

WINTERGREEN

A monthly update on Steven Winter Associates, Inc.'s work in the realm of Energy Efficient, Sustainable, and High-Performance Buildings

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Tracking to be the First LEED for Homes Mid-rise Building Certification in Washington, DC Area

Gables 12 Twenty One is a 132-unit mid-rise multi-family development now under construction in Arlington, Virginia. The project, developed and built by **Gables Residential** of McLean, Virginia consists of one and two bedroom rental units in two 4-story wood framed buildings over concrete open parking structures located underneath.



Courtesy of The Preston Partnership

Gables 12 Twenty One

Steven Winter Associates (SWA) is the LEED for Homes Provider for this project, which is tracking to be the first in the Washington, DC market area to achieve certification under the **U.S. Green Building Council's** LEED for Homes Pilot Program for Mid-rise Multi-family Buildings. **The Preston Partnership** is the architect, landscape architect, and MEP engineer. The project is a redevelopment of two non-contiguous and previously developed parcels located at the southern edge of an existing urbanized community, and within a half-mile radius of a Metro station.

The LEED for Homes Mid-rise program is specifically applicable to 4-to-6-story multi-family buildings, and encourages greater density and redevelopment of urban sites. Based on its location, the Gables 12 Twenty One project was able to score well in the Location and Linkages (LL) and Sustainable Sites (SS) categories. Energy performance is estimated to be at least 15% better than ASHRAE 90.1-2004. As part of the project support, SWA conducted LEED-related training to Gables' construction staff and key subcontractors, which resulted in a one-credit gain for Trades Training. More importantly, the training heightened understanding in the field for better quality air sealing and insulation installation – both important and challenging objectives for building envelope integrity and unit compartmentalization in mid-rise wood framed construction.

The team was challenged to meet Indoor Environmental Quality (IEQ) prerequisites to provide mechanical kitchen exhaust to the outside and mechanical make-up fresh air ventilation to comply with both ASHRAE Standards 62.1-2007 and 62.2-2007. Location of wall-mounted exhaust outlets and air intakes on exterior building walls to meet minimum separation distances, aesthetic concerns, and sealing the envelope penetrations were important design and construction coordination issues. Exhaust fans with integral fire dampers were used to maintain fire separation between floors and avoided the need for dropped soffits for enclosure of exhaust ducts. Lessons learned from the Gables' experience are transferable to another similar Gables Residential multi-family project, currently in the planning stages, utilizing many of the same consultants and key contractors, thus reducing the LEED for Homes learning curve for this team.

For more information, contact Ed Acker acker@swinter.com.

Wisdom Way Village's First Solar Home Nearing Zero Energy



Wisdom Way Solar Village

In Greenfield, MA, **Rural Development, Inc. (RDI)** has completed construction of the first home at the "Wisdom Way Solar Village." This community of 20 homes – a mix of affordable and market rate – began with careful site planning to maximize solar access for all of the homes. Designers then focused on plans and envelope systems that would be exceptionally efficient and practical to build. The homes' 12-inch exterior walls consist of two 2x4 frame walls filled with dense cellulose (for an R-value above 40). Most windows are triple-pane (U 0.18 Btu/ft²hr°F), and attics are insulated with R-50 cellulose.

To ease implementation of the double wall system, **Austin Design** created plans that are basically rectangular with few additional angles. Still, these wall systems were substantially more expensive than standard frame construction. SWA and RDI estimate that total incremental cost for the thermal envelope (walls, attic, basement, and windows) is approximately \$7,000 per home. According to SWA's energy modeling, homeowners will save over \$1,000 each year in heating costs. In addition, because the design loads of the homes are so low (10,000 – 12,000 Btu/h), RDI installed much simpler heating systems that cost \$3,000 - \$5,000 less per home than the conventional boilers with hydronic baseboards. As the homes are sold, SWA plans to continue working with RDI and the homeowners to evaluate the homes' performance and document real energy costs.

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After insulation



Double walls before insulation

An Enlightened Way of Designing a Rest Area



Owl Hollow Rest Area



Owl Hollow energy modeling

New York City Department of Parks and Recreation is in the midst of creating a rest area in Staten Island that will be a class apart. The rest area is designed to be open year round and will accommodate over 150 people per day. It will be an efficient all-electric building that will not burn any fossil fuel on-site and will generate over 50% of its energy with an on-site 10kW wind turbine.

Unlike other rest areas, it is also designed with ample windows to capture daylight. This was made possible by clever use of a double-wall system using a metal screen to obstruct the direct outside view while still capturing the multiple benefits of daylight. Coupled with day lighting sensors, electric energy for lighting is expected to be cut by approximately 50%.

High-efficiency water-source heat pumps will provide both heat and air-conditioning from a ground-coupled heat exchanger. In the summer, heat from the air-conditioning system will be quietly rejected to the ground. In the winter, heat will be transferred from the ground to an efficient, low temperature, in-floor radiant heating system.

Steven Winter Associates, Inc. analyzed the energy use and energy cost of the building in eQUEST, a DOE-2.2 building energy modeling program. The challenge was to integrate two systems, the heat pump and the radiant system in one space while overcoming a DOE-2.2 limitation of only one system per space. The solution was to model heat pumps as a primary system with hot water baseboards attached to the heat pump, simulating the radiant system. Current analyses indicate that the building is on track for a LEED-NC rating, with over 25% energy and water savings.

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