

New York Construction

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Affordable Platinum

Often Considered a Luxury, Affordable Housing Goes Green

By Diane Greer

Les Bluestone, president of Huntington, N.Y.-based Blue Sea Development Co., is again raising the bar for designing and constructing healthy, green affordable housing in the city with his latest project, Melrose Commons 5 in the South Bronx.

The five-story, 71,640-sq-ft building, which, at press time, was scheduled for completion in early 2009, is expected to achieve platinum certification under the LEED for Homes Mid-Rise pilot program. The development will also comply with the New York State Energy Research and Development Authority's Multifamily Performance Program for Energy Star buildings, which requires energy savings of over 25% above code.

New York-based Danois Architect's design for the \$12.2 million project provides 63 apartments for families with incomes below 60% of the city's adjusted median income. The building features one-, two- and three-bedroom apartments, with storage and laundry rooms on each floor; landscaped courtyards; a community room; and parking.

Bluestone learned of the vacant city-owned site, located on East 156th Street between Melrose and Elton avenues in the Melrose section of the Bronx, in 2001. He approached the local community board with a plan for a low-income rental building on the site and enlisted its support to gain control of the property from the city. To satisfy community requests for green space, the project includes 6,800 sq ft of landscaped recreation space for residents. A portion of the site was also allocated for a community garden.

Project financing is provided by the New York State Division of Housing and Community Renewal's Homes for Working Families Program and New York City's Housing Development Corporation's LAMP program. Additional financial incentives will be earned under the NYSERDA Multifamily Performance Program.

Equus Design Group, Belmont, Mass., converted Danois' original design for the masonry building into a precast concrete structure with hollow-core plank floors, interior bearing walls and staircases made from precast concrete. The façade's precast panels were constructed to resemble stone and masonry by embedding thin brick into the concrete during the production process, says Michael Smith, Equus president. The concrete is given the appearance of stone where it is exposed on the exterior.

Precast structures can cut about 30% off the construction time, Smith says. "As the building is erected floor by floor, the developer is able to get trades inside the building and working under protection."

Fewer joints in the exterior panelized walls reduce air leakage, making the cladding system more energy efficient. The panel system also allows for more continuous insulation and thermal breaks, says Maureen Mahle, project manager for Steven Winter Associates, New York, the project's LEED consultant.

Structurally, precast concrete construction permits larger window openings than plank construction with masonry walls, says Danois president, David Danois. "We have much more glass than you would find in a low-income project."



Melrose Common 5, which will provide 63 rental units for lower-income families, is expected to achieve LEED Platinum certification under the LEED for Homes Mid-Rise pilot program. (Rendering courtesy of Danois Architects.)

Early Delays

Construction, started in November 2007, faced early setbacks due to problems with the structure's foundation. "There were more unforeseen subsurface conditions than I can ever remember coming across in my 30 years of experience," Bluestone says.

Initial test borings showed the underground rock profile starting a few feet below the surface at Elton Avenue, then sloping downward to a depth of 25 ft at Melrose Avenue. Based on the rock profile, the team decided to support the structure with 36-in. sonatube casings filled with concrete.



Original design plans were modified to create a precast concrete structure with hollow-core plank floors, interior bearing walls and precast concrete staircases.

But during drilling for the sonatubes, small boulders and large stones got caught in the helical of the drill bit, jamming it, "so we scrapped that idea," Bluestone says.

The second design featured conventional spread footings. But more borings in the area thought to contain rock 25 ft below the surface now showed rock at 8 ft. "We just happened to hit all the 25-ft spots on the initial borings," Bluestone adds. "So we redesigned the foundation for a third time." The final design places the foundation atop the bedrock.

Due to the footing problems, the project was well behind schedule in June. But erection of the precast portion of the job proceeded quickly, taking just seven weeks. By December, the team had made up the lost time and may now complete the project ahead of schedule.

Sustainable Features

Bluestone's projects emphasize indoor air quality. The complex employs a unitized ventilation strategy that compartmentalizes and seals individual apartments, preventing air transfers between units. Separate ventilation systems exhaust air out each apartment's hollow-core floor planking. Trickle vents on the windows draw fresh air in. Finishes, sealants and adhesives throughout the building are low- or no-VOC. Kitchen cabinets are formaldehyde free.

On a prior project Bluestone discovered over 90% of the gas ranges failed carbon monoxide tests, and so to avoid similar problems on this project, he is installing ceramictopped electric ranges.

Researchers from the Mount Sinai School of Medicine will track residents' health to quantify the effect of indoor air quality measures on people with asthma. The Melrose neighborhood is located in the "Harlem-South Bronx Asthma Corridor," an area with exceedingly high rates of asthma.

Measures to improve energy efficiency include 2 in. of rigid foam thermal break insulation on exterior walls along with 3.5 in. of fiberglass R.13 insulation in cavities formed by the metal stud work. On the roof, 6 in. of R30 insulation is used.

Energy Star fiberglass framed windows are used throughout the building. Although the windows are more expensive, the fiberglass does not conduct heat and cold as much as aluminum, Mahle says.

The well-insulated, air-sealed building allows a smaller heating system than typically found in a building of this size, Danois president David Danois says. Boilers are sealed combustion, high-efficiency condensing units with pumps that employ variable-frequency drive motors to save energy.



The complex is being built on East 156th Street between Melrose and Elton avenues in the South Bronx. The one-, two- and three-bedroom units are for families with incomes below 60% of New York City's adjusted median income.

NYSERDA selected the project as a demonstration site for two 5-kW gas-fired micro- CHP (combined heat and power) systems. The units will generate electricity for the building's common areas. Waste heat from the generators will produce domestic hot water, satisfying 15 to 20% of the building's demand.

Most CHP systems in the U.S. are microturbines. "They are effectively the same as a small jet engine and require high gas pressure," Bluestone says. "The ones we are using are basically internal-combustion engines, not unlike a big lawn mower."

The micro-CHP systems use street-pressure gas from Con Edison and "are quieter than most dishwashers," Bluestone says.



Ten 1-kW parapet-mounted wind turbines will provide additional onsite electricity. The turbines take advantage of the physics principle that wind traveling up a vertical wall accelerates as it comes over the top of the wall, Bluestone says. "The boost can be as much as 33%," so a 10-mph wind becomes an effective 13-mph wind as it comes over the parapet, he adds.

Bluestone expects the wind turbines and CHP units to meet 90% of the constant electrical load for the building's common areas during the evenings. "The percentage during the weekdays and weekends remains to be seen," he says.

Mahle says the success of high-efficiency, healthy buildings is greatly dependent on the quality of the construction. "All these measures are worthless if they are not assembled and installed correctly," he adds. "Melrose Commons 5 is a wonderful example of the quality in construction of these building components."

Team List:

Developer: Blue Sea Development Co. LLC, Huntington, N.Y.

General Contractor: Blue Sea Construction Co. LLC, Huntington, N.Y.

Architect of Record: Danois Architects PC, New York

Design Architect: Equus Design Group, Belmont, Mass.

Structural Engineer: William Atlas Associates, New York

Mechanical Engineer: Sideris Engineering, Bayside, N.Y.

LEED Consultant: Steven Winter Associates, New York

Precast Components: Oldcastle Precast, South Bethlehem, NY.