ABOUT GREENBUILDING

At Archetype Design we prefer to design homes which, regardless of style, are energy-efficient and in harmony with the land. This usually means educating prospective homebuilders about green systems: what works and what doesn't; what is cost-effective and user-friendly and what is not; what fits the style of your house; what is appropriate for your particular site or personal lifestyle. Here are some basic guidelines for a greenbuilding plan:

Build small. Whatever your "dream house" might be, build 25% smaller. You'll conserve resources in the short term and save tons of energy for heating over the long term.

Build solid. Take some of the savings from building small and build a house that will last centuries rather than decades.

Build close to town. It makes no sense to have a green home with a thirty mile commute.

Super-insulate. A super-insulated house needs less energy to heat or cool, and less solar gain as well.

Use Thermal mass. Slab floors or subfloors and interior walls of adobe help temper the home against rapid fluctuations of heat and cold.

Limit heat loss. North facing windows and extensive exterior walls are to be minimized.

Work with Nature and keep it simple, so that you can heat your house and hot water with passive solar techniques - minimizing pumps, pipes, collectors and controls.

Direct your roofwater to major trees and shrubs, avoiding expensive cisterns and another set of pumps, pipes and controls.

Use native, non-toxic materials such as adobe, pumice-crete, vigas, roughcut wood, and stone - make your house healthy, reduce the energy costs of manufacture and transportation, and support both the local economy and building traditions.

Use energy-efficient appliances, heating systems, daylighting and electric lighting.

Radon abatement may be desirable in areas known to harbor radon gas in the soil.

These green building examples are from Archetype Design projects going back to 1983.

The collectors pocketed into the garage wall heat this entire 2,200 s.f. pumice-crete home

Who says solar can't be beautiful?

Heat Recovery Ventilation in today's supertight homes is a way to ensure fresh, pure air - particularly in the case of environmental sensitvity.

Water testing and treatment may be an important health consideration.

Landscape with natural cooling in mind: Spot trees to serve as exterior swamp coolers and to protect from excessive sun penetration.

We think it's important to recognize that every home has an environmental impact and each of us has to achieve a realistic balance between lifestyle and earth-friendliness. Not everyone is prepared to live an alternative lifestyle, but almost everybody is interested in making some initial steps towards sustainability. A 50% solar house might be a reasonable goal for almost any homeowner, while a completely solar home will appeal to only a few. Start with greenbuilding systems which are user-friendly, cost-effective, and utilize fewer resources to manufacture and install.

Natural viga post, roughcut treads, hand-forged brackets, and clay plaster

These systems and techniques top the list for cost-effectiveness and user-friendliness:

1. Passive solar gain (heat from the sun penetrating through south-facing windows).
2. Super-insulation (foundations and slabs, walls, roofs, window coverings).
3. Solar hot water heating (the simpler the better!)
4. Roofwater utilization (directly to trees or, for household use, to a cistern).
6. Energy-efficient appliances, daylighting, electric lighting, and backup heating systems.
7. Drip irrigation, permaculture, and xeriscapic plants in a natural cooling design.

This aspen grove acts like a swamp cooler for the adjacent rooms

Many other options are available to complement your particular needs. For example, if you have an art collection and great furniture, you may need to reduce the sun penetration characteristic of passive solar gain, and instead resort to an active solar system with collectors, pumps and controls. Stand-alone solar electricity is not cost-effective if you have ready access to grid power, but if your site is remote you may have no choice. Graywater systems are prohibitively expensive if installed per state health codes, but out in the boondocks there may be no one around to care if you cut a few corners. The construction process itself is also worthy of attention, and more homeowners are requiring their builders to recycle cardboard and discarded building materials, use certified sustainably-harvested lumber, and guard against erosion or loss of ground cover.

One simple thing we can all do is sign up at the Kit Carson Electric Co-op for the Green Energy program, ensuring that your electricity comes from wind-generated sources on the Great Plains rather than from coal-fired plants at the Four Corners. It costs a few pennies more, but it's a great way to help give birth to a new, clean-energy industry and avoid new power plants. Call 758-2258 for details.

A living roof is about as green as it gets!

This flagstone path drains 600 sf of patio into the perennial beds, while the apricot tree behind shades the living room from excessive afternoon sun.

This house in Sag Harbor, Long Island, is entirely cooled with geothermal heat exchange.

10. GREENBUILDING AND RENEWABLE ENERGY SYSTEMS

A. Electricity

- Photo-voltaic system w. batteries for typical 2,000 sf house: $18,000-$28,000* less tax credits
- 12KW automatic back-up generator: $3,000-5,000*
- Gridtie PV system for 2,000 sf house: $10,000-$20,000* less tax credits
- 500 watt wind turbine: $700 and up* less tax credits
- Compact fluorescent light bulbs: $10-$30*

B. Hot Water

- 125K BTU Aquastar tankless water heater: $900-$1,200*
- Rinnai Continuum tankless water heater: $1,200-$2,000*
- 80 gallon hot water storage tank w. heat exchanger: $1,200-$1,600*
- 4x8 solar hot water collector: $1,000-$1,500*
- Basic 80 gallon active solar hot water system: $5,000-$7,000 installed Less tax credits

This rooftop clerestory isn't pretty, but you never see it. It captures the solar energy which heats the water tanks below to 100 degrees on a decent solar day. (see photo right).

- State-of-the-art active solar heat and hot water system for 2,000sf house: (seven panels, controls, tank & heat exchanger, radiant tubing on 6" centers) $35,000-$50,000 installed less tax credits.

C. Water Systems

- Underground plastic cistern $1.50-$2.00 per gallon installed
- 30 gallon pressure tank: $300-$500*
- Solar waterwell pump packages: $3,500-$7,500*
- Whole house filtration for roof catchment supply: $1,250-$1,750

D. Wastewater and Solid Waste

- Complete graywater system (per NM code w. dedicated septic tank, split black/graywater lines, aeration/circulation, storage tank): $15,000-$25,000
- Plastic water tank only: $1.50-$1.75 gal.
- Cost of split black/graywater lines only: $2,500-$4,500

- Interior wetlands planter for graywater treatment: $4,000-$6,000
- Composting toilet: $1,200-$2,500*

E. Energy-efficient Appliances and Add-ons

- Clothesline: $5.00
- Conserve energy-efficient refrigerator: $1,000-$1,400*
- Sunfrost 19 c.f.energy-efficient refrigerator: $3,500*
- Staber energy-efficient clothes washer: $1,400-$2,000*
- Premier spark ignition ranges: $500-$1,500*
- LP refrigerator $1,200-$1,600*
- Insulating window coverings: $15 p.s.f and up
- hot water tank insulating jacket: $25-$40*
- weatherstripping, typical exterior door: $7-$15

This trombe wall radiates heat into a bookshelf-lined study.

F. General Construction / Healthy Home

- Typical 4'w. x 8' h. section of trombe wall (6" CMU plastered two sides; 4676 PDR glazing): $200-$225 p.l.f.
- Two-coat adobe interior plaster system, no wire coat: $25-$35 p.s.y.
- Micaceous clay slip coat: $10-$12 p.s.y.
- Adobe floor: $10-$12 p.s.f.
- Radon abatement system: $1,500-$2,000 for typical 2,000sf house.
- Reverse osmosis water filter: $400-$1,800*
- Whole house activated carbon water filter: $2,000-$3,000*
- Heat Recovery Ventilation (HRV) system for supertight homes or people with environmental sensitivities: $7,000-$10,000

This west-facing portal provides covered dining and shades the interior from the brutal afternoon sun.