Net Zero–Ready Community

High-performance, affordable homes characterize this modern pocket neighborhood

BY SEAN GROOM

The natural beauty of Grand Teton National Park has long drawn people to Wyoming. Over time, visitors to the Jackson Hole Valley area have shifted their focus away from hunting and trapping and toward pursuits like skiing, rock climbing, and fly fishing. The allure of the setting and lifestyle has spread beyond nature enthusiasts to include hedge-fund managers and Hollywood producers. This influx has ratcheted up the cost of living for people in the city of Jackson and the surrounding communities.

Climbing real estate prices are creeping across the border to Idaho's Teton Valley. A group of small towns—including Victor and Driggs—on the western slope of the Teton Range are separated from Jackson by 25 miles and an 8431-ft. mountain pass. Survey data collected from the Western Yellowstone region's Housing Needs Assessment shows high housing costs have impacted three-quarters of Victor's households, which has made affordable housing a concern.

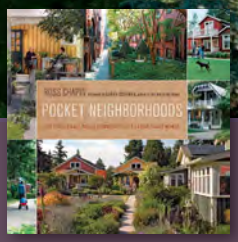
Neither Victor nor Driggs has an affordable housing authority, but a few years ago, the zoning board changed the rules to allow "cottage courts" in some parts of those towns. The cottage courts—also referred to as "pocket neighborhoods" (see sidebar, facing page)—are a way to allow high-density development of small homes. The first such development was designed with the aesthetic sensibility of a trailer park, making it unpopular with neighboring residents. The public backlash resulted in the temporary elimination of the zoning category—highlighting