

# SAGE Near-Zero-Energy Home

Sponsored by Owens Corning



Featuring the latest innovations in green home design and materials, including:

**GEOHERMAL HVAC • SOLAR POWER  
INSULATED CONCRETE FORM CONSTRUCTION  
MUCH MORE!**

**BUILDER:** Sage Homebuilders • **LEAD SPONSOR:** Owens Corning

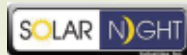
**DESIGNER:** Jeff Day & Associates • **FINANCING:** Westbridge Bank

**COMPLETION:** Summer 2007



[www.sageSTL.com](http://www.sageSTL.com)

314.265.6143



## Who is Sage Homebuilders?

A leader in the green building movement in St. Louis, Sage Homebuilders designs and builds custom homes that combine:

### HIGH PERFORMANCE

high efficiency/lower utility bills, healthier & more comfortable air, less maintenance, and more eco-friendly

### HIGH DESIGN

enhanced architectural detail, efficient use of space, and more aesthetic appeal, inside & out

Our unique approach yields a better home investment, making Sage the wise choice.

Learn more at

[www.SageSTL.com](http://www.SageSTL.com)

## Contact Information

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## Green Building is Here

The time for green building has arrived; research data indicates that a major paradigm shift in the building industry is underway. This shift is being driven by builders, suppliers, and manufacturers, who have embraced the wisdom of green, as well as the conscientious consumer who's demanding a better built home. Across the nation, a more broad move to greener practices & products is taking place; so it is no surprise that 2007 is expected to be a "tipping point" year for green building.

Sage Homebuilders, a green-only builder, set out to build a Showcase home in an effort to do our part to help hasten the pace of change. What makes this home special is that it goes farther than a typical green home to include many of the latest and best green features. The home combines "hyper-efficient" construction with self generation of power. What makes it a "Near Zero" home is that it generates most of the power it needs from the sun, so it uses "near zero" energy from "the grid".

But the "zero" aspect is only one of many green features of the home. Nearly every building practice used has been done in a greener-than-typical way, and nearly every material used to build the house is a greener-than-typical material.

In the years to come, houses like this one will become commonplace. But for now it is an exciting, cutting edge home that will serve as a valuable, tangible, tool for educating builders, homebuyers, and the general public about the potential for the homebuilding industry.

## About the Home

### Location

- 29 Beacon Hill, Creve Coeur, MO 63141
- Centrally located in metro area, near intersection of Interstate 64 and Highway 270.

### General Description of the Home and Lot

- Cottage-style, helps demonstrate that green homes do not have to look like “a rocket ship.”
- 1-1/2 story, 3,600 sq/ft, clad in Cultured Stone and fiber cement cedar shake style siding.
- Situated on a 1 acre, partially wooded lot, backing to Conway Park.

### Green Goals

- “Near-Zero Energy Home,” producing a majority of the energy it uses.
- Projected to be certified under 3 programs:
  - GBI (Green Building Initiative) — Local HBA program, 3rd party verified, NAHB guidelines
  - LEED-H (Leadership in Energy and Environmental Design for Homes)
  - Energy Star Homes



3-D rendering of front elevation



3-D rendering of rear elevation

## Green Features

### Building Envelope

- ICF (Insulated Concrete Forms) on Foundation and 1st Floors, Attic truss framed on 2nd
- Steel Bucking for ICF window & door openings
- Blown-in fiberglass insulation in non-ICF areas
- Radiant Barrier roof sheathing
- Cultured Stone & Fiber Cement siding
- 50 Year, lighter color roof shingle
- Sealed with exterior water barrier, interior caulking and spray foam application

### Systems

#### Most Efficient HVAC system available

- Geothermal Heat Pump, forced air system
- Advanced air purification system
- ERV (Energy Recovery Ventilator),

#### New Era Plumbing & Electrical Systems

- PEX & manifold system plumbing
- Geothermal / tankless heated water
- Green plumbing fixtures – low flow faucets, dual flush toilets, etc.
- Home automation of lighting , HVAC, & security. Automatic bath fans.
- High efficiency light fixtures (Energy Star) — LED, fluorescent, insulated can lights, etc.

