

Is There An Optimum Approach To Incorporate Universal Design Principles When Designing A Home?

Walton D. Dutcher, Jr.

As a designer and a person who uses a wheelchair, my first priority is Principle One: Equitable Use—the design is useful and marketable to people with diverse abilities.

This premise comes from the logic that unless you can get into the home, traverse through it, and have sufficient maneuvering space in each room or area, then everything that follows is meaningless. I feel that this approach allows the adaptation of the home to any circumstance without the alteration of the structure. It does not mean that the home is being designed specifically for an individual with a disability because Universal Design and “Barrier Free” or “Accessibility” are not the same.

Universal design is not a prescriptive set of features but rather a set of seven “principles” that, according to the North Carolina State University Center for Universal Design, serves to result in: “The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.”

Who then is the arbiter of what universal design is or is not? The answer is that there is no organization or group of individuals who dictate or certify whether a home can carry the title or imprimatur of being universal design. Even if there were a set of standard features, would the home buyer see value in them?

That being said, let’s first examine what features might be incorporated using the Principles of Universal Design without significantly increasing the cost of a home or impacting the esthetics.

PRINCIPLE ONE: Equitable Use

“The design is useful and marketable to people with diverse abilities.”

The key is “diverse abilities.” In my opinion, this means that a home must either be basically useable by all or be able to be adaptable to accommodate the

specific needs of an individual without incurring significant cost or modifying structural elements. My approach was to establish a basic set of features under the term “Life Span Design.” Is it marketable? This requires a comparison of the cost features in the home versus those in the same target market. What else should be considered in designing a marketable home. The following information should be considered in differentiating the universal design home design from the other “me too” production builders. An article in the August 27, 2007 edition of the Blue Ridge Business Journal “Women In Charge,” by Michelle Long, stated that: “Women make 80 to 85 percent of the buying decisions for families, represent roughly half of the population, and comprise nearly half of the working population.” Given the significance of this statistic, the designer should be aware of what features are priorities of women. In the “Home & Garden” section of the September 8, 2007 edition of *The News & Observer*, in an article entitled “What Women Want In A House,” by Marni Jameson, the following items were listed:

- Bigger kitchens
- More bathrooms
- Closets, closets, and more closets
- Smaller living room

While these design features are important marketing considerations, they aren’t actually considerations under Principle One because one cannot separate “marketable” from “people with diverse abilities.” Therefore, in order to develop an “optimum approach” to designing a universal design home, the builder and designer need to establish a logical system that will result in a set of features for each principle. The critical consideration is if any feature will impact the cost and esthetics of the home, which would negatively influence the marketability.

Life Span Design Features

- A 4-foot wide walkway from sidewalk or driveway
- No-step entries
- ADAAG-compliant thresholds
- 36-inch wide doors throughout

- Minimum 44-inch wide hallways
- Accessible traffic pattern to all rooms and activity areas
- Electrical outlets and telephone jacks 18 inches from floor
- Switches 42 inches from floor
- Environmental controls 48 inches from floor
- Access to circuit breaker panel. Topmost breaker at maximum reach of 48 inches

PRINCIPLE TWO: Flexibility In Use

“The design accommodates a wide range of individual preferences and abilities.”

Life Span Design Features

- Blocking for grab bar and shower-seat installations
- Roll-in showers offering adequate maneuvering room for wheelchairs
- Shower system including temperature set/pressure balance single-handle control, diverter valve, and handheld shower
- Side and front transfer access space to commodes
- Single-lever kitchen and bathroom sink faucets
- Adaptable bathroom vanities with separate sub-base that can be removed for clear access underneath
- Telephone jacks placed for convenience and ease of access
- CAT 5e/6 wiring to provide for technology requirements
- Wiring available for future outlet at top of hinge side of exterior front, and interior garage entry for installation of door operator

PRINCIPLE THREE: Simple And Intuitive Use

“Use of the design is easy to understand, regardless of the user’s experience, knowledge, language skills, or current concentration level.”

Life Span Design Features

- Thermostat with intuitive features and directive notations or symbols large enough to read and with sufficient color contrast

PRINCIPLE FOUR: Perceptible Information

“The design communicates necessary information effectively to the user, regardless of ambient conditions or the user’s sensory abilities.”

Life Span Design Features

- Contrasting colors of floor materials delineating traffic passages.
- Energy-saving illumination with the following levels of minimum foot-candles (fc) for specific areas:

Task surfaces: 50fc
Passageways: 15fc
Kitchen (counter, sink, range): 30fc
Bathrooms at vanity tops: 30fc
Showers and bathtubs: 15fc

- Various floor materials, all of which comply with the Federal Housing Accessibility Design Guidelines, and colors to differentiate areas

PRINCIPLE FIVE: Tolerance For Error

“The design minimizes hazards and the adverse consequences of accidental or unintended actions.”

