

# THE ULTIMATE IN UNIVERSAL DESIGN

The Universal Design Living Laboratory showcases the best and brightest universal design ideas in both the home and the garden. And oh yes, it's green, too. Here, the home's co-creator shares the story behind this remarkable home.

By Rosemarie Rossetti, Ph.D.



Rosemarie Rossetti and Mark Leder relax in their great room. Their home has achieved three national universal design certifications and the NGBS Gold rating.

Designing and building the Universal Design Living Laboratory has been a fulfilling labor of love that began with a terrible accident nearly 17 years ago. On June 13, 1998, my husband, Mark Leder, and I went for a bicycle ride on a rural wooded trail in Granville, Ohio. After riding for a few minutes, Mark thought he heard a gunshot and slowed down to investigate. As he scanned the scene he saw a large tree falling. He shouted, "Stop!" But the warning was too late. Instantly, I was crushed by a 3-½ ton tree and paralyzed from the waist down.

Coming home from the hospital in a manual wheelchair after my spinal cord injury, I realized how my two-story home

intensified my disability. There were a myriad of things I was unable to do: I couldn't come and go out of any door independently, roll my chair on the carpet, or fit through bathroom doorways. I couldn't reach the clothes in my closet, nor glasses and dishes in the kitchen. I couldn't use the oven or microwave, get food out of the freezer, nor access food in the pantry. I couldn't take a shower or bath independently, do the laundry,



Hardwood flooring, five-foot turning radiuses, and multi-height counters make this spacious home both beautiful and practical.

get to the second floor or basement, and I couldn't access any of the landscape. My husband and I knew that we had to sell our home and find something more suitable.

In September of 2004, we hired architect Patrick Manley to draw plans for our new home in Columbus, Ohio. A few months later, Mark and I were encouraged by our mastermind group to make our house a national demonstration home and garden, acquire corporate sponsors, and open it for tours to the public. Sponsors would help us by contributing products and services in order to make construction feasible. We wanted to share our home for others to see so they could borrow a few good ideas.

We hired S. Robert August, a Denver-based consultant,



The 3,500-square-foot Universal Design Living Laboratory home, on a 1.5 acre lot in Columbus, Ohio, has educated and inspired thousands of people about the importance of universal design.

### THE KEY TO UNIVERSAL DESIGN: CREATING INDEPENDENCE

I learned many invaluable lessons about universal design throughout the planning and building of our home, but mainly that independence, accessibility, safety, convenience, and usability features need to be top of mind in the design phase of any new home or remodeling project. Attention to these factors will help create homes that make life easier for the homeowner—especially if that person uses a wheelchair for mobility.

To create independence, there should be no-step exterior entrances at all doors or a minimum of one no-step entrance. Door thresholds should be low, less than one-half inch. Exterior and interior doors should be 36 inches wide. In the Universal Design Living Laboratory, we used a lot of sliding pocket doors. Pocket doors take up less space in a room compared to a hinged door. They are easier to open and close, especially if you are seated in a wheelchair.

For multiple-story homes, an elevator or stair lift will be needed. Our elevator is sized to hold a person using a power wheelchair or scooter and boxes. It is quiet and has self-closing car gates, allowing total independence to get from floor to floor. There is ample room to turn my manual wheelchair in a circle in the cab, as well as room for boxes that I transport with me.

in October 2005 to help us with branding, marketing, and contacting international and national corporations to partner with us by contributing products and services. He named our home the Universal Design Living Laboratory. ([www.udll.com](http://www.udll.com))

Mark and I bought an acre-and-a-half lot in December of 2006 and continued with the planning and design process. We hired interior designers Mary Jo Peterson and Anna Lyon. On September 23, 2009, we broke ground.

Nearly 220 companies and individuals contributed products and services to the home. Mark and I have personally funded the UDLL and served as the general contractors, with Mark doing much of the work himself.

On May 18, 2012 we moved into “the lab,” our new home. The team’s efforts to create a green and universal design

home exceeded even my own high hopes. The home achieved *three* national universal design certifications: Livable Design, ZeroStep, and Life-Flex Home. In addition, we followed the guidelines for green building construction including LEED for Homes, ENERGY STAR, and the ICC 700-2008 National Green Building Standard, for which the home received a gold rating.

Best of all, we’ve been able to educate and inspire thousands of people about the importance of universal design through home tours, our website, presentations I have delivered, articles, and social media. More than 1,475 people have toured our home since June 2011, and we’ve raised thousands of dollars in public tour proceeds given to The Ohio State University Wexner Medical Center in Columbus for spinal cord injury research. We are continuing to give tours to groups by appointment.



