

Green Bend home will catch the rain

By Rachael Rees / *The Bulletin*

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Editor's note: Tom Elliott and Barbara Scott invited The Bulletin to follow their efforts to build the ultimate green home in Bend, to document the project from start to finish. The structures are up and window and roof installation is scheduled to begin in the next few weeks. This installment focuses on the project's water, all of which must come from captured rain and snow, one of the requirements outlined in the Living Building Challenge, the standards being followed by Elliott, Scott and the builders.

While an average person in the U.S. uses 98 gallons of water each day, Tom Elliott and Barbara Scott will each strive to use only 30 gallons once they move into Desert Rain, the sustainable home they are building.

"Water use is always on your mind," Scott said, "and it should be in this climate."

From highly efficient faucets and toilets to a landscape with native vegetation, the Desert Rain project will use as little water as possible. The goal is for precipitation falling on the Northwest Shasta Place property to provide Elliott and Scott with enough water to live.

To meet the strict, no-impact standards of the Living Building Challenge, 100 percent of the couple's water must come from captured rain and snow, with one exception. The rules allow an initial purchase of water to fill up their 35,000-gallon cistern.

Because of Bend's dry climate and building and plumbing codes, the water system was one of the bigger challenges of the Desert Rain project, said Morgan Brown, president of Whole Water Systems.

Desert Rain pushed the limits of Oregon plumbing code requirements for collecting rainwater, he said.

"We were trying to make it work for the Oregon plumbing code and the Living Building Challenge," Brown said. "It was



Dean Guernsey / The Bulletin

Construction workers pour concrete April 10 to create a 35,000-gallon cistern that will store water for Barbara Scott and Tom Elliott's Bend home, called Desert Rain. "Water use is always on your mind," Scott said, "and it should be in this climate."



The Living Building Challenge

Like the Leadership in Energy and Environmental Design standards, the Living Building Challenge provides guidelines and requirements for constructing

an interesting dance to make sure we met both requirements and were still able to squeeze enough water out of the sky to make it through the dry season.”

Brown said his company's engineer gathered 20 years of data to determine both the average annual rainfall and the minimum amount over the time period.

The system is designed to support the couple's water usage during a year with only 7 inches of rainfall.

an environmentally friendly building.

The challenge, created by the International Living Future Institute, “defines the most advanced measure of sustainability in the built environment possible today,” according to the institute's website. It rests on seven areas, or petals: site, water, energy, health, materials, equity and beauty.

For more information, visit <https://ilbi.org/>.

To ensure enough water, Brown said, the design of the roof needed to include the appropriate surface area. The property also needed somewhere to store the water. Crews have been building a 35,000-gallon cistern, which will be located under the garage.

Then, Brown said, a filtration system had to be developed to make the water safe for drinking.

ML Vidas, the project's sustainability consultant, said the state allows rainwater collection, and Desert Rain is the first Central Oregon project approved to use captured rain for drinking water.

When collecting rainwater for potable purposes, Brown said, the building code mandates the use of a first-flush diverter, a system that flushes away the initial water that hits the roof and removes pollutants. But through discussions with the city and state, he said the project received approval without the diverter.

“We couldn't afford to lose the water we would lose with the first-flush diverter,” he said. “We designed a filtration system so we didn't need it.”

Brown said the design calls for an approved roofing material for potable rainwater collection that stops surface chemicals from leeching into the water.

The precipitation then runs off the roof into various gutters, equipped with screens to stop any debris. It then flows out the downspouts and into gravel filters.

Once the water travels through the gravel, it makes its way into the cistern, where it goes through one of two micron-filtration filters. It enters the second as it moves from one chamber of the cistern to the other. Finally, the water flows past ultraviolet light, which kills any harmful microorganisms.

Even with the cutting-edge rainwater system, Brown said Elliott and Scott will have to be very careful with their water usage to meet Living Building Challenge standards.

Elliott and Scott understand.

“We timed all our showers (and counted) how many times we flushed the toilet to calculate how much water we used,” Scott said. “I'm confident with a keen eye towards conservation, we'll have enough water.”

In addition to the main water system, highly efficient water-conservation fixtures will be used throughout the home.

Allyson Hamlik, Elliott and Scott's assistant for Desert Rain, said while a regular toilet uses 1.6 gallons per flush, the Desert Rain toilets will each use 0.8 gallons.

Chris Hart-Henderson, the Desert Rain landscape designer, said water from the cistern will not be used for irrigation. While Elliott and Scott will have to irrigate as needed during the first and second growing seasons, she said a combination of drought-tolerant and native plants will be used.

“The ultimate goal is to use the rainwater for domestic use,” Hart-Henderson said.

For Elliott, limiting his water use might force him to change his habits, but he won't be deprived.

It's the right thing to do, he said.

“When you run water through a home, you have to deal with it and the city has to deal with it,” Elliott said. “If all the homes were managing their water differently, we would have a much lower demand. We wouldn't need as much infrastructure to supply and treat the water.”

Phil Chang, program administrator for the Central Oregon Intergovernmental Council, said making homes that use water more efficiently is probably the single most important action residents can take to help preserve the Deschutes River basin.

“When we can find innovative ways like this to reduce the demand on our local streams and groundwater resources,” he said, “we leave more water to support fish, farms, and potential future residents.”

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