



Visitability

Universal design

People who inhabit and visit the houses we live in come in all shapes and sizes, ranging from infants to seniors, with various ever-changing abilities and skills. As we grow up, grow old and welcome new people to our homes, our housing needs change. A house that is designed and constructed to reflect the principles of universal design will be safer and more accommodating to the diverse range of ages and abilities of people who live in and visit these homes. One of the goals of universal design is to maximize the usability of environments. Designers and builders must talk to and work with as many people with disabilities as possible.

Effective accessible design and construction can only occur when we truly appreciate how persons with disabilities engage the built environment. Universal design is only a subtle shift from what is typically done; designing for greater accessibility then is not a new way of designing, simply a more focused one. By providing flexibility in the selection of design features and incorporating adaptability into home design, the life and usability of a home is extended, which promotes the concept of **aging in place**.

This concept is increasingly popular with families and individuals who choose to stay in their homes and neighbourhoods as they grow and age. Planning for individuals' changing needs and abilities allows for periodic home customization based on changing requirements and reduces the need for future costly renovations.

Planning for future needs is good practice. Principles of universal design encourage flexibility, adaptability, safety and efficiency.

Visitable homes

Visitable housing is an approach to house design that promotes the inclusion of a basic level of accessibility into all housing, and enables everyone to get in and out of the house and be able to use a bathroom on the entrance level. The concept of "visitability" is one of the simplest and most economical approaches to universal design that can address homeowners' and community needs over time, contributing to a more flexible and sustainable built environment.

Universal design is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size and ability. "The Principles of Universal Design" are found on page 14.

Bolded terms throughout this fact sheet are defined in the Glossary on page 11.



Such an approach will not only accommodate visitors to a home who may be elderly or disabled, but it will also better accommodate the reality of changing ability that we all experience as we grow older. Visitable design is meant to benefit as many people as possible, including friends and family members, parents pushing strollers, individuals using mobility devices and individuals moving furniture or other large items into a home (see figure 1).

A visitable house incorporates three basic access features:

- A **no-step (zero-step) entry**
- All main floor interior doors (including bathrooms) feature a clear opening width of 810 mm (32 in.), but a clear space of at least 860 mm (34 in.) is better. It is highly recommended to install a 915-mm (36-in.) wide door to all rooms of a home.
- At least a **half-bath**, but preferably a **full bath** on the main floor complete with a 1,500-mm (60-in.) turning circle in the room.

Please note that the criteria for establishing housing varies from jurisdiction to jurisdiction, however, the objective is the same in all cases. The more stringent criteria is more universal, allowing for larger wheelchairs and scooters. Some jurisdictions may even suggest an accessible bedroom on the visitable floor level.

Visitable housing in North America

The concept of visitability was first introduced in North America in 1986 by Eleanor Smith and a group of advocates for people with physical disabilities. The vision of the visitability movement was to create an inclusive community where people with mobility limitations could visit their families, friends and neighbours without barriers. Eleanor Smith is well known for the following quote: “When someone builds a home, they’re not just building it for themselves—that home’s going to be around for 100 years. [Accessible entrances] hurt nobody—and they help a lot of other people.”



Figure 1: Visitable home complete with a no-step front entrance
Photo by Ron Wickman



Why visitable housing is important

One in six Canadians (14.3 per cent) have a disability, and one-third of all Canadians aged 65 years or over have mobility problems. Older adults aged 65 years and over account for 14.1 per cent of the Canadian population, and they will make up more than one-fifth of the population by 2026 and one-quarter of the population by 2056. Visitability housing responds to the increasing seniors' population and their desire to **age in place**. The vast majority of elderly persons prefer to remain in their homes as long as possible. With today's housing stock, this is virtually impossible.

Over 50 per cent of falls suffered by older adults occur in their own home. Staircases are one of the common areas within the home where falls occur. Stairs are the leading cause of serious falls among community-living elderly, accounting for about one-third of all fatal falls. A large portion of Canadian older adults are hospitalized after a fall on stairs or steps in their homes.

