

# Sustainability and Universal Design for Homes

Universal Design Living Laboratory, the National Demonstration Home & Garden

Ohio CDC Association  
November 18, 2013

Presenters: Rosemarie Rossetti, Ph.D. & Mark Leder

---

Universal Design Living Laboratory: National Demonstration Home and Garden

Columbus, OH [www.udll.com](http://www.udll.com)

## What is good design?

*Design is not just what it looks like and feels like. Design is how it works.*  
Steve Jobs, Co-founder, Apple Inc.

*Design is directed toward human beings. To design is to solve human problems by identifying them and executing the best solution.* - Ivan Chermayeff, architect

## Important Dimensions for Space Planning

- 5' turning diameter for wheelchair
- 30" X 48" – minimum approach in front of a sink & toilet
- Anthropometrics - Average adult in wheelchair
  - Vertical reach range – 18" - 48" high
  - Chair seat level – 20" high
  - Eye level – 4' high

## Successful Use of Operable Devices & Controls

- Approach clearances
- Reach length of arms
- Anthropometrics -
  - The hand and its grip
- Biomechanical abilities to exert force and form grips
- Psychomotor skills

## Floor Surfaces

- Carpet
  - The maximum pile *thickness* – 1/2 inches
  - Firm or no cushion, pad or backing
  - Level or textured loop, level cut/uncut pile texture
- Slip-resistant tile and marble
- Hardwood flooring
- Linoleum
- Cork

## Universal Design Features

The following list of Universal Design features can be easily incorporated into any new home from production home to luxury. It is important to note that almost none of the features are prohibitively high in cost and that a builder does not have to do this all or nothing. Adapting any of these features would be a step in the right direction.

Rosemarie Rossetti, Ph.D.   Rosemarie@UDLL.com   614-471-6100 Mark Leder   Mark @UDLL.com   614-478-4670 Universal Design Living Laboratory   www.udll.com © 2013
--

## The Entries

- Level thresholds at any door, no higher than ½"
- 36" wide doors with lever handles
- Lighting for safety and access
- Mail drop for easy access
- Porch shielded from the weather
- High visibility house address numbers
- 5' x 5' level maneuvering space (turning circle) on both sides of door
- Stepless, level grade at the entrance
- Sloped garage floor to the house entry with level threshold
- Use sloping walks, earth berms, retaining walls, bridges, or porches instead of obtrusive front ramps
- Package shelf or bench outside the door
- Full-length sidelight(s) at entry or window in door to see visitors

## The Kitchen

- Sufficient clear floor space for work/traffic flow
- Circulation routes 40" wide at a minimum at entryways to the kitchen
- No thresholds at any door
- 36" wide doors with lever handles
- Easy to roll on hard surface flooring
- Strategically placed visual barriers to kitchen mess
- Point of use storage
- Open/visible storage; flexible pantry storage
- Flexible base storage allowing for use as knee space
- Roll-out carts for storage of cook ware
- Single lever faucets, mounted on the side of a low profile sink
- Pot filler at cooktop if sink is not close by
- Garbage disposer mounted in the rear of the sink allowing for knee space under the sink
- C or D-shaped handles rather than knobs on cabinets and drawers
- Counter tops at a variety of common heights: 30", 34", 36", and 42"
- Roll-out full extension shelves and drawers in lower cabinets
- Pull down articulated hardware to lower shelf contents stored in wall cabinets
- Toe kick area at the base of lower cabinets: 9-10" high by 6" deep
- Glass doors or open shelves in upper cabinets
- Vertical (pantry style) cabinets with pull out shelving for most used items
- Waste and recycling container on pull-out drawers in lower cabinets
- Side by side refrigerator/freezer (prefer 24" deep) w/ full extension shelves
- Safety shut-offs and dual cueing (where available) on appliances
- Pull-out step stool
- Contrasting edge on counter and flooring to define spaces, transitions and edges
- Rounded corners on counter tops
- Built-in desk
- Side hinged doors on oven and microwave at counter height or lower
- Dishwasher elevated 8" above the floor
- Front-mounted controls on all appliances (Ex. cooktop, oven), with easy to read print
- Knee space under sink and cooktop
- 5' turning radius in working areas

Rosemarie Rossetti, Ph.D. Rosemarie@UDLL.com 614-471-6100  
Mark Leder Mark @UDLL.com 614-478-4670  
Universal Design Living Laboratory www.UDLL.com  
© 2013

