A Pretty Good

What is a PRETTY GOOD HOUSE?

By Jesse Thompson

A lot of attention is being paid to ambitious building-certification programs. For energy conservation, Passive House is the gold standard, but there are many other competing programs that all attempt to define what "the best" might be. Then there's Pretty Good House (PGH).

This building program isn't a program at all; in fact, its founders have resisted any attempt to codify, market, exploit, or monetize their creation beyond a few blog posts. If the concept remains a bit nebulous, the creation story isn't. The concept grew out of the Building Science Discussion Group in Portland, Maine, which is a monthly gathering of contractors, architects, engineers, energy raters, and product suppliers who have been meeting since 2009 to hash out the potential pitfalls and best practices of construction. Dan Kolbert, Mike Maines, Steve Konstantino, and Chris Briley are the individuals generally credited with pushing the rough outline of what a Pretty Good House in this era would look like and what makes sense in terms of efficiency, budget, timetable, etc.

PGH has jelled around a set of complementary building practices and components. These include using local, low-embodied-energy products; testing a house after construction is complete to

House in Maine

This home's low energy bills speak louder than any performance certificate

BY STEPHEN SHEEHY

Like many people approaching retirement age, my wife and I decided that it was time to downsize. At more than 4000 sq. ft., our home of 22 years was much too big for us. We selected a building site alongside our existing house in Alna, Maine, a small town of 700 people near the coast, that offered views of a small pond and fields beyond.

I'd done a lot of research into modern building practices and materials, and I wanted our new house to be cheap to operate and easy to maintain—while also being nice to look at and to live in.

Lots of organizations will certify a house based on whether it meets particular standards for efficiency, including LEED, Energy Star, and Passive House. While these certification programs have aided in the development of technologies and construction processes and spurred the creation of many new products, certification itself comes at a significant financial cost. Someone needs to be paid to certify that the claimed efficiencies have been realized, and it may be necessary to spend extra money to meet the standard, even though some expenses may not be recouped through energy savings.

Certification certainly didn't make sense in our case, mostly because we were not building for resale. And even if we were, I felt that a history of low utility bills would

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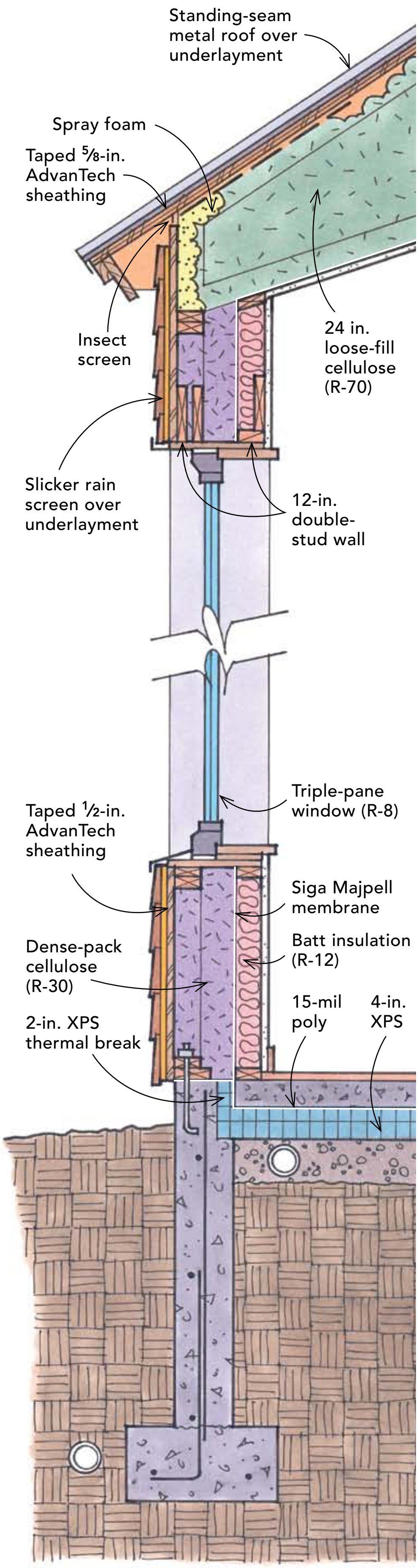
ensure that it's performing as designed; installing a fresh-air ventilation system to go along with good air-sealing levels; insulating to Building Science Corporation's recommended 5-10-20-40-60 levels (in climate zones 5 and 6); using triple-glazed windows; and designing a house that can probably be net-zero energy with a PV array on the roof. There are no required calculations, no paperwork, no plaques.

