long-term planning. Prioritizing will ensure that necessary qualities are incorporated into the home's plan. Information collected should include physical capabilities, as well as deficiencies and recognizing methods of mobility, balance, coordination, fine and gross motor abilities, reach, agility, stamina, sensory deprivation, and/or impairment.

General design considerations that are of particular importance include, but are not limited to:

1. Fixture placement (light switches, phones, heating/cooling units).
2. Hardware type (on cupboards, doors, cabinets).
3. Equipment location (adaptive devices, emergency products).
4. Usable work, grooming and recreational spaces/surfaces (appropriate height, width and depth while allowing sufficient knee and toe space).
5. Sufficient amount of accessible/adjustable storage in all rooms.
6. Elimination of wheelchair barriers (door widths/clearances, entrances/exits, parking area, threshold treatment, bathrooms, placement of furniture).
7. Functional arrangement of floor plan (minimize the traffic pattern and facilitate ease in activities of daily living).
8. A minimum space required to accommodate wheelchair clearance, and transfers.
9. Safety of life (smoke/heat detectors, exits, call-for-help system).
10. Environmental control features to meet needs of all resident's of the home (zoned heating/cooling).
11. Ease of maintenance of exterior and grounds.
12. Aesthetics

The following design ideas are from Welcome, H.O.M.E., a model accessible home located near West Bend, WI. They were created by merely exploring needs and then innovatively utilizing common sense. For example:

POCKET DOORS

- Are easy to open
- Do not require swing clearance space
- When opened are completely out of the way, a convenience for persons who are visually impaired and persons who are wheelchair users, toddlers, etc.

ROLL IN SHOWER

- Allows for easy transfer from wheelchair to shower chair
- Provides enough room for individual requiring assistance to easily receive it; this may include parent and child, care-giver and wheelchair user
- Allows for easy access to person who has an unsteady gait

ROOM SIZES

- May seem large when one views the blue prints. This is not out of extravagance. An electric power wheelchair requires a clear area measuring 5' in diameter to maneuver a turn, such as:
 - at least on one side of the bed
 - along sides of toilet (or at least 3')
 - in front of bathroom sink as well as the tub
 - in the roll-in shower
 - between work areas in the kitchen
 - in walk-in/roll-in closet
- Just as some folks are right-handed while others are left-handed, persons living with physical limitations may favor, out of necessity, one side over the other. Buildings not designed to meet the specific needs of one person, in order to ensure usability by all, must allow enough room to accommodate access from either side.

HEIGHT

- Height is important when considering placement of:
 - the toilet seat (transferring skills/styles may be as unique as fingerprints)
 - electrical switches, receptacles, thermostats, telephones (a general rule of thumb ranges from 15" above the floor to no more than 42". Individual abilities are very influential upon what height is usable for the resident of the home.)
 - counter tops, cabinets and coat rods
- To persons experiencing a loss of strength and/or control of their upper body, "an inch here or there" makes the difference between dependence and independence

KNEE SPACE

- Under sinks (protect/wrap hot water pipes to prevent burns)
- Next to the oven, cooktop and dishwasher
- At lowered work surfaces

ENTRY WAYS

- Covered or protected from the elements (sun, rain, wind, snow)
- Shelves (located near doors) to hold parcels while unlocking, opening doors
- Varied height peep holes and/or windows allow for easy identification of guests

(Actually, can you think of anyone who would not enjoy these designs?)

DESIGNS: BY TOPIC

LIGHTING

1. Varied light switch types located at measured heights may accommodate specific needs (ranging from 15" to 46"), such as: rocker switch, dimmer switch, central control box, motion sensitive, pressure sensitive, and headboard control panel.
2. Limit or totally eliminate overhead lights. Changing bulbs is a difficult and hazardous (if not impossible) task.
3. Switches adjacent to doors, horizontally aligned with door handles for ease in locating.
4. Light switches located on wall outside entry to bedrooms and bathrooms eliminate the need to enter a dark room.
5. Lighted switches aid in ease of locating.
6. Fluorescent lights underneath cabinets and over the stove provide extra illumination during kitchen activities, meal preparation.
7. Cordless battery-operated lights provide easily installed, low cost additional lighting, particularly when electrical outlets are not available.
8. A swivel lamp that clamps to the headboard (equipped with a dimmer) makes bedtime preparation easier.
9. Light-colored wall coverings and counter tops utilize available light due to increased reflectance.
10. Matte-finish paint, wallpaper, counter tops help control glare.
11. Fuse/circuit box located for easy access.
12. Electrical outlets should be numerous in bedrooms, bathrooms, and kitchen at a height ranging from an 18" minimum to a 4' maximum.