Single-family housing is largely unaffected by accessibility requirements. Building codes include barrier-free design requirements for public buildings, however, they do not force barrier-free requirements on single-family homes. If we build visitable housing today, the future economic benefits will be vast. Given the statistical information that we already know, what an incredible waste of resources if we build homes today, only to have them undergo unnecessary costly modifications 10 years later to make them accessible for persons with disabilities.

Typically, persons who own visitable homes live with a family member who uses a wheelchair. Other family and friends do not own visitable homes. Therefore, the owner of the visitable home usually becomes the host of others, simply because it is the only home that someone in a wheelchair can independently access. In many Canadian suburban neighbourhoods, one architectural control dictates at least three steps at the front door; it is thought that this leads to higher resale values. A special variance is required to have a no-step entrance (see figure 2). Figure 2 clearly shows that a home with a no-step level entry can look like all the other homes on the street. In no way does the visitable home stand out and look different.



Figure 2: Visitability home with a no-step level entrance beside a home with steps leading to the front door

Photo by Ron Wickman



Other factors that make visitable housing important include the following:

- Visitable features easy to incorporate and conceptualize.
- Easy access to the house for friends and family visiting and people with mobility difficulties, those with young children in strollers, those carrying large and heavy shopping items, furniture or equipment.
- Housing becomes age-friendly for more homeowners.
- Community participation and social integration.
- Reduced costs for home renovations at a time of mobility changes.
- Reduced risks of fall or injuries.
- Homeowners can easily return to their home following a sudden change in mobility.
- Prevention of premature institutionalization of older adults.
- Visitable homes can be purchased by and sold to a wider demographic.
- Visitable housing needs to be beautiful and invisible so that everyone uses the home in the same way and so that the visitable features blend in with the architectural style of the home.
- Visitable features can easily be incorporated with other building innovations, such as affordable design, green architecture and energy efficiency.



Figure 3: Single-family home with visitable entrance at the side
Photo by Ron Wickman



Figure 4: Visitable home, on left, with sloping sidewalk and no-step entrance located at the back of home
Photo by Ron Wickman

Visitability ensures that a basic level of accessibility will be provided in all housing and it opens opportunities for participation in community life. For this to happen, visitable homes must themselves become part of the neighbourhood fabric, a commonplace addition to the catalogue of housing types that comprises our communities and an appealing choice for able-bodied consumers.

When visitability features are planned at the outset, additional costs are minimal. There are several ways in which a site may be graded depending on where the no-step entrance is located. The grade can slope between the street and the home to provide an accessible entry on any side of the home (see figure 3). The grade can slope from an alley to the house to provide a no-step entrance at the rear (see figure 4). Figure 4 shows that there is little difference between a visitable home with a no-step level entrance at the back door and a home with steps leading to the back door. A combination of front and rear grade slope can also provide no-step access to a side door from both street and/or alley.



Design requirements

Several trends in new single-family detached housing design and construction make a well-integrated, accessible route to an entrance difficult to achieve. These include the desire for large basement windows and the trend toward long homes on shallow lots with the drainage directed either to the front or back (no split).

We should encourage lot grading plans with split drainage to reduce the grade differential between the site and finished floor. Basements should have at least one quadrant without windows to allow earthwork against the building in support of an accessible walkway and entry area. Lot size and shape and house siting on the lot should support an accessible walkway to an entrance, and the developer's engineering consultants should have a provisional accessible route in mind when laying out the lots and designing the lot grades.

While it is possible to build a **no-step entry** with standard platform framing, this usually involves bringing the exterior grade up against the rim joist to create a sloping entry. Careful flashing is needed to prevent rot. We can place the top of the floor joists at the same elevation as the top of the mudsill by adding height to the foundation wall and framing a bearing wall inside the basement perimeter. This method is only slightly more expensive, but it eliminates the need to push dirt up against the wood framing and allows the entry door to be at the same level, creating a no-step entrance (see figure 5). Please note that the construction detail identified in figure 5 is only one of several good examples of achieving a no-step entrance.