One fascinating aspect of this approach is that your goals end up being defined by other people's efforts. If PGH aims always to be close to what's considered the best, then when someone else moves the marker, PGH follows them along the path. We've seen this with air-sealing in the past decade. While 3 ACH50 to 5 ACH50 became the standard for Energy Star and building codes, Passive House moved the bar to 0.6 ACH50. As a result, it takes 1.5 ACH50 to reach PGH.

We will probably never know how popular the PGH concept ends up being. There will never be a nationwide database of certified projects, no grand headquarters in Washington, D.C., and no annual trade show in Las Vegas. Instead, there will be happy homeowners near and far with low energy bills and comfortable houses, all living a pretty good life.



Anatomy of a **PRETTY GOOD HOUSE**

In a nutshell, the PGH approach is about finding the sweet spot between the cost and benefits of energy-efficiency measures. The originators of the concept list 23 distinct characteristics that identify a Pretty Good House. Several of those as exhibited by the Sheehys' house are described here.

Near net-zero

The 6.5kw of solar panels on the roof should generate about 8000kwh per year, roughly equal to what the author expects to use, although initial use so far has been lower than expected.

No fossil fuels

The house is 100% electric. Heating and air-conditioning are provided by a pair of Fujitsu RLS3H minisplits (9000 Btu and 12,000 Btu), with additional radiant heat under the bathroom tile. Although a heat-pump clothes dryer was chosen for its efficiency and to eliminate a vent that would impact the building envelope, a conventional electric-resistance water heater made better sense for a single-level dwelling; plus, it's quieter than a heat-pump model. Cooking appliances include an induction cooktop and an electric convection oven.

Adaptability, durability, and recyclability

On the exterior, both the standing-seam metal roofing and the unfinished white-cedar shingles require little maintenance. Inside, a polished concrete floor is scratch resistant, is easy to maintain, and stores heat when the sun shines through the south-facing windows. Recycled materials include 4-in.-thick foam (greeninsulationgroup.com) under the slab.

Air leakage capped at 1.5 ACH50

Air leakage in the house was minimized by taping sheathing and housewrap and by limiting penetrations through the building envelope. A blower-door test measured 0.59 ACH50, meeting Passive House standards. Airtightness was

enhanced with Siga Majpell membrane behind the ceiling drywall and inside the walls, and windows were sealed with Siga Wigluv tape.

Service core for plumbing and wiring

Flat ceilings on the north side of the house create room for a utility chase between the ceiling and the roof trusses that is accessible through a hatch. Almost all wiring and plumbing are on the conditioned side of the building envelope. The only exceptions are the lines for outdoor lights, outdoor receptacles, and hose bibs. These and the other penetrations through the envelope—for the plumbing vent, the HRV's intake and exhaust, and the lines for the two minisplits—were air-sealed carefully.

5-10-20-40-60 insulation rule (windows, slab, foundation, walls, roof)

Built atop an insulated slab (R-20), the double-stud walls (R-42) combine dense-pack cellulose and fiberglass batts and have high-performance Intus windows (R-8). The roof is framed with raised-heel scissor trusses, which allow for an insulated cathedral ceiling (R-70).

Good design and a simple structure

A single-story, relatively open floor plan makes for easier heating and cooling, and most of the glazing faces south, which allows for significant solar gain, especially when the sun is low in the sky in winter.

