



Digging For GOLD IN THE PARK

The Millennium Tower Residences in Battery Park face both the Hudson River and tough neighborhood sustainability standards. This article focuses on the selection and performance benefits of the heat pumps within the overall design, from giving each family accountability for conserving energy to the critical issue of minimizing noise. They have been an important but single step among many in pursuing the Gold standard near Manhattan's southernmost patch of green.

BY JOHN VASTYAN

On the West coast, California is recognized as having the toughest environmental restrictions. And on the East coast, New York typically sets the most stringent expectations, with New York City at the state's cutting edge.

For some commercial enterprises, it's challenging enough just to meet the city's environmental stipulations. Yet, some will exceed them.

On the southern tip of Manhattan Island, along the shore of the Hudson River, is the area known as Battery Park. Managers of the City Authority have set their own standards for new construction. Lofty environmental requirements for Battery Park City are spelled out in its *Residential Environmental Guidelines*, intentionally setting the affluent community apart as one of the highest-profile green neighborhoods in the country.

Millennium Partners is widely recognized for their development of luxury mixed-use hotel-and-condominium projects with some of the biggest names in the hospitality industry, including Ritz-Carlton. Recently, they built and quickly sold out the first environmentally friendly pure-condo building in Battery Park City: the 35-story Millennium Tower Residences.

The 400,000-sq-ft building offers 234 condominium and apartment units; many sold to families with children. The living units range from one to four bedrooms in size, each within a single-story living space.

"Often, the paradigm is that when you're single, you live in the city," commented Charles Norman, project manager at Millennium Partners. "Then when you get married, you move out to the suburbs. But what we have here is kind of an urban oasis where families are choosing to stay and live in New York City."

The environmentally sustainable facets of the development appealed to buyers and broadly exceed Battery Park City's stringent requirements — because Millennium Partners has pledged to attain Gold certification of the building under LEED®, administered by the USGBC in Washington.

Achieving LEED Gold at Millennium Tower is possible, in part, because the developer chose to install 932 ClimateMaster water-to-air heat pumps that are woven into the building's closed-water-loop, boiler/cooling-tower heating/cooling system. A boost toward LEED Gold certification comes with the manufacturer's non-ozone-depleting refrigerant: EarthPure® HFC-410a.

"A point was earned under LEED for having the green refrigerant."

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View of a condominium living room shows how neatly the central system's water-to-air vertical units are integrated discreetly.

ant," said Christopher Bisaccia, sales engineer for Gil-Bar Industries Inc., the manufacturer's commercial representative in the New York metropolitan area. "In addition, our heat-pump units' higher EERs contributed toward energy savings within the building's energy envelope.

"But we also did some things in the spirit of LEED that actually go above and beyond what's required — things like stainless-steel drain pans, antimicrobial cleanable insulation, ports for monitoring water flow and temperature at all times, multiple-speed fan control, and MERV-11 filtration. All of these contribute to the development's recognition as being environmentally responsible."

In fact, managers at Millennium Partners saw to it that all facets of the building's energy-efficient design were rigorously evaluated.

"In this building, we've managed to reduce our anticipated energy consumption by about 22%," said Norman. "We measured it in a simulated study against a 'baseline' condominium building. It's an ambitious effort, and one we're quite pleased with; it can be attributed to a number of positive factors."

Two different types of heat pumps serve the building's heating and cooling system: the vertical style and the console style — both in sizes of about a ton to a ton-and-a-half of heating and cooling capacity. Console units were installed under bed-

room windows and the vertical units were installed in living rooms and kitchens.

"One of the things we like about the heat pump arrangement is that each system has its own seven-day programmable thermostat, giving us a couple of advantages," added Norman. "First, it allows the condo owner to program heating and cooling

operation within individual spaces. This can save enormous amounts of energy.

"But because each resident or family pays for their own energy use, most are proactive in exercising the features of the 'smart' T-stats," continued Norman. "With heat pumps, each condo-owner either takes personal responsibility for conserving energy in the individual living space or is required to pay more for energy that's essentially wasted."

"In many ways, this project marks a turning point, an important benchmark for multi-unit development in the New York City market," said Bisaccia. "It's a luxury condominium building in which heat pumps were deemed acceptable because of the system's quiet operation. And since this building went up, heat pumps have been installed in most other new condominium developments in New York."

Millennium Partners, when choosing HVAC equipment for the facility, saw the noise-muffling design of the unit's enclosure as an acoustic benefit. "The elimination of noise was critical to our decision-making process," said Norman. "So, early in the planning stage of the project, we installed the systems in our office here, and we ran them. We even hired a sound consultant to verify and confirm the manu-



The multiple condensing boiler/cooling-tower arrangement for the closed-water-loop heat exchange system is physically, part of the tower's energy-efficient design.

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The green spaces on the roof of Millennium Tower contribute to the building's LEED® pursuit.

facturer's claims."

According to Bisaccia, other ease-of-construction factors tied to the features of the heat pumps. Many of the units came with pre-installed risers that permitted a simple, closed water loop, linking floor to floor.

"It's a very efficient design," continued Norman. "We laid out the piping network and simply put the cabinets in. With the vertical heat pumps, cabinets are placed during the framing process without installing the chassis or the actual mechanical portions of the unit. Equipment chassis are installed only after all of the rough work has been completed. This prevents the chassis from taking a lot of abuse during the construction process."

In addition, the multiple condensing boiler/cooling-tower arrangement for the closed-water-loop heat-exchange system figures physically into the tower's energy-efficient design.

Many more of the characteristics point to the environmentally savvy concepts underlying the Millennium Tower's funda-

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mental design.

On the roof of the building is the cooling tower for the water loop heat pump system. And, nearby is the building-integrated photovoltaic system, or BIPV. The BIPV solar-powered system generates about 30 kW, which satisfies about 5% of the building's energy use. And, up on the roof, it'd be hard to miss another green feature —

abundantly growing vegetation.

The building also has its own wastewater treatment system and storm-water retention, reducing water use by nearly 50%. Rainwater is used to supply toilets and also irrigates the green roof landscaping.

According to Norman, 27% of construction materials came from recycled sources. And over 60% of those materials came

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from suppliers within 500 miles of the project site, and a third of those suppliers sourced or extracted their raw materials within 500 miles of the project site.

Norman also pointed out that the Millennium Tower Residences were artfully designed by New York architectural firm Handel Architects, which also has a substantial role in the World Trade Center redevelopment project — visible about a quarter-mile north of the Tower.

The overall result is that a green, urban, family high-rise has helped to establish important environmental expectations on a national level, and has won the appreciation of many New Yorkers. Millennium Towers has helped to set a living example for future generations within and beyond the Big Apple. **ES**

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