



Design Resources

Open Range Construction Co. does not endorse any of the companies, designers, or websites listed below. They are provided as a resource to get ideas that will help in designing your home.

Home Plans (all categories)

- B4UBuild <http://b4ubuild.com>
- EPlans <http://eplans.com>
- Dream Home Source <http://www.dreamhomesource.com/default.asp>
- Global House Plans <http://www.globalhouseplans.com/>
- Architectural Designs <http://www.architecturaldesigns.com/>
- Cool House Plans <http://www.coolhouseplans.com/>
- Ahmann Design <http://www.ahmanndesign.com/>
- The House Designers <http://www.thehousedesigners.com/>
- The House Plan Guys <http://www.houseplanguys.com/>
- All House Plans <http://www.allplans.com/>
- The Design Connection <http://www.designconnection.com/>
- Family Home Plans <http://www.familyhomeplans.com/?source=googleppc&ordercode=05WEB>
- Home Plans <http://www.homeplans.com/>

Insulating Concrete Form (ICF) Home Plans

- <http://www.designbasics.com/search/202877/index.asp> (links to different ICF manufacturers plans)
- Reward Wall http://www.rewardwalls.com/h_homeplans.html (offering free Reward Wall home plan CD)
- Polysteel Home Plans <http://www.polysteel.com/homeplans.htm>
- Fox Blocks http://www.foxblocks.com/home_plans/
- North Star Engineering
<http://www.northstareng.com/building/InsulatedConcreteFormHomePlans.htm> (3-D Models - Quad-Lock ICFs)

Universal Home Plan Designs (UD Homes)

Universal design is the process of designing products and environments that are usable to the greatest extent possible, by everyone regardless of their age or ability.

Seven Principles of Universal Design

1. **Equitable Use:** The design is useful and marketable to any group of users.
2. **Flexibility in Use:** The design accommodates a wide range of individual preferences and abilities.
3. **Simple and Intuitive Use:** Use of the design is easy to understand.
4. **Perceptible Information:** The design communicates necessary information effectively to the user.
5. **Tolerance for Error:** The design minimizes hazards and the adverse consequences of accidental or unintentional actions.
6. **Low Physical Effort:** The design can be used efficiently and comfortably.
7. **Size and Space for Approach and Use:** Appropriate size and space is provided for approach and use.

- <http://www.orderhomeplans.com/exec/action/story/content/homestyles.5005005520/hspos/B4UNET>
- <http://www.eplans.com/features/universal-design.hwx>
- <http://www.makoa.org/accessable-design.htm> (has more links and resources)
- <http://www.extension.iastate.edu/universaldesign/building/plans.html>
- http://www.uniteddesign.com/accessable_plans.html
- <http://www.extension.iastate.edu/universaldesign/building/plans.html> (links to resources)



Design Resources

- http://www.humec.k-state.edu/atid/udf/ud_checklist.html (UD checklist)

Interior Design Ideas

- Home Portfolio <http://www.homeportfolio.com/GetInspired/index.jhtml>
- Turtle Homes <http://www.turtlehomes.com/index.html> (accessible bath products)
- HGTV <http://www.hgtv.com/hgtv/decorating/>
- Decorating Studio <http://www.decoratingstudio.com/archives/index.html>

Smart Ideas Checklist

[From the NAHB Research Center](#)

Exterior

- Low-maintenance exterior (vinyl, brick)
- Low-maintenance shrubs and plants
- Deck, patio or balcony surfaces are no more than ½" below interior floor level if made of wood

Overall Floor Plan

- Main living on a single story, including full bath
- No steps between rooms/areas on the same level
- 5' x 5' clear/turn space in living area, kitchen, a bedroom and a bathroom

Hallways

- Minimum of 36" wide, wider preferred
- Well lit

Entry

- Accessible path of travel to the home
- At least one no-step entry with a cover
- Sensor light at exterior no-step entry focusing on the front-door lock
- There needs to be 32" of clear width, which requires a 36" door
- Non-slip flooring in foyer
- Entry door sidelight or high/low peep hole viewer; sidelight should provide both privacy and safety.
- Doorbell in accessible location
- Surface to place packages on when opening door

Thresholds

- Flush preferable
- Exterior maximum of ½" beveled
- Interior maximum of ¼"

Interior Doors

- There needs to be 32" of clear width, which requires a 36" door
- Levered door hardware

Windows

- Plenty of windows for natural light
- Lowered windows or taller windows with lower sill height
- Low maintenance exterior and interior finishes
- Easy to operate hardware

Garage or Carport

- Covered carports and boarding spaces
- Wider than average carports to accommodate lifts on vans
- Door heights may need to be 9'-0" to accommodate some raised roof vans
- 5' minimum access aisle between accessible van and car in garage
- If code requires floor to be several inches below entrance to house for fume protection, can slope entire floor from front to back to eliminate need for ramp or step
- Ramp to doorway if needed
- Handrail if steps

