WORK IN PROGRESS
Clockwise from top right: **Freshly poured concrete, framing the walls, the exterior wall with the first layer of polyiso, then the second layer of polyiso and firring. The Danbury house nearly complete.**

Houses That Green Built

THE REAL STANDARDS FOR A SUSTAINABLE BUILDING // By Karen Sackowitz

DESPITE the runaway use of the term in just about every industry, when it comes to quality home construction, it isn't easy being "green." What should be a well-quantified distinction has become a marketing term, shortchanging homeowners who want to know how the real process works and how to best ensure the life of their new or existing house. "Everybody in the building community will say they are green builders, but it's a sophisticated science and a complicated process if you do it right," says Mike Trolle of BPC Green Builders. "It's also fascinating. As a builder, you need to keep educating yourself."

Over the last 15 years, Trolle has seen the difference between builders who simply wanted to ride the green wave and those who wanted to immerse themselves in the true science of it. "Most builders are doing the same old, same old and moving it up a notch or two to meet updated building codes," he says. "That means they're doing what they have to do, but not what they could do."

Case in point: BPC Builders recently completed a 1,650-square-foot home in Danbury. The house is completely heated by one wall-hung, heat pump that extracts heat from the outside air. According to Trolle, the house has been heated with the single unit this winter even at zero degrees outside.

At the other end of the spectrum, BPC recently completed a 10,000-square-foot home in Ridgefield that is heated by six ducted units and two outdoor heat pumps. The goal for any size home is to achieve energy savings via load reduction. From a framing perspective, Trolle says wall construction and insulation is critical as well. "The Danbury house was built using 2 x 6 construction, 24 inches on center," he explains. "Less wood in the wall allows us to fill the spaces using cellulose, then wrap the walls with two layers of foam board. The resulting R-value is 55." The Ridgefield house was built with double 2 x 4 walls filled with cellulose for an R-value of 35.

Cellulose has replaced spray foam as skilled green builders' primary insulation product. Made from recycled wood fibers and possessing excellent moisture management qualities, it is an excellent product for use in air-tight construction when

combined with taped sheathing joints.

Contrary to the long held belief that an overly air-tight home can be a negative, the latest green building science works on a "build tight, ventilate right" mantra. To that end, a key efficiency gauge is measuring the number of air changes per hour when a home is tested with a blower door. "Currently, the building code in Connecticut is 7.0 air changes per hour; in 2015, that will go down to 3.0," Trolle says. "Building science experts believe that number should be 1.0 or less, which is where we aim for all of our projects."

BPC's Danbury home was tested at .46, and was the winner of the 2013 CT Zero Energy Challenge for the lowest Home Energy Rating System (HERS) score without renewables (ctzeroenergychallenge.com). It was also built to meet Passive House standards (phaus.org).

Known as the most stringent building energy standard in the world, Passive House construction includes super-insulation, air-tight walls and roof, much better windows, and small, simple heating and cooling systems. The result is 80 percent or more less energy used than with conventional techniques, providing superior air quality and comfort. Passive House design also uses detailed, specific annual weather data in modeling a structure's performance, and holds each building to a quantifiable set of criteria prior to certification.

For any homeowner considering green building, Trolle says a good place to start is the DoE's Energy Star for Homes program (energystar.gov).

"Compliance adds some cost but seriously improves performance, leading to a quick return on investment, greater comfort, better indoor air, and enhanced durability," he says. "You can make a difference by investing a little or a lot."

To read more, follow Mike Trolle's blog at bpcgreenbuilders.com/blog.

PACKS A PUNCH This small air-source heat pump warms the entire house with heat pulled from the winter air. It is rated for one ton, or 12,000 btu, which is quite small. It functions down to 17 degrees below zero. In summer, it runs in reverse, dumping heat from inside the house into the outdoor air. The efficiency is about 300%.

Finding Her Life's Rhythm

ELLY PESCÉ doesn't get far around town without being recognized by her pint-sized fans. Among the preschool crowd, she brings excitement to the class, arriving with her guitar, keyboard, music and props. The first strum of the guitar or stroke of the keyboard and the children are hooked. Mrs. Pescé, as she is known to her students, visits an awe-inspiring 17 of Ridgefield's preschools on a rotating schedule, as well as three schools in neighboring towns, nurturing a love of music with between 100 to 200 children daily.

Pescé gently develops children's tempo, movement and listening skills through participation activities. She entices her students to sing, move, and play along with a wide range of percussion instruments on cue. The kids love it, and the effect is amazing, prompting one mesmerized student in a recent class to exclaim, "Wow, that's beautiful music!"

Her program, officially called Fun With Music, is based on her philosophy that all children are musicians. Pescé believes "If you have a heartbeat, you have a natural rhythm." This enthusiasm and attitude possibly originated from her upbringing: Her mother was a Carnegie Hall pianist, and mentored Pescé.

Interestingly, although Pescé had studied music since she was ten, she started her career in the medical field as a dental nurse, finding herself inspired by her father, a physician. Perhaps teething babies led her in another direction because after taking time off to have children, when she was ready to re-enter the work force, her lifelong love of music ended up taking center stage. She began volunteering in schools, covering for absent music teachers. It wasn't long before teachers noticed that the children were very receptive to her. So it was not surprising that when Pescé talked to her friend Kate Dayton about possible careers, Kate said, "Why don't you think about doing music to get paid?"

That bit of advice got the ball rolling. Pescé started to write a program based on theory, practical knowledge, and educational philosophies. Within a year, she was knocking on doors, offering free demonstration lessons. Every school that invited her in, hired her. Pescé has since built on her program, adding classes designed for special-needs children, children ages 5 to 8, and most recently, 18-month- to 30 month-olds.

After teaching for 22 years her enthusiasm has not diminished, and Pescé teaches every lesson as though it were her first. She says, "Every child I have ever been blessed to share music with, has truly enriched my life. I'll never retire!" —**Louise Casella**