A side-hinged oven and side-by-side refrigerator allow access for those who are seated.



Raised 18 inches off the floor, the dishwasher height is more convenient for both Rosemarie in her wheelchair, and her husband Mark, who is tall.

Of course, hard-surface flooring such as hardwood, tile or linoleum is preferred by people who use wheelchairs to get around. In our Living Lab, we've found that hardwood flooring, wide door openings, and an open floor plan accentuate our home's airy feel.

### UNIVERSAL DESIGN FEATURES IN THE KITCHEN

Universal design features in the kitchen include the overall design of the circulation pattern, cabinet design, countertop height, and appliance selection. Allow for a five-foot turning radius throughout the kitchen to allow a person who uses a wheelchair the ability to do a 360-degree turnaround. Here again, spreading things out adds a luxuriously spacious feeling to our home.

# Building Systems Mega-Tour

## June 14-16, 2015

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Over the course of two days, **Mega-Tour** attendees will travel aboard a charter bus to different manufacturing facilities throughout east-central Wisconsin for a firsthand look at the many advantages of building systems.

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\*Source: Prefabricated Housing: A US Market Report published by Global Industry Analysts, Inc



NAHB Building Systems Councils

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## Drawing Board




Side-hinged ovens are preferred to those hinged at the bottom. Place ovens where they can be reached by someone who uses a wheelchair.

Typically, kitchen countertops are installed at 36 inches. Consider having multiple countertop heights—40, 34 and 30 inches—to accommodate a diverse population. A person who remains seated is likely to prefer a 30-inch countertop with knee space underneath.

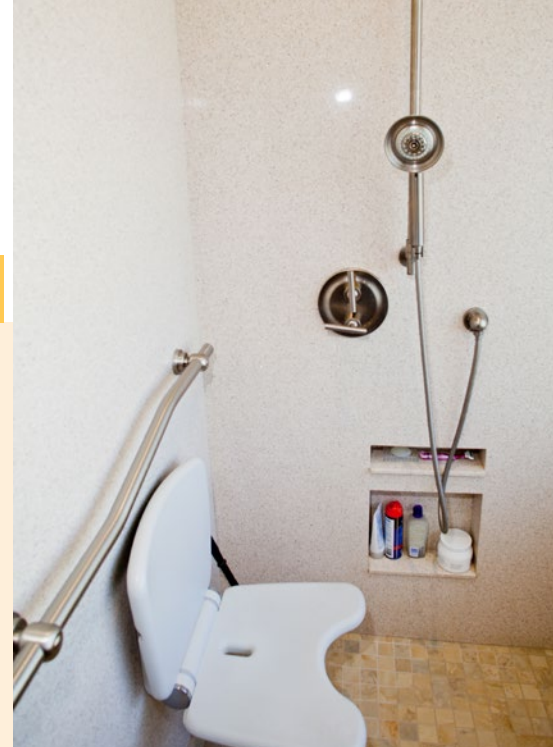
Be mindful of where electrical outlets and light switches are located to ensure that the seated person can also reach them. Plan to have at least 50 percent of the storage space accessible from a seated position. Include pull-out drawers and shelves in the cabinets so people have an easier time reaching the contents. Our Living Lab home is chock-full of pull-outs in the kitchen, including pull-out spice racks, a pull-out pantry cabinet, and a pull-out closet organizer for cleaning supplies. We also have a rolling cart for food preparation and serving that is stored under the counter in the pantry.

The cooktop and sink need to have knee space underneath for access. This knee space can be in the initial design of the lower cabinets, or the cabinet doors can be removed later to accommodate the wheelchair user.



Locating all the burner control knobs at the front of the cooktop saves a seated person from having to reach over a hot surface.

The master shower features a bench, an adjustable height nozzle, and a toiletry niche just 10 inches from the floor.



Cooktop controls need to be at the front so users don't reach across a hot surface. If possible, place cooktop surfaces side-by-side so seated cooks can reach them without reaching over hot surfaces. One of my favorite features in our Living Lab home is an in-counter steamer/pasta cooker that has a drain at the cooktop to make it safer to drain scalding hot water. The control panel for the ventilation fan and light is at waist height, but there is also a panel above on the range hood for Mark's convenience.

Raising a dishwasher 15 to 18 inches off the floor eliminates the need to bend down low when loading and unloading. A side-by-side refrigerator/freezer is reachable from a seated position. Ours has pull-out shelves and drawers so I can reach things easily.