Faucets

- Lever handles or pedal-controlled



Design Resources

- Thermostatic or anti-scald controls
- Pressure balanced faucets

Kitchen and Laundry

Counters

- Wall support and provision for adjustable and/or varied height counters and removable base cabinets
- Upper wall cabinetry - 3" lower than conventional height
- Accented stripes on edge of countertops to provide visual orientation to the workspace
- Counter space for dish landing adjacent to or opposite all appliances
- Base cabinet with roll out trays and lazy susans
- Pull-down shelving
- Glass-front cabinet doors
- Open shelving for easy access to frequently used items

Appliances

- Easy to read controls
- Washing machine and dryer raised 12" - 15" above floor
- Front loading laundry machines
- Microwave oven at counter height or in wall
- Side-by-side refrigerator/freezer
- Side-swing or wall oven
- Raised dishwasher with pushbutton controls
- Electric cook top with level burners for safety in transferring between the burners, front controls and downdraft feature to pull heat away from user; light to indicate when surface is hot

Miscellaneous

- 30" x 48" clear space at appliances or 60" diameter clear space for turns
- Multi-level work areas to accommodate cooks of different heights
- Open under-counter seated work areas
- Placement of task lighting in appropriate work areas
- Loop handles for easy grip and pull
- Pull-out spray faucet; levered handles
- In multi-story homes, laundry chute or laundry facilities in master bedroom Bathroom
- Wall support and provision for adjustable and/or varied height counters and removable base

Cabinets

- Contrasting color edge border at countertops
- At least one wheelchair maneuverable bath on main level with 60" turning radius or acceptable T-turn space and 36" x 36" or 30" x 48" clear space
- Bracing in walls around tub, shower, shower seat and toilet for installation of grab bars to support 250 - 300 pounds
- If stand-up shower is used in main bath, it is curbless and minimum of 36" wide
- Bathtub - lower for easier access
- Fold down seat in the shower
- Adjustable/ handheld showerheads, 6' hose
- Tub/Shower controls offset from center
- Shower stall with built-in antibacterial protection
- Light in shower stall
- Toilet 2 ½" higher than standard toilet (17" to 19") or height-adjustable
- Design of the toilet paper holder allows rolls to be changed with one hand
- Wall-hung sink with knee space and panel to protect user from pipes
- Slip-resistant flooring in bathroom and shower

Stairways, Lifts and Elevators

- Adequate hand rails on both sides of stairway, 1 ¼" diameter

- Increased visibility of stairs through contrast strip on top and bottom stairs, color contrast between treads and risers on stairs and use of lighting,
- Multi-story homes may provide either pre-framed shaft (ie. stacked closets) for future elevator, or stairway width must be minimum of 4' feet to allow space for lift
- Residential elevator or lift

Ramps

- Slope no greater than 1" rise for each 12" in length, adequate handrails
- 5' landing provided at entrance
- 2" curbs for safety

Storage

- Adjustable closet rods and shelves
- Lighting in closets
- Easy open doors that do not obstruct access

Electrical, Lighting, Safety and Security

- Light switches by each entrance to halls and rooms
- Light receptacles with at least 2 bulbs in vital places (exits, bathroom)
- Light switches, thermostats and other environmental controls placed in accessible locations no higher than 48" from floor
- Electrical outlets 15" o.c. from floor; may need to be closer than 12' apart
- Clear access space of 30" x 48" in front of switches and controls
- Rocker or touch light switches
- Audible and visual strobe light system to indicate when the doorbell, telephone or smoke or CO2 detectors have been activated
- High-tech security/intercom system that can be monitored, with the heating, air conditioning and lighting, from any TV in the house
- Easy-to-see and read thermostats
- Pre-programmed thermostats
- Flashing porch light or 911 switch
- Direct wired to police, fire, and EMS (as option)
- Home wired for security
- Home wired for computers

Flooring

- Smooth, non-glare, slip-resistant surfaces, interior and exterior
- If carpeted, use low (<.50" high pile) density, with firm pad
- Color/texture contrast to indicate change in surface levels

Heating, Ventilation and Air Conditioning

- HVAC should be designed so filters are easily accessible
- Energy efficient units
- Windows that can be opened for cross ventilation, fresh air

Energy Efficient Features

- In-line framing with 2x6 studs spaced 24" on center
- Air-barrier installation and sealing of duct work with mastic
- Reduced-size air conditioning units with gas furnaces
- Mechanical fresh air ventilation, installation of air returns in all bedrooms and use of carbon monoxide detectors
- Installation of energy efficient windows with Low-E glass

Reduced Maintenance/Convenience Features

- Easy to clean surfaces
- Central vacuum
- Built-in pet feeding system
- Built-in recycling system
- Video phones

- Intercom system

Other Ideas

- Separate apartment for rental income or future caregiver
- Flex room that can be used as a nursery or playroom when the children are young and as a home office later; if combined with a full bath, room could also be used for an aging parent/aging in place

Seven Important Steps to a Successful Zero Energy Home (ZEH) From Toolbase.org.

