

Tried, True & Net Zero Too

Zero-Energy Plans,
Kirby Nagelhout Construction

Gold

Mitchell, Oregon
Custom/Demonstration Category, Cold Climate

The mission of the National Park Service (NPS) is to "preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations." It is no wonder, then, that when building a ranger's house at John Day Fossil Beds National Monument in Oregon, the NPS sought to create a functional and durable net-zero energy home that would serve park rangers for generations to come.

Net-zero energy was a mandate. Anything better would be a bonus.

The park service was off to a good start when it placed Ted Clifton of Zero-Energy Plans (ZEP) and president of 2011 ENR Remodeler of the Year,

Clifton View Homes, at the helm of the design team. Yes, all along, ZEP's objective was to exceed expectations without dramatically increasing cost. To accomplish this, Clifton stuck to "tried and true" approaches like SIPs construction, previously-proven slab insulation details, triple-pane windows, and a ductless mini-split heat pump.

When it came time to put the construction out for bid though, Washington-based Clifton's building company was never in the running. "We knew that federal government procurement regulations would prohibit us from bidding on the construction," Clifton said. Besides, he noted, "the site was more than seven hours from my office." Therefore, in the plans, ZEP thoroughly spelled out all construction materials, methods, and sequences. "We made sure, before [the plans] went out to bid, that every note or required detail was clear," Clifton explained.

When the construction contract was awarded to Kirby Nagelhout Construction based in Bend, Oregon, a unique partnership ensued. The project exemplified how, with the right mix of communication, detailed plans and scopes of work, and quality control mechanisms, carefully crafted plans can be well executed by a good contractor, even if the construction methods are unfamiliar.

According to Chris Prah, project manager at Kirby Nagelhout Construction, "The combination of great documentation, our experience and standard quality control procedures, and Clifton's vast SIP experience was critical to the project's success." Part of the success was also due to Clifton's two-day site visit at the start of the SIPs construction Prah noted, "It was very helpful to have [Clifton's] knowledge transferred to our personnel on site."



Vidaro drove on the site making challenging to position the house at the optimum solar orientation.

Besides the two-day site visit and the comprehensive construction documents, the team held weekly conference calls and occasional educational sessions with subs and the NPS project manager to maintain quality standards. As evidence of the successful coordination in this 1,000-sq-ft house, air leakage tested at 1.27 ACH50. As Clifton notes, "There are many experienced SIPs builders who would be quite happy with [that result]."

The noteworthy project execution resulted in a highly functional and energy-efficient final product with a HERS index of 44 without and -13 with renewable energy production. The compact design isn't fancy, but it provides everything a ranger needs to live comfortably and in alignment with the park service's philosophy. In fact, the 5.6-kW PV system produces enough electricity to power the home, the visitors' kiosk and restrooms, and the ranger's vehicle—often with a credit remaining from the electric company!



Glazer door beds done before drywall is installed helps seal door and its leaks.

