



A Living

Is it a home? Is it a laboratory? No—it's a *super* facility that is both, and building it has been at times as much a challenge as those faced by the "Man of Steel."

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It has been ten years

since my spinal-cord injury. I can clearly remember so much of the trauma of being crushed by a 7,000-pound falling tree when my husband Mark Leder and I were riding bicycles on June 13, 1998. Ten long years—and still I sit in this wheelchair in a home Mark and I built when we married on June 10, 1995. When we built the house, we thought it would last our lifetimes. We could never have anticipated how our home could further create limitations, thus enhancing my disability.

When I came home from the hospital, Mark and I wondered how permanent my injury would be. We didn't want to remodel our

home to accommodate my needs too quickly, should there be an outside chance I would be walking in a few years. I continued to hope that someday we would find another house that would work better for me—where I would have things within reach; a home that was more comfortable and safe, providing me an independent lifestyle; a place where I would not depend on my husband to retrieve items that were not accessible.

With little money to invest, we worked with what we had to make changes. We installed a platform lift at the front door; removed a few interior doors (sacrificing my privacy); moved items within my reach in the kitchen, bath, clos-



Laboratory

ets, and home office; and bought new home-office furniture I could access.

As a professional speaker, trainer, writer, publisher, and consultant, I need space in which to work as well as to store files and materials. I also need access to my desk, computer, files, books, phone, fax, and printer. My current office space is a cramped 11 feet x 11 feet. Many of my files and resources, as well as book inventory and marketing materials for my business, are stored in the basement. These are accessible to me only if I ask Mark to bring them upstairs. This is a daily occurrence he does without hesitation.

Fifty percent of our home is inaccessible, including the basement and two upstairs bedrooms and bathroom. Mark also works in our home doing Internet programming and has converted one of the upstairs bedrooms into his office.

Awareness and Research

I became aware of universal design (UD) housing while reading a magazine about a woman in a wheelchair who had built a new home. She had

designed her kitchen so she could roll under her sink and cooktop. Encouraged by this illustrated magazine article, I devoted much of my time to research. This included trips to the library, Internet searches, speaking with others who used wheelchairs, and a visit with our independent-living-center director. We saved for future use every article or photo we saw about UD homes.

As I learned more, I came to understand UD is more than just for kitchens. It is for the *entire* house and landscape. It is a framework for creating places benefiting the widest possible range of peo-





One of the most critical design areas in a home is the kitchen (above and on next page). Among universal-design features are a side-by-side refrigerator, a cooktop with open kneespace, and varied-height counters.

ple in the widest range of situations without special or separate design. It is human-centered, accommodating people of all sizes, ages, and abilities.

During our research, Mark and I visited homes built by wheelchair users and took photos and extensive notes on what features limited accessibility for the owners and which ones worked well. After months of information collection, Mark began to sketch out a floor plan for our new home.

Selecting a Location, Builder, and Architect

The home-building process began with choosing a location. We wanted to live in metropolitan Columbus, Ohio, so in summer 2004, we began to drive around looking for our ideal location. We found a new subdivision where two builders had several home sites available. However, we became discouraged because each builder offered only one ranch-style floor plan.

Our needs analysis of space within the home revealed these floor plans were not adequate for us. Our current home is 2,200 square feet. The new home needed to be larger to accommodate wider hallways and larger bathrooms, kitchen, master closet, laundry, and home offices.

Based on referrals, we chose our builder and put a deposit on a home site. Our builder said we could modify his existing floor plan by erasing all interior walls and redrawing a new

floor plan within the original house footprint. As Mark and I attempted to modify the plan, we quickly became overwhelmed and searched for an architect.

We interviewed three architects. Patrick Manley, RA, AIAA, came to our home with his construction manager and *feng shui* design consultant, Cathy Van Volkenburg. He brought his reference list and described previous projects where he worked on ADA-compliant housing projects, as well as residential universal design. We hired Manley in September 2004.

Approaching the Design Process

In the next few months, we held several meetings with Manley in which we tried to “shoe-horn” our room and space needs into the builder’s existing house footprint. We realized we were spinning our wheels, and this approach to designing our new home was not working. The only logical solution would be to create a unique floor plan from scratch.

As Manley presented blueprints to us, we monitored the square footage to keep the costs lower. The house was designed from the inside out. That is, first we positioned the rooms in relation to each other. Then we sized each room based on our furniture placement and pathways of travel for my wheelchair. We considered “point of use” when locating appliances in the rooms,

Built for People

“Universal design” is a term coined by the late Ron Mace at the North Carolina State University Center for Universal Design. It is human-centered, accommodating people of all sizes, ages, and abilities.

Following are some universal-design features experts agree should be incorporated into floor plans and product specifications:

- Step-free entrance (a gradual, level grade; no conspicuous ramps)
- All doors without thresholds, wide enough for wheelchairs or walkers (36 inches)
- Wider hallways (46 inches)
- Lever-style handles on doors and faucets
- Various heights of kitchen counters
- Full-extension drawers and shelves in kitchen base cabinets
- Cooktop set into a counter with open knee space
- Side-hinged microwave and oven doors at countertop height
- Side-by-side refrigerator
- Sliding casement or awning windows
- An elevator to the basement and/or second floor
- Lower rocker-style light switches (36 inches above floor)
- Higher electrical outlets (25 inches above floor)
- Large bathroom with decorative grab bars
- Wood, nonslip tile and a dense-weave, low-pile (less than a half inch) carpet floors
- Large bathtubs with plenty of grab bars
- Curbless roll-in showers with numerous grab bars
- Hand-held shower fixtures
- Toilet seat 17–19 inches high
- Adjustable hanging closet rods and shelves
- Front-loading washer and dryer
- Open knee space under all sinks

and rooms within the house. Finally, the exterior shell of the home was detailed.