### Renewable Energy Systems

#### Advanced Solar Design

- Passive solar design
- 4kw PV arrays
- Integrated Energy Management Component (combined inverter, battery for backup power, whole house energy monitoring, etc.)
- Solar landscape lighting

### Green Materials

Almost every material used in the house will be a green alternative to industry standard materials.

#### Construction materials

- Locally produced, non-off-gassing, sustainably harvested, energy efficient, durable/ sustainable and recycled content. Many examples.

#### Green Finishes

- Flooring, cabinets/tops, plumbing/ electric fixtures, appliances, shelving

### Green Building Practices

- Indoor Air Quality (pollutant & moisture control)
- Water Efficient Design
- Eco-Friendly site development
- Recycling, waste reduction

Sage Homebuilders would like to thank Owens Corning for their lead sponsorship.



## Sage Near Zero Energy Home Owens Corning Product Background

### Fold-Form® ICF

Owens Corning's Fold-Form® ICF system is made of interlocking form blocks featuring high-grade expanded polystyrene insulation that can withstand winds of up to 250 miles per hour. Its smooth concrete walls insure maximum structural strength.

The expanded polystyrene insulation used in Fold-Form is energy efficient and does not support the growth of mold. Unlike traditional wood-framed buildings, there are no bridges or cold spots in this permanent blanket of insulation so there is 67 percent less air infiltration. Finished walls can reach an insulating value of R-20, thus improving a home's energy efficiency.

URL: <http://www.owenscorning.com/foldform/fold-form.asp>

### PRO PINK Loosefill Insulation

Owens Corning's loosefill insulation, also called "blown-in" insulation, is made of virgin PINK fiberglass insulation. It's used in new construction and in older existing homes, typically in hard-to-reach areas. Since fiberglass insulation is non-combustible and non-corrosive by nature, PINK fiberglass loosefill insulation offers significant advantages over other loosefill insulation products.

PINK loosefill will not settle or lose its energy-saving abilities over time. In fact, homeowners see consistent energy savings throughout the year. Loosefill will not rot or decay, nor will it support the growth of mold. Instead, the product tightens the building envelope and contributes to improved energy efficiency. Loosefill is also GREENGUARD certified for indoor air quality and approved under the Scientific Certification System because it is made with 35 percent recycled content.

URL: <http://www.owenscorning.com/around/insulation/products/propinkloosefill.asp>

### QuietZone Batts

Owens Corning QuietZone acoustic batts are an essential part of controlling noise transmission between rooms. QuietZone acoustic batts absorb sound vibrations within the wall cavity to control noise in the home.

QuietZone acoustic batts help reduce noise transmission coming from laundry rooms, entertainment rooms, family rooms and any other area where noise is created. It can also be used to create privacy in home offices, master bedrooms or other areas where peace and quiet is desired.

QuietZone acoustic batts are GREENGUARD certified for indoor air quality and approved under the Scientific Certification System because it is made with 35 percent recycled content.

URL: [http://www.owenscorning.com/quietzone/pdfs/QZBAtts\\_DataSheet.pdf](http://www.owenscorning.com/quietzone/pdfs/QZBAtts_DataSheet.pdf)

### Cultured Stone®

Owens Corning is the world's largest producer of manufactured stone veneer products. The business began making replicas of natural stone in 1962 and today offers more than 21 textures, 100 colors and countless blended texture and color options for interior and exterior residential, commercial and landscape applications. Cultured Stone® manufactured stone veneer products meet AC-51 criteria, the strictest requirements in the industry. In addition, studies have shown that Cultured Stone® manufactured stone veneer not only adds curb appeal but adds to the perceived value of the home.

Today, the trademark CSV® (Cultured Stone® Veneer) stamp still appears on each and every piece of stone to guarantee customers they are getting the original: a proven and preferred brand they can trust and take pride in.

URL: <http://www.culturedstone.com>

### Oakridge Pro® Series Shingles

Owens Corning pairs outstanding performance with exceptional beauty in the design of its roofing products. Oakridge Pro® Series shingles with SureNail™ technology perform better than ever. The Tru-Bond sealant grips to the nailing strip on the shingle below for double the bonding strength allowing it to withstand hurricane-force winds of 130 mph. The wider nailing area allows for improved and consistent installation and the extra wide adhesive bands keep shingles laminated together.