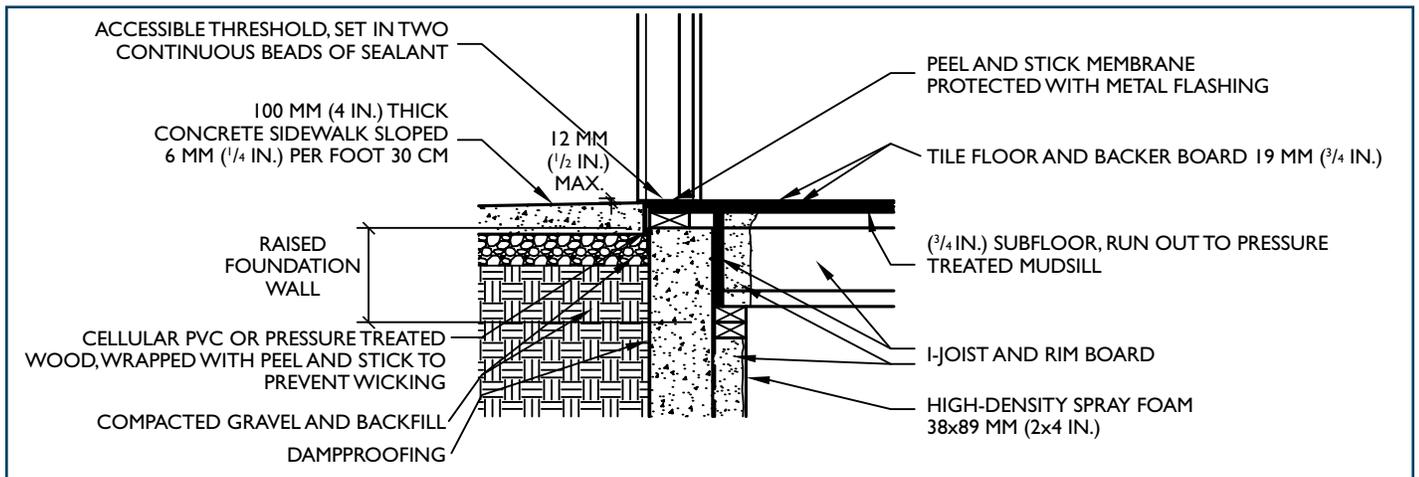


Figure 5: No-step entrance detail
Diagram by Ron Wickman, Architect



A no-step (zero-step) entry

The primary intent of having a no-step entry is to allow a pathway into a dwelling that is free of barriers for any individuals using a walker or wheelchair, pushing wheeled equipment or carrying heavy loads when entering or exiting the dwelling; and to improve safety for all by minimizing the risk of tripping on steps. VISIBLE homes must have at least one no-step entrance. Whenever possible, a no-step entrance should be considered for the main entry to the dwelling unit. Where this is not possible, a no-step entrance may be made at the back or side of the house, or through an attached garage. The entrance needs to be accessible from a sidewalk, a driveway, or other public route. The exterior path of travel should be at least a clear width of 915 mm (36 in.), while 1,200 mm (48 in.) is preferred. A level landing that is at least 1,500x1,500 mm (60x60 in.) should be at the entrance door (see figures 6, 7 and 8).

Other considerations include the following:

- The no-step entrance should not have a slope greater than a ratio of 1:20, unless designed as a ramp. (A running slope between 1:20 and 1:12 is considered a ramp).
- Considerations should be made in the areas of canopy protection, drainage and entrance lighting.
- The no-step entrance should have a maximum 25-mm (½-in.) bevelled threshold (see figure 8).