- Pull out spice and towel racks
- Electrical wall outlets 18" above the floor
- Electrical outlets and controls within reach Ex. Garbage disposer, range hood ventilation
- Varied light sources (mix of compact fluorescent, LED, incandescent or halogen with similar color temperatures)
- Under cabinet lighting: linear T5 fluorescent, low profile so as not to protrude below cabinet trim, well shielded (diffuse lens), good color (choose bulbs with a high color rendering index, good distribution, located at front of cabinet with lens facing towards the backsplash
- Adjustable lighting controls with dimmer switches
- Light switches should have rocker switch, and be located within easy reach of user, (not on the back wall!) 42-48" off the floor
- Preset lighting control system option – allows you to set varying light levels according to the room or task
- Important to note – California's Title 24 requires that 50% of wattage in kitchen must be high efficiency, i.e. fluorescent; all other hardwired fixtures that are not fluorescent throughout the house must be either dimmable or on a manual on occupancy sensor

## The Bathrooms

- No threshold entries
- 36" wide swinging doors with lever handles and/or pocket doors as a space saving alternative
- Circulation routes 40" wide at a minimum, to get to the bathroom
- Sufficient clear floor space for functional passage
- 5' turning radius in key areas
- Point of use, easily accessed storage
- Multiple-height vanities with flexible knee space under the sink
- Toe kick area at the base of lower cabinets: 9-10" high by 6" deep
- Increased use of support rails and grab bars in the toileting, shower and tub areas that compliment the aesthetics
- Walls reinforced with ¾" plywood or wood blocking behind wallboards where grab bars will be installed
- Optional heat in the floor and towel warmers
- Anti-scald fittings on tub and shower
- Non-slip flooring
- Controls for windows, lighting and fixtures that are easy to operate
- Full length mirror
- Vanity mirror at height for a seated person or able to tilt to adjust
- Flush threshold shower
- Curbless shower designed for transfer (36" wide by 36" deep minimum) or roll in (36" wide by 48" deep minimum) depending on entry
- Channel shower drain preferred over center drain
- Shower chair or bench – built in or free standing made with non-slip surface products. Padded with U shaped seat preferred.
- Easy maintenance, i.e. showerheads and whirlpool tubs with self-cleaning features
- Towel bars at various heights for access by people who sit and those who stand
- Hand-held shower spray on a sliding vertical bar, with 60" long hose
- Water controls within reach of person seated in the shower
- Tub deck with 15" extension for easier entry
- Tub with non-slip bottom
- Tub with built in grab bars
- Comfort-height toilets 17-19" from the floor
- Toilet centered 18" from a side wall so grab bars can be within easy reach
- If toilet is compartmentalized, provide an option to open it up for wheelchair access
- Increased lighting from varied sources with adjustable controls
- Provide sufficient, well shielded lighting along either side of vanity mirror to eliminate shadows while grooming
- Provide moderate light level for wayfinding and orientation from bed to bathroom during the night
- Electrical outlets and controls within reach
- Light switches should have rocker switch, and be located within easy reach of user, (not on the back wall!) 42-48" off the floor
- Electrical wall outlets 18" above the floor

### **The Wardrobe/Laundry**

- Front-loading washer and dryer with front controls installed on a raised storage platform. Platform is 15.5" and contains storage for laundry essentials.
- Utility sink with knee space underneath
- Tall windows and a skylight provide natural lighting and ensure privacy
- Wall-mounted ironing board that adjusts in height for a person who is seated or standing
- Motion-activated lighting system
- Location of laundry appliances and clothing storage within same room increases efficiency
- Use of pocket doors to save space and allow for privacy
- Full length mirror
- Center island allows for accessible storage and a place to pack and unpack luggage and fold clothing
- Full extension shelves and drawers
- Pull down hardware on tall closet rod to bring clothing to a lower level
- More than 50% of storage space is less 54" or less from floor

### **The Bedrooms**

- Light switches are illuminated rocker switches
- Electrical outlets are located at a minimum of 20" above the floor from the top of box
- Carbon monoxide detector in all bedrooms
- Ceiling fan
- The hardwood floor is easy to keep dust free and is wheelchair friendly.
- 36" wide door which allows for 32" clearance
- Pocket door to save space and have the ability to keep light out of the bedroom if someone is in the bathroom
- Sound reducing property of all drywall in this room to keep this room quiet and keep out the street noise
- 36" of clear space around the king size bed
- The adjustable king size bed is 27" high with a memory foam mattress and a massage unit
- The sheets have pockets on each side. Convenient to store remote controls, tissues, glasses, medications and ear plugs
- Casement windows with locks that are reachable from a seated position

**Definition of Universal Design:** 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.  
*Ron Mace*

**Definition of Accessible Design:** Meets prescribed requirements set forth by the ADA or other mandatory requirements found in state, local, and model building codes.

**Definition of Adaptable Design:** Can be readily adjusted in a short time by unskilled labor without involving structural or finished material changes.

