

green choices | roofing | insulation | LEED certification



Mountain Living
**NATURAL
DREAM
HOME**
'08
Luxury. Green. Living.



PHOTOS BY DAVID FOXHOVEN

PROGRESS REPORT: MONTHS 9-11

green choices

WASTE MANAGEMENT From the moment we broke ground, we've been doing our best to keep our waste-generation levels well below the industry norm. Currently, we're diverting 53 percent of our construction waste from the landfill by reusing what we can, recycling our leftovers and donating usable materials to the local Habitat for Humanity chapter. But we've decided to take things a step further.

We've noticed that many building supply manufacturers use quite a lot of packaging materials. While we certainly understand the need to protect fragile items, we also can't help but think that this practice isn't very green. So now, when we select our suppliers we're not just considering the product, but also the waste generated when manufacturing, packaging and transporting it.

CASE IN POINT: Kitchens by Wedgewood is providing the kitchen cabinetry for the Natural Dream Home 2008. We chose this company because it offers a true green product, it is located in Colorado, and it will ship the cabinets without packing materials; instead, each piece will be wrapped in reusable blankets to prevent damage.

What we learned: Local companies are best able to ship with minimal packing materials simply because their products don't have as far to travel and typically use fewer modes of transportation to get to their final destination, which means fewer opportunities for damage to occur.



Did you know? If you buy locally you can request that your products be wrapped in blankets instead of excessive packaging that will be taken to a landfill.

THE DREAM TEAM

- DEVELOPER** Margie Hamrick, Ecoexistence, Edwards, CO, (970) 926-3464, ecoexistence@aol.com
- ARCHITECT** Peter MacDonald, Peter Stafford MacDonald & Co., Minneapolis, MN, (612) 333-1822
- BUILDER** Boles Custom Builders, Inc., Edwards, CO, (970) 926-3202
- SUSTAINABLE DESIGN TEAM** Associates III, Denver, CO, (303) 534-4444
- ENERGY CONSULTANT** Active Energies, Avon, CO, (970) 227-0272
- STONE PROVIDER** Telluride Stone Co., Denver, CO, (303) 388-8863
- LOG PROVIDER** Custom Log Homes, Stevensville, MT, (406) 777-5202
- REAL ESTATE AGENT** Patti Brave, Slifer, Smith & Frampton, Cordillera, CO, (970) 926-3505
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This month, readers ask Margie Hamrick, the Natural Dream Home 2008's developer, their questions about building green.

ASK THE DREAM TEAM

Q: Why are you pursuing Gold LEED certification instead of Platinum, which is the highest level attainable?

A: Although we are doing everything possible to achieve the highest LEED rating, we are limited to the Gold level strictly because of the size of the home, which is 7,945 square feet. An 8,000-square-foot home is not generally considered a low-impact structure. But we wanted to build a green home of this size to set a new standard for luxury mountain homes. We believe that all homes, large or small, should be built right, and our goal is to demonstrate that even a large, luxury home can have a minimal impact on the environment and attain a very impressive level of LEED certification.

Q: What choices have you made to reach the Gold LEED certification?

A: With gold as our goal, the completed home will focus on high performance and a healthy living environment. Some of the environmental choices we have made to date include:

- The use of low- or no-VOC materials in order to prevent the emission of harmful gases into the home and atmosphere. For example, we are using tea, coffee and wine to stain wood used in the home
- The use of photovoltaic solar panels which will allow the house to produce its own energy, rely far less on public utilities and actually feed the power grid
- The use of reclaimed and recycled materials throughout the project, including beetle-kill logs, roofing made from recycled materials and insulation made from recycled blue jeans
- The use of low-flow plumbing fixtures and permeable pavers

Have a Question?

Do you have a question about building green or a sustainable solution you'd like to share with The Dream Team? Send your thoughts to Margie Hamrick, the Natural Dream Home 2008's developer, at ecoexistence@aol.com.

David Huffman Boles Custom Builders

INTERVIEW BY IRENE RAWLINGS

MOUNTAIN LIVING: What are some of the challenges of building a home in the mountains?

DAVID HUFFMAN: Boles Custom Builders has been building in the mountains for more than 25 years, so we definitely have some experience dealing with the quick-changing weather and large volumes of snow that can affect the pace of construction. The mountain environment is a harsh test of all kinds of building materials and techniques. In addition, everything requires more time for transportation because most materials have to travel over several mountain passes.

ML: Are there different challenges when building a LEED-certified mountain home?