Life Span Design Features

- Low/no Volatile Organic Compound (VOC) materials and finishes
- Fire extinguisher mounted on base cabinet wall next to range/cooktop

PRINCIPLE SIX: Low Physical Effort

“The design can be used efficiently and comfortably and with a minimum of fatigue.”

Life Span Design Features

- Lever handles on all swinging doors
- Handles that accommodate grasp on all sliding or bifold doors
- Kitchen, bathroom, and other cabinet doors fitted with D-shape or other style of handle that facilitates grasp and are ergonomic
- Garage door opener

PRINCIPLE SEVEN: Size And Space For Approach And Use

“Appropriate size and space is provided for approach, reach, manipulation, and use, regardless of user’s body size, posture, or mobility.”

Life Span Design Features

- 60-inch turning radius in bathrooms and kitchen
- Lazy Susan corner cabinets in kitchen where indicated
- Pullout shelves in kitchen base cabinets

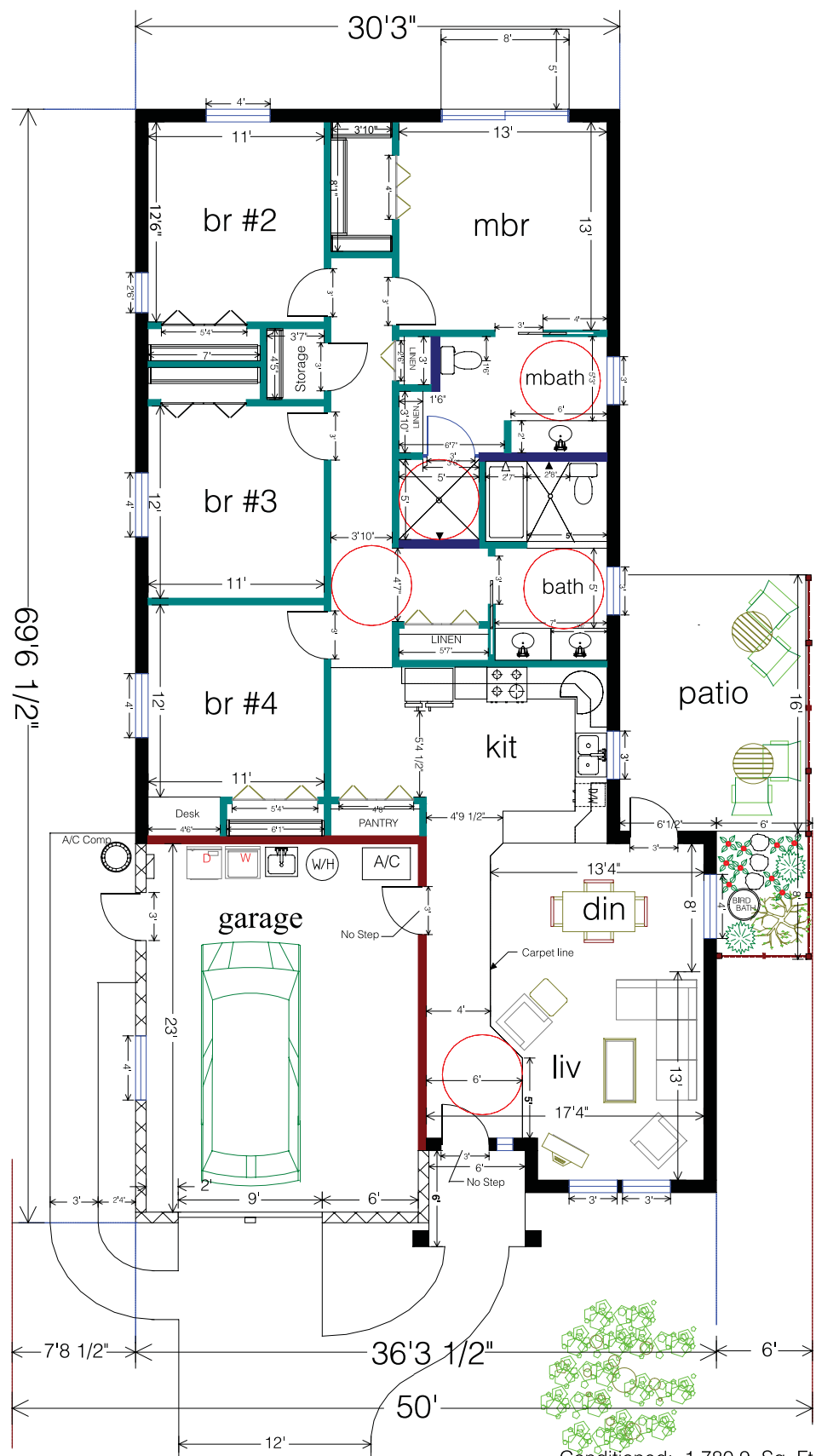
¹ Copyright 1997 NC State University, The Center for Universal Design
http://www.design.ncsu.edu/cud/about_ud/udprincipleshtmlformat.html#top

² Ibid.