**Definition of Aging in Place:** The ability to live in one's own home for as long as confidently and comfortably possible. Livability can be extended through the incorporation of universal design principles, telecare and other assistive technologies.

**Definition of Visitability:** An international movement to change home construction practices so that new homes offer three specific accessibility features.

1. At least one zero-step entrance at the front, back or side of the house on an accessible route leading from a driveway or public sidewalk.
2. All main floor doors, including bathrooms, with at least 32 inches of clear passage space.
3. At least a half bathroom on the main floor that is wheelchair accessible.

## The Principles of Universal Design

The authors, a working group of architects, product designers, engineers and environmental design researchers, collaborated to establish the following Principles of Universal Design to guide a wide range of design disciplines including environments, products, and communications. These seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments.

The Principles of Universal Design are presented here, in the following format: name of the principle, intended to be a concise and easily remembered statement of the key concept embodied in the principle; definition of the principle, a brief description of the principle's primary directive for design; and guidelines, a list of the key elements that should be present in a design which adheres to the principle. (Note: all guidelines may not be relevant to all designs.)

### **PRINCIPLE ONE: Equitable Use**

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

- Provide the same means of use for all users: identical whenever possible; equivalent when not.
- Avoid segregating or stigmatizing any users.
- Provisions for privacy, security, and safety should be equally available to all users.
- Make the design appealing to all users.

### **PRINCIPLE TWO: Flexibility in Use**

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

- Provide choice in methods of use.
- Accommodate right- or left-handed access and use.

Rosemarie Rossetti, Ph.D.   Rosemarie@UDLL.com   614-471-6100 Mark Leder   Mark @UDLL.com   614-478-4670 Universal Design Living Laboratory   www.UDLL.com © 2013
--

- Facilitate the user's accuracy and precision.
- Provide adaptability to the user's pace.

### **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.

- Eliminate unnecessary complexity.
- Be consistent with user expectations and intuition.
- Accommodate a wide range of literacy and language skills.
- Arrange information consistent with its importance. Provide effective prompting and feedback during and after task completion.

### **PRINCIPLE FOUR: Perceptible Information**

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

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide adequate contrast between essential information and its surroundings. Maximize "legibility" of essential information.
- Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

### **PRINCIPLE FIVE: Tolerance for Error**

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

- Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- Provide warnings of hazards and errors.
- Provide fail safe features.
- Discourage unconscious action in tasks that require vigilance.

### **PRINCIPLE SIX: Low Physical Effort**

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

- Allow user to maintain a neutral body position
- Use reasonable operating forces.
- Minimize repetitive actions.
- Minimize sustained physical effort.

### **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.

- Provide a clear line of sight to important elements for any seated or standing user. Make reach to all components comfortable for any seated or standing user.
- Accommodate variations in hand and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.

Please note that the Principles of Universal Design address only universally usable design, while the practice of design involves more than consideration for usability. Designers must also incorporate other considerations such as economic, engineering, cultural, gender, and environmental concerns in their design processes. These Principles offer designers guidance to better integrate features that meet the needs of as many users as possible. *Compiled by advocates of universal design, listed in alphabetical order: Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, and Gregg Vanderheiden. Copyright 1997 NC State University, The Center for Universal Design*

#### **DESIGN IMPLICATIONS FOR DOORS**

- Grip shape must allow a hook, flat hand or finger push grip -- lever opener, door pull or push plate.
- Force of opening door would be established by existing accessibility codes and standards (8.5 lb, 4 kg-f).
- Operating force of handle would be 11 lb (5.2 kg-f) maximum if bar (lever opener).
- Cross section (diameter) of handle (assuming power or hook grip): 0.5 inches (13 mm) to 1.7 inches (43mm).
- Minimum length of handle: 3.5 inches (88 mm).
- Grasp clearance: 2.7 inches (69mm) grip; 1.4 inches (36 mm) fingers.

#### **DESIGN IMPLICATIONS FOR HANDRAILS AND GRAB BARS**

- Shape must allow a power grip.
- Cross section (diameter): 1.3 inches (33mm) to 1.7 inches (43 mm).
- Maximum perimeter of 5.2 inches (132 mm).
- Minimum grip clearance: 1.5 inches (38 mm).
- Minimum live load of 270 lb (121 kg-f).
- Minimum edge radius of 1/8 inch (3mm)
- All gripping surfaces shall be free of abrasive edges and sharp elements.
- No rotation or lateral movement within fittings.

#### **DESIGN REQUIREMENTS FOR HANDLES**

- Shall be operable by at least one of the following grips: hook, flat hand or finger push.
- All handle surfaces shall be free of abrasive textures and sharp elements.
- The edge radius of a handle must not be too small or it will cause pain as it is grasped.
- There should be adequate hand grasp space throughout the movement distance of the handle.
- Through its full movement distance, a handle shall not extend beyond the reach limits.