DH: This is our first LEED-certified home and we're finding pre-construction planning to be more important than ever. We need to verify the sustainability of every product and process, and find people who are qualified in green building or willing to try.

ML: How do you know if a product is truly green?

DH: We ask a lot of questions, not only about the products but also about how they are manufactured. Through the LEED program, we have had many third-party inspections so suppliers can't make green claims without substantiation.

ML: Is it more expensive to build green?

DH: People have really started to consider how much energy their homes use. Maximizing a home's thermal value and minimizing its energy appetite may cost more up front, but over time, those resources are recouped.

ML: What are the first steps a homeowner should take when building a green home?

DH: The first step is to define your vision. Putting it in writing clarifies and solidifies your thoughts. You can build a green home without any certifications, such as Built Green® Colorado, LEED or ENERGY STAR, but you should have a working definition of what "green" means to you. Then start looking for architects, designers and builders who have experience and passion. And remember: the more planning, communication and specification you do before the first shovel hits the ground, the better. *For more of our conversation with David Huffman, visit mountainliving.com.*

MEET

THE
DREAM
TEAM



PHOTO BY DAVID FOXHOVEN

BOLES CUSTOM BUILDERS, INC.

David Huffman, Project Manager, Natural Dream Home '08

bcbi.net or (970) 926-3202 (Edwards, CO); (406) 763-4850 (Bozeman, MT) and (435) 658-1507 (Park City, UT)

In business for more than 25 years, Boles Custom Builders specializes in custom home construction, luxury multi-unit construction and home renovation in mountain resorts. Services include: pre-construction consultation (constructability, material selection, detailing and estimating), and complete project management during construction and post construction (warranty and service). "We build with integrity and enthusiasm, making every home a dream home," says John Boles, the company's president. "Our clients demand the best and we deliver it in quality, inspired design, performance and green building principles."

MEET

THE
DREAM
TEAM

Megan Gilman, Active Energies

INTERVIEW BY IRENE RAWLINGS



PHOTO BY DAVID FOXHOVEN

ACTIVE ENERGIES, INC.

Megan Gilman, President
activeenergies.com or (970) 227-0272

Active Energies, Inc. designs and installs photovoltaic systems and provides consulting services for architects, contractors and homeowners to promote renewable energy, energy efficiency and cost savings. Megan Gilman holds a bachelor's degree in mechanical engineering and is experienced in mechanical systems, design process and interdisciplinary coordination. "We undergo continuous training and research in passive and active energy efficiency so you don't have to," says Gilman. Active Energies donates to and volunteers for Habitat for Humanity of Eagle & Lake Counties.

MOUNTAIN LIVING: What is Active Energies?

MEGAN GILMAN: We are an energy consulting company that offers assistance in energy efficiency and green building for new and existing homes and businesses. We work with builders and homeowners to determine which of the green-building programs (ENERGY STAR, Built Green® Colorado or LEED for homes) is right for them.

ML: Why do homeowners want to build or renovate green?

MG: People are beginning to be more mindful of their impacts. It is not just about the environment. Green elements—durability, energy efficiency, good indoor air quality—are things people want for their homes. In the past, people were interested in building green but didn't know the resources available to accomplish these goals. But now, why wouldn't you run your home for less money if you could?

ML: At what point in the design process does Active Energies become involved? What about remodels?

MG: The earlier the better and certainly no later than the design-development process. We like to hold a brainstorming meeting with everyone who will be involved in the design and building process. That way, we can hash out our ideas and goals. In the case of remodels, this is a perfect chance—when the walls are open—to see what improvements have the best payback and are feasible for the home.

ML: How does the certification process work?

MG: In the very first meeting we talk with our clients about their project and about the different programs available. Ideally, the architect, builder and homeowner all sit down together with us to discuss goals and strategies for the home. Then we produce an energy model for the home, including orientation, insulation, HVAC equipment, and window and door specifications. During planning and construction, we work with our clients to keep them on track and to document what they're doing to satisfy the program requirements.

ML: If we are considering building green, what are the things we must do? What are the things we must not do?

MG: The building-green "musts" are energy efficiency, indoor air quality, durability and limiting the amount of construction debris that goes to the landfill. The biggest "don't" is allowing yourself to be talked out of the things you really want. Using new products, technologies and resources is something a homeowner should be adamant about. *For more of our conversation with Megan Gilman, visit mountainliving.com.*

up on the rooftop

TO MEET CORDILLERA'S CODE requirements, which prohibit shake roofs, as well as our goal of installing a sustainable product, we will cover about 70 percent of the Natural Dream Home's roof with Seneca Cedar Shake Tiles™ from EcoStar™, a division of Carlisle SynTec Inc. These synthetic cedar shakes are made from recycled rubber and plastic but have the look and feel of true wood shakes.