Figure 6: Entering a visitable home – photo 1 of 3
Photo by Ron Wickman



Figure 7: Entering a visitable home – photo 2 of 3
Photo by Ron Wickman

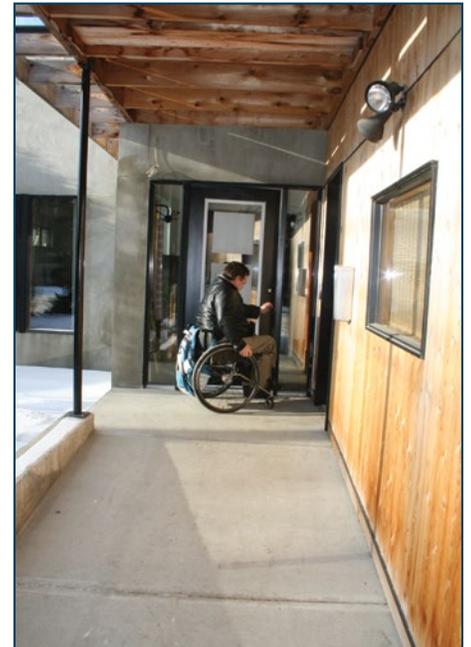


Figure 8: Entering a visitable home – photo 3 of 3
Photo by Ron Wickman



Doorways

It is intended that the designed environment will allow freedom of movement throughout the visitable floor area for individuals to join with others in social interactions. This freedom of movement is to allow individuals, including those who use wheelchairs, to manoeuvre safely, while reducing the potential for surface damage to walls, doors and door frames from accidental impacts.

It is also a good idea to think about the manoeuvring space required for the door. Adequate space should be provided inside the bathroom to allow one to close the door when one is inside. Also, for doors that swing outside the bathroom, consider installing a D-type handle, 140 mm (6 in.) long, on the door so that one may pull it closed once inside. Likewise, space is required to allow one to easily open the door to exit.

Other considerations include the following:

- All doorways on a visitable floor should be 915 mm (36 in.) in width.
- A minimum 600-mm (24-in) clear space should be provided on the latch side of the door on the pull side and 300 mm (12 in) of clear space on the latch side of the door on the push side.
- Doors should have lever door handles.
- Lever door handles should be operable with one hand and not require fine finger control, tight grasping, pinching or twisting of the wrist.
- All hallways on a visitable floor should be a minimum 1,100 mm (43 in.) in width.
- Electrical rough-in on the hinge side for the option of installing a power door operator in the future should be provided.

Bathrooms

One of the latest design trends involves the creation of spacious bathrooms that incorporate a variety of features and flexibility of use. As a result, bathrooms become more adaptable and comfortable for individuals and families. We tend to spend more time in our bathrooms, and we desire an attractive space. Builders and homebuyers recognize the positive resale value of functional and beautiful bathrooms. The concept of universal design, whose objective is to meet all users' needs, is incorporated into many bathroom features, such as bathtubs, showers, toilets, sinks, lighting and flooring. A bathroom that anticipates the needs of all the family members and visitors will become that much more valuable. See CMHC's fact sheet *Accessible Housing by Design—Bathrooms*.

Areas within bathrooms in the visitable floor area must allow for the accommodation of individuals using basic mobility equipment such as a manual wheelchair. The intention is to provide an opportunity for an individual to manoeuvre and turn around within the bathroom area safely as well as to close and open the bathroom door to maintain privacy and dignity.



When designing a bathroom for someone who uses a walker or wheelchair, you should allow a sufficient manoeuvring space of 750x1,200 mm (30x48 in.) in front of or beside all fixtures, including the bathtub, shower and storage spaces. It is especially important to consider the manoeuvring space in front of all of the controls, so that it is not necessary for someone to lean to reach them, which may result in a fall. Do not forget to also provide sufficient manoeuvring space in front of all windows and window controls (see figure 9).

A minimum manoeuvring space of 1,500x1,500 mm (60x60 in.) within the bathroom will allow for turning around and approaching the bathroom elements (see figure 10). For users of power wheelchairs or scooters the required turning circle is larger, increasing the minimum manoeuvring space to 1,800x1,800 mm (72x72 in.), depending on the size of the mobility device. Room should also be provided for people who give assistance or care in the bathroom (see figure 11).