DOORS AND ENTRY WAY

1. Must be a minimum of 36" wide with at least 18" free wall space to the latch side of the doors. (36" door allows for 32" clearance.)
2. A minimum unobstructed length of 4-1/2' provided on each side of all doors.
3. For doors used in pairs, each door must meet all criteria.
4. Doors should open with a single movement effort. (Locks that must be turned simultaneously with the door knob present problems.)
5. Sliding/pocket doors or hinged doors which require a single swing-out motion to open are easiest for many wheelchair users.
6. Easy-close mechanisms: automatic, rocker, pull.
7. A maximum resistive force of 8 pounds recommended for interior doors.
8. Door closers installed should have a minimum time delay of 4-6 seconds.
9. Door locks at convenient height, easy to operate.
10. Varied door handle options include: lever, knob, automatic opener, knob adapted with lever.
11. Entry ways are sheltered or covered to provide comfort in all weather conditions.
12. Entry's should have a wheelchair threshold.
13. Level entry unobstructed by door mat, drainage grates (may be sloped 1/8" per foot to provide drainage).
14. Windows at main entry allow home's residents to see who is approaching the door.
15. Kick plates on one or both sides of door to protect from damage.
16. A shelf (conveniently located near entryway) for holding parcels while door is being unlocked and opened.
17. A dog door allows easy care of companion dog or pet access to the kennel.
18. Doorbells and mailbox located between 36" and 45" in height from the floor.

HEATING AND COOLING

1. Thermostat with large numerals and raised temperature settings that click and vibrate each time thermostat is adjusted.
2. A programmable thermostat provides energy efficiency as well as convenience.
3. Zone heating and cooling control allows for comfort throughout the home for individual needs or desires.
4. Adequate insulation and weather-stripping is of particular importance for persons vulnerable to drafts.
5. Mechanical room (fuse box controls, etc.) located on the main living level of the home.
6. Furnace should be easily accessible allowing for maintenance (filter change) performed from wheelchair.
7. An optional heat lamp located in bathroom

SAFETY AND SECURITY

1. Intercom system throughout the home and the surrounding grounds allows for easy communication or call for assistance.
2. Emergency numbers clearly noted (large print) near all telephones.
3. At least one programmable telephone (centrally located) with emergency numbers entered.
4. Telephones located within easy reach for all of the home's residents. Wall mounted telephones must not be put above counters, restricting access. Maximum height of 4' (33" to 39" preferred range).
5. An anti-scald mechanism located on sinks automatically mixes water to a pre-set temperature.
6. Exposed hot water pipes wrapped to avoid burns on contact. This is especially important for folks with limited or no sensation in their lower limbs (and also toddlers).
7. The temperature gauge on hot water heaters set at lower than the usual 150°.
8. Position of peep hole(s) in entry way doors at staggered heights to accommodate residents of the home (children, persons utilizing wheelchair, tall and short folks who are ambulatory).
9. Bells on a rope, hung on entry doors, let you know when someone is entering or leaving the home.
10. Door to confined space should swing out. (A potential danger exists with in-swinging doors, should the user fall and block the door, preventing needed assistance.)
11. Automatic shut off device attached to all heating appliances.
12. Smoke/heat detectors installed throughout the home (bedrooms, kitchen, garage, basement, attic) including:
 - smoke penetrating flashlight that is triggered by the sound of a smoke detector alarm;
 - smoke detector which triggers a flashing light to signal persons who are hearing impaired.

ACTIVITIES OF DAILY LIVING

1. Talking alarm clock with large numerals and adjustable volume will help everyone start the day.
2. Central vacuum cleaning system with outlets located throughout the home/garage.
3. Appliances, home environment labeled with Braille tags, large print and/or color keys accommodate persons with visual impairment.
4. Special telephone equipment can meet the needs of persons with a hearing impairment.
5. Open wall space between counters and cupboards, covered with noise resistance material (cork allows wall to act as large memo board).

WINDOWS

1. Maximum sill height of 33” allows viewing from a seated position or a child’s height.
2. Varied window types include:
 - floor to ceiling windows allow for an unobstructed view as well as permitting desired light in
 - large southern exposure windows create a passive solar effect, bright sunny rooms.
 - casement with crank hardware
 - sliding, side-to-side
 - skylights
 - remote control
3. Double glazing and weather-stripping prevent drafts and temperature variations.
4. Easily manipulated window treatments.