³ Americans with Disabilities Act Accessibility Guidelines

⁴ Copyright 1997 NC State University, The Center for Universal Design

^{5a} Ibid.



Prototype 4 Bedroom, 2 Bath Design
A custom design by Walton Dutcher

Conditioned: 1,780.9 Sq. Ft.
Garage: 389.25 Sq. Ft.
Porch: 42 Sq. Ft.

- Front control electric range
- Switches for disposal installed in the front apron of the sink base and range/cooktop exhaust fan/light switch installed in the base cabinet next to the range

In reviewing the Life Span features listed above, ask yourself: Do any of these mean that the home is intended solely for a wheelchair user? For instance, no-step entries mean that a baby carriage does not require lifting. It also eliminates a liability related from falling. Traffic pattern and maneuverability could mean that there may be more space, especially in the smaller "affordable" homes, and thus be the single most element that may add cost to a home. The only way you can achieve equitable use is if you can get to it. This does have a beneficial side, even if you don't use a mobility device. For instance, it gives you more space to move furniture, and if someone needs an ambulance to go to the hospital, then EMS can get a stretcher into the home without having to lift it up the steps, as well as maneuver through the home.

I realize that this design needs to be explained. The intent was to be marketed to the "affordable" population segment as well as being able to place it on a typical urban lot. There are no steps to get into the home. There is a good traffic pattern. The bathrooms and kitchen offer maneuvering space. Door swings or openings allow maneuvering. The hall bath incorporates a "wet room" design. This means that a family with children can still have a tub, but the space between the tub and the toilet can be used as a roll-in shower because there is a floor drain. That same space can be used for a side transfer from a mobility device to the toilet. Access to closets is sufficient. Other details such as outlets, switches, and such are not noted because they have no effect on access, traffic pattern, and maneuvering. In other words, it meets the basic elements of Life

Span Design and Universal Design Principles. The red circles you see in the drawing depict a 5-foot turning radius.

There are some good and sufficient reasons to think beyond the optimum approach to incorporating Universal Design Principles in designing that I feel are worthy of note.

- The aging of the population.
- The expansion of the population.
- The advancement of medical technology increasing the capability of recovery following traumatic injury or disease, which also increases the potential for disabilities.
- The federal budget issues in addressing the deficit forcing either a tax increase, which is unlikely, or the diminishment in social services and health care, plus legislation advancing community-based services and supports.
- Potential for increase in the rate of disabilities based on obesity, the nation's number one health care issue, and low-birth-weight infants.
- Parents living with their children because of the cost of alternative housing or long-term care facilities.

I consistently see two-story homes being marketed to the "Active Adult," 55+, and Baby Boomers with no provision for

future vertical access. I also see bathrooms, other than the master bath, defined by the width of a 5-foot tub. As a Medicaid Waiver provider doing home-accessibility assessments, I am constantly challenged to figure out a way to create an accessible bathroom within the small confines of these bathrooms. These and other modifications are paid for by your tax dollars, as attested to a study that showed that 87 percent of modifications to achieve accessibility in homes were funded by sources other than the homeowner. This cost, to say nothing of the inconvenience and dust that must be suffered by the homeowner, could be totally avoided if all housing incorporated Life Span design features that allow a home to be adapted to any circumstance, whether it be temporary or permanent, that may arise during one's lifetime. A home having these features also expands the market for resale.

The Author

Walton D. Dutcher, Jr. is a quadriplegic, the result of a spinal cord injury in May, 1956 while serving in the Navy. His educational background includes the study of Architecture at the University of Illinois, a graduate of the Milwaukee School of Broadcasting, an AA degree from St. Petersburg College, and a BA in Business Administration from the University of South Florida. His passion is architectural design. He has designed and built three of his own homes and designed a number of others for individuals throughout the U.S. He does home modification assessments as a Medicaid Waiver provider and also consults with architects, builders and developers. Mr. Dutcher can be reached at wdutche1@tampabay.rr.com.

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