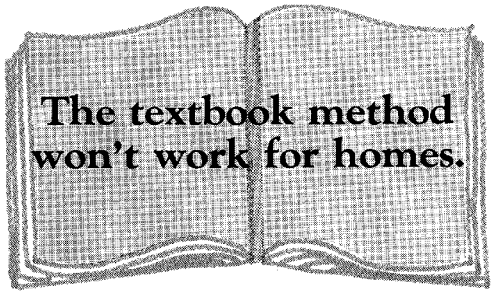
BARRIER-FREE DESIGN



by **R**ae **L**yle *and* **A**l **W**asco

As a contractor, you may have been asked to build or rehab a home for someone requiring barrier-free design. If this is your first barrier-free project, you'll probably have a lot of questions.

What is Barrier-Free Design?

Barrier-free design (also known as accessible or universal design) is aimed at making the environment hospitable to the user, especially people with physical impairments, young and old.

Before 1973 little attention was paid to the concerns and rights of the disabled. That year federal guidelines were enacted to make public facilities accessible to physically handicapped people. There are still no standards, however, for private homes. So when designers are called upon to create barrier-free homes, they often draw on the institutional standards. This results in an institutional-looking home. The designer does not realize that a disabled person can—and wishes to—live in a home that looks no different than anyone else's.

Barrier-free design means more than "accessibility"—more than a ramp to the door. A disabled person wants what everyone else wants: the freedom to perform daily living activities; the right and means to maintain privacy; the knowledge that he or she is "in control," requiring minimum outside assistance.

Barrier-free or universal design tries to create an environment that will be hospitable to people with a wide range of physical abilities. Some design features can be planned that will benefit all, while others will need to be tailored to specific abilities.

Where to Start

If you haven't had much experience along these lines, it is best to begin researching disabled and elderly needs long before you start your first job. Read and ask questions (see reading list at the end of the article).

Learn about the effects that various disabilities and the aging process have on the human body. You can learn a great deal from those who are disabled or elderly about typical lifestyle requirements they might have. If possible, visit the homes of people who have modified or built barrier-free homes. Your local building inspector or department of community development may be able to refer you to a disabled or elderly individual who has modified his home. Ask why they made the design decisions they did, and what they would change if they could do it again.

You can also seek out the advice of a design professional. Very few specialize in the barrier-free concept, but your chances of finding a specialist are greater if you live in or near a large city. For referrals, check with agencies serving the disabled or elderly, local rehabilitation centers (usually a hospital), a clinic serving the special needs of disabled people (e.g. the Mellon Center of the Cleveland Clinic), the local "independent living center" if you have one, or your state's agency for vocational rehabilitation.

◆ONE SIZE FITS ALL◆

While author Lyle recommends that builders use standard products for the disabled and elderly, and avoid using institutional "handicapped" products, there is another approach. Design companies responding to the growing "older adult" market, are coming up with products that aren't institutional, but do accommodate users' physical limitations.

One such company, Advanced Living Systems, has designed what it calls the Lifespec Cabinet System, a line of units adaptable to all ability levels. The system's designer, John Zellner, based the system on data he collected on people's varying ability "to negotiate the environment." His goals were to design a kitchen system that provided "ease of use and efficiency of space" without sacrificing aesthetics. The cabinets are Euro-style, built of high-density melamine impregnated laminate, using the 32mm frameless system.

The stove and sink are close enough together that the user doesn't have to carry hot pans very far. Cabinets are strategically located to reduce the likelihood of fire or scalding. A pull-out seat under the sink eliminates the need to stand while working for long periods of time. Storage cabinets feature shallow shelves. To reach the highest the user doesn't have to stand on a stool; to use the lowest, which have pull-out drawers instead of cabinets, the user doesn't have to bend down too far.

As the housing market ages it's likely that more innovative products like this one will become available. Builders for the handicapped and elderly will have more options.

For more information about the Lifespec System, contact Advanced Living Systems, a division of the Institute for Technology Development, at 428 North Lamar Boulevard, Oxford, MI 38655; 601/234-0330.

