

geo@utlook

American Icon's
Retail Pavillion
Goes Geothermal



18



Photos provided by Jim Fuhmann of Jim Fuhmann & Associates



From Sick House to Green House

By Linda Allen

The home of the Robert F. Kennedy, Jr. family recently received an extreme green makeover to become a model of environmental consciousness. Black mold forced the family from their 1920s colonial farmhouse in Westchester County, New York. Their three children suffered chronic respiratory problems from the mold that resisted two years' efforts to abate it. Their sick house was making them sick.

Instead of bulldozing the structure, the family chose to salvage the house to create a healthy living space for their family and to reduce their impact on the environment. With Kennedy's reputation and passion as advocate and defender of the environment, it was a no-brainer that the project would be as green as possible.



+

The green team for the project reads like a who's who of green building:

Brooks Washburn, architect, AIA and LEED AP, Potsdam, N.Y.

Jim Blansfield, general contractor, president and owner of Blansfield Builders, LEED AP, member of the U.S. Green Building Council and certified green builder, Danbury, Conn.

Dean Demague, vice president of B & D Controlled Air Corporation, IGSHPA accredited, NATE certified and member of the Radiant Panel Association, New Milford, Conn.

Robin Wilson, award winning eco-friendly and eco-healthy home interior designer, author of *The Kennedy Green House*, member U.S. Green Building Council, Manhattan, N.Y.

The project started in May 2008 by raising the house to remove the foundation. "The original house could not be moved because of the septic system. Steel beam trusses supported the house while the foundation was excavated and replaced," said Blansfield.

In keeping with the goal to salvage and reuse as much material as possible from the original structure, the foundation was crushed and used as gravel. "It's really a new structure on a new foundation with mostly reused and reclaimed materials from other sites and projects," said Blansfield.

The Kennedys chose a geothermal system because of their dedication to protecting the earth's resources. The system would also meet their objectives to increase energy efficiency and to rely on power generated onsite. Once the new foundation was in place, the structure was lowered and work on the geothermal system began to replace the existing oil system. B & D Controlled Air designed and installed the system.

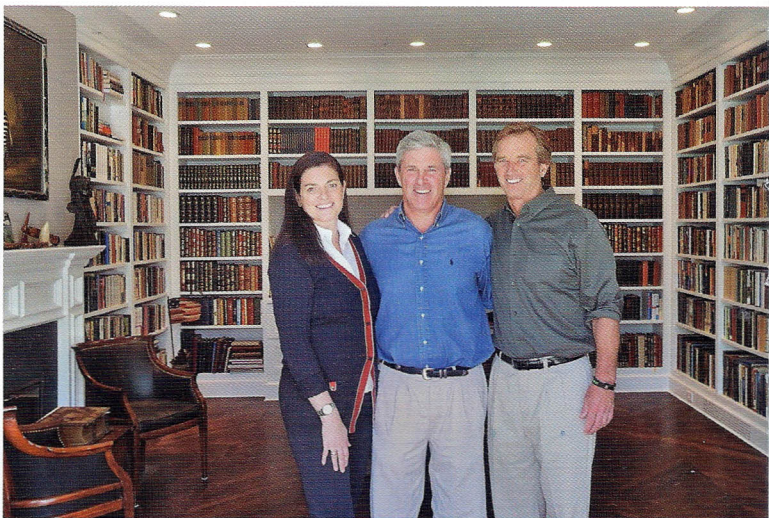


The expansive kitchen is thoughtfully daylighted and provides the needed room for the kind of family gatherings the Kennedys are known for.

(Photos provided by Jim Fuhrmann of Jim Fuhrmann & Associates)

Two well fields contain six 400 foot deep wells. "Drilling required a lot of chipping of granite rock," said Demague. "The rock was a positive because usually where there is rock, there is water moving through it, which is great for conductivity so you might not have to drill as deep."

The 12-ton system services the 10,540 square-foot house, with a reverse/return closed loop system that features five radiant heating zones. All areas including the attic and mechanical spaces are in a conditioned environment. The loops contain 1 1/4-inch piping with 2-inch return piping. Five water-to-air



Builder Jim Blansfield, the Kennedy's general contractor, is seen with Mary and Robert Kennedy in one of the popular areas of the finished home.

(Photos provided by Jim Fuhrmann of Jim Fuhrmann & Associates)

Florida Heat Pumps provide cooling in the summer, and three water-to-water Florida Heat Pumps furnish heat in the winter.

A Dow Building Solutions continuous insulation product was a major upgrade to the poorly insulated house. The tight envelope created by the continuous insulation, a layer of rigid foam insulation applied outside the studs, air sealants and energy-efficient windows, reduced unit sizes of the geothermal system by 30 percent to 50 percent. These complimentary features resulted in cutting energy required to heat and cool the house by half. "You can't have an optimum geo system in a poorly insulated building," said Demague.

With ten new geothermal installations and three retrofits, including three LEED Platinum homes, Demague approaches construction as a building science rather than building mechanics. "The loads of geo houses are much less than conventional heating and cooling systems, which requires less mechanical equipment. The VIP certification test showed we are running 3.5 to 4.0 COP on the equipment on the heating side. On the air conditioning side, we're running 27 to 30 EER," he said.

The mechanical room, or engine of the house, as Demague calls it, is 15 by 15 with a 7 foot ceiling, located in the basement-



Gaia
Geothermal

Ground Loop Design 2009

Geothermal Design Software

COMMERCIAL EDITION • RESIDENTIAL EDITION

FREE ONLINE EDITION

Horizontal, Vertical & Surface Water Designs
CO2 Emissions and Life Cycle Cost Analysis
Boiler, Cooling Tower and Solar Hybrids
Conductivity Test Analysis and Reports

Advancing the Art of Geothermal Design

* coming soon



Phone: 1.763.479.3638
www.GroundLoopDesign.com

Another Innovation by



Maximize the heating and cooling efficiency of your Closed-Loop Heat Pump Systems. THERM-EX GROUT™ gets the most from your geothermal application.