Mechanical ventilation

A Zehnder ComfoAir 200 HRV in the mechanical room brings 72 cfm of fresh air into the bedroom, den, and great room, and it expels spent air from the bathrooms and kitchen. A boost switch in the master bath can be activated to remove humidity when someone is running the shower.

Universal design

The house has wide doors with lever handles, no stairs, and a curbless shower to make accessibility and aging in place possible.

SPECS

Bedrooms: 2

Bathrooms: 1½

Size: 1860 sq. ft.

Cost: $242 per sq. ft.

Completed: 2015

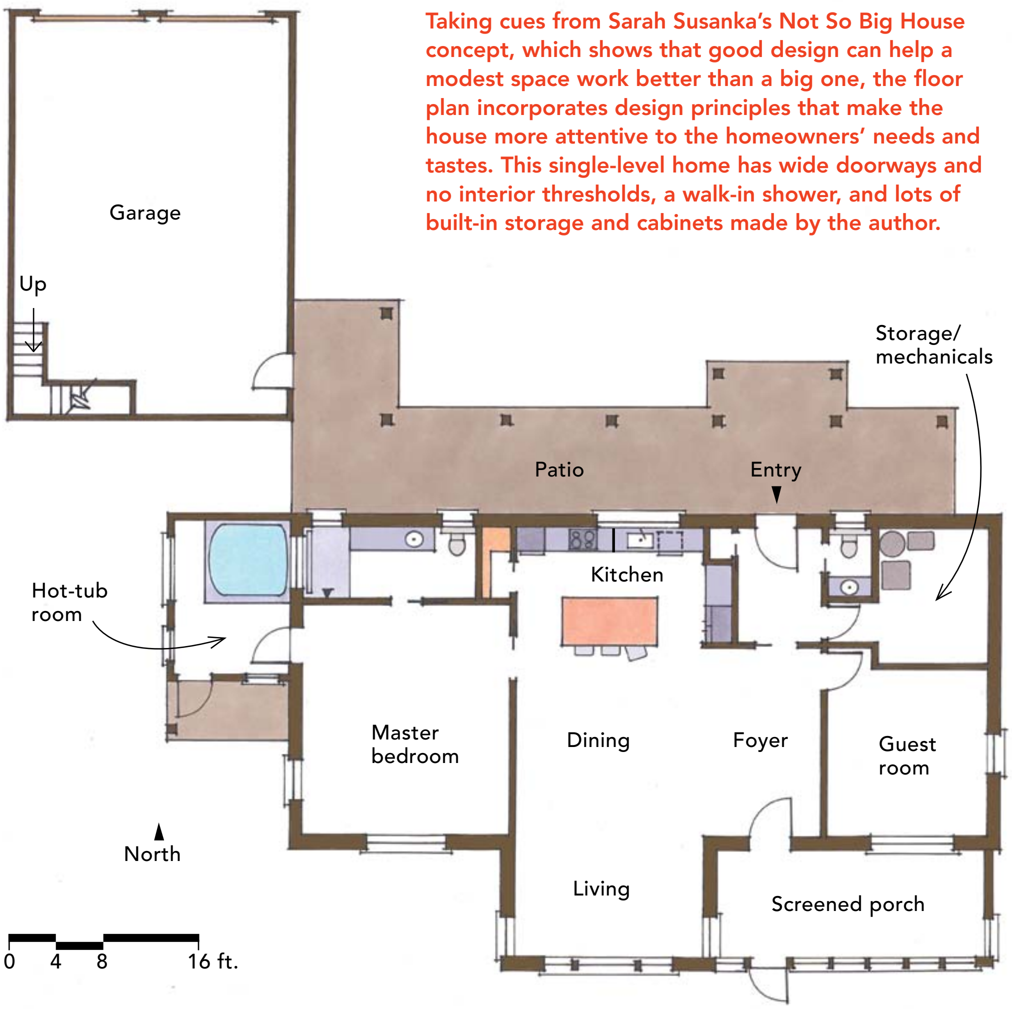
Location: Whitefield, Maine

Architect: Kaplan Thompson Architects, kaplanthompson.com

Builder: Tom Greenleaf, greenleafbuilding.com

A LOOK INSIDE

Taking cues from Sarah Susanka's Not So Big House concept, which shows that good design can help a modest space work better than a big one, the floor plan incorporates design principles that make the house more attentive to the homeowners' needs and tastes. This single-level home has wide doorways and no interior thresholds, a walk-in shower, and lots of built-in storage and cabinets made by the author.



