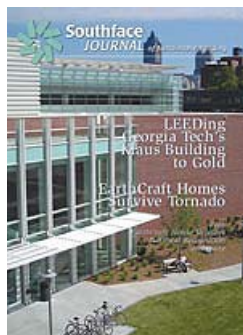


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## EcoLumina Shines a Light on Green Building



Design by: Caldwell- Cline Architects & Designers

By LaTaunynia Campbell, LEED AP, Southface

Green building equals market differentiation among builders, it also increases overall product quality and customer satisfaction. Building green is building smarter. EcoLumina builder, Matt Hoots, president of The Hoots Group, uses sustainable design and building principles in all of his projects and upon completion, EcoLumina will achieve LEED for Homes and EarthCraft House certifications. The EcoLumina home was recently featured as the 2008 Southern Building Showcase Home. This project demonstrates how to implement green building principles.

### A Successful Green Project Should:

- Include an Integrated Approach to Project Delivery
- Address Durability
- Address the Site
- Increase Water and Energy Efficiency
- Improve Indoor Air Quality
- Implement a Hint of Innovation
- Integrated Approach to Project Delivery

The first step to a successful green project is integrating the project delivery process. Start by bringing all team members into the project early during the conceptual phase and continue to foster this collaborative relationship throughout the process. This approach will optimize the integration of green aspects in creating a high-performance home. From the beginning, a common vision is established, problems are solved head on, as they occur or, often times, before they arise. In addition, collaborative synergies and innovation can also be implemented. Such an approach can be fulfilled for all housing types and development sizes: single-family housing (both custom and production), multifamily housing and community development.

The EcoLumina House started as an owner's vision. A vision, which a team of building science professionals and generous sponsors, helped make EcoLumina a shining example of a successful green project.

### Durability

Building green is really about using building science concepts to help alleviate risk. What are some of the risks?

1. Poor Comfort or Indoor Air Quality
2. Inefficient Use of Energy or Energy Loss
3. External and Internal Moisture Issues
4. Pests
5. Natural Disaster

The sustainable approach involves exploring opportunities and finding solutions to address these issues early by creating a strategic plan of action. To carry out the tasks involved all team members must understand their role. Green building programs provide the tools, the plan of action and the framework.





*Attention to the details: Above, exterior finishes protects the integrity of the structural components, such as the Delta® Dry drainage plane that gets covered up by the external cladding.*

For example, the EcoLumina House addresses water risks and energy loss by installing Superior Walls, a prefab foundation system. This fully insulated foundation system is waterproof and air sealed. This system saves on materials and time by using only one third the concrete of standard foundations and reducing the time to assemble the complete foundation. The continuous insulation helps retard heat gain and loss, thus lowering the operating costs.

This project also uses a Cosella-Dorken product, DELTA-Dry, a combined weather-resistive barrier and drainage membrane with integrated window and door flashing to keep moisture out; as a result, mold and other side effects are greatly reduced by controlling the flow of moisture in the wall assembly.

### **Creating a Greener Site**

The green process requires a project to assess site needs comprehensively. A project team should seek previously developed sites to help reduce sprawl and minimize site disturbance which preserves the natural landscape.

As a previously developed infill site, the EcoLumina House manages erosion both pre- and post- construction by recycling construction waste, then using it as aggregate, mulch, or soil amendment; and by installing permanent terracing on sloped areas. The planting of native and drought tolerant landscaping and efficient irrigation using rainwater helps reduce potable water use. Impervious surfaces are kept at a minimum to encourage on-site stormwater infiltration. The project implemented non-toxic pest control measures.

### **Water Saving Strategies**

Much of the drinkable water used in a typical home is not used for drinking. Green building practices encourage finding other sources of water for non-potable usage. The EcoLumina House addresses non-potable usage in unique ways.

### **Rainwater System and the Constructed Wetland**

The rainwater harvesting system collects 100% of the water from the roof through a gutter system. This water is stored in an underground tank from which it is pumped through the constructed wetlands to begin the filtration process. Plants in the wetland help filter contaminants from the water. The water is stored in a final tank until it is required for use. When needed, it goes through a particulate and carbon filter before it is pressurized. The goal is to satisfy most of the indoor water needs through rainwater collection. All non-toilet water needs and select irrigation needs will be satisfied with this system.

### **Grey Water System**

Grey water is collected from the house, then sent to a storage tank outside the house and processed through a filtration system. Some of the treated water is sent back to the house to flush toilets and the rest of the water flows into the constructed wetland system.

### **Indoor Water Efficiency Features**

The house has installed high-efficiency dual-flush toilets, which save approximately 5,000 gallons per fixture per year. Low-flow showerheads have a 20% water savings compared to standard showerheads and low-flow faucets have a 30% water savings. Cast iron tubs are used because they hold heat better. Tankless water heaters are installed and a central manifold hot water distribution system is used to improve the dispensement of hot water

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### Energy Efficiency

Building green started with focusing on improving energy efficiency and performance. The idea is to build the house tight, and install efficient space conditioning equipment to create the optimum indoor environment and save money. A green building program provides additional assurance through third-party testing and verification.



EcoLumina uses spray applied Icynene insulation to increase air sealing and achieve a higher R-value. The project also uses WaterFurnace geothermal heat pumps. Each of the 11 geothermal wells has a depth of 200 feet. A solar photovoltaic system and solar water heating system were installed to take advantage of the sun's free energy.

*Interior spray-in foam insulation by Icynene® is ideal for vaulted ceilings with unique geometry.*

### Indoor Air Quality

Best practices for addressing indoor air quality should focus on reducing the source of contaminants; sealing potential contaminant to block the pathway to occupants; and diluting contaminants through effective ventilation.

A high-performance whole house air filtration system has been installed to decrease allergens and pollutants. A central vacuum system, which exhausts outside the building envelope, and a shoe storage area located near the main entry, will help reduce pollutants. The homeowners wanted to reduce off gassing by requesting the use of urea formaldehyde-free wood products and low-VOC paints, stains, adhesives and sealants. A passive radon ventilation system has also been installed as a preventive measure to remove any potential radon gas, the second leading cause of lung cancer, and any other soil gas from the home.

### A Hint of Innovation

The EcoLumina House has many innovative features, "using some existing technologies and creating some new ones," explains Bert Jones, homeowner. The home automation system utilizes low-wattage components and recycled consumer electronics that power up only when needed to sense room and floor occupancy. The system includes an intercom with automated voice response technology and occupant tracking minimizing the use of high-voltage copper wires.

The project team has come up with beneficial ways to conserve water and energy and, "as our awareness of the severity of the implications of global warming grew, what we increasingly wanted was an environmentally sensitive, healthy and comfortable home," says Jones.

### To learn more:

[www.ecolumina.org](http://www.ecolumina.org)

### Links:

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

[www.cosella-dorken.com](http://www.cosella-dorken.com)

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

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

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