#### **GENERAL PRINCIPLES FOR DESIGN OF PRODUCTS**

1. Grip shapes should allow the use of several grips and alternatives to standard grips.
2. With the exception of lever handles, rotational movements in combination with pinch or disc grips should be limited to small maximum force.
3. The grip shape should be free from sharp edges and accommodate finger sizes.
4. Door openers and locks should be simplified as much as possible to reduce the need for use of two hands and secondary grips.
5. All devices should be usable without reliance on a pinch grip or disc grip.

Rosemarie Rossetti, Ph.D. Rosemarie@UDLL.com 614-471-6100  
Mark Leder Mark @UDLL.com 614-478-4670  
Universal Design Living Laboratory www.UDLL.com  
© 2013



## Questions to Ask your Clients when Discussing Universal Design

- Who will be living in the house with you?
- How long do you want to live here?
- Do you have older family members that will be living with you now or in the future?
- Do you have older family members come to visit? Stay overnight?
- What health limitations do you currently have that may impact the ease of living in your home?

## Words to Better Communicate About the Concept of Universal Design

- Ease of living
- Comfortable
- Sustainable
- Safer
- Easier to access
- More ergonomic
- Adaptable
- Inclusive
- Flexible
- Convenient
- More independence

## Fundamental Components of a Green and Healthy Home

### Lot Preparation and Design - Use of Land

- Erosion control during construction
- Limit turf
- No invasive plants
- Design permeable site
- Design and install permanent erosion controls

### Resource Efficiency - Use of Materials

- Low waste when building the structure

### Energy Efficiency - Use of Energy

- Passive solar house design and orientation of the home to the sun
- Plentiful energy efficient windows, clearstory, skylights and glass block to let in natural lighting
- Solar energy panels for exterior and landscape lighting
- 6' overhangs on roof to shield windows from the sun
- High efficiency insulation throughout all walls, ceiling, and attic
- Spray foam insulation made from soybeans for selected areas
- Tankless water heater
- Radiant heat floors in bathroom
- Structured insulated panels on exterior walls
- Pre-cast concrete, Styrofoam insulated foundation walls

Rosemarie Rossetti, Ph.D. Rosemarie@UDLL.com 614-471-6100  
Mark Leder Mark @UDLL.com 614-478-4670  
Universal Design Living Laboratory www.UDLL.com  
© 2013

- LED and halogen lighting
- Energy Star appliances that use less energy
- Dividing the house into multiple zones to control air temperatures
- Integration of a heat pump with the energy efficient HVAC system
- Thermostats on timers to reduce energy use
- High performance vented fireplace
- Trees and shrubs utilized to shade the home

#### Water Conservation - Use of Water

- Energy Star appliances that use less water – dishwasher, clothes washing machine
- Low water use toilets
- Low flow sink and shower faucets
- Native landscape materials
- Rainwater collection from the roof for landscape irrigation
- Mulch on landscape trees, shrubs and flowers
- Drought tolerant plants

#### Occupancy Comfort and Enhanced Indoor Air Quality

- Foundation moisture control
- Air sealing and advanced insulation techniques
- High performance windows
- Energy efficient, sealed combustion heating systems
- High efficiency air filtration
- Whole house ventilation
- Carefully selected construction products, adhesives, plywood, solvents, wall covering, synthetic fabrics, interior finishes and paints with low or no volatile organic compounds (VOC)
- Carbon monoxide detection and alarms
- Precautions taken to eliminate radon gas in the basement during construction
- Microban incorporated in countertop and shower wall quartz surfaces
- Specialized wall boards that inhibit mold growth
- All hard surface flooring to reduce dust and dust mite populations
- Seal off ducts during construction

#### Green Features of High Interest

- Low-flow touchless faucets
- High efficiency toilets
- Countertops
- Appliances
- Energy efficient roofing options
- Energy efficient flooring
- Cabinetry made from recycled materials

#### How to identify if It Is a Green Product

- **Improve** – protects or repairs the environment
- **Protect** –overall impact on people in every phase of manufacturing and use
- **Reduce** –impact from materials, transportation, fuel, energy to manufacture, storage and use, and reduce and eliminate overall toxicity
- **Reuse** – recycling products and using them for other purposes
- **Close the loop** – eliminates all waste and everything is fed back into the process of producing the product

Rosemarie Rossetti, Ph.D. Rosemarie@UDLL.com 614-471-6100  
 Mark Leder Mark @UDLL.com 614-478-4670  
 Universal Design Living Laboratory www.UDLL.com  
 © 2013

