



COMPLETION DATE

August 2012

PROJECT TEAM

Homeowner

Peter Nichol

Developer

NOW Communities, LLC,
Concord, Massachusetts

Engineer

ZeroEnergy Design, Boston

HVAC Contractor

Concord Heating & Air Conditioning,
Inc., Acton, Massachusetts

CHALLENGE

Selecting an HVAC system for a community of high-performance homes in Massachusetts, where winter temperatures average a low of 19 degrees Fahrenheit

SOLUTION

Zoning systems from Mitsubishi Electric

RESULT

A successful pocket community with low energy bills and ample wintertime comfort

A few years ago, Dan Gainsboro was exploring development models when he came across the Northwest's pocket neighborhoods – groupings of smaller homes located around shared green space. He said, "I fell in love with them. They have a strong element of community and are responsible from a sustainability perspective. I knew I wanted to do a version here on the East coast." As founder and principal of NOW Communities, LLC, a developer out of Concord, Massachusetts, Gainsboro acted on that vision. He created Concord Riverwalk – **an award-winning community in West Concord, Massachusetts, comprised of 13 Zero Energy Ready Homes** that would make even the Northwest proud. "Obviously, though, the Northeast has a very different climate." That's where zoning systems from Mitsubishi Electric US, Inc. Cooling & Heating Division (Mitsubishi Electric) come in, and where the story takes off.

Gainsboro partnered with building scientist Marc Rosenbaum. "We first looked at Passive House but decided it was too constraining in terms of design. So we went for being as net-zero as possible – designing homes with high-performance systems that would enable the simple life. **We wanted buildings that would be very easy to maintain and that didn't require a lot of attention.**" That had to be true even in the middle of a Massachusetts winter, when day after day is cold and snowy, and when residents would need a lot of heating.

Cue Jordan Goldman, engineering principal at Boston's ZeroEnergy Design, and the HVAC designer for Concord Riverwalk. Goldman said, "The goal was to make the houses zero energy

ready. Meaning if you put a small array of solar panels on the roof, each could be net-zero. That brought us to electric heat pumps. Having electricity as the fuel, and with sustainability and practicality in mind, we knew they were a good choice. They're very energy-efficient and they work in low outdoor temperatures. They're also right-sized for small, insulated buildings." Gainsboro added, "**Japanese-designed mini-splits are just bulletproof. They require little maintenance and are reliable. And the efficiencies!**"

With electric heat pumps decided on, the team looked at products from Mitsubishi Electric, Daikin and Sanyo [now Panasonic]. Year-round performance was a big consideration and "**I've had good luck with Mitsubishi [Electric] in the past; they're a bit ahead of the others in terms of addressing concerns related to heating,**" said Gainsboro. Goldman favored Mitsubishi Electric "for its extended track record, performance, reliability and the service network in the Northeast."

That choice has paid off. Since project completion, the community has received ample media attention lauding its innovative concept and triumphant performance. Accolades include the 2014 Builder's Choice award from *BUILDER* magazine, the 2014 Community of the Year award from the National Association of Home Builders and the 2015 Project of the Year award from *Professional Builder* magazine, among others.

The community's success is also evident from its homeowners' satisfaction. Peter Nichol, for example, lives in a 1,300-square-foot home with his wife and three children, and teaches environmental

and earth sciences. He said, “Being in this home allows me to walk the talk to be more sustainable.” The zoning system is a big part of that: “I wouldn’t heat any other way. It’s the fact that if my only utility is electric and I can make my electric green or net-zero, I can lower my carbon footprint. You can’t do that with gas or oil.”

Nichol’s zoning systems also offers him **“pretty seamless cooling and heating, and I certainly appreciate the low utility bills. It’s been a fraction of what a conventional system would be.** This past winter – with its extended coldness – our biggest electric bill was only \$275. That’s our only utility, so that’s kind of neat.”

The Nichols have been able to keep electric costs down thanks to the zoning system’s ability to cool some rooms to different temperatures. Nichol said, “Our kids, now that they’re a little older, shut their door and sleep with their room cooler. There are times my wife wants it not quite as cool in our bedroom, so **it’s nice to have that option – to have individual room controls for the bedrooms. And if you have a room no one is in, you can turn it off. That’s good for efficiency.** The upstairs – we don’t turn the units on unless we’re in the room.”



MITSUBISHI ELECTRIC EQUIPMENT INSTALLED

13 MXZ-4B36NA Outdoor Units, 8 SEZ-KD15NA Horizontal-ducted Indoor Units, 40 MSZ-GEO6NA Wall-mounted Indoor Units

Nichol’s experience captures that of the whole community. Gainsboro said, “I think people are generally pretty satisfied with the return-on-investment for their high-performance home. I believe one resident’s daily electricity is 25 cents a day!”

Homeowner satisfaction is also due to the indoor units’ discrete operation. Nichol said, “We’ve been extremely comfortable. The wall-mounted units are very quiet, and they’re higher up on the walls so you don’t tend to notice them.”

Maintenance has also been a high point, “and **this is something that the residents really like – that they can clean out the filters themselves,**” said Gainsboro. Nichol agreed: “It’s pretty easy and there’s just not a lot of maintenance. I vacuum the filters every six weeks. That’s really it.”

Goldman also feels that Concord Riverwalk has worked out well. “This was an ambitious development that serves as a paradigm for what developments can be in the future. You don’t need to sacrifice curb appeal. You don’t need to design McMansions. People just want energy-efficient components, and it’s been very rewarding to be a part of a project that exemplifies that.”



“People were dubious that electric heat pumps would work throughout the winter. After the last few winters, we now have evidence that these things work.”

- Jordan Goldman, engineering principal, ZeroEnergy Design

