



Universal Design

HOUSING FOR THE LIFESPAN OF ALL PEOPLE

COLLEGE OF DESIGN

THE CENTER FOR **UNIVERSAL DESIGN**

NC STATE UNIVERSITY

“Too often older or disabled people live limited lives or give up their homes and neighborhoods prematurely because standard housing of the past cannot meet their needs. While a truly universally usable house is a goal for the future, many features in houses today already are or easily can be made universally usable. The universal design concept increases the supply of usable housing by including universal features in as many houses as possible, and allows people to remain in their homes as long as they like.”

Ronald L. Mace, FAIA
Architect and Product Designer

UNIVERSAL: applicable or common to all purposes, conditions, and situations

a definition

The intent of the universal design concept is to simplify life for everyone by making more housing usable by more people at little or no extra cost. Universal design is an approach to design that incorporates products as well as building features and elements which, to the greatest extent possible, can be used by everyone. While accessible or adaptable design requirements are specified by codes or standards for only *some* buildings and are aimed at benefiting only *some* people (those with mobility limitations), the universal design concept targets *all* people of *all* ages, sizes, and abilities and is applied to *all* buildings.

What is a universal feature? Any component of a house that can be used by everyone regardless of their level of ability or disability. Universal features are generally standard building products or features that have been placed differently, selected carefully, or omitted. For example, standard electrical receptacles can be placed higher than usual above the floor, standard but wider doors can be selected, and steps at entrances can be eliminated to make housing more universally usable. Examples of other universal features in housing are:

- handles for doors and drawers that require no gripping or twisting to operate—such as louver or loop handles;
- living space on one floor or stair landings big enough to accept lifts;
- audible and visual alarm systems
- storage space within reach of both short and tall people.

Some products and design elements are already universal. Others can be made so. Manufacturers and builders who use the universal design concept will design their products and buildings to be as usable as possible by a larger population including children, older people, and people with disabilities.

“The universal design concept considers those changes that are experienced by everyone as they grow from infancy to old age. Problems related to temporary or permanent disabilities are incorporated into the concept as well. Because all groups are placed within the context of normal expectations of the human condition, trying to justify the importance of each vulnerable population group becomes unnecessary.”

Leon A. Pastalan, Ph.D.
Gerontologist and Urban Planner

D E S I G N UNIVERSAL DESIGN the rationale

Living spaces have long been designed for use by one “average” physical type – young, fit, male, and adult. The fact is that only some of us fit that description, and none of us can be described that way for a lifetime. As children, as older adults, or as physically disabled people, millions are never average. Many millions more, because of a broken limb, serious illness, or pregnancy, know how unsettling it is to try to function in an environment that no longer meets their needs.

The point is, no “average” actually represents the majority because too many people have vastly differing requirements. The composition of our population is changing. Many people are surviving permanently disabling accidents and illness and even more are living longer. It would seem logical that the spaces built to accommodate this population must, by necessity, change also.

The building and design industries have responded to this need for change by producing special products and spaces for special groups. But “special” is often synonymous with “expensive”. Specialization leads to complicated building standards and products which, in the end, seldom meet the needs of more than a fraction of those they were meant to help and often seem to stigmatize and separate them further from other people.

Universal design succeeds because it goes beyond specialization. The concept promotes designing every product and building so that everyone can use them to the greatest extent possible – every faucet, light fixture, shower stall, public telephone, or entrance. Universal design is a revolutionary but practical leap forward in the evolution of building and design procedures. When designers and manufacturers seize this concept, universal design will become common, convenient, and profitable.



THE FRONT DOOR

UNIVERSAL DESIGN

invisible solutions

T H E F R O N T D O O R

A walk through a house with universally designed features shows that they are simple and often almost invisible.

The front door to the house is made easier for everyone to open by one simple change – a lever handle in place of the traditional knob. This is appreciated by anyone returning home with hands and arms full of parcels, a briefcase, grocery bags, a baby and a diaper bag, or a cane. Small children can manipulate a lever more easily than a knob, as can those with arthritis or other physical disabilities that limit a full range of movement.

COST

While commonly available in Europe, lever handles were once used in this country as expensive hospital hardware to benefit busy people moving quickly from room to room with trays and medicines. Today, levers are popular and stylish. Available from local hardware stores and building supply houses in a variety of materials, colors, and prices, they can be used anywhere. For no additional cost, in new construction, lever handles with locksets and other safety features can replace less usable hardware of the same quality. In fact, an inexpensive non-locking lever hardware set for a passage door may cost as little as \$15.



THE BATHROOM

UNIVERSAL DESIGN

invisible solutions

T H E B A T H R O O M

The bathroom wall above the tub appears conventional, but it is actually reinforced with blocking. Built into the wall itself, blocking allows the wall to accept grab bars when, and if, they are needed by the residents.

The bathtub faucet is located close to the outside rim of the tub making it easy for everyone to reach. Wheel-chair users and other mobility impaired people need to have the controls in this offset position. Non-disabled people will discover that what is a necessity for some can be an added convenience for others.

COST

The universally designed bathroom is slightly larger than a conventional bathroom to accommodate wheelchair users. The extra space allows more than one person to occupy the bathroom at the same time so that, for example, a parent can help a child brush his teeth, or provides space for furniture or additional storage.

The offset tub control requires only about six inches of additional supply pipe. Since the additional cost of materials and labor should not be any more than \$5 to \$20 per tub, offset tub controls could easily become standard features in all housing.