## Universal Design – Related Resources

### Associations, Organizations, Corporations, Agencies

**Abledata**

800-227-0216  
[www.abledata.com](http://www.abledata.com)

**Access One**

[www.beyondbarriers.com](http://www.beyondbarriers.com)

**Adaptive Environments**

617- 695-1225  
[www.adaptenv.org](http://www.adaptenv.org)

**AARP**

[www.aarp.org](http://www.aarp.org)

**Alzheimer's Association**

800-272-3900  
[www.alz.org](http://www.alz.org)

**Alzheimer's Disease Education & Referral Center**

800-438-4380  
[www.alzheimers.org/](http://www.alzheimers.org/)

**American Foundation for the Blind**

AARP  
888-687-2277  
[www.aarp.org](http://www.aarp.org)

**800-AFB-LINE**

[www.afb.org](http://www.afb.org)

**American Heart Association National Center**

800-AHA-USA-1  
[www.americanheart.org](http://www.americanheart.org)

**American National Standards Institute**

212-642-4900  
[www.ansi.org](http://www.ansi.org)

**American Occupational Therapy Association**

[www.aota.org](http://www.aota.org)

**Center for Inclusive Design and Environmental Access (IDEA Center), University of Buffalo**

716- 829-3485 Ext. 329  
<http://www.ap.buffalo.edu/idea/Home/index.asp>

**Center for Universal Design North Carolina State University**

800-647-6777  
[www.design.ncsu.edu/cud](http://www.design.ncsu.edu/cud)

**Charles Schwab Architects**

309-792-4599  
[www.universaldesignonline.com](http://www.universaldesignonline.com)

**Concrete Change**

In support of visitable homes  
404-378-7455  
[www.concretechange.org](http://www.concretechange.org)

**Council for Exceptional Children**

888-CEC-SPED  
[www.cec.sped.org](http://www.cec.sped.org)

**Cystic Fibrosis Foundation**

800-344-4823  
[www.cff.org](http://www.cff.org)

**Disabled American Veterans**

202-554-3501  
[www.dav.org](http://www.dav.org)

**Disability Rights Education Defense Fund**

202-986-0375  
[www.dredf.org](http://www.dredf.org)

**Draware (Ireland)**

<http://www.ucd.ie/avc/DraWare/default.htm>

**Easter Seal Society**

312-726-6200  
[www.easter-seals.org](http://www.easter-seals.org)

**EasyLiving Home**

[www.easylivinghome.org](http://www.easylivinghome.org)

**Eldercare Locator**

800-677-1116

Rosemarie Rossetti, Ph.D. Rosemarie@UDLL.com 614-471-6100  
Mark Leder Mark @UDLL.com 614-478-4670  
Universal Design Living Laboratory www.UDLL.com  
© 2013

**American Stroke Association National Center**

888-4-STROKE  
[www.strokeassociation.org](http://www.strokeassociation.org)

**Area Agencies on Aging**

[www.aog.dhhs.gov/agingsites/state.html](http://www.aog.dhhs.gov/agingsites/state.html)

**Amputee Coalition of America**

888-AMP-KNOW  
[www.amputee-coalition.org/](http://www.amputee-coalition.org/)

**Arthritis Foundation**

800-283-7800  
[www.arthritis.org](http://www.arthritis.org)

**CAST**

[www.cast.org](http://www.cast.org)

**Home Modification List Serve**

[Homemodification-list@listserv.acsu.buffalo.edu](mailto:Homemodification-list@listserv.acsu.buffalo.edu)

**Independent Living Research Utilization Project**

713-520-0232  
[www.ilru.org](http://www.ilru.org)

**Institute on Independent Living (Sweden)**

[www.independentliving.org](http://www.independentliving.org)

**Lifese**

[www.lifese.com](http://www.lifese.com)

**Lighthouse International**

800-829-0500; 212-821-9713 TTY  
[www.lighthouse.org](http://www.lighthouse.org)

**Muscular Dystrophy Association**

800-572-1717  
[www.mdaua.org](http://www.mdaua.org)

**National Association of the Deaf**

301-587-1788; 301-587-1789 TTY  
[www.nad.org](http://www.nad.org)

**National Center for Accessible Media**

[www.ncam.wgbh.org](http://www.ncam.wgbh.org)

**National Council on Independent Living**

703-525-3406; 703-525-4153 TYY

[www.eldercare.gov](http://www.eldercare.gov)

**European Concept for Accessibility**

(Luxembourg)  
[www.eca.lu](http://www.eca.lu)

**European Institute for Design and Disability**

[www.design-for-all.org](http://www.design-for-all.org)

**Harris Communications, Inc.**

[www.harriscomm.com](http://www.harriscomm.com)