Passive solar. *The south-facing, triple-glazed Intus windows are Passive House certified, and the low-maintenance concrete floors store heat from the sun.*

Service core. *Flat ceilings on the north side of the house create room for a utility chase that keeps almost all wiring and plumbing within the house's conditioned space.*

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make a stronger case to new buyers than a paper certificate. Ellin and I had heard about the Pretty Good House (PGH) concept, and we were intrigued with the sensible approach to construction it entails (see "What is a Pretty Good House?" p. 58).

The Pretty Good path

To guide us in designing our PGH, we selected architect Jesse Thompson of Kaplan Thompson Architects in Portland, one of the originators of the concept, because I had read about Jesse's work at GreenBuildingAdvisor.com. For our contractor, we chose Tom Greenleaf, who had done various small projects with us since building an addition on our former house about 10 years ago. We found Tom great to work with, highly skilled, and intrigued with our ideas.

Armed with a basic floor plan and a list of needs, wants, and don't wants, we met with Tom, Jesse, and Jamie Broadbent, also of Kaplan Thompson Architects. We discussed a single-level home with wide doorways and no interior thresholds; a walk-in shower; lots of built-in storage and cabinets, which I would build myself; a low-maintenance exterior with clean, simple lines; and a covered entry. We also wanted lots of windows to take advantage of the view. Most of all, we wanted the new house to be energy efficient. Energy costs in our previous home had been as high as $6000 annually, a financial burden we did not wish to continue.

We've long been fans of Sarah Susanka's Not So Big House concept, which focuses on quality, not quantity, and recognizes that good design can help a smaller home work better than a big one. Susanka suggests establishing a budget and then focusing not on maximizing square footage but on using features such as built-ins, ceilings of various heights, and interior details to make a house more attractive and user-friendly. These features, it turns out, were right in line with our vision of a PGH.

Modeling, with moderation

Once we had established our basic design parameters, Jesse and Jamie used the Passive House Planning Package (PHPP) modeling software to analyze the impact that various changes in design would have on energy use and cost. Among those variables is airtightness. The Passive House standard for airtightness is 0.6 air changes per hour at –50 pascals (ACH50), which is much lower than that allowed by the most stringent building codes. We figured we would aim for that and be happy if we got reasonably close. But when our initial blower-door reading came in at 0.8 ACH50, we got caught up in the challenge of driving it down further. The blower-door technician cranked up the blower again and, armed with canned foam and Siga tapes, we went looking for air leaks. We found and plugged a few, which helped us eventually reach an airtightness of 0.59 ACH50.

Taking the best, leaving the rest

At Jesse's suggestion, we looked at Intus windows and doors and were impressed at the robust construction and terrific performance numbers. Their cost was competitive with windows from larger, better-known companies. We ended up using their Passive House–certified, triple-pane windows throughout the house, except on the sunporch and hot-tub room, both of which are outside the conditioned space.

At the same time that we chose to pull out all the stops to maximize airtightness, our PGH approach allowed us to skip unnecessary and expensive refinements designed to squeeze that last bit of efficiency out of the project. For example, we knew that 4 in. of foam under the slab would save a good deal of heating energy and enhance comfort but that increasing the amount to 10 in. or more, as is typical in a certified Passive House, was unlikely to be worth the extra several thousand dollars.

Our new home is comfortable and was cool over the summer, and we expect that it will be plenty warm this winter. It's also nice to look at, is easy to clean, and promises to require minimal maintenance. It's a pretty good house, indeed. □

Stephen Sheehy built his own house many years ago and spent a few years as a carpenter before attending law school. Photos by Debra Judge Silber.