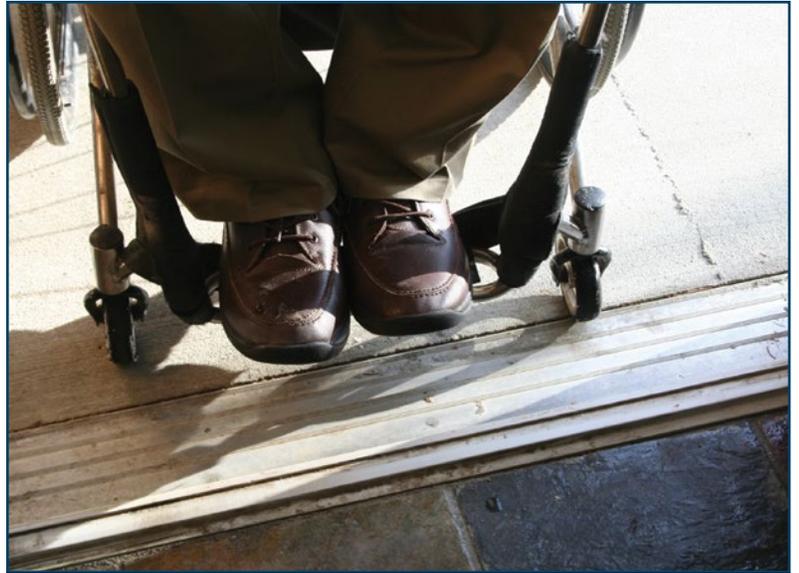


Figure 9: Low profile door threshold
Photo by Ron Wickman

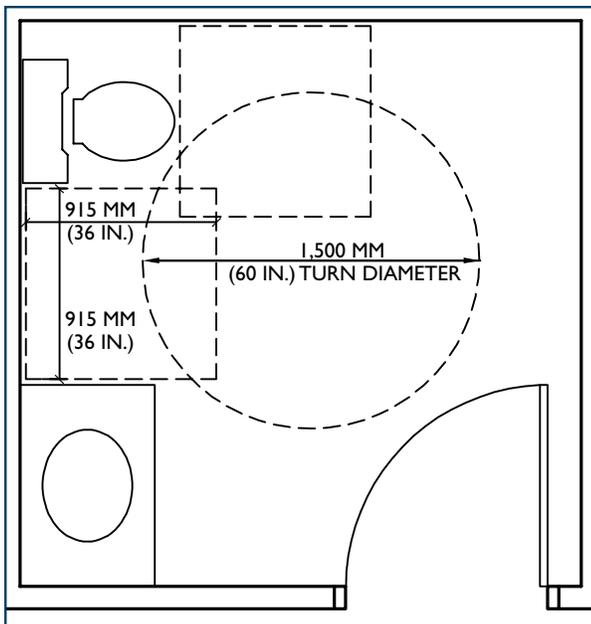


Figure 10: Bathroom layout
Diagram by Ron Wickman, Architect

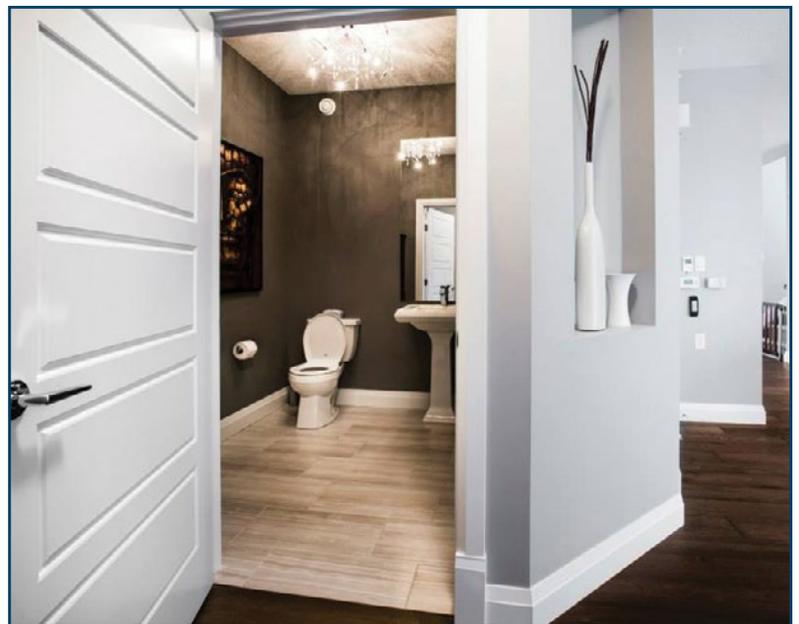


Figure 11: A toilet with sufficient transfer space adjacent
Photo by Ron Wickman



Vanities

The key to proper height placement of the countertop is to keep the counter to a minimum thickness. This maximizes the ability to keep the countertop low enough for those users in wheelchairs to reach into the sink; the countertop can also be high enough to allow the same users in wheelchairs to get underneath the counter (see figure 12). The front edge of the counter can also be in a contrasting colour to assist individuals with limited vision. A bar located in front of the counter could assist those individuals with balance issues standing at the sink. It is recommended to have rounded edges around the sink/vanity to reduce the risk of skin abrasions or injury from accidental impacts.