Oakridge® shingles have a warm, inviting look in popular colors for a step up from traditional three-tab shingles.

URL: [http://www.owenscorning.com/around/roofing/shingles/selectedstyle.asp?Shingle\\_Line=62](http://www.owenscorning.com/around/roofing/shingles/selectedstyle.asp?Shingle_Line=62)

## Kolbe Windows and Doors

At Kolbe & Kolbe, our goal is to produce a product with superior features that are built into every window and door — not added on. These “quality in detail” features are evident in all our units — from our most intricate custom units to our utility windows. Rest assured, we remain steadfast in our commitment to produce only the best.

To achieve that goal, we remain dedicated to the philosophies that inspired Herb & Ervin Kolbe nearly 60 years ago:

- We will always use the best materials and superior craftsmanship to produce the finest windows and doors available.
- We will strive to completely satisfy our customer.
- We will not allow manufacturing shortcuts that compromise the integrity of our design.
- We will not sacrifice either innovation or competitiveness.
- We will continue to manufacture windows and doors by harmonizing technology with the artful skill of the human eye and hand.
- The safety and health of our employees and a healthy environment will always be priorities.

Your complete and total satisfaction is our primary concern. Take a look at Kolbe® windows & doors... and See the Difference Quality Makes™.

It's your home or project. You have many choices with Kolbe. At Kolbe, the only option we don't offer is ordinary windows.

### For more information:

[www.kolbe-kolbe.com](http://www.kolbe-kolbe.com)



## MANABLOC Manifold System

### Manufactured by Viega

A MANABLOC system works for the homeowner. Unlike conventional systems which simply deliver water to fixtures, the MANABLOC distributes the water supply quietly, efficiently and economically.

The MANABLOC plumbing system can reduce energy and water waste by about half in an average home by reducing the wait time to deliver hot water.

### For more information:

[www.viega.com](http://www.viega.com)



## Velux Skylights

**Good for your home, Great for the environment.** Well lit, open spaces improve your mood and prevent SAD syndrome brought on from inadequate daylight levels.

Insulated low-E, gas filled glazings:

- Offer 3 times more protection against solar heat gain.
- Resist condensation twice as long as clear glass.
- Protect interiors by reflecting most of the sun's fade-causing rays.

Improve your indoor air quality through passive air conditioning from venting skylights by exhausting:

- Pollutants known as Volatile Organic Compounds (VOCs).
- Excess heat and moisture which can lead to mold.
- Smoke, pet and kitchen odors.

**Bring the best of the outdoors inside with you.** VELUX was the first skylight manufacturer to meet the ENERGY STAR® criteria in all climate zones.

Reduce HVAC loads by utilizing the natural power of the sun to bring passive light, without the normal heat emitted by electrical sources.

Regular exposure to full spectrum light helps to balance our circadian rhythm (internal clock).



**For more information:**  
[veluxusa.com](http://veluxusa.com)

**VELUX®**

## GridPoint Connect

**Manufactured by GridPoint, Inc.**

At GridPoint, our mission is to address today's energy challenges by providing clean-tech products and intelligent energy management solutions that benefit consumers, businesses and utilities as well as the environment. GridPoint Connect™ is an award-winning product that easily integrates and stores renewable energy, automatically increases energy efficiency and provides instant, reliable backup power. GridPoint Connect combines power electronics, high-capacity battery storage, and an advanced computer in an attractive, plug-and-play appliance, replacing the traditionally complex balance of system required for renewable energy installations. The appliance's accompanying Web portal, GridPoint Central, enables customers to set a personal energy profile to automatically reduce consumption and costs (i.e. turning a water heater off during the day), as well as view environmental data such as how much renewable energy they've produced.

**For more information:**  
[www.gridpoint.com](http://www.gridpoint.com)



**GRIDPOINT™**

## Envision Series Line

### Manufactured by WaterFurnace International

The WaterFurnace Envision Series offers industry-leading efficiencies, exceptional comfort, whisper quiet operation, increased longevity, and improved serviceability. With 5 COP and 30 EER efficiency ratings, the Envision Series offers homeowners the most efficient heating, cooling, and hot water generation system ever rated by the Air-Conditioning and Refrigeration Institute (ARI) 13256-1 (GLHP).

