

## Local Architecture Firm Wins National Award for Top K-12 Sustainable School Design

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RALEIGH, NORTH CAROLINA, JANUARY 22, 2008 – The Sustainable Buildings Industry Council has just selected Innovative Design, a Raleigh-based architectural firm, for its Beyond Green 2007 High Performance Building Award. The firm won the national, juried award for its design of the energy- and water-efficient Northern Guilford Middle School, located in Greensboro, NC. The Beyond Green award recognizes initiatives that shape and catalyze the high performance building market as well as the real world application of high performance design and construction practices. Helen English, Executive Director of SBIC, states that, “The judges were particularly impressed by Innovative Design’s whole-building design approach that successfully integrated and balanced the design objectives that included accessibility, aesthetics, cost effectiveness, functionality, productivity, security and sustainability.”



Northern Guilford Middle School was constructed as a three-dimensional (3D) textbook so the students, teachers and the community could learn about sustainable design strategies and how they can effectively reduce the impact of human development on our environment. “The whole building approach

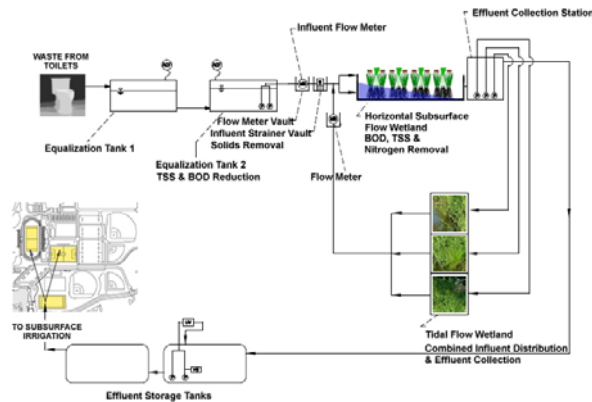
was the key factor that enabled us to implement the extensive list of green strategies and still be constructed at a cost less than other schools,” say Bae-Won Koh, Project Architect with Innovative Design. Inclusive of all the sustainable features, the building was constructed for \$148 per square foot. The average middle school constructed in North Carolina during the same time period without these sustainable features cost approximately \$154 per square foot.

The school features a comprehensive and well-integrated set of green strategies that include:

- A holistic water cycle approach that incorporates bioswales and wetlands and a highly conserving water system (rainwater flushes toilets, goes through a Living Machine™ to an underground irrigation system, and finally into the aquifer)
- A new daylighting design that had never been implemented before in any facility
- Energy-efficient building shell and under-floor air distribution system
- Indirect lighting with photocells and occupancy sensors
- Solar water heating and photovoltaic systems
- 3-D experiential learning centers linking sustainable design features to the curriculum
- Recycled materials and use of local products.

Guilford County Facility Planning Consultant Joe Hill describes the school design. “In addition to minimizing the impact on the earth’s natural resources, this facility is very energy efficient and will result in significant savings in terms of operating costs....This is truly an example of how school facilities can maximize use of limited resources and protect the environment at the same time.”

## Water Saving Features



The rainwater harvesting system saves over 4 million gallons of water annually but is only the beginning of a holistic water cycle approach. Mike Nicklas, FAIA, president of Innovative Design, explains that, “The school’s sustainable cycle of water is a unique feature and a wonderful lesson for the students in ecology, but it is also a practical example for all North Carolinians on cost-effective strategies that can significantly reduce the water problems we face today.”

Rainwater is collected from the roof areas of the middle school and an adjacent high school and stored in a centrally located 360,000 gallon underground tank, the top of which also serves as a basketball court. The water stored in the top half of the tank is used primarily for toilet flushing at both schools. All of the toilet fixtures are low-flow, and have automatic shut-off and flow restrictors. Given that no city water is available at the site, the bottom half of the tank is kept in reserve for firefighting.

From the toilets, the waste water from both schools is directed to an on-site, plant-based treatment system called a Living Machine™ that cleanses up to 30,000 gallons of waste per day. After being treated, the water is used a second time for irrigating the athletic fields. The treated water is distributed to the fields through a sub-surface irrigation system that requires 40% less water than conventional sprinkler systems.

This water strategy saves over nine million gallons of water per year. The system not only meets 90% of the water demand at Northern Middle School, but also exports more than 5.7 million gallons to the adjacent high school. This on-site treatment strategy costs less than other pretreatment strategies, greatly reduces the amount of nitrogen entering the watershed, and allows the clean water to seep into the ground, replenishing the aquifer.

The overall water cycle approach was pursued originally because no municipal water or sewer was available at the site and it would have cost over \$4,000,000 to bring city services to the site.

## Natural Lighting

Daylighting strategies were used in all student/staff occupied spaces. Carefully designed lightshelves make a striking vision from the exterior and provide beautiful light inside the classrooms. The unique daylighting design incorporates curved, white, translucent lightshelves located just below south-facing clerestory windows. The sunlight entering through the high windows either reflects to the back of the classrooms or filters through the translucent panels to the work surfaces. Outside the clerestory windows is a second set of lightshelves that bounces additional sunlight into the clerestory areas and helps shade the lower window glass in the classrooms. Through the use of the lightshelves and highly reflective ceilings that slope down from the heads of the clerestory



windows to the opposite side of the room, the glass area that provides natural lighting is reduced by 40% over typical daylighting strategies. This results in both energy savings as well as initial cost savings.

Daylighting in the gymnasium, multipurpose and dining areas is provided by south-facing roof monitors with translucent fabric baffles in the light wells. These features eliminate potential direct beam radiation, reduce glare, and effectively diffuse light throughout the spaces. Dimmable, indirect fluorescent light fixtures are tied to photosensors, as well as motion sensors.

According to Nicklas, "Daylighting is particularly beneficial in school design because it is the only thing that improves student performance and health, saves energy, helps our environment, and pays for itself in less than one or two years."

### Background

The Sustainable Buildings Industry Council is an independent nonprofit organization whose mission is to advance the design, affordability, energy performance, and environmental soundness of America's buildings. The Council established the awards program in 2001 to recognize the exceptional contributions being made to energy sustainability across the United States. For more information about the Council visit [www.SBICouncil.org](http://www.SBICouncil.org) or call 202-628-7400.

Innovative Design was formed in 1977 with energy-efficient, environmentally sensitive design as its primary focus. For three decades the mission has remained the same – to be a leader within the field of energy-efficient, environmentally sound design and utilize that status to help influence the consumer and move the architectural/engineering community to a greener, more sustainable path. As a result of the firm's expertise, passion and commitment to promoting sustainable design, Innovative Design is recognized internationally as a firm that not only excels in green design but also understands the importance of educating others about the possibilities and necessity of choosing a greener path.

Innovative Design has designed 4,750 buildings, all of which have routinely incorporated sustainable building practices including at least one of the many ways of using solar energy. Total peak energy savings now exceeds 40 megawatts, with clients saving \$6.8 million annually on energy bills. Through rainwater harvesting, buildings the firm has designed are saving 33 million gallons of water each year, and since 2000 have saved over 123 million gallons of municipal water. For more information on Innovative Design see [www.innovativedesign.net](http://www.innovativedesign.net).

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