Advantages of Seneca Cedar Shake Tiles™

ECO FRIENDLY Made from 80 percent recycled materials, the tiles are comprised of recycled rubber (EPDM) sourced from old wheel wells and radiator hoses, and pre-consumer plastic (thermo-plastic polyolefin, or TPO) from the leg cut-outs of diapers.

WEATHER RESISTANT Naturally flexible, rubber makes these roof tiles very resistant to impact and the harsh high-country elements. "Water from rain, ice or snow can't permeate the tile and cause freeze/thaw damage," says Dan Govan of BR McCracken Co., our EcoStar™ distributor. "The tiles also have a Class-4 Impact Resistance rating, the highest hail rating attainable.

"The TPO is a UV-stable material that can withstand prolonged UV exposure and also provides rigidity, which helps the tiles stand up to high winds."

FIRE RESISTANT Because forest fires are a concern, we chose EcoStar™'s Class-A fire-rated shingles. "A fire retardant that works by removing oxygen, thus preventing combustion, is mixed in with the rubber and TPO before the tiles are molded," says Govan.

LIFESPAN EcoStar™ warranties Seneca Cedar Shake Tiles™ for 50 years but, says Govan, "the chemists at Carlisle estimate the life span to be closer to 70 years."

VALUE EcoStar™'s Class-A roof tiles are not inexpensive—\$550 per 100 square feet—but when you consider their life span, the value is high. "The average true shake roof, which has no fire rating, may cost about \$300 per 100 square feet, but will only last about 15 years," says Govan. "A dimensional asphalt shingle roof may only cost \$180 per 100 square feet, but they typically have a 40-year warranty and rarely last that long."



>> RESOURCES

EcoStar™ by Carlisle, (800) 211-7170, ecostar.carlisle.com

Distributed by BR McCracken Co., (303) 421-8103, brmccrackenco.com

a tight seal

WHEN IT CAME TO CHOOSING INSULATION, it was important for us to find the most energy-efficient solution available, as this will allow us to minimize energy demands—and heating and cooling costs—for the life of the home. We chose InsulStar® high-performance spray-foam insulation from NCFI, an energy-efficient, eco-friendly, closed-cell, spray-in-place polyurethane insulation system that stops airflow into and out of the home, reduces noise, and blocks dust, pollen and other pollutants from entering. Made from renewable agricultural resources, InsulStar® is odorless and completely non-toxic after installation.

EFFICIENCY InsulStar®'s R-value (a measure of insulation's ability to resist heat flow) is about R-6.8 per inch, compared to fiberglass batting insulation's R-value of about R-3.2. By stopping air infiltration and eliminating convective looping, which degrades the R-value of most insulation, InsulStar® saves an estimated 40 percent on energy bills.

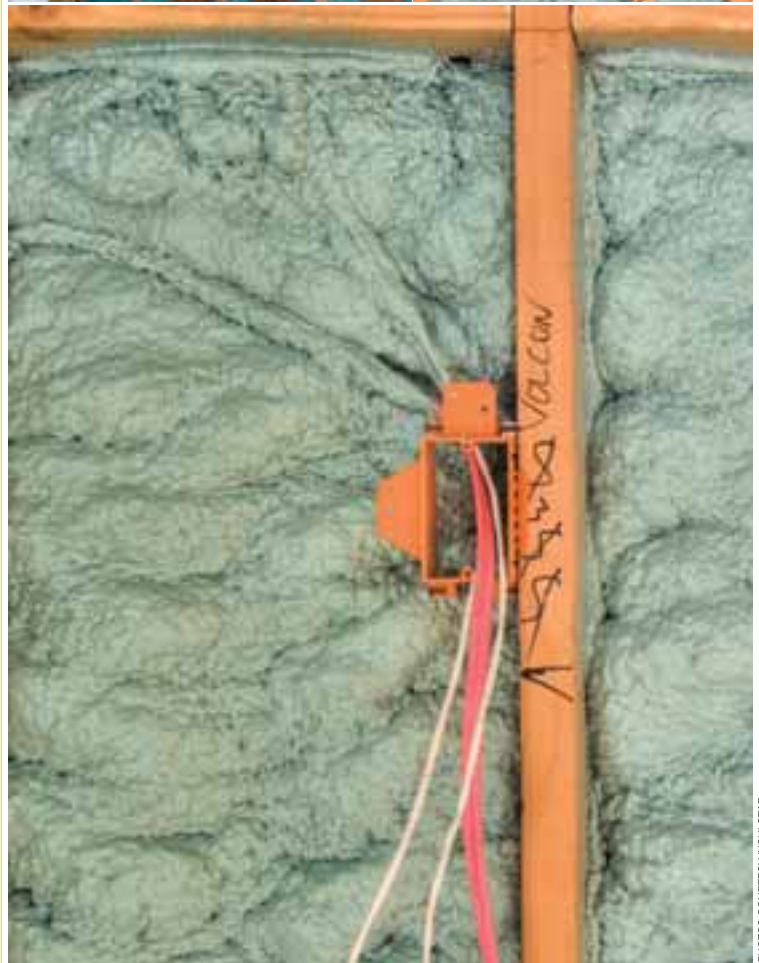
SUSTAINABILITY InsulStar® is made from renewable agricultural resources and uses an eco-friendly blowing agent with zero ozone-depletion potential (ODP). In 2004, NCFI Polyurethanes received the EPA's Stratospheric Ozone Protection Award for its work in developing environmentally friendly spray polyurethane foam (SPF) insulation systems.