With 25 years of geothermal experience, and more than 200,000 units installed nationwide and abroad, WaterFurnace International is the leading manufacturer of geothermal and water source heating and cooling systems. The company pioneered the use of “closed loop” geothermal systems to heat, cool, and provide hot water for residential homes and commercial buildings. In fact, WaterFurnace products are both nationally and internationally recognized as the most efficient, reliable and environmentally friendly HVAC systems offered in today’s market.

#### For more information:

To learn more about WaterFurnace geothermal systems, and to contact a dealer for an estimate, visit [www.waterfurnace.com](http://www.waterfurnace.com).



## Thermastrand™ Radiant Barrier Roof Sheathing

### Manufactured by Ainsworth

Thermastrand™ radiant barrier panels are engineered for homeowners who are looking for improved energy efficiency and cost savings. The panels feature an aluminum facing that reflects up to 97% of the sun’s radiant energy, which can save homeowners 10-25% on their annual cooling costs. The savings grow as energy costs increase. The additional cost of Thermastrand radiant barrier panels (compared to standard OSB roof sheathing) can be recouped in as little as three years, making Thermastrand a smart investment in energy efficiency. Thermastrand features Energy Star® certification and is backed by a 25-year warranty.

Ainsworth is a leading Canadian forest products company with a 55-year reputation for high-quality products and customer service. The company has operations in British Columbia, Alberta and Ontario, Canada as well as Minnesota in the United States. Ainsworth is committed to maintaining the integrity of the environment through responsible and sustainable forest management and stewardship. AinsworthEngineered® products are APA-certified and known for their consistent quality, reliability and price.

Thermastrand features an aluminum facing that reflects up to 97% of the sun’s radiant energy, saving homeowners 10-25% on their annual cooling costs. The savings grow as energy costs increase. Thermastrand is an Energy Star® certified product, which can be produced from FSC certified timber (LEED credits).

#### For more information:

[www.ainsworth.ca](http://www.ainsworth.ca)



## Jamb-It-All

### Manufactured by All-terior Systems

All-Terior Systems LLC introduces their new product line JAMB-it-ALL™ a revolutionary new product designed to improve the methods of creating openings in ICF walls and floors.

JAMB-it-ALL™, a 20 gage galvanized steel system designed for all ICF manufactures forms is providing contractors a cost effective structural system for all openings. Unlike the few options available for ICF's in the construction industry today, JAMB-it-ALL™ provides a simple design and standard concepts to encapsulate the openings and integrate into the concrete itself. This versatile design allows contractors to focus all their time and resources into a product that improves the entire construction process and increases the overall value of the project.

All-Terior Systems LLC is using American galvanized steel which is one of the most recycled products in the industry. JAMB-it-ALL™ promotes the use of the scrap pieces of steel or off cuts by design to be used in the inspection plate process. Our manufacturing plant has been engineered and constructed with reclaimed machinery and controls for every operation possible.

### For more information:

www.all-teriorsystems.com  
geoff@all-teriorsystems.com  
Office 314-894-7675  
Fax 314-892-1073  
All-Terior Systems LLC  
6108 Baumgartner Crossing  
St. Louis, MO. 63129



## MAGNAMITE SYSTEMS

### Manufactured by Nisus Corporation

Magnamite Systems offers a comprehensive twenty year termite guarantee and superior mold protection with a single pretreatment application. The system is approved for use by the International Building Code and HUD. The materials is manufactured by the Nisus Corporation and was awarded the "Best In Show" at the National Green Building Show in April 2006.

The system and materials used are applied directly to the premises, and not in-ground, and WILL NOT CONTAMINATE THE SOIL OR GROUND WATER.

### For more information:

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magnamitecon@centurytel.net

# Project Team

## Builder

Sage Homebuilders, LLC



## Designer

Jeff Day & Associates



## Surveyor

210 Surveying



## Energy Consultant

MaxHome



## Landscape Architect

Acorn Landscape



## Public Relations

CarltonWerremeyer



## Financing

WestBridge Bank & Trust