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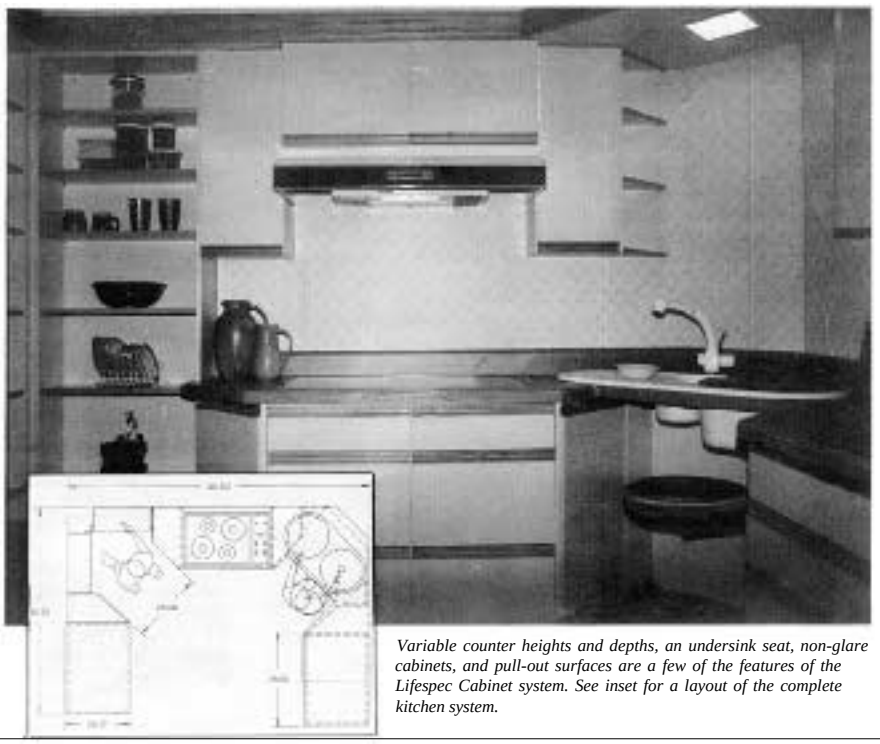

Variable counter heights and depths, an undersink seat, non-glare cabinets, and pull-out surfaces are a few of the features of the Lifespec Cabinet system. See inset for a layout of the complete kitchen system.

Be careful not to rely on architects who are as inexperienced as you are on the subject. They are likely to rely heavily on institutional guidelines such as those laid out by the American National Standards Institute (ANSI); unfortunately this textbook approach isn't very helpful. The ANSI guidelines were developed as a guide to the design of public facilities and spaces, and it's perfectly adequate for that use. Use it as a guide to design a person's home and the home will look like your local institution.

Your First Project

Before you begin working on a barrier-free project, as in any project, make certain you understand what your client wants. Also discuss how your client's special needs will be accommodated, how much they will cost, how long it will take to complete the job, and how inconvenient it might be to the client (in the case of renovations).

Projects can get complicated if you are building not only for the disabled or elderly client but for other members of their family. Family members will have to live, work, or at least visit, in the space too, so the modifications should not be extreme in either direction.

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For example: even if the primary user of the kitchen space uses a wheelchair, it is not necessary to make all the counter heights lower than standard. A tall person can develop backache from bending over a too-low counter.

Also keep in mind that what works for a person with one type of disability may not necessarily work for a person with another type (another reason to forget the textbook approach).

Just as disabled people are not all alike, neither are elderly people. An elderly person in generally good health but of short stature may need to have the upper kitchen cabinets lowered to about 12 to 14 inches between counter and upper cabinets, but can use a standard toe kick. A person who uses a wheelchair, however, needs a 6- to 8-inch kick space to move in close enough to work at the counter top.

Continue to consult with the customer throughout the design and building process, As often as you can, have the client "test drive" your work. Before permanently putting cabinets or fixtures in place, set them up and let the person try using them, or use masking tape to outline on the floor how things will be set up. This is especially helpful in determining whether there's enough room to manuever a wheelchair. In the long run, this one effort will save you and your customer time and money.

Products and Materials

Once you and the customer have agreed on a design and layout, where do you find the special fixtures and equipment you will need? It's much easier than you may think. For the most part you can find the "special" equipment you need at your local supplier. In other words, use standard equipment. By consulting with your client, and using common sense, you should be able to choose which of the standard products available are appropriate and which are not. Steer clear of fixtures (tubs, shower stalls, sinks, etc.) supposedly made for people who are disabled. Some manufacturers, in an effort to mainstream institutional fixtures, promote the items by labeling them "handicap" or by using the international symbol of accessibility, the figure in a wheelchair. These so-called "handicap" fixtures and equipment are usually unnecessary and unnecessarily expensive. Designed for institutional settings, they look and feel out of place in a home.

When renovating or building houses, you'll be taking conventional materials and using them in unconventional ways. If a doorway on the outside wall needs to be widened a bit and doing so will encroach on hallway space, try removing the existing door frame and installing a sliding door. The hardware is readily available—it's frequently used for closet doors.

In some situations, it seems like nothing can be done without great cost and inconvenience, but by looking beyond the usual approaches you should be able to come up with your own solutions. Sometimes it's as simple as replacing the existing faucet with a single-lever mixing faucet or wrapping the existing water pipes under the sink with insulation to prevent the hot pipes from burning the wheelchair user. Simpler still, you can just lower the water temperature to 115° F. (For more specifics, see "Rules of Thumb".)