PROTECTION By creating a low-permeance air seal, InsulStar® blocks not only air and noise infiltration, but also water vapor movement, which prevents condensation, eliminating the moisture needed to support mold growth. InsulStar® is also blended with an anti-microbial to inhibit mold, mildew and bacterial growth, and has a Class-1 fire rating.

STRUCTURAL RIGIDITY A test conducted by the National Association of Home Builders Research Center showed that a 2"x4" wall sprayed with polyurethane foam insulation had twice the racking strength, or ability to resist wind loads, of a wall filled with fiberglass batting insulation.

>> RESOURCES

InsulStar® by NCFI, (866) 678-5283, insulstar.com



PHOTOS COURTESY INSULSTAR

go
green

Insulate and Save: One of the most cost-effective ways to make your home more comfortable and efficient is by adding insulation to your attic. To find out if you have enough (homes in the high country should ideally have R-49 insulation in the attic), measure the insulation's thickness. If it is less than R-49 (about 16 inches of fiberglass or 14 inches of cellulose), you could benefit from more.

going for gold

Our LEED Checklist

Becoming LEED certified is no small task. The process starts long before construction begins and requires diligent planning. Here, you'll find our simplified version of the LEED project checklist that illustrates a selection of the points we're pursuing. Stay tuned to upcoming issues for more. To learn more about the LEED certification process, visit usgbc.org/LEED.

points	
INNOVATION & DESIGN PROCESS Our Goal: 7 to 9 out of 9 possible points	
	INTEGRATED PROJECT PLANNING
1	Integrated Project Team
1	Design Charrette
	QUALITY MANAGEMENT FOR DURABILITY
3	Third-Party Durability Inspection
	INNOVATIVE/REGIONAL DESIGN
2-4	Provide Description & Justification for Specific Measure
LOCATION & LINKAGES Our Goal: 7 out of 10 possible points	
	SITE SELECTION
2	Avoid Environmentally Sensitive Sites & Farmland
	PREFERRED LOCATIONS
2	Select an Infill Site
	INFRASTRUCTURE
1	Site Within 1/2 Mile of Existing Water and Sewer
	COMMUNITY RESOURCES & PUBLIC TRANSIT
1	Basic Community Resources/Public Transportation
	ACCESS TO OPEN SPACE
1	Publicly Accessible Green Spaces
SUSTAINABLE SITES Our Goal: 14 out of 21 possible points	
	LANDSCAPING
2	Basic Landscaping Design
3	Limit Turf
1	Drought-Tolerant Plants
	SURFACE WATER MANAGEMENT
4	Design Permeable Site
2	Design & Install Permanent Erosion Controls
	NON-TOXIC PEST CONTROL
2	Select Insect & Pest Control Alternatives from List
WATER EFFICIENCY Our Goal: 9 out of 15 possible points	
	IRRIGATION SYSTEM
3	Select High-Efficiency Measures from List
1	Third-Party Verification
	INDOOR WATER USE
1	High Efficiency Fixtures (Toilets, Showers and Faucets; one point each)
4	Very High Efficiency Fixtures (Toilets, Showers and Faucets; two points each)
ENERGY AND ATMOSPHERE Our Goal: 28.5 out of 37.5 possible points	
	INSULATION
2	Third-Party Inspection of Insulation, Grade I AND 5% Above Code
	AIR INFILTRATION
2	Third-Party Envelope Air Leakage Tested <= 5.0 ACH50 (CZ 1-2)

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Points in this category are awarded for innovative design for the structure's climate or region or for far exceeding specific categories.