**National Resource Center on Supportive Housing and Home Modifications**

**Andrus Gerontology Center,  
University of Southern California**  
213-740-1364  
[www.homemods.org](http://www.homemods.org)

**National Rehabilitation Information Center**

800-346-2742  
[www.naric.com](http://www.naric.com)

**Paralyzed Veterans of America**

800-424-8200  
[www.pva.org](http://www.pva.org)

**ProMatura**

[www.promatura.com](http://www.promatura.com)

**Regional ADA technical assistance**

800-949-4232  
[www.adata.org](http://www.adata.org)

**Rehabilitation Engineering and Assistive Technology Society of North America**

(RESNA)  
703-524-6686  
[www.resna.org](http://www.resna.org)

**Trace Research and Development Center**

**University of Wisconsin**  
[www.trace.wisc.edu](http://www.trace.wisc.edu)

**Universal Design Alliance**

770-667-4593  
[www.universaldesign.org](http://www.universaldesign.org)

**Universal Design Education Online**

<http://www.udeducation.org/>

**Universal Designers & Consultants**

301-270-2470

Rosemarie Rossetti, Ph.D. [Rosemarie@UDLL.com](mailto:Rosemarie@UDLL.com) 614-471-6100  
Mark Leder [Mark@UDLL.com](mailto:Mark@UDLL.com) 614-478-4670  
Universal Design Living Laboratory [www.UDLL.com](http://www.UDLL.com)  
© 2013

[www.ncil.org](http://www.ncil.org)

**National Institute on Aging**  
301-496-1752  
[www.nia.nih.gov/](http://www.nia.nih.gov/)

**National Institute on Deafness and Other  
Communication Disorders**  
**National Institute of Health**  
301-496-0252  
[www.nidcd.nih.gov](http://www.nidcd.nih.gov)

**National Institute on Disability and  
Rehabilitation Research**  
**US Department of Education**  
202-205-8134; 202-205-4475 TYY  
[www.ed.gov](http://www.ed.gov)

**National Endowment for the Arts**  
[www.arts.endow.gov](http://www.arts.endow.gov)

**National Kitchen & Bath Association**  
908-843-6522  
[www.nkba.org](http://www.nkba.org)

[www.universaldesign.com](http://www.universaldesign.com)

**United Spinal Association**  
718- 803-3782  
[www.unitedspinal.org](http://www.unitedspinal.org)

**U.S. Access Board**  
800-872-2253; 800-993-2822 TTY  
[www.access-board.gov](http://www.access-board.gov)

**U.S. Dept. of Housing and Urban Dev.**  
**Tech. assist. on Section 504 &  
Fair Housing**  
800-827-5005  
Publications Center: 800-767-7468  
[www.hud.gov/fhe/fheo.html](http://www.hud.gov/fhe/fheo.html)

**U.S. Dept. of Justice**  
**Technical Assistance on ADA**  
800-514-0304, 800-514-0383 TTY  
[www.usdoj.gov/crt/ada/adahom1.htm](http://www.usdoj.gov/crt/ada/adahom1.htm)

**U.S. Dept. of Veterans Affairs**  
**Home Loan Guaranty Services**  
[www.homeloans.va.gov/](http://www.homeloans.va.gov/)

**Visitability List Serve**  
[visitability-list@ACSU.buffalo.edu](mailto:visitability-list@ACSU.buffalo.edu)

**Volunteers for Medical Engineering**  
2201 Argonne Drive  
Baltimore, MD 21218  
<http://www.toad.net/~vme/>

**Checklists, related resources and universal design resources compiled with the assistance of Mary Jo Peterson, [www.mjpdesign.com](http://www.mjpdesign.com).**

#### **Universal Design Resources – Books and Printed Materials**

“Universal Design: Creating Inclusive Environments”, Edward Steinfeld and Jordana Maisel, Wiley, 2012

“Inclusive Design: A Universal Need”, Linda L. Nussbaumer, Fairchild Books, 2012

“Knack Universal Design: A Step-by-Step Guide to Modifying Your Home for Comfortable, Accessible Living” (Knack: Make It Easy), Barbara Krueger and Nika Stewart, Knack, an Imprint of Globe Pequot Press, 2010

“AARP Guide to Revitalizing Your Home: Beautiful Living for the Second Half of Life”, Rosemary Bakker, Lark, 2010

Rosemarie Rossetti, Ph.D. [Rosemarie@UDLL.com](mailto:Rosemarie@UDLL.com) 614-471-6100  
Mark Leder [Mark@UDLL.com](mailto:Mark@UDLL.com) 614-478-4670  
Universal Design Living Laboratory [www.UDLL.com](http://www.UDLL.com)  
© 2013

"Universal Design Handbook, Second Edition", Wolfgang Preiser and Korydon Smith, McGraw-Hill, 2010

"Livable Design by Eskaton Certification Guidebook", 2010 Residential Edition.