The Result

As a builder or remodeler of barrier-free homes, your goal is to build an environment that allows all people, whether disabled or non-disabled, young or old, tall or short, to function at their maximum level. It need not be costly, and it need not look institutional. You can design and build these homes so that someone would have to look twice to determine that the person living there has a handicapping condition, By becoming familiar with disabilities, getting to know the person you're working *with*, and using standard tools and fixtures creatively, you can achieve this goal. ■

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Suggested Reading:

Lifchez, R. & Winslow, B. *Design for Independent Living: The Environment and Disabled People.* Berkeley, Calif: University of California Press, 1979.

Hale, Glorya, ed. *Sourcebook for the Disabled.* New York, N.Y.; Bantam Books, 1981.

Cary, Jane R. *How to Create Interiors for the Disabled.* New York, N.Y.; Random House, 1978.

Chasin, Joseph. *Home in a Wheelchair.* Washington, D.C.; Paralyzed Veteran's of America, 1978.

Rules of Thumb for Barrier-Free Design

Here are some tips for improving accessibility in rehab and new construction. But keep in mind that barrier-free design results not so much from following a list of design and construction guidelines as it does from being sensitive to the needs of the person who will live in the house. Also understand that you are not doing for the customer so much as you are working with the customer to create an environment that is as accommodating as possible.


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Throughout:

- Build all interior doorways with a *clear* opening of at least 32 inches; at least 36 inches in hallways.
- Mount electrical switches 40 to 48 inches from the floor to center of switch; receptacles 24 inches from the floor.
- Slope ramps at 1:12 (photo 1).
- Put clothes rod at lower height (photo 2). Check with customer for comfortable height.
- Replace door knobs with lever type handles or use special door knob converters (photo 3).
- Keep thresholds to a minimum—only 1/4-inch step up.
- Windows should operate easily. Sliding windows may be helpful, but make sure they are good quality, durable, and easy-to-open.

Bathroom:

- Reinforce framing in walls around toilet for the addition of grab bars later.
- Install bathroom door to swing out; if someone should fall in front of the door it can still be opened.
- Provide enough space between commode and bathtub to allow for a wheelchair to be positioned alongside the toilet for transferring (check with your client on this). Open space under the sink can provide some of this space.
- Place tub/shower controls on side wall within easy reach of someone sitting down to bathe (photo 4). A hand-held shower should be usable by someone in either sitting or standing position.
- Install mixing valve controls to reduce likelihood of accidental scalding. This goes for kitchen as well.
- Place medicine cabinet on the side wall and closer to counter top (photo 5).
- Use grab bars to complement the decor of the room (photo 6, next page). This applies to the use of grab bars throughout the home.
- Other features that can make the bathroom more hospitable include: a tub chair, recessed soap shelf, support legs under the vanity (or design vanity high enough) to allow wheelchair access, a mirror that tilts with good visibility for someone in either sitting or standing position, and an outlet/light switch located on the front of the vanity.

Kitchen:

- Install kitchen counters at various heights: 36 inches at the dishwasher, 34 inches at the stove, 31 inches for workspace or eating (photo 7).
- Install upper cabinets at less

than standard height from counter (12 to 14 inches). This is helpful to those of shorter stature.

- Use electric ranges with front-mounted controls; this eliminates reaching across burners (photo 8). Mount range hood switch on front of cabinet.
- Use cabinets that feature pull-out or roll-out shelves (photo 9). Hinged cabinets can provide convenience as well.
- Install a cutting board for additional workspace (photo 10).
- Install single-lever faucets. This goes for bath as well. Locate water shut-offs where they can be reached from a sitting position; lever-action valves will provide easy operation. An insulated hot-water line can prevent accidental burns.
- Leave space beneath the sink open; or install small drawers on only one side as in the bathroom (photos 11 and 12). This applies to kitchens too. In either case, make sure drawer pulls are wide and easy to grasp.
- Fire extinguishers should be mounted low for easy reach.
- Side-by-side refrigerator styles allow for variations in reach.
- Other features to make life easier in the kitchen include: a knife rack that is mounted low and swings down for use; a double-bowl sink that is shallow for easy reach; and undercounter light controls and towel racks mounted on the inside of cabinet doors.


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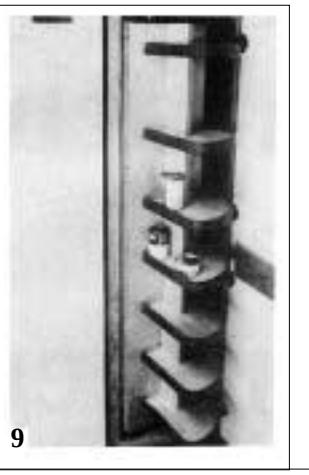
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