

Sustainable Residence

Architects design home using a combination of prefabricated modular units and custom construction



PHOTOS: BRUCE DIMONTE

By Marcy Marro, Editor

Located 10 minutes from downtown Calistoga, Calif., in the Mayacamas Mountains between Sonoma and Napa, the owners envisioned a weekend retreat where they could build lasting memories with their children, entertain friends and enjoy the slower pace of wine country. Designed by Signum Architecture, St. Helena, Calif., the project capitalizes on the unique nature of the site and views, while respecting the land's character.

Nicknamed Downtempo for not only the visual rhythm of the house, but the sense of balance and retreat desired by the owners, the 4,911-square-foot residence is built using a combination of prefabricated modular units and custom construction.

Using a hybrid model of both prefab and site-built construction allowed the designers to push the architectural vocabulary of prefab construction beyond the expected, with a bold, new visual vocabulary. "We chose to work with a modular toolkit but pushed the limits of that toolkit to bring our custom residential detailing to the project," explains Jarrod Denton, principal-in-charge and partner, Signum Architecture. "The home has recessed pockets for shades, drop down projector and screen, large expanse of glass openings, home automation system, three zones for mechanical, flush baseboards, flush doors, and many of the custom elements we typically use with the custom homes we design. These elements are far less commonly used in prefabricated construction, so we pushed the visual envelope, but also what owners can come to expect from prefab design."

BUILDING SITE

Located on a large parcel of land, the building site is constrained by a pre-existing building envelope, stands of manzanitas and dense woodlands. Made up of two small knolls with a gentle swale in between, the site backs up to the woodlands with a creek running below and sweeping views in multiple directions. Views go down the valley in one direction, and in the other, the Pepperwood Preserve, a 3,000-acre nature preserve that includes the headwaters of three creeks that feed into the nearby Russian River.

By placing the home between the two knolls, Denton says it allowed them to create an indoor/outdoor environment that communed with the site rather than dominating it. "The central entry, directly aligned with the views of the preserve, opens to a custom-built living area, while private living areas enjoy up-valley views," he says. "A strong sense of horizontality and a

palette of wood-on-wood, punctuated with metal, relate to the wooded hillside behind the house."

HYBRID CONSTRUCTION

With a ratio of 80% prefab to 20% site-built construction, the building consists of six prefabricated modules downstairs and five upstairs. The modular units were supplied by Method Homes, Seattle, and once they arrived on-site were stitched together. The custom elements and parapet roof were then constructed on-site.

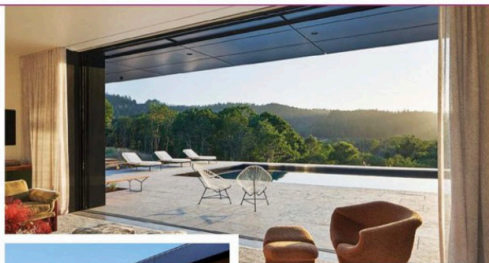
"Given the remote and delicate nature of the site, delivery and placement of the modules was carefully orchestrated," Denton says. "After delivery, the modules were stitched together, and the custom elements and parapet roof were constructed on-site. Conditioned, ventless attic space, highly fire-resistant materials and an emphasis on minimizing fuel near the home mitigate fire risk."

By doing site construction, the designers were able to achieve a taller living room that seamlessly flowed out to the rear terrace and pool deck, while enabling larger sliding door openings than would have been possible using only modular construction. The custom-constructed living room has a 10-foot, 6-inch door height, and pocket sliding exterior doors and screen into the wall to form a seamless transition to the terrace.

"This simply would not have been possible with modular construction," Denton adds. "The master suite has a 21-foot sliding door to align with the opening in the living room below, but since the master suite slider does not pocket into the wall, we were able to use a modular unit. The deck—with its raised pedestal pavers, integrated glass railing support and splayed walls—was not ideal for modular construction but early in the design we decided to build this on-site."

MATERIAL PALETTE

From the earliest sketches, Denton shares that one theme that continued to play out was the horizontality of the structure, and



Mitsubishi Chemical America—ALPOLIC Division, Chesapeake, Va., supplied its 4-mm ALPOLIC metal composite material (MCM) panels with a composite PE core and a two-coat Mica finish in TOB Black for the exterior framing.

"My goal was to keep the palette of materials to a minimum: cedar, Shou Sugi Ban and a black metal composite material," Denton shares. "The durability of the material, with its factory finish, was another important factor, as was the ability to have flush panels. It also was impressive to see that the materials could be used effectively at a residential scale."

the simplicity of working with just three exterior materials. "The palette of materials is purposefully restrained, primarily concrete, glass and wood. Siding on the modular units composed of stained cedar and Shou Sugi Ban, a traditional charred wood finish that resists insects and fire, framed with thick aluminum frames painted black."

"Using metal and charred wood as primary exterior finishes allowed us to effectively address the issue of fire resiliency, a critically important factor in the design of any structure in this wine country region," Denton adds.

On the front façade, Denton explains the ground floor is all black with cedar only appearing on the upper floor, and on the rear, the order is reversed with matte black aluminum banding providing continuity and a framework for the transition. "We then pulled the charred wood finishes into the dining area to create a strong connection between the exterior and interior," he adds.

HOLISTIC COMPOSITION

"We worked to temper the typically recognizable modular elements of a prefabricated house and create a seamless architectural expression," Denton says. "The limited palette of materials on the exterior—Shou Sugi Ban, cedar and thick perimeter boxed exterior finishes composed of black metal panels—as well as the use of steel beams to span the large openings and enable expanses of glass—all helped form a holistic composition."

A purposefully restrained palette of materials is set into black metal boxed frames. "We pulled the charred wood finishes into the dining area to create a strong connection between the exterior and interior," Denton says. "To keep the impact of the house as open and transparent as possible, a carport replaces the more traditional garage." **MI**

Downtempo, Calistoga, Calif.

Size: 4,911 square feet

Owner: Private client

Architect: Signum Architecture, St. Helena, Calif., signumarchitecture.com

General contractor/metal installer: Fairweather Associates, Santa Rosa, Calif., www.fairweather-assoc.com

Modular construction: Method Homes, Seattle, www.methodhomes.net

Metal wall panels: Mitsubishi Chemical America—ALPOLIC Division, Chesapeake, Va., www.alpolic-americas.com, Circle #16

PHOTO: BRUCE DAMONTE

FEASIBILITY STUDY

Due to the remote and delicate nature of the site, delivery and placement of the modules was carefully orchestrated, including a feasibility study of how to truck the modular units to the site from Washington state and orchestrate crane access.

MODULAR AND CUSTOM CONSTRUCTION

With a ratio of roughly 80% prefabricated to 20% site-built construction, six prefabricated modules were used for the downstairs and five for the upstairs.

MATERIAL PALETTE

A simple palette of three materials—cedar, Shou Sugi Ban and black metal composite panels—is purposefully restrained in the design.

HOME PLACEMENT

Placing the home between two knolls created an indoor/outdoor environment that communed with the site rather than dominating it.

ON-SITE CONSTRUCTION

After delivery, modules were stitched together, while the custom elements and parapet roof were constructed on-site.

FRAMED IN METAL

Thick aluminum frames surround the Shou Sugi Ban and cedar sections of the residence.

SHOU SUGI BAN

Shou Sugi Ban is a traditional charred wood finish that resists insects and fire.