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D.C. Condo Goes Green on a Tight Schedule

In addition to the extensive mechanical system, the Alta development's roof was incorporated with green roof elements to reduce urban heat, and to enhance on-site storm water management.

The Alta at Thomas Circle, Washington, D.C., recently became the first certified LEED® condo/mixed-use development in the District of Columbia.

The Alta includes 126 residential units and two retail spaces — all packed into 13 stories and a five-level parking garage.

The Alta's green-based features include insulation, paint, and a water-source heat pump, closed-loop heating-and-cooling system.

But that wasn't the first HVAC system of choice. The original specifications included equipment that used R-22 refrigerant, which is slated for a drastic reduction in supply starting January 1, 2010. During the construction phase, the developer decided to switch to water-source units that use Earth-Pure 410A refrigerant. The ClimateMaster R-410A Tranquility system was selected.

Vertical stacking made good use of limited space in the Alta units.

"Everyone was pulling in the same direction to get this done. Otherwise, it probably wouldn't have happened," says Al Hedin, senior vice president of development at residential developer PN Hoffman, Inc., Washington, D.C.

Managers at PN Hoffman saw the benefits of switching to a LEED-certifiable multifamily/mixed-use concept.

"We decided that the green emphasis would be a way to distinguish our building from others in the marketplace," Hedin says.

Contractor Experienced in Complex Projects. Duncan & Shapiro, Rockville, MD, was the mechanical contractor selected to install the Alta comfort systems. Jake Shapiro started J. Shapiro Plumbing & Heating in Washington, D.C. during the 1930s. He retired in 1976, and his son David, a mechanical engineer, organized a merit shop mechanical contracting company known as Shapiro & Duncan.

Shapiro & Duncan provides single-source HVAC and plumbing systems using the Design/Build delivery method for new and retrofit construction projects. It has a reputation as being a provider of complex and demanding renovations. It has completed more than 2,000 projects, including schools, and commercial and government buildings.

Components Arrived On Time. "The construction team ultimately came to the decision that if the somewhat higher cost would be feasible, and if delivery of the equipment could happen within the set schedule, we'd move forward with it," according to DMR Associates sales engineer Mike Benson.

Jac Chiang, project manager for Shapiro & Duncan, says timely delivery of system components helped facilitate the change from an R-22 system to one using R-410A refrigerant. "The unit enclosures arrived first, then we received the unit chassis, popped them in place, and made the connections," explains Chiang. "The mid-stream change to R-410A could have potentially been a real challenge. Fortunately, because of the way the risers and extension couplings are attached to the heat pumps in back, and also that the units were arranged in a 'stacked' fashion, from one floor to the next, there were very few changes to deal with."

"Physically, we didn't have to change anything in the job to do this; the R-22 and HFC-410A cabinets are the same dimension, and with the same water flows," Benson adds.

All of the Alta's residential units have one or two water-to-water heat pumps. The closed loop includes a boiler and cooling tower installed on the roof.

Hedin says vertical-stack heat pump units were used in an effort to conserve floor space. "The residential units are relatively tight, and we had about 6 sq.ft. of floor area in each residential unit that we would need to house the heat pump," Hedin says. Many of the smaller systems we used are in closet spaces, or even built into the kitchen island."

"On the heat pump unit in most of these condos, all of the ductwork comes off the top and then elbows out both ways. The exposed, spiral ductwork feeds into that 'loft' feel and look," Hedin adds.

"They're also pre-piped. So it's like putting blocks together vertically," Benson says. "One set of pipes fits inside the

other set of pipes, and then you go to the next floor – do the next unit, and so on."

Noise reduction was another advantage to the ClimateMaster systems they selected. "It's a big issue," Hedin says, "because we have these heat-pump units right in the middle of the living/dining areas. We're very pleased with the acoustics of the heat pumps."

As an added safety feature, carbon dioxide (CO_2) detectors were installed to monitor CO_2 levels in the condo's common areas.

THIS MONTH IN CB HISTORY...

1965: In *"Biography of a Big System,"* Associate Editor Earl Swaney described the engineering that went into the design and installation of a giant heat pump plant in Allen-Bradley's new research center. The 300 ft.-square building featured an interior source heat pump rather than a convential HVAC system.

1979: Editor Jeff Forker's *"Entering the Age of Thinking Machines"* examined the giant steps in electronics technology. "Microelectronics has the potential to reshape our industry in product design, manufacture, and service," Forker wrote. The many developments in technology we see today — in building controls, for example — show that some predictions do come true.