Sinks should be shallow enough to allow persons in wheelchairs to get in underneath. Also, it is important to keep the users' legs from coming into contact with exposed hot pipes. To prevent potential burns to legs, the pipes can be insulated or a protective panel can hide exposed pipes. A third option is to offset the sink pipes as far back up against the wall, where a person's legs could never come into contact with exposed pipes. See CMHC's fact sheet *Accessible Housing by Design—Bathrooms*.

Community design

Accessible community planning encompasses the ideas of inclusion, diversity, and social and environmental sustainability for all generations. An accessible community includes access to public transportation, is a walkable community close to amenities, health, recreation and cultural facilities, and a caring, supportive, safe neighbourhood with adequate, affordable and accessible housing. VISIBLE design attempts to change home construction practices so that more new homes—not merely those custom-built for occupants who currently have disabilities—offer accessible features that make them easier for people to live in and visit.

Visitability lends itself to the opportunity for social interaction among friends, family and neighbours in the community but more importantly in each of our homes. To make visitability a norm, inclusive, sustainable approaches to community planning and the design and construction of single- and multi-family homes is required.

It is easiest to implement visitable housing when it is planned for in the neighbourhood design process. Visitability tends to be more difficult to realize in mature neighbourhoods because these areas never considered the concept in the planning stages. In new construction, added costs for visitability features are very small. This would reduce future renovation costs by thousands of dollars as accessible dwelling modifications can range from \$10,000 to over \$200,000.

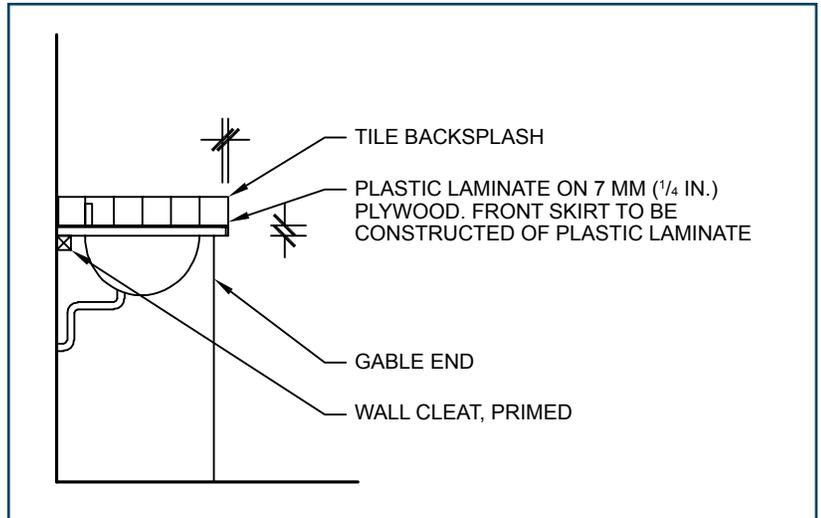


Figure 12: Section drawing through sink and counter
Diagram by Ron Wickman, Architect



Neighbourhood plans should be designed and engineered in advance to accommodate at-grade entries. The two key features are sewer inverts made deep enough to allow for lower basements, and site grading that allows for easy no-step level entry construction. Neighbourhood plans to accommodate visitable housing would lower underground service lines to accommodate a deeper basement, slope the land so that the highest point is in the middle of the lot and maintain a greater distance between a home's front door and the sidewalk to achieve a gently sloping walkway.

The best example of progressive planning for visitable housing has been achieved in Winnipeg, Manitoba. The Bridgewater project, started in 2006, is a housing development initiative involving three residential neighbourhoods and a Town Centre in the Waverly West area in South West Winnipeg. Over 1,000 visitable single-family lots have been planned into the development.