"Houses That Work for Life!", Lisa Sandlin, Booksurge Publishing, 2009

"Residential Design for Aging in Place", Drew Lawlor and Michael A. Thomas, Wiley, 2008

"Universal Design for the Home: Great-Looking, Great-Living Design for All Ages, Abilities, and Circumstances", Wendy A. Jordan, Quarry Books, 2008

"Universal and Accessible Design for Products, Services, and Processes", Robert F. Erlandson, CRC Press, 2008

"Universal Design and Visitability: From Accessibility to Zoning", Jack Nasar & Jennifer Evans-Cowley, The John Glenn School of Public Affairs, 2007

"Universal Design Ideas for Style, Comfort & Safety", RSMMeans and Lexicon Consulting Inc., 2007

"Accessible Home Design: Architectural Solutions for the Wheelchair User" Second Edition, Thomas D. Davies and Carol Peredo Lopez, Paralyzed Veterans of America Distribution Center, 2006

"Home Planning for Your Later Years" William K. Wasch, Beverly Cracom Publications, 2006

"Remodeling for Easy Access Living", Rick Peters, Popular Mechanics, 2006

"Universal Design "Smart" Homes for the 21st Century: 102 Home Plans You Can Order and Build", Charles Schwab, Schwab Publishers, 2005

"The Right Space: A Wheelchair Accessibility Guide for Single-Family Homes", Albert Ayala, Debold-Marquez Books, LLC, 2005

"Directory of Accessible Building Products", NAHB Research Center, 2005

"Using Your Home to Stay at Home", National Council on Aging, 2004

"We the People: Aging in the United States", Census 2000 Special Reports, Issued December 2004

"AARP Beyond 50.03", A Report to the Nation on Independence and Disability, AARP, 2003

"The Accessible Home: Updating Your Home for Changing Physical Needs", Creative Publishing International, 2003

"High Access Home: Design and Decoration for Barrier-Free Living", Charles A. Iii Riley, Rizzoli Universe Promotional Books, 2003

"Living Independently in Your Later Years", A special report of the Harvard Medical School, Harvard Health Publications, 2002

"Aging in Place- Solutions to a Crisis in Housing and Care", Neighborhood Reinvestment Corporation, August 2002

Rosemarie Rossetti, Ph.D. Rosemarie@UDLL.com 614-471-6100  
Mark Leder Mark @UDLL.com 614-478-4670  
Universal Design Living Laboratory www.UDLL.com  
© 2013

"A Quiet Crisis in America", The Report to Congress by the Commission on Affordable Housing and Health Facility Needs for Seniors in the 21st Century, June 30, 2002

"Universal Design", Selwyn Goldsmith, Architectural Press, 2001

"A Basic Guide to Fair Housing Accessibility: Everything Architects and Builders Need to Know About the Fair Housing Act Accessibility Guidelines", Steven Winter Associates, Inc., John Wiley & Sons, 2001

"Universal Design Handbook", Wolfgang Preiser and Elaine Ostroff, Editors; McGraw-Hill, 2001

"Aging in Place, Coordinating Housing and Health Care Provision for America's Growing Elderly Population", The Harvard University Joint Center on Housing Studies in conjunction with the Neighborhood Reinvestment Corporation report entitled, October 2001

"Aging in Place – Aging and the Impact of Interior Design", American Society of Interior Designers, 2001

"Products and Plans for Universal Homes", Home Planners, LLC, 2000

"Fixing to Stay", A National Survey of Housing and Home Modification Issues, AARP, May 2000

"Aging in Place", Ellen D. Taira and Jodi L. Carlson, Editors, The Haworth Press, Inc., 1999

"High-Access Home: Design and Decoration for Barrier-Free Living", Charles A. Riley II, Ph.D., Rizzoli, 1999

"Universal Interiors by Design: Gracious Spaces", Mary Jo Peterson and Irma Dobkin, McGraw-Hill, 1999

"Beautiful Universal Design: A Visual Guide", Cynthia Leibrock, James Terry, James Evan Terry, Wiley John & Sons, 1999

"The Universal Design File: Designing for People of All Ages and Abilities", Molly Story, James Mueller, Ronald Mace, The Center for Universal Design, 1998

"Universal Kitchen and Bathroom Planning: Design That Adapts to People", Mary Jo Peterson, McGraw-Hill Professional Publishing, 1998

"Universal Design: Creative Solutions for ADA Compliance", Roberta L. Null, Professional Publications Inc, 1998

