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SEPTEMBER 2009 » RECENT PROJECT

The Precast Cabin

When it comes to log construction – especially with an eye toward energy savings – there's more than one way to say "timber."

Project: Cabin, Henry's Lake, ID

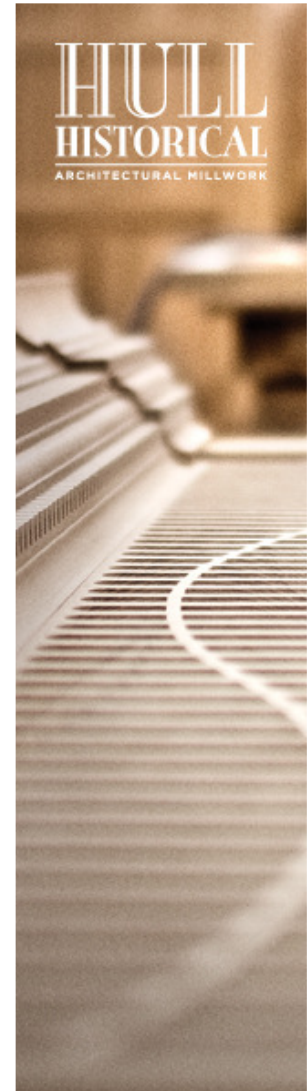
Architect: Buccellato Design, South Bend, IN; Aimee Buccellato, principal; Kevin Buccellato, principal

By Gordon Bock

Mention log buildings and most people imagine a primitive, pioneer dwelling of America's frontier past – think Abraham Lincoln's birthplace – or the oversized, hyper-rustic hunting retreats of Gilded Age business barons. Either way, the mental picture is neither particularly high-tech nor convenient. Suppose, though, it was possible to blend the best of timber's earthy ambiance and regional authenticity with 21st-century efficiency and sustainability. That's what the folks at Buccellato Design did in creating a lakeside residence in eastern Idaho that is as easy living and traditional as it is earth friendly and innovative.

Situated on Henry's Lake, a trout fisherman's paradise a dozen miles west of Yellowstone Park, the commission presented some interesting conditions for the husband-and-wife design firm of Aimee and Kevin Buccellato. First was the reality of the climate – beautiful but extreme, with short, intense summers bringing 90-degree days, but long and snow-filled winters. Others were the confines of a relatively narrow site, and a client who wanted easy access – minimum of stairs, living mostly on one level – yet the amenities to entertain regularly and comfortably. On top of this was a call to design a house architecturally consistent with the outdoor lifestyle heritage of the area while being both energy efficient and sustainable in construction. Horizontal log building – almost a neo-vernacular tradition in the area – filled the bill stylistically, but was vulnerable to gaps, drafts and insects. So when the architects and their client learned about a new product of man-made concrete timbers that assemble and look like hewn logs, the pieces of the project started to come together. "In our work, we believe that traditional methods are sustainable and durable because they're climate-responsive and borne out of what's locally available," says **Aimee Buccellato**. "With this house, we were able to fuse these methods with an emerging technology that actually extends the properties of the traditional materials."

Among a handful of residential structures built so far with the novel log material, the Henry's Lake house is a departure from stick building not only in construction, but also in the design





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process. In the **EverLog** system, the logs are reinforced, precast-concrete units that assemble Lincoln Log style to form a building. Each log is a sandwich of a four-in.-thick outer concrete section (cast to give a hewn timber appearance), two in. of insulation (for R19 rating) and a two-in.-thick inner section (formed flat to create a vertical surface). Rebar every 24 in. or so add vertical reinforcement, which is particularly important in seismically active terrain like the Yellowstone region. Once assembled, the logs are exterior-coated with a long-lasting paint to simulate wood, and furred out on the interior to accommodate services and then wall finishes. "The concrete logs are not only appropriate for the climate," says Aimee, "but also have better insulating qualities and resistance to rot and fire than wood."

Much like true traditional log buildings, the dimensions of the materials have a big influence on design. "The longest log the manufacturer can make is about 28 ft.," says Kevin, "so that sets a design module similar to the 8- or 16-ft. lengths of hand-cut logs. Though it's technically possible to splice the concrete logs, that's not something you see in traditional log construction, so we did our best to avoid splices."

"The longest straight run is on the side facing the lake, where we were able to break up the façade with a series of four French doors with transoms," adds Aimee.

