

Old Colony, new thinking

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The Homes at Old Colony, situated near South Boston's waterfront, was designed to attain a high level of energy and water efficiency, and was built as a potential model for similar dated housing projects across the country. Constructed in 1941, the Old Colony, once a distressed public housing site, has undergone a “gentrification” process and demonstrates how green building can create a community renaissance of sorts in areas with dated housing projects. The Homes at Old Colony is now seen as a model for sustainable multi-family design and successful urban living.

BOSTON — The Homes at Old Colony, situated near South Boston's waterfront, was designed to attain a high level of energy and water efficiency, and was built as a potential model for similar dated housing projects across the country. Constructed in 1941, the Old Colony, once a distressed public housing site, has undergone a “gentrification” process and demonstrates how green building can create a community renaissance of sorts in areas with dated housing projects. The Homes at Old Colony is now seen as a model for sustainable multi-family design and successful urban living.



“The redevelopment of Old Colony is extremely important to the residents of the development and the surrounding community,” said Bill McGonagle, administrator of the Boston Housing Authority, which has owned and managed the site since it was built. “We created construction jobs, and beautiful, affordable, energy efficient housing for the people of this community.”

Going through a phase

In Phase One of the project, which was completed in March 2012, seven dilapidated buildings were demolished, and in their place 116 energy-efficient townhomes and a six-story midrise building — both designed to achieve LEED for Homes and LEED for Home Midrise Platinum — were constructed. Phase One also includes construction of a 10,000-sq.ft. LEED Gold learning center, named in honor of former Boston City Council President and Old Colony resident, Joseph M. Tierney, and an outdoor play area.

A innovative master plan and a green building design approach developed by Beacon Communities and sponsored by the Boston Housing Authority (BHA), the housing project, recently renamed The Homes at Old Colony, was given a green light with the aid of grant money by the U.S. Department of Housing and Urban Development (HUD) through the federal American Recovery and Reinvestment Act (ARRA) funding in addition to funding from the City of Boston, the Commonwealth of Massachusetts, and private equity. “Phase One of the project created 600 jobs,” said Barbara Fields, HUD regional administrator.

HVAC, green building design

According to Michael D. Binette, AIA, principal at the The Architectural Team, Old Colony was among the most physically distressed sites in the BHA federal portfolio, paying annual energy and water costs of more than \$4,000 per unit due to its aged infrastructure.

“The new Old Colony introduces ambitious green building and energy-efficiency measures, making it arguably the first U.S. affordable housing project ever to meet major national criteria and certifications for sustainability,” said Binette. Old Colony is also designed to EPA’s Energy Star and HUD Healthy Homes Guidelines, with its site in accordance with LEED for Neighborhood Development. “Efficient mechanical systems, appliances and lighting are matched by new policies at Old Colony to limit waste and improve indoor air quality,” said Szymanski.

Significant levels of insulation and air sealing throughout the new buildings reduce energy consumption. “The first steps were to make the building envelope as tight as possible,” said Jay Szymanski, AIA, LEED AP Associate, The Architectural Team, Chelsea, Mass. In the midrise and community buildings, exterior spray-foam insulation aids with thermal insulation as well as air sealing. Units are compartmentalized from each other to reduce the “stack effect,” which pulls cold air in at the base of the building and pushes hot air out the top of the building.

With the acknowledgement that buildings needed controlled ventilation 24/7, the object was to extract as much energy as possible from the air that is being exhausted and use that to condition the fresh air coming into the unit.

“The energy-recovery ventilator ERV is the tool that allowed us to provide controlled ventilation rates without the loss of energy due to exhausting condition air to the exterior,” said Szymanski.

The townhouse units used individual Lifebreath heat-recovery ventilators (HRVs), and the midrise building used a central ERV system with Annexair units. The combination of using energy efficient equipment and “right-sizing” the equipment results in very efficient systems.

For the townhomes, medium-density spray foam fills the wall cavities and one-inch of rigid insulation blankets the exterior, reducing thermal bridging.

“Green features are incorporated throughout the plan,” said Szymanski. “The buildings are oriented to maximize solar exposure, with carefully designed exterior envelopes that inherently reduce heating and cooling loads.”

Also, the site allows for energy generation to be collected through 140 kW photovoltaic panels installed on all Phase One buildings. The panels are owned and operated by a third party, who then resells the electricity produced to Beacon Communities used for the common area electric consumption and site lighting loads. The third party owns, installs and maintains the system and sells the power generated to the owner for a fixed cost over a fixed timeframe, it is not stored onsite. Solar thermal was explored but, at the time, it didn’t make financial sense, so the roof space was dedicated entirely to PV. Also, light colored, highly reflective roof materials were used on the midrise and community building to reflect heat from the sun and reduce cooling loads.

Throughout all the buildings, all central heating, cooling and hot-water systems are high-efficiency units and the windows are Energy Star-certified. Additionally each living unit is equipped with a HRV or ERV that continuously exhausts a steady, but small stream of air from bathrooms. The heat energy from the air is exchanged to heat the cold fresh air coming in from outside and being sent to the air-handling units to be tempered and distributed throughout the unit. Corporate Mechanical Inc., Tewksbury, Mass., handled the HVAC tasks.

Low-flow fixtures

A great deal of emphasis has been put on reducing overall water usage at Old Colony. An important part of this effort is to utilize low-flow plumbing fixtures — pressure-assisted toilets, kitchen and bathroom faucets, and showerheads — that are able to provide a comfortable experience for the user while using less water than a standard fixture. The major users of hot water in multi-residential buildings are typically showers, dishwashers and laundry. Specification of high-efficiency appliances addresses dishwashers and laundry, although residents must be encouraged to use dishwashers rather than handwashing, which uses more water. The requirement for showerheads is 2.0 GPM; exceeding this requirement with an even lower flow will further reduce domestic hot water demand. TMC Mechanical LLC, Marshfield, Mass., was the plumbing contractor on the job. Grohe plumbing fixtures were used extensively on the project — Eurosmart 1.0 GPM lavatory faucets, Eurosmart 1.5 GPM kitchen faucets and Relaxa 1.5 GPM showerheads. Gerber Ultraflush 1.1 GPF toilets were also used.

A stormwater management plan and system has been put in place. The site has been designed to infiltrate as much water as possible through pervious pavers — at the entry to the midrise building, as well as at the community building — vegetated areas, and underground storm-water infiltration systems.

“We used six large stormwater leaching galleys throughout the site to collect rainwater from roof leaders and area drains and allow it to infiltrate back into the ground,” said Szymanski. “We also used pervious pavers in select locations to reduce runoff and allow water to infiltrate back into the ground. We did not collect rainwater for re-use.”

Old Colony will continue its redevelopment as it moves into phase two — developed by Beacon Communities — thanks to \$22 million in funding from the U.S Department of Housing and Urban Development’s Hope VI Program. Phase Two, which has an estimated price tag of \$80 million, broke ground last fall, and the remaining buildings between Old Colony Avenue and Reverend Burke Street will be demolished and 169 new affordable rental units will take their place. The first 129 apartments are to be completed in spring 2014, with construction on the remaining apartments to begin soon after.