

Shelter Dynamics Arc House

Ridgecrest, CA

Architect	James Gregory/Shelter Dynamics
General Contractor	Shelter Dynamics
SPF Subcontractor	USI
Insulation System	Bayseal® Closed-Cell (CCX) SPF Insulation, Bayblock® coating
Completion	January 2016

Project Overview

The Arc House has been a demonstration home at several major trade shows. It features two major residential trends – off-grid living and tiny house construction. The wood structural support beams of the home are continuous, curved from the floor and up over the wall to form the roof. The home is 432 square feet. The home was designed and built using a systems approach to achieve maximum energy and water efficiency. With a sealed envelope, optimized insulation, and the addition of photovoltaic panels, the home is net-zero energy usage.

Challenge

The Shelter Dynamics Arc House is designed as a production home to be built at a production yard and transported to a final location upon completion. The unique design and shape of the pod required careful masking of uninsulated portions of the home, such as the beams, windows and doors. Spray quality and control also factored into the application, since an additional layer of plywood was formed on top of the spray foam. The envelope system had to be closely coordinated due to the number of different materials, and to ensure it would remain intact during transportation.

Solution

Due to the unique architectural style of framing with arched beams for the walls and roofs, USI applied 7,500 bd ft of closed-cell SPF to the walls and roof. Lateral framing over these beams holds curved polyiso boards, with another layer of framing on top of that. USI sprayed the closed-cell SPF directly onto the polyiso in between the framing. Bayblock® roof coating, a fluid-applied membrane, was used as the outermost material of the envelope.



Benefits

SPF was the perfect insulation to meet the precision install of this home's irregular shape. Combining polyiso board with approximately five inches of Bayseal® CCX SPF Insulation was a cost-effective solution to achieve an insulation value of R-40 and minimize air leakage. Since Bayblock® is a 100% acrylic coating, it is weatherproof and highly resistant to UV-degradation. It becomes fully adhered when applied and has negligible volatile organic compound (VOC) content. The light tan color specified meets EnergyStar reflectance criteria and creates a continuous, seamless coating around the entire home. The builder intends to develop this home into a production model that can be built for volume sales. Shelter Dynamics estimates starting prices on similar pod homes will be \$120,000 - \$140,000. The Shelter Dynamics Arc House model will allow people to own a small home rather than rent. If running at net zero energy usage, homeowners will realize substantial savings over time.





Savings vary. Find out why in the seller's fact sheet on R-values. Higher R-values mean greater insulating power. Actual savings may vary depending on type of home, weather conditions, occupant lifestyle, energy prices and other factors. No specific guaranty or warranty of energy or costs savings is being given and all such guaranties or warranties are expressly disclaimed.

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