The extra space in a larger bathroom need not increase the overall square footage of the house. The required inches can usually be “borrowed” from a closet or utility space. Although it is not always possible to increase the bathroom size without increasing the overall square footage, any additional cost could be balanced by the greater market for the universal home and its extended lifetime occupancy for older owners.

“The overwhelming preference of older persons is to age in place; that is, to remain in their homes as they grow older. It is essential that residences be designed to be safe, comfortable, and accommodating to persons of all ages but particularly to those who are faced with diminishing physical abilities which make daily domestic routines difficult to manage. Universal design is a concept that will enable older people to remain in their homes as they would wish”

Cyril F. Brickfield
Former Executive Director of AARP



THE KITCHEN

T H E K I T C H E N

The kitchen has the usual appliances – oven, stove, and refrigerator. However, the refrigerator is a standard side-by-side refrigerator/freezer and the stove has front or side mounted controls; both can be used by a greater number of people. The advantage of the side-by-side refrigerator/freezer is that it places both the freezer and refrigerator compartments within reach of everyone, even children.

The cabinets also look and function like conventional cabinets. The difference is that the counters can be adjusted to any level to suit users of different heights.

COST

Although more expensive than other models, the side-by-side refrigerator/freezer is a universally usable product that is already on the market. A medium priced side-by-side refrigerator/freezer will cost approximately \$150 more than a medium priced over-under refrigerator/freezer*. For those who can afford it, the side-by-side expands the universality of a home which already has other universal features that are no-cost or low-cost.

Adjustable height counters could become a universal feature. While in most states they are only required in accessible housing for disabled people, New York and California have incorporated them as adaptable features in multi-family housing. Although innovative, low-technology approaches exist for providing adjustable height counters, no manufacturer has yet mass produced them. The manufacturer who chooses to do so could reduce the cost of the counters, and find a growing and profitable market for this product.

*Prices will vary regionally. The price quoted here is valid only in the southeastern United States.



THE BEDROOM

T H E B E D R O O M

The bedroom clothes closet rods appear to be standard. The difference is in the way rods are mounted. Notched mounting blocks on either wall allow the rods to be lowered or raised to accommodate people of all heights and ages. Children's closets can "grow" with them. People temporarily restricted to wheelchairs can lower rods to be within their reach.

A wider passageway door leading from the hallway to the bedroom is another universal feature that is invisible until furniture movers or wheelchair users discover its advantage.

COST

The adjustable closet rod detail may cost the price of two pieces of 1" x 4" and the time it would take a carpenter to cut the notches in each. If individually custom made by a competent carpenter, they should cost no more than \$20 to \$30 a pair, much less if mass produced. Manufactured and sold through building suppliers these brackets and rods would cost no more than fixed hardware and could be a profitable item to the manufacturer. Clearly, this universal feature could be made standard in all housing.

Wider doors do not increase construction costs because the extra cost of the wider door is offset by the higher cost of the wall area it replaces. Introducing the one-size door by making 2'-10" wide passage doors standard also eliminates the additional costs of planning, ordering, stocking, and coordinating numerous door sizes for every job.

UNIVERSAL DESIGN

a low-cost solution

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Many universal features are no-cost options. Others are low-cost solutions that can become no-cost with widespread use. In our society, mass production is used to keep costs low and to produce products that are widely marketable. Because universally designed products make as little as possible “special”, make as much as possible “standard”, mass producing design that is both usable and attractive to everyone can become a practical reality.

“Today’s architects address the life cycle of buildings. It is time that they began to address the life cycle of people as well. Universal design is considerate of the human lifespan and the continuum of abilities of all individuals.”

Ruth Hall Lusher, D. Arch. Candidate

“Specifying different features for different groups of

people will always cost more and require massive coordination and selective judgment about who should be

accommodated and where. All of these impossible

issues are eliminated by the universal design concept.”

Edward Steinfeld, D. Arch.

Architect and Gerontologist

Include universal features in your home for easier living throughout your lifetime. Include universal design features in speculative housing for increased profits, expanded markets, and better housing for all.

UNIVERSAL DESIGN

Universal design benefits the public and the entire building industry. For builders, the benefits are less construction coordination, lower costs, and manufactured rather than custom-built features; for designers, less design time, fewer compliance and liability problems, and features that can become standardized. For manufacturers and suppliers, the advantages are larger volumes of fewer products. For building owners, the benefits are rentable units that are attractive to everyone. Finally, the advantage to the consumer is comfortable surroundings that suit a lifetime of changing needs.

Statistics derived from such benefit programs as social security, disability payments, and Medicaid suggest a disabled population of 46 million. Since most affluent disabled people are not listed on the rolls of government programs, many industry people place this number much higher. For example, the manufacturers of support devices and medical equipment estimate that there are 80 million disabled people. Researchers in the disability field include the families and friends of disabled and elderly people among those who benefit from accessibility (and therefore universal design) and arrive at a figure just over 100 million people involved in, or directly affected by, disability issues.

No matter which figure is used, it is clear there is a growing market for universal design in housing and an increasing body of how-to-do-it information. The simplicity of the concept, the subtle, non-obtrusive, almost invisible features required, and the potential profits are generating opportunities for creative innovation among those who produce and market housing.

For more information contact the people and organizations listed on the back of this brochure.

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