MOBILITY

1. Non-plush carpet (level-loop) without pad, glued directly to floor.
2. Stairs should have sufficient lighting.
3. Highlight edge of each stair with contrasting color.
4. Hand rails located at all stairs, ramps and/or platforms,
5. Hand rails of 18” diameter provides safe grip (larger width with an 18” wide groove may be used).
6. Hand rails mounted to provide 18” clearance from wall.
7. Wall surfaces behind handrails should be untextured to prevent scrapes.
8. Hand rails should be smooth, continuous and uninterrupted and extending a minimum of 1’ beyond end of ramp and/or stairs.
9. Hand rails on both sides of stairs, ramp, platform with ends that curve toward the wall or turn down at end of path (a tactile clue that the last step is approaching).
10. Hand rails provided on both sides of stairs mounted at height of 33”.
11. Hand rails along ramps mounted between height of 30” and 32”.
12. Nonskid surfaces in bathroom, shower and entryway.
13. Rubber flooring in the bathroom will help prevent slips.
14. Sand mixed with varnish creates nonskid surfaces for exterior wood.

MISCELLANEOUS

1. Slide board makes transfers from wheelchair easier.
2. Dressing hooks, an assistance device for zippers.
3. Turn-round universal holder for flatware, toothbrush, hair brush, pens, etc.
4. Long trigger sprayer for any size spray can and may be activated with light pressure.
5. Door hinge coat rack.
6. “Go Fly a Kite” kit useable from wheelchair.
7. Playing card caddies.
8. Motorized sliding rural mailbox mechanism which extends mailbox up to 30”.
9. Braille playing cards. Monopoly, Scrabble games.

DESIGNS: BY ROOM

BATHROOMS

1. Bathroom door opens out (if not a pocket door).
2. Illuminated light switches located outside bathroom door for easy access.
3. Sink allows wheelchair access (open underneath), with hot water pipes wrapped to prevent burns.
4. Sink projection of approximately 27" from wall.
5. Varied faucet types include: lever-single handle, lever-dual handle, automatic eye, gripper tap turner which fits over existing faucets, adjustable goose neck.
6. Faucets located a maximum distance of 21" from edge of vanity.
7. Spigot located a minimum of 4" clear of obstruction from rear and at least 4" above sink rim.
8. Flexible hose located at bathroom sink for easier hair washing, personal grooming.
9. Wall-mounted, extending, magnifying mirror near sink.
10. Tilted mirror over sink accommodates seated position.
11. A 4' unobstructed length precedes all fixtures.
12. A minimum of 4' allowance between centerline of toilet and edge of sink (when mounted on same wall).
13. Vanity height does not exceed 34" with a 27" minimum height and 36" minimum width. Vanity tops approximately 27" deep.
14. Disposable cup, towel and soap dispenser located near the sink.
15. Towel racks are also grab bars and should be capable of supporting 250 pounds for five minutes.
16. Floor to ceiling mirror will allow for all heights to view themselves from top to toe.
17. Medicine cabinet mounted at counter height allows visibility of contents as well as easy reach.
18. Easy access linen closet.
19. Thermostat controls protect against sudden change in water temperature.
20. Roll-in shower: curb-less (measuring 60" wide x 40" deep), floor pitched to drain at the corner farthest from the center.
21. Varied shower head types includes: height adjustable, permanent; hand held; large over-head.
22. Varied shower and/or tub seating include: portable, folding, permanent.
23. Tub seating area should be no less than 18" wide and located at end of tub for ease of transferring.
24. Grab bars on tub (48" long and set 21" to 36" in height) above floor line along wall. Located so as to extend 6" beyond the seat.
25. Bathtub height varies according to need.
26. Bathtub controls located on the long wall, 15" from the tub seat and approximately 28" above the floor line.
27. Varied grab bar options include: zig-zag grab bar (keeps wet hands from slipping), wall-mounted, adjustable safety rail with clamps, fold-down.
28. Varied toilet seat options include: a minimum of 3' side access (5' is best), grab bars, hydraulic, dual-seat.
29. Telephone jack or extension telephone located for safety/need to call for assistance.

