

# Beachfront, Properly

GreenTek Consulting and the pride of Sag Harbor **BY EVE MARX**

**This New England shingled house** looks like many other elegant beach homes dotting the eastern shore. It features a shapely gambrel roof and waterfront porch that invites lingering conversations over cool beverages overlooking Sag Harbor. But this is no commonplace beach house. This is the green dream home of Mica and Russell Diamond, built to reflect their commitment to sustainable living.

At groundbreaking, the Diamonds lived in Westport, CT. Russell was a founding member of Westport's Green Task Force. He runs Solution Capital, a Clean Tech investment firm and is a partner in The Solar Center, an alternative-energy storefront and solar integrator serving Connecticut, New York, and New Jersey. Mica grew up on Long Island and longed for a summer home at the shore. What began as a second home evolved into a primary residence when they fell in love with the house and fully immersed themselves in a green lifestyle.

The Diamonds hired Westport-based GreenTek Consulting LLC, a member of the U.S. Green Building Council, to manage the greening process for their home.

Architect Katherine McCoy had already begun designing the home when GreenTek was called in to reduce the carbon footprint. "We can work at all stages of development or remodeling," says David Mann, principal of GreenTek. Mann is a LEED Accredited Professional with a Masters in Architecture from Harvard



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**BEAUTIFUL DETAILS**  
**A detail of the 11kw solar panels on the south-facing barn roof; a Fronius inverter converts the solar array's DC power to AC for home use; LEED Accredited Professional and GreenTek principal David Mann; a high-performance hybrid foam insulation seals the attic roof rafters; highly efficient geothermal pumps heat and cool the home while also providing domestic hot water for the house, pool, and spa.**

University and more than 15 years of experience in design, construction, development, and financial analysis of alternative energy. He is also vice chairman of Westport's Green Task Force, and sits on the steering committee for the Connecticut Alliance for Sustainable Enterprise and Westport's Architectural Review Board. He founded GreenTek in 2006 with the mission of making going green easy. "New and better products and practices are being introduced all the time, so it's important for homeowners and contractors to keep up."

The Diamonds wanted their new home to be as green as possible without compromising luxury or budget. "We evaluate a homeowner's needs and create a customized and affordable plan that can be implemented all at once or in stages," says Mann. "Often it's the savings analysis and return on investment that nudges clients toward sustainability."

GreenTek's basic approach is "to understand the people and their motivation and to identify the best choices for their project," says Mann. "The construction must be environmentally and pocketbook friendly." To get started, GreenTek evaluated the needs of the Diamond family and helped lead a team of professionals, including solar and mechanical engineers, to maximize sustainability.

The Diamonds' primary focus was on climate change and the economics of energy efficiency. However, they wanted to address all aspects of sustainability, especially indoor air quality. To address this they eliminated the use of building materials containing formaldehyde, and minimized the use of volatile organic compounds. The home uses air cleaners that filter microscopic particles including pollens, dust, pollutants, pet dander, bacteria, and even some viral-sized particles to maintain healthy air quality. Additionally, the home employs energy recovery ventilators, which exchange indoor air for fresh air while warming or cooling incoming air and managing humidity.

The home's resource efficiency was improved through the design. The house is approximately 4,000 square feet and has four bedrooms and 4½ baths. There is a semi-detached barn and a solarium. The barn serves as garage with expansion potential for a play area, gym or guest quarters. The fumes from autos are isolated from the main living area and the southern-facing roofline allows photovoltaic panels that supply between 90 and 100 percent of the home's total energy consumption. There is also a small bike barn, as the owner is a cycling enthusiast.

The wall construction starts with exterior Forest Stewardship Council certified plywood sheathing. Energy sapping thermal bridging was mitigated by employing a micro-insulator that coats the studs and improves the wall's thermal performance by 15 to 20 percent. Advanced framing techniques produce a wall that performs structurally as well or better than a traditional wall, while using 17 percent fewer studs. The walls were then insulated using high and low density foam to create an insulation ensuring a high-performing wall at a low cost. To reduce deforestation, the home's structure includes a variety of engineered woods, resulting in an eco-friendly structure. The environmental impact of the concrete foundation was offset by using fly ash and recycled aggregate material previously destined for a landfill.

The home's large windows and exterior glass doors are low-e insulated glass with argon gas filling. Despite the amount of glass, the home's orientation controls solar gain while allowing for natural ventilation. To improve system efficiency by minimizing energy loss, ductwork is installed within insulated space and made from sheet metal instead of flexible ducting and sealed for appropriate airflow.



## "The construction must be environmentally and pocketbook friendly"

The flooring used throughout the home is gorgeous reclaimed hardwood or natural fiber carpet. Wherever possible, reclaimed ceramic tile was used, and the decking was constructed from ecologically sound, plantation-grown wood, competitive in price with traditional materials.

To save water, motion sensors trigger hot-water heaters when you enter a room. This reduces water-heating costs and water waste significantly. Low-flow fixtures from Kohler were chosen for toilets and showerheads in the children's and guest bathrooms. "Even though Long Island is a water-rich area, they'll be saving thousands of gallons of water, which means saving money—on the water bill and by heating less domestic hot water," Mann says.

The home makes good use of LED lighting, which is 80 percent more efficient than incandescent bulbs, and 50 percent more efficient than compact fluorescent light. They pay for themselves in two years and continue to do so over their lifetime; each fixture will save the Diamonds more than \$700.

The geothermal system is a highly efficient heat pump that takes advantage of the constant temperature of the ground to cost-effectively heat and cool the home, while also producing domestic hot water and heat for the pool and spa. The pool has an automatic cover to minimize heat loss from evaporation and an efficient variable speed motor for the filtering system.

Original plans included extensive use of wood burning fireplaces, but GreenTek convinced the owners that a single heat

efficient fireplace set as a centerpiece in the great room would increase building efficiency and lessen the home's environmental impact.

Outside the home, there is very little traditional turf compared to the thirsty lawns of their Hamptons neighbors. The plantings are drought-resistant native species. The landscape is being restored to its natural state along the water and in the field leading up to the house. Long-term plans call for an organic vegetable garden to provide seasonal produce. The garden and landscape will be maintained utilizing drip irrigation to avoid moisture loss, and a smart controller that bases watering off weather data and needs of the species.

Construction debris was either mulched for the garden or utilized for family projects—like a treehouse. Used drywall was ground up and the gypsum was added to amend the soil. "Why put something perfectly useful in a landfill?" asks Mann.

"One of the really fun and wonderful things about this project was being able to consider a variety of different solutions for each part of the home where you could look at sustainability and let the right one for the family come to the surface," Mann says. "Green building has been around for 40 years, but we're just now reaching a tipping point. Building a sustainable home is not only beautiful, but affordable and easily accomplished with a little guidance. In 10 years, what is today called green building will just be called building." ❀