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Green enough? Not yet, says Bend couple

By Erin Golden / *The Bulletin*

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The dream home that Tom Elliott and Barbara Scott are building probably won't have a hot tub or sauna.

Many days, drawing a hot bath or using a hair dryer probably won't be an option. Watering a lush, green garden? Out of the question.

It's not that the couple don't want a few luxuries or seek a Spartan lifestyle. Using more water or power than they need is just not part of the plan.

In their quest to build the greenest house in Bend, Elliott and Scott have spent months researching sustainable design techniques, assembled a team of experts and overseen the painstaking, piece-by-piece deconstruction of the two houses that once sat on the site of their future home.

But now, several months into the process, they've taken the most dramatic step yet: deciding to participate in the Living Building Challenge, a stringent set of rules that will force them to create all of their own energy; shower and irrigate with rainwater; and push the envelope on all aspects of green building. Because they won't be hooked to the city's water system, they also must capture rainwater for drinking.

In many ways, the Living Building Challenge has turned Elliott and Scott's project on its head. The plans drawn up last year will likely have to be altered to meet the standards. The timeline has already been extended, and the budget and the project team continue to grow.

The couple acknowledges that joining the challenge has complicated the project and caused plenty of new stress, but they say they're committed to trying something new — even if it means approaching day-to-day living in a completely new way.

“I don't want to live in a home that's uncomfortable or not our

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Homeowners Barbara Scott and Tom Elliott (seated at the far end of table, clockwise) with Al Tozer of Tozer Design Studio; M.L. Vidas, of Sustainable Design Services; Kristian Willman of Timberline Construction; Bruce Sullivan of Earth Advantage; and Chris Hart-Henderson of Heart Springs Landscape Design on Tuesday.

lifestyle," Scott said. "But I think we can get used to anything."

From the time they started talking about building a home more than two years ago, Elliott and Scott were thinking about sustainable features and environmental building guidelines, including the Leadership in Energy and Environmental Design system developed by the U.S. Green Building Council.

When they found a site on Northwest Shasta Place in Bend, the couple hired a contractor, designer, landscape architect and a LEED consultant to help put together plans for an approximately 3,000-square-foot, two-story home with three bedrooms and 2½ bathrooms, along with a detached two-car garage and separate guesthouse.

The project was full of unknowns, but it was moving along steadily. Then at some point last fall, Elliott and Scott heard about the Living Building Challenge and decided it was a perfect fit for the project.

"It was one of those things — when we heard about it, it just clicked," Elliott said.

The challenge

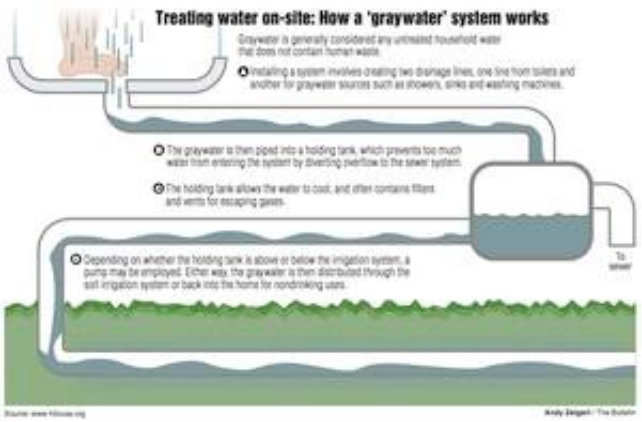
The Living Building Challenge was introduced in 2006 and sparked by a green building project in Montana, said Eden Brukman, the vice president of the International Living Building Institute, the Seattle-based organization that runs the program.

The idea, she said, was to turn big goals and ideas about sustainability and conservation into a formal plan that could be used by builders of everything from homes to office buildings, parks, bridges and college campuses. The challenge outlines 20 imperatives on issues ranging from site selection — living building projects can't be located on or near sensitive environmental areas — to the type of materials that can be used and how far they can be transported for use in the project.

For many builders, the most challenging aspects of the program might be the requirements that a living building be "net zero" for both water and energy. In other words, homes like Elliott and Scott's can't be hooked up to traditional water and power systems. They must capture rainwater and produce their own energy for heating, cooling and power on-site, with the help of solar panels and wind turbines.

Submitted photo

Tom Elliott and Barbara Scott hope to help produce energy by installing a wind turbine that uses small blades that spin around a pole. The couple would have to get approval from the city of Bend to put up a turbine.