"Fair Housing Act Design Manual", Barrier Free Environments, Inc., 1998

"Accessible Housing by Design: Universal Design Principles in Practice", Steven Winter Associates, McGraw-Hill, 1997

"Elder Design: Designing and Furnishing a Home for Your Later Years", Rosemary Bakker, Penguin Group, 1997

"Residential Remodeling and Universal Design: Making Homes More Comfortable and Accessible", U. S. Department of Housing and Urban Development, 1996

"Accessible Housing", Leon A. Frechette, McGraw-Hill, 1996

Rosemarie Rossetti, Ph.D.   Rosemarie@UDLL.com   614-471-6100 Mark Leder   Mark @UDLL.com   614-478-4670 Universal Design Living Laboratory   www.UDLL.com © 2013
--

“Building for a Lifetime: The Design and Construction of Fully Accessible Homes”, Margaret Wylde, Adrian Baron-Robbins and Sam Clark, Taunton Press, 1994

“Enabling Garden: Creating Barrier-free Gardens”, Gene Rothert, Taylor Publishing Co., 1994

“The Accessible Housing Design File”, Barrier Free Environments, Inc., John Wiley & Sons, 1991

### **Universal Design Checklists**

Gold, Silver and Bronze Universal Design Features in Houses

[http://www.ncsu.edu/www/ncsu/design/sod5/cud/pubs\\_p/docs/GBS.pdf](http://www.ncsu.edu/www/ncsu/design/sod5/cud/pubs_p/docs/GBS.pdf)

Universal Design & Green Home Survey Checklist, University of Iowa Clinical Law Programs, Leonard A. Sandler. <http://www.uiowa.edu/legalclinic/> August 2010.

New Home Universal Design Option Checklist

A checklist created in 2007 of universal design features to guide builders and architects during the design and building process. California law, section 17959.6 of the Health and Safety Code, requires a builder of new for-sale residential units to provide buyers with a list of specific “universal design features” which make a home safer and easier to use for persons who are aging or frail, or who have certain temporary or permanent activity limitations or disabilities.

<http://www.hcd.ca.gov/codes/shl/ModelChecklistFinal1-10-07Version.pdf>

Home Assessment Surveys for Senior Housing

Room by room and whole house surveys designed to collect information about the people who live in the home and how they get things done. The idea is to be proactive rather than waiting to react when there is a fall, a sudden illness or the need for a mobility device. Created by Dynamic Living, Inc.

<http://www.adaptmy.com/article/home-assessments/#clear>

Universal Design Checklist

Shared Solutions America is a national non-profit organization and resource center for education, technology, and funding alternatives for seniors and people of all ages with disabilities. Includes checklists, articles and information on livable and universal design homes.

<http://www.livablehomes.org/checklist.html>

Universal Design Checklists

AARP has a list of seven physical disabilities that can be addressed with universal design solutions.

[http://www.aarp.org/home-garden/home-improvement/info-04-2005/home\\_special\\_needs\\_checklist.html](http://www.aarp.org/home-garden/home-improvement/info-04-2005/home_special_needs_checklist.html)

Universal Design in Housing

Includes characteristics and benefits of universal design features and benefits.

[http://www.ncsu.edu/www/ncsu/design/sod5/cud/pubs\\_p/docs/UDinHousing.pdf](http://www.ncsu.edu/www/ncsu/design/sod5/cud/pubs_p/docs/UDinHousing.pdf)

Rosemarie Rossetti, Ph.D. Rosemarie@UDLL.com 614-471-6100  
Mark Leder Mark @UDLL.com 614-478-4670  
Universal Design Living Laboratory www.UDLL.com  
© 2013



## **Universal Design Certification Programs**

Livable Design by Eskaton <http://www.livabledesign.com/>

ZeroStep <http://www.zerostep.org>

Life-Flex Home <http://www.life-flexhome.com>

Better Living Design <http://www.betterlivingdesign.org>

## **Green and Healthy Home Building Techniques Resources – Books and Printed Materials**

“National Green Building Standard”, ICC 700-2008, National Association of Home Builders, 2009

LEED Reference Guide for Green Building Design and Construction, 2009 Edition, USGBC.

LEED for Homes Reference Guide, First Edition 2008, USGBC.

LEED for Homes Rating System, January 2008, USGBC

LEED for Homes Project Checklist, 2009, USGBC

LEED for Homes Durability Checklist, 2009, USGBC

“Comparing Green Building Guidelines and Healthy Homes Principles: A Preliminary Investigation” National Center for Healthy Housing, April 2006

Rosemarie Rossetti, Ph.D. Rosemarie@UDLL.com 614-471-6100  
Mark Leder Mark@UDLL.com 614-478-4670  
Universal Design Living Laboratory www.UDLL.com  
© 2013