The Natural Dream Home 2008 is just steps away from a pickup/drop-off station for a ski shuttle, a community center that houses restaurants, a golf club house, swimming pool, tennis courts, fitness facility and a real estate office.

Currently, we are planning to plant turf on approximately 20% of the landscaped area. However, we may eliminate turf altogether in order to potentially earn an additional point for innovation.

We will install an irrigation timer/controller that will only activate during low-evaporation times. We'll also be installing high-efficiency nozzles and sub-surface drip-irrigation systems which reduce evaporation. A moisture sensor will ensure that the irrigation system never activates while it is precipitating.

going for gold

Our LEED Checklist

points		
3	DISTRIBUTION EFFICIENCY Install Outdoor Reset Control	Our boiler is 93% efficient.
3	SPACE HEATING & COOLING HVAC Substantially Exceeds ENERGY STAR >90% Boiler	
1	WATER HEATING Pipe Insulation	Perfect for a second home, our drawer-size on-demand water heater doesn't have a reservoir tank and therefore doesn't use any gas unless hot water is being used. Instead, water is instantly heated as it passes through the heater, ensuring energy savings—and a limitless supply of hot water.
2	Improved Water Heating Equipment	
1.5	LIGHTING Energy Efficient Fixtures & Controls	
2	APPLIANCES Select Appliances from List	
1	Very Efficient Clothes Washer (MEF>1.8, AND WF<5.5)	
10	RENEWABLE ENERGY Renewable Electric Generation System (1 point/5% reduction)	The 7-kW photo-voltaic solar system we plan to install will produce 50% of the home's annual electrical usage.
1	REFRIGERANT MANAGEMENT Minimize Ozone Depletion & Global Warming Contributions	
MATERIALS & RESOURCES Our Goal: 8.5 out of 14 possible points		
6.5	ENVIRONMENTALLY PREFERABLE PRODUCTS Select Environmentally Preferable Products from List	The 7-kW photo-voltaic solar system we plan to install will produce 50% of the home's annual electrical usage.
2	WASTE MANAGEMENT Reduce Waste Sent to Landfill to 1.5 lbs./sf or 9.6 cubic yards/1000 sf	
INDOOR ENVIRONMENTAL QUALITY Our Goal: 19 out of 20 possible points		
2	COMBUSTION VENTING Install High-Performance Fireplace	Our energy recovery ventilation (ERV) system exhausts indoor air, exchanging it with fresh outside air. Before indoor air is exhausted, however, the heat recovery system transfers the heat energy from the indoor air to the incoming outdoor air.
2	OUTDOOR AIR VENTILATION Dedicated Outdoor Air System (with heat recovery)	
1	Third-Party Testing of Outdoor Air Flow Rate into Home	
1	LOCAL EXHAUST Timer/Automatic Controls for Bathroom Exhaust Fans	
1	Third-Party Testing of Exhaust Air Flow Rate Out of Home	
2	SUPPLY DISTRIBUTION Use At Least Two Distinct Zones with Independent Controls	
2	VENTILATION AIR FILTERING ≥3 MERV Filters, with Adequate System Air Flow	
1	CONTAMINANT CONTROL Seal Off Ducts During Construction	
2	Permanent Walk-Off Mats OR Shoe Storage OR Central Vacuum	
1	Flush Home Continuously for One Week with Windows Open	
1	RADON PROTECTION Install Radon Resistant Construction if Home is not in EPA Zone 1	To achieve maximum energy savings, the Natural Dream Home will have numerous zones that can be controlled independently.
2	GARAGE POLLUTANT PROTECTION Tightly Seal Shared Surfaces between Garage and Home	
1	Exhaust Fan in Garage	
AWARENESS & EDUCATION Our Goal: 2 out of 3 possible points		
1	EDUCATION FOR HOMEOWNER AND/OR TENANTS Comprehensive Occupant's Manual & Multiple Walkthroughs/Trainings	When a car enters or exits the garage, the exhaust fan will automatically activate to remove fumes.
1	Public Awareness of LEED Home	

95 GRAND TOTAL

Minimum Points Required: Certified: 65 Silver: 80 Gold: 95 Platinum: 110