THERM-EX GROUT

- Superior Thermal Conductivity
- Easy Placement, Resists Settling
- Easy Mixing
- Environmentally Safe

1-800-548-7055

WYO-BEN, Inc. ■ P.O. Box 1979 ■ Billings, Montana 59103 ■ Fax: 406-656-0748 ■ www.wyoben.com



Florida Heat Pump units are tied into the geothermal system for the Kennedy home in a basement mechanical room showing extensive use of copper piping. (Photos provided by Jim Fuhrmann of Jim Fuhrmann & Associates)

a tight fit for 90 percent of the houses' mechanical equipment. "When you look in the room, all you see is a jungle, yet the owners call it the most beautiful room in the house. It's a testament to the efficiency of the system and their green philosophy," he said. The mechanical room for the second floor is located in the attic trusses.

The system includes a desuperheater and boiler for hot water and radiant heat as a backup if the geothermal system needs repairs.

Radiant flooring adds to the comfort of the home. More than 10,000 feet of Viega tubing snake through the two main floors and the basement living area.

Blansfield and Demague worked closely with the interior design team to hide all the ductwork. "We did a nice job of keeping the envelope of the entire heating and air-conditioning ductwork hidden within the insulation envelope. It finished out well," said Blansfield.

Cost of the system was \$200,000 including the wells. The family took advantage of the 30 percent government tax credit incentive. "There was not much available in local utility rebates. The driving force was the long-term payback to the environment instead of rebates. Kennedy stayed true to his core beliefs as an environmentalist," said Demague.

Energy bills from the previous structure were not documented. Compared to a similar non-geothermal home, energy savings in the Kennedy Green House are estimated at 30 to 35 percent.

Working from the ground up, the project team continued with sustainable building practices and products. The extreme green home reused every piece of the old structure and sent unusable items to Green Demolition, a nonprofit compa-

ONE SIZE DOESN'T FIT ALL

Now, with five new model sizes to choose from, there's a Sonic with your name on it. From urban geothermal to remote mineral exploration, you can rely on our patented high-performance technology to get the job done!

SONIC
SONIC DRILL CORPORATION
 Suite 190, 119 N. Commercial Street, Bellingham, WA 98225
 Tel: 1.604.854.1383 Fax: 1.604.854.1384 Web: www.sonic-drill.com

ny that recycles and resells building materials – nothing went to the landfill the owners proudly claim.

The four-bedroom, six-bathroom house sits on twelve acres overlooking a 30-acre private lake at the back of the property. Surrounded by trees, wetlands and rocky terrain, it is a perfect site for environmentalists like the Kennedys and their green house.

Other energy-saving features of the house include solar shingles – the first of their kind on the East Coast, newspaper and soybean sealant insulation, LEDs, hybrid hot water heater, passive Solatubes for natural daylight, fiber-optic lighting, energy-star appliances and a three-bin recycle center.

Kennedy's involvement as founder and president of the Waterkeeper Alliance and attorney for Riverkeeper and the Natural Resources Defense Council carries over to water conservation in his personal home with low-flow plumbing fixtures and an underground storm water collection system.

Reclaimed, reused and salvaged materials and items continue the green theme throughout the house. Some bring a history of their own like the slate roof from the former Wassaic Mental Institution from upstate New York and reclaimed brick pediments featuring the eagle emblem of the United Farm Workers of America, a favorite cause of the Kennedy family.

The interior of the house is a classic design that belies the scavenged elements. Memorabilia and heirlooms of U.S. and family history combine with natural art to make the house a comfortable story of the Kennedy family's public service and environmental interests. A virtual tour of the home is available at <http://www.kennedygreenhousetour.com>.

The home's design also includes accessibility features to make it comfortable for all ages and abilities, including a rear entrance ramp, elevator, curbless showers, lowered light switches and closet storage for wheelchair users.

Designer Robin Wilson named the project the Kennedy Greenhouse and wrote a book by the same name detailing the construction process from architectural drawings to final move-in. Photos document the project from start to finish. Once settled in, the family opened their home to suppliers and various community interests to demonstrate green construction techniques and how to live a green lifestyle. The project is in the application process for LEED Gold certification.

"We utilized some of the best technology that now exists to allow us to move construction to sustainability," said Blansfield. In a house where everything old has become almost new again, the Kennedy family practices day-to-day lessons in healthy green living. The Kennedy Green House is a family and industry legacy for the future with forethought, resourcefulness and creativity in design, construction and function. 9

New High Capacity Grout Plant



**CG-500/031
Geothermal Series**

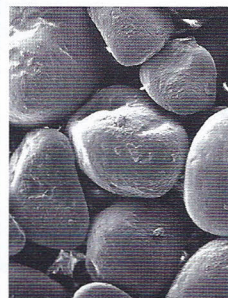
- Exceptional productivity
- Minimum maintenance
- Quick payback for the grouting of energy efficient geothermal loops

ChemGrout®
Making grouting profitable for over 45 years


www.chemgrout.com 708.354.7112

**For Optimum
Geothermal Performance**

Granusil®
SILICA FILLERS



- Maximizes Thermal Exchange
- High Purity and Silica Content
- Optimal Shape and Size Distribution
- Complete Product Range
- Available Nationwide

 **unimin.**

For more information and local availability:
Northeast - 800-292-0678 • Midwest/Canada - 800-665-1204
Southeast - 877-531-9496 • West - 800-624-6129
inquiries@unimin.com

©GRANUSIL is a registered trademark. ©2010. All rights reserved.