ZEH Overview from the U.S. Department of Energy: The U.S. DOE's Zero Energy Homes research initiative ...combines state-of-the-art, energy-efficient construction and appliances with commercially available renewable energy systems... [that] can result in net zero energy consumption. A ZEH, like most houses, is connected to the utility grid, but can be designed and constructed to produce as much energy as it consumes on an annual basis.

Like most homes, the ZEH design uses electricity from the electric utility grid. However unlike most homes, the ZEH puts electrical energy back into the grid. Ideally, the amount of electricity put back into the grid equals the amount used from the grid, on an annual basis. This means that during any particular month, the home may either have used more grid electricity than it put back or it may have put an excess of electricity back onto the grid. The goal is that at the end of a year, the electricity taken from the utility grid is offset by the solar electricity put back onto the grid — a Net-Zero Energy Home.

1. Decrease the energy requirements for space heating, cooling and water heating:
 - a. Orient the home with smaller walls facing west and include overhangs and porches (*See [Passive Solar Design Fact Sheet](#)*)
 - b. Increase foundation, wall and ceiling insulation (*See Oak Ridge National Laboratory's [Insulation Fact Sheet](#) and ENERGY STAR's [Recommended Levels of Insulation](#)*)
 - c. Use low U-value, low-E windows in all climates and low solar heat gain (low SHGC) windows in cooling climates (*See [Efficient Windows Collaborative](#)*)
 - d. Seal all holes, cracks, and penetrations through the floor, walls, and ceiling to unconditioned spaces (*See Department of Energy's [Air Sealing Fact Sheet](#)*)
 - e. Install adequate ventilation, especially from kitchens and baths (*See [Ventilation Control Systems](#) and [Whole House Mechanical Ventilation Strategies](#)*)
2. Increase the efficiency of the furnace (or heat pump), and the air-conditioner:
 - a. Buy as high-efficiency equipment as affordable for the climate
 - b. Design the supply and return duct system appropriately and seal tightly using approved tapes or mastic
 - c. Consider ground-source heat pump technology where space and cost conditions permit
 - d. Where climate-appropriate consider alternative cooling systems such as ventilation only or evaporative coolers
 - e. Find additional information at:
 - [ENERGY STAR®](#)
 - [DOE Building Technologies Program](#)
 - [Partnership for Advancing Technology in Housing \(PATH\)](#)
3. Install a solar hot water pre-heat system, an efficient backup water heater, and an efficient distribution system:
 - a. Consider a parallel, small diameter piping system for the hot water outlets
 - b. Install low-flow fixtures
 - c. Choose water heating equipment with a high Energy Factor
 - d. Look for a knowledgeable solar hot water installation company
 - e. Evaluate solar systems using the [Solar Rating and Certification Corporation \(SRCC\)](#)
 - f. Find additional information at:
 - [National Renewable Energy Laboratory \(NREL\)](#)
 - [DOE Office of Energy Efficiency and Renewable Energy](#)
4. Install efficient lighting fixtures:

- a. Consider permanent fluorescent fixtures in as many locations as possible
- b. Look for the [ENERGY STAR®](#) label
5. Install efficient appliances:
 - a. Include the refrigerator, dishwasher, and laundry appliances
 - b. Look for the ENERGY STAR label
 - c. Compare appliance efficiencies (See [American Council for an Energy-Efficient Economy - Consumer Resources](#))
6. Install a properly sized photovoltaic (PV) system:
 - a. Look for a knowledgeable solar PV installation company
 - b. Evaluate tax and other incentives (See [Database of State Incentives for Renewable Energy](#))
 - c. Use [PVWATTS](#) for a quick estimate of PV output
 - d. Find a Certified Solar PV Installer from the [North American Board of Certified Energy Practitioners](#)

7. Turn off lights, computers, and appliances when not in use
The successful Zero Energy Home doesn't end with the designer and builder. The homeowner plays an extremely important role as they do with any well-maintained home. Throughout the life of the home, the homeowner has the most significant impact on the actual performance of the ZEH. Therefore, the ZEH homebuyer must be conscious of daily habits and patterns that affect energy use in the home as well as proper maintenance of equipment and appliances. For instance, understanding the way certain energy efficiency features of the home work such as programmable thermostats or photo-sensitive outdoor light fixtures is essential. Simple things such as turning off lights when leaving a room or closing doors when performing even quick tasks outdoors can eliminate "wasted" energy. Paying careful attention to actual energy needs and avoiding unnecessary energy use are the first steps in ensuring that the ZEH performs as it was designed and built. Secondly, as with any valued property, equipment in the home and the structure itself must be carefully maintained. Changing furnace filters, having heating and cooling systems cleaned regularly, periodically checking the operation of solar systems, and maintaining exterior caulking and painting are only a few examples of ways in which a homeowner can assure a long-lived, high-performance, and zero energy home.