Another learning curve was the formidable "front-loading" of the design. "Like many customizable products," says Kevin. "There's an extensive shop-drawing phase." As one might expect, it is very difficult to bore through an eight-in. concrete log section, so any penetrations have to be designed from the get-go. This includes locating every window and door opening, down to vents for a washer/dryer or a range hood – even electrical junction boxes. "There are two or three rounds of back-and-forth with the factory to catch all the details and minimize costs later in the project," says Kevin. "During the process, something always comes up that the product can't do but, conversely, maybe there's something we designers didn't realize that the product can do." After a final sign-off, the logs are cast exactly to the shop drawings.

The benefit of all the calculations and pre-construction becomes clear at the site. "Once the foundation is in and the logs are ready to be installed, the house pops up in about three days," says Kevin. "In fact, I think that was why the neighbors were so interested in this project, because there was nothing on the site on Monday, and by Friday there was a house."

"What constitutes traditional design in a region that was barely settled a century ago?" is an interesting question. Yellowstone Park was not open to cars until 1916, and modern-day Henry's Lake really came into being with the construction of a dam in 1924. Tourism and world-class trout fishing have been the major industries ever since and, coupled with ample lodgepole pine and Douglas fir in the region, helped foster a recreational style of architecture drawing upon log construction, stone masonry and a mix of rustic, bungalow and Tudor Revival influences. "We've both spent a lot of time in the Adirondacks visiting the great camps," says Kevin, "and I'd say they were our inspiration as much as local buildings and the National Park's lodges, which were modeled on the great camps and built in the same era."

An equally powerful design influence is the rugged weather – a shaper of all vernacular forms. "The Idaho climate really has informed our design in a lot of ways," says Aimee. "Snow – which averages 22 ft. a season – and ice dams are a big issue here, so you have to be very careful about how you design a

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roof, minimizing hips and valleys wherever possible. In this house the roof is a steep 10:12 to help shed water, and gutters, which tend to get ripped off in the first big snow, are eliminated." The ceiling of the large, open, living space in the main bar of the house is finished with V-jointed boards, and behind that, a cold roof installation using closed-cell Icynene insulation that helps avoid ice dams on the corrugated metal roof.

Traditional design is evident in the plan of the house and its interior layout as well – not as something consciously historical, but as a result of environmental needs and goals that are the same today as in the past. The building is, in effect, one large bar some 60 ft. long without jogs or major appendages. "The entire house is really one-room deep," says Aimee, "so it is very light and airy." Indeed, it is the unobstructed space with windows placed across from each other that promotes cross-ventilation with lake breezes and makes air conditioning unnecessary. "We really worked to align doors and windows and openings so that the house can be passively cooled and ventilated in the summer," says Aimee. By no coincidence, this is the same configuration seen in many summer houses of the pre-air-conditioning era of the early-20th century. Other passive cooling features, such as the deep porch overhangs and the orientation of windows, keep solar gain in check in the summer when the sun is high. The high-tech logs themselves are an added factor. "The concrete has very high thermal mass and acts almost like adobe," says Aimee, "keeping the house very cool in the summer while, in the daytime, collecting heat that it transmits to the interior in the evening."

Hand-in-hand with this straightforward geometry is the room layout – basically a large, open, multifunction space that flows from a kitchen on one end, to a dining/living area ending in a fireplace, to a master bedroom on the other end. "We tried to keep the parti very compact, with the main bar for living and entertaining, says Aimee. "The clients can fulfill everyday needs all on one level if they so choose." Not only does this efficient, open layout meet the client's lifestyle, it also makes sense environmentally. "It's not going to be a very sustainable house if you have to heat a lot of excess space," adds Aimee.

The major exception from the single-bar layout is the garage ell, connected to one end of the house by a breezeway. The second floor houses a suite of two guest bedrooms and a bath and sitting room that, occupying its own heat zone, can be shut down when not occupied.

Where the house departs from traditional interiors, log or otherwise, is in the large, open volume of the interior. "In true log construction you often don't get huge internal spaces, but in this house, the roof is supported by wood trusses that make such spans possible," says Kevin. With walls that run 14 ft. high from floor to roof-plate level, the Buccellatos were aware that such an unobstructed volume could become cavernous and out of scale with an otherwise cabin-like house, so they incorporated a seven-ft.-high board-and-batten wainscot. "It breaks up that vertical run," says Aimee, "making a very large and lofty room feel humane and comfortable; it's also painted a deep green that adds a sense of being grounded." That's a fitting impression for a house that does a lot to tread lightly upon the earth. ■

Gordon Bock, longtime editor of Old-House Journal magazine, is a writer, architectural historian, lecturer and technical consultant who comments on historic buildings at www.bocktalk.com.

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