The new ranch-style home will have 3,500 square feet of space on the main floor, consisting of two bedrooms, two home offices, 2.5 bathrooms, kitchen, great room, and a laundry/wardrobe, as well as a library in the hallway. An elevator will access the lower level, which has an additional bedroom/office and bathroom, and storage space.

The kitchen and bathroom(s) are the most critical design areas in a home. To give these rooms expert consideration, in January 2005 we hired kitchen and bath designer and internationally renowned universal-design specialist Mary Jo Peterson, CKD, CBD, CAPS, who lives in Brookfield, Conn. She worked with Manley on the kitchen and bath floor plan and positioned the cabinets, appliances, plumbing fixtures, and countertops. She also helped select these items.

One of my best friends, Anna Lyon, is an interior designer. She reviewed the floor plans and elevations and suggested improvements. She also assisted us by drawing furniture to scale on the floor plan. Currently we are working with her to select the colors and finishes for the cabinets, flooring, countertops, and walls.

From Private to Public

Mark and I intended that the home we were building would be our private residence. We





Adjustable shelves, hanging closet rods, and wide areas for wheelchair maneuverability result in accessibility.

thought about inviting a few people to see it when it was completed so others could learn from it. A major turning point in the project occurred during a meeting in early January 2005.

The idea to build a national demonstration home was given to us by a Mastermind group to which Mark and I belong. The ten of us are professional speakers, trainers, writers, and consultants. The group suggested our home not only be universal design but also be sustainable and green,

use the latest technology, and be open to the public as well as the building and design industries. They recommended we find corporate contributors and that I speak internationally about universal design and green building practices.

Mark and I returned home from that meeting, slowly began to absorb the Mastermind group's suggestions, and moved into action. We began contacting international, national, and local corporate contributors. Thanks to the efforts of S. Robert August in Denver, the marketing consultant we hired in October 2005, we currently have 97 contributors—and more to come. These contributors are providing specially selected products and services for the home. August named our home the Universal Design Living Laboratory (UDLL). He has been integral in making our dream become a reality through his team's creative and pragmatic talents.

As a result of a team presentation I was involved with for the National Association of Home Builders (NAHB) in August 2005, I became acquainted with lighting-design expert Patricia Rizzo, from the Lighting Research Center at the Rensselaer Polytechnic Institute in



A new larger lot in a rural setting gives Rosemarie and Mark their accessible dream home—and the public an extensive, educational resource.

Troy, N.Y. In January 2006, she and seven graduate students created an interior lighting design.

Project Stalls and New Directions

In February 2006, our builder, Mark, and I went to the subdivision where the lot was located and met with the homeowner's association board of directors to discuss the UDLL project. Unfortunately they asked us to not build in their neighborhood because they didn't want the traffic and tour visitors. Mark and I were dumbfounded! We released the lot to the builder. Our project was delayed for several more months.

We immediately set out to find a new home site that was not in a subdivision. In April 2006, Mark spotted a 1.5-acre lot for sale by owner. From April until the deal was closed in December 2006, we worked with the owner to purchase her land. This new larger lot in a rural setting inspired us to meet with Manley to redesign the house. Since he no longer was bound by any architectural guidelines from a homeowner's association, he could design our home to be more creative—which he did! Inspired by the famed architect Frank Lloyd Wright, Manley created a new look with a roof that includes a clerestory and added a portico at the front entrance.

In August 2007, we learned our builder had gone out of business. This also came as a major blow and further delayed construction. After many builder interviews in summer 2007, Mark and I decided to build the home as the general contractors and hired UBuildIt, a nationwide construction consulting company, to assist us.

In February 2008, Mark and I met with Ardra Zinkon, lighting designer with Tec Inc. Engineering & Design. Because of the substantial changes to the interior space, Zinkon agreed to redesign the lighting.

National Demonstration Home

The Universal Design Living Laboratory (www.udll.com) will be a national demonstration home for the building, architectural, and design industries as well as the public. It will showcase universal-design principles, and we will apply for certification for programs from the U.S. Green Building Council (LEED for Homes), NAHB National Green Building Program, and Energy



Among universal-design features in bathrooms are large tubs with plenty of grab bars and curbless roll-in showers with numerous grab bars.

Star. The exterior landscape will incorporate universal-design fundamentals and water conservation techniques, including a water garden feature.

UDLL is receiving international, national, and local attention. Media and press coverage is ongoing and expected to increase once construction begins, which is targeted for summer 2008. The Web site serves as an extensive educational resource containing articles, conference handouts, information, house renderings, floor plan, and links to other resources.

When the home is completed, hopefully in summer 2009, tours will be given to the public for about a month before Mark and I move in. All net proceeds from tours will benefit spinal-cord-injury research at The Ohio State University. Once we move in, we will conduct tours by appointment.

This endeavor by Mark and me will serve others so they can learn from it, be inspired by the ideas they gather, and serve as a catalyst for change in the building, architectural, and design communities. Most importantly, this house will serve as a model to show others how they can improve the quality of their lives by building homes that are energy efficient, environmentally friendly, healthy, and accessible. ■