### UNIVERSAL DESIGN FEATURES IN THE BATHROOM

A curbless shower is a must-have feature in the bathroom. The shower needs to be large enough to accommodate an easy transfer for a person with a disability. Be mindful that an assistant may be needed, so provide space for this person. A shower chair/bench could be mounted on the wall, or the person can use a portable one. Install an adjustable height, hand-held shower nozzle. Use blocking or plywood on the



People who use wheelchairs are likely to prefer 30-inch counter heights with knee space underneath.

walls in the shower and next to the toilets for the installation of grab bars. Toilets with seats that are 17 to 18 inches from the floor are easier to get on and off.

Finally, consider lowering lots of things. For example, by the shower chair in our master shower, we have a niche for toiletries 10 inches above the floor.

### UNIVERSAL DESIGN FEATURES IN THE LAUNDRY ROOM

In our home, we incorporated the laundry room into the master closet, making it super easy for both Mark and I to do

## Drawing Board



As in the kitchen, the master closet includes lots of storage space that is accessible while seated—including shoe racks and hanging rods.

laundry and get the clothes back where they belong. As in the kitchen, we included lots of storage space that is accessible while seated—including shoe racks and hanging rods.

Regardless of where you put the laundry room, make sure there is navigation space with a five-foot turning radius throughout the room. A front-loading washer and dryer on pedestal drawers positions these appliances to be accessible for a standing or seated person. For washing clothes by hand, it is convenient to have a sink with knee space underneath.

### IMPROVED QUALITY OF LIFE BEYOND INDEPENDENCE

By following universal design guidelines, a home will provide an improved quality of life for all occupants, not only those with disabilities. In addition to having more independence in a home due to universal design, a home may also provide improved health, safety, privacy, and restore human dignity. 🏡

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## Products Used at the Universal Design Living Laboratory

### ■ Cabinetry – KraftMaid

The cabinetry in the UDLL was contributed by KraftMaid. We selected their Passport series because of the 9" high by 6" deep toe kick. All cabinets were standard sizes, and it was easy to have the kitchen cabinets made so there were multiple heights of countertops.

### ■ Closet Storage System – ClosetMaid

Closet rods for hanging clothing as well as clothing and shoe storage shelves were installed at various heights to accommodate a person who uses a wheelchair as well as a tall standing person.

### ■ Elevator – Garaventa Lift

A Garaventa Lift, model Elvoron HR residential elevator, 42" wide by 60" deep, three-stop elevator with automated clear acrylic accordion car gates; roped/hydraulic drive.

### ■ Hardwood Flooring – Mannington

Hickory 5" wide plank engineered hardwood flooring is used throughout the UDLL, making wheelchair travel easy.

### ■ Ironing Board System – Iron-a-Way

This ironing board is stored on the wall in a wood cabinet. The board can be adjusted for a person who is seated or standing.

### ■ Microwave, Ventilation Hood – Thermador

The microwave has a side-hinged door and is also a convection oven.

### ■ Oven, Cooktop, In-counter Steamer/Pasta Cooker – Gaggenau

The controls for the three gas burners and the steamer are in the front of the cooktop.

### ■ Refrigerator/Freezer, Ice maker, Beverage Refrigerator & Dishwasher – KitchenAid

The side-by-side refrigerator/freezer has shelves and drawers that roll out for ease in reaching items. An icemaker and beverage refrigerator were installed in the pantry.

### ■ Sinks, Toilets, Shower & Faucets – Kohler

All plumbing fixtures at the UDLL, including toilets, sinks, faucets, and the step free shower stall, were from Kohler. The toilets are Comfort height with the seats 17" to 18" from the floor. This provides for an easy transfer. They only use about a gallon of water per flush. The sinks are stylish and allow access for knees. The hand-held shower nozzle is lightweight and conserves water, yet is powerful in delivering water where you need it. The Freewill barrier-free shower stall came complete with the fold down shower bench and grab bars.

### ■ Washer and Dryer – Whirlpool

The Duet model was selected. These appliances are on top of drawer pedestals, making the front loading doors easy to reach. The washer is High efficiency and ENERGY STAR rated.

### ■ Windows & Patio Doors – Marvin Windows and Doors

Casement windows were installed throughout the UDLL. The window cranks fold in place and are easy to operate. The window locks are reachable from a seated position. The windows are energy efficient, with Low-E window glazing and argon gas between the double panes of glass. Windows rotate to clean the outside of the glass from inside the home.