Living Building Challenge

Editor's note: Tom Elliott and Barbara Scott invited The Bulletin to follow their green-building project from start to finish to share their goals, decisions, costs, concerns, problems and achievements, and to be an open book on what it takes to build such a home.
The Bulletin will follow the couple's project through periodic stories. In this installment, Elliott and Scott have decided to participate in the Living Building Challenge. They'll have to create all their own energy and capture all their water from the rain. So far, just four buildings have begun the challenge.

Introduced in 2006, the Living Building Challenge provides a set of 20 imperatives that govern how a building should be constructed and operate. Among the standards are rules for where a building can be located — based on the natural environment and the ability to live without a car, among other issues — and requirements for the building to be able to capture all of its own water from natural sources and supply all of its own energy on-site. To be certified as a living building, the project must be lived in or used for a 12-month

Under their current calculations, the couple will only be able to use about 83 gallons of water per day. Currently, they use about 145 gallons per day in the winter and nearly twice that when they are irrigating in the summer.

To be certified under the program, a building must first be lived in or operational for a full 12 months, a period during which the owner tracks energy usage and other data. At the end of the year, a team analyzes the operation of the building and decides if it meets the required guidelines.

period, when the owners track energy use and other data. Three Living Building Challenge projects in the U.S. and one in Canada are currently occupied and data from them are being tracked, but no buildings have been certified to date.
For more information about the Living Building Challenge, visit the Web site of the International Living Building Institute at www.ilbi.org.

So far, four buildings — in New York, Missouri, Hawaii and British Columbia, Canada — have begun the 12-month period, but no building has achieved certification. Only one of those projects is a private residence, but others are under construction, including one in Portland.

Brukman said the projects vary, but the people behind them all have something in common.

“The people who are tending to follow the program and use the program have it very clear in their mission statement as an organization or in their core values as an individual that we need to redefine the relationship of the built environment with the natural world, and acknowledge the impacts,” Brukman said.

Elliott and Scott plan to work toward LEED certification, in addition to their participation in the Living Building Challenge.

M.L. Vidas, owner of Sustainable Design Services and serving as the project's LEED consultant, said the two sets of standards work well together. LEED, she said, provides a road map for how a project can develop, while the challenge tracks how it works in practice.

“Living Building Challenge is looking big picture: big picture water issues, big picture energy issues,” she said. “Living Building Challenge is not going to dictate how you get there, whereas LEED is going to be more specific, with the plumbing fixtures you need to have to have this flow rate.”

A new direction

Elliott and Scott's project team is now in the process of figuring out exactly how the Living Building Challenge will change their plans.

The project's lead designer, Al Tozer, owner of Tozer Design Studio, said the challenge demands that everyone involved in the project must take a hard look at every piece of material selected for the process with an eye to serious efficiency. The initial plans called for plenty of windows, but many of them could be replaced by walls in the final design to help prevent heat loss in the house. The square footage could have to be reduced or the angle of the roof changed to allow it to capture more sunlight.

“There's nothing that we won't look at,” he said. “Every water line, every plug has to be examined.”

Tozer said it's not clear yet if his team will be able to alter the existing plans enough to meet the requirements of the challenge or if they'll have to scrap everything and start over again. Either way, the adjustments will set the project back at least a month or two.

Chris Hart-Henderson, the owner of Heart Springs Landscape Design LLC, is heading up work on the project's landscaping and doing much of the planning work on the house's water system.

She's calculated how much rainfall Bend gets in an average year — about 10 inches — and how much of it can be captured on the roof of the house or from drainage that would usually flow into the city's storm water system. That water would be used again and again in a “graywater” system, where it is treated on-site and made available again for a variety of uses.

“The intention of graywater is to reutilize water that is going down the sink,” she said. “The idea is to take water, put it though some sort of treatment cleaning, whatever, that would allow it to be of adequate quality to reuse for something that does not need it to be drinkable — things like dishwashing water, sink water, washing machine water, hose water.”

It's not clear yet exactly how much more Elliott and Scott will have to spend, but it's clear that participating in the Living Building Challenge won't come without a cost.

Last fall, the couple estimated they'd probably spend about $350 per square foot, or about $1 million for the entire house. They don't know how much the per-foot cost will increase, but Elliott said the design budget — about 10 or 12 percent of the overall project budget — has already jumped by 20 percent.

At a recent meeting, the project's lead contractor estimated it could cost $15,000 to build a cistern for the water, largely because several feet of solid rock are beneath the site and would have to be blasted away.

Elliott and Scott say they're willing to spend more on a project they believe in, but they don't have an unlimited budget and know they might have to make some tough choices.

“I don't know if I'll be more at ease in our new home,” Scott said. “But I do believe that we can't go back now that we've learned about what's possible.”

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