KITCHEN

1. Varied kitchen cupboards include: slide out shelves, lazy susans, swing out storage, removable sliding or hanging baskets.
2. Counter tops have rounded corners to reduce potential for bruising or injury.
3. Kitchen drawers compartmentalized (especially those holding knives).
4. Drawers have full extension guides.
5. A maximum of 24" reach allowance for counter space from seated position.
6. Cabinet and closet hardware: loop, c-shaped, tassel pull, 3-1/2" wire pull.
7. Open access spaces under the counter not less than 36" wide.
8. Varied counter top levels accommodate all persons who want to help in kitchen.
9. A 10" x 7" toe space allows for front wheels and footrest of a wheelchair to clear cupboards.
10. Microwave at counter height with pull-out extension shelf located below or to the side of the unit.
11. Built-in oven with side-hinged door should have pull-out counter below door.
12. Flexible sink hose extending to range top eliminates need to lift heavy, water-filled pots.
13. Second sink with side-mounted faucets located on lower counter.
14. Shallow sink (5-1/2" to 6" deep) with a rear drain.
15. Plumbing recessed, insulated or otherwise guarded.
16. Chopping block located near sink.
17. Sling belt attached to counter at sink assists during standing tasks.
18. Stationary floor to ceiling pole located at sink area allows support while standing at sink.
19. Built-in induction heat cooktop positioned at end of counter allows cooks to use the appliance head on. Induction heat may prevent serious burns. Light touch push controls allow for easy operation.
20. A mirror suspended above the cooking area allows extra vision for seated person.
21. Under counter dishwasher: front-mounted controls with open counter space at one side for easy access.
22. Side-by-side refrigerator/freezer: self-defrosting, with pull-out shelves, exterior door ice maker and water dispenser.
23. Electrical switches and outlets installed on the counter front.
24. Adjustable height towel holders.
25. Generous storage area minimizes energy expending shopping trips.
26. Labor saving devices (dishwasher, ice maker, garbage disposal) make sense.
27. Movement areas in the kitchen providing not less than a clear space of 60" in diameter and measuring 12" above floor to allow for turning space.
28. Halon fire extinguisher located within easy reach of oven/range.
29. Parcel pass-through between garage and pantry allows for easy trash collection or parcel transfers. Pull-out carts allow access from a wheelchair.

ENTRY WAY

1. Sheltered and/or covered to protect user from all weather.
2. Ramp/stairs constructed of flame-retardant material.
3. Approach walks at least 48" wide.
4. Grade interruption of no less than every 20' with an incline no steeper than 1" per foot.
5. Porch size: a minimum of 5' x 5' if the door swings out (3' x 5' if door swings in) measuring 1' beyond the door.
6. A minimum of 60" diameter clearing space (measuring 12" above floor) at entry.
7. Hallways no less than 42" wide.

BEDROOMS

1. Walk-in closet for easy access to all items stored.
2. Adjustable height clothes rods in closets.
3. Closet doors permit access to the entire closet.
4. Rooms large enough to allow access to all furniture (minimum of 3' for transferring purposes and 5' diameter for turning area required by electric wheelchair users).
5. A minimum width of 3' must be provided on at least one side of the bed. (Many wheelchair users dress and undress in bed.) Three foot clearance on both sides of bed allows bed making to be done by wheelchair users. A 4' clearance width should be located at foot of bed.
6. Bedside table heights may vary with need.
7. Strong joist located in ceiling area where trapeze suspension is installed.
8. Varied bed options include: platform, hospital, trundle, day bed, water bed.
9. Zone heat/air conditioning allows temperature to be adjusted to meet personal preference or need.
10. Porta-Bathe located next to bed served by a Mobilift; allows for complete grooming for persons restricted to bed.

LAUNDRY

1. Side-by-side washer and dryer with front opening are easiest to use from seated position.
2. Raised appliances permit for easier access from wheelchair.
3. Grab bars located above stacked washer/dryer unit provide standing assistance.
4. Fold-out ironing board located in/near laundry area.
5. Laundry facility located near bedroom and bath area minimizing carrying distance.
6. Adjustable clothes rod located at varied heights allow clothes to drip dry.

MUD ROOM

1. Accessible from the garage and kitchen as well as from yard.
2. Serves as pantry and allows space for a freezer (handy to both car and kitchen).
3. Recessed duckboards in the floor allow for muddy feet and wheelchairs to be hosed off before entering the house.
4. A 4" floor drain catches water from duckboards.
5. Large wall closet and additional hooks on a second wall allow for easy storage of damp clothes, recreational equipment, seasonal clothes, spare wheelchair parts, etc.
6. A low wall faucet located for easy filling of dog's dish, hosing off muddy wheels or concrete floor.

EXTERIOR AND SURROUNDING GROUNDS

1. A nonskid surface (brushed cement, granules of sand mixed with varnish) used on walks, ramps, porches, etc.
2. Raised planting beds allow for no-bend gardening.
3. Maintenance free exterior windows.

GARAGE AND PARKING

1. Parking spaces with sufficient unobstructed area to allow for:
 - driver (driver's side) to load and unload wheelchair
 - wheelchair lift (passenger side or rear)
2. Sheltered parking/carport.
3. Easy access pass-through window and carts for transporting of groceries, parcels, trash.
4. Wood closet between garage and home for easy access for fireplace to stored wood supply.
5. Parking areas, garage, should be well lit.