Bridgewater project (2006-2021)

- A housing development project initiated by the Province of Manitoba (Manitoba Housing and Renewal Corporation).
- The first neighbourhood plan in Canada that includes a large proportion of housing to be built as visitable.
- Vision – A walkable neighbourhood with a diversity of housing.
- Key features – Visitable housing, increased green space, mature forest, sidewalks and pedestrian paths.

Project progress

- Fastest selling neighbourhood in Winnipeg.
- Over 250 visitable homes are now occupied.
- No difference in selling rates between visitable homes and non-visitable homes in the neighbourhood.

In accessible home design, it is a good idea to consult with a health professional, such as an occupational therapist. It also helps to consult with an architect, and interior designer or another design professional who is familiar with the design of accessible residences. During the design, work with the designer and occupational therapist to determine the most positive layout for a visitable home.



Glossary

Aging in place: The ability to remain in one's home safely, independently and comfortably, regardless of age, income or ability level throughout one's changing lifetime.

Half-bath/Full bath: A half-bath is a bathroom with only a toilet and a sink, a full bath has a toilet, a sink and a tub and/or shower.

No-step (zero-step) entry: An entrance into a building that is without steps or any elevation change of more than 12.5 mm (½ in.)



Additional resources

Books

Barrier Free Environments Inc. *The Accessible Housing Design File*. New York: John Wiley & Sons, 1991.

Behar, S., and C. Leibrock. *Beautiful Barrier-Free: A Visual Guide to Accessibility*. New York: Van Nostrand Reinhold, 1993.

Boyle Hillstrom, S. *Design Ideas for Bathrooms*. Upper Saddle River, NJ: Creative Homeowner, 2005.

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Mace, R. *Residential Remodeling and Universal Design: Making Homes More Comfortable and Accessible*. Darby, PA: Diane Publishing Co, 1996.

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Wormer, A. *The Bathroom Idea Book*. Newtown, CT: Taunton Press, 2001.



Websites

American Association of Retired Persons—AARP (May 2016)
<http://search.aarp.org/everywhere?Ntt=bathroom&intcmp=DSO-SRCH-EWHERE>

Bob Vila (May 2016)
<http://www.bobvila.com/search?utf8=%E2%9C%93&q=accessible+solutions>

Canadian Centre on Disability Studies (May 2016)
<http://disabilitystudies.ca>

Concrete Change (May 2016)
www.concretechange.org

Institute for Human Centered Design (May 2016)
<http://humancentereddesign.org/>

IDEA Center for Inclusive Design and Environmental Acces (May 2016)
<http://idea.ap.buffalo.edu/>
www.udeworld.com/visitability.html

Home for Life (May 2016)
<http://www.homeforlife.ca/>

Livable Housing Australia (May 2016)
<http://livablehousingaustralia.org.au/>

VisitAble Housing Canada (May 2016)
<http://visitablehousingcanada.com>



The Principles of Universal Design

Principle 1: Equitable use

This principle focuses on providing equitable access for everyone in an integrated and dignified manner. It implies that the design is appealing to everyone and provides an equal level of safety for all users.

Principle 2: Flexibility in use

This principle implies that the design of the house or product has been developed considering a wide range of individual preferences and abilities throughout the life cycle of the occupants.

Principle 3: Simple and intuitive

The layout and design of the home and devices should be easy to understand, regardless of the user's experience or cognitive ability. This principle requires that design elements be simple and work intuitively.

Principle 4: Perceptible information

The provision of information using a combination of different modes, whether using visual, audible or tactile methods, will ensure that everyone is able to use the elements of the home safely and effectively. Principle 4 encourages the provision of information through some of our senses—sight, hearing and touch—when interacting with our home environment.

Principle 5: Tolerance for error

This principle incorporates a tolerance for error, minimizing the potential for unintended results. This implies design considerations that include fail-safe features and gives thought to how all users may use the space or product safely.

Principle 6: Low physical effort

This principle deals with limiting the strength, stamina and dexterity required to access spaces or use controls and products.

Principle 7: Size and space for approach and use

This principle focuses on the amount of room needed to access space, equipment and controls. This includes designing for the appropriate size and space so that all family members and visitors can safely reach, see and operate all elements of the home.

