

Super Insulated Low Energy House

Going Green now for the future

The design of this house incorporates numerous “green” design features which result in an environmentally responsive and extremely energy efficient home. The major principles of “Green” Design are the three “R”s; Reduce, Reuse, and Recycle. Energy efficiency is achieved by working with the natural solar attributes of the site and by designing an building “envelope” base upon air tightness, super insulation (2-3 times a typical house), reduction of thermal bridging, and proper house ventilation.

SITE

- Gravel Driveways to reduce storm water runoff
- Minimized off-site removal of excavated material
- 250 gallon cistern for rain water collection

PROGRAM

- 2 story 2,824 square feet with 1,100 square foot basement
- Handicapped Accessible with ramp, first floor bathroom and guestroom
- 5 bedrooms, 3 full bathrooms plus one accessible bathroom

CONSTRUCTION

- Basement: Superior Wall with cellulose insulation (R-value = 40) with R-20 insulation under entire floor
- Walls: Double 2x4 with spray foam air barrier and wet spray cellulose insulation (R-value = 44)
- Siding: Fiber-cement panels with battens
- Floors: Wood floor joists to minimize use of dimensional lumber and accommodate HVAC ducts
- Roof: TJI Rafters with spray foam air barrier and blown cellulose insulation (R-value = 58)
- Windows: Anderson high performance Low-E4 glass (R-value = 3.3)
- Finishes: Low VOC paints, linoleum, cork, and bamboo flooring

DOMESTIC HOT WATER

- 80 gallon electric with recirculating pump
- Consumption reduced via 250 gallon rainwater cistern for outdoor use

ELECTRICAL

- “Energy Star” appliances, compact fluorescent lighting, ceiling fans

HEATING

- Heating Load: 20,161 BTU (0 degree outside air temperature, without internal heat gain)
- Estimated Annual Heating Costs: 380 dollars
- Annual Air Change: .25 Air Changes per hour (tested before installation of window taping, siding, drywall & trim)
- System: Variable speed air handler with heat pump and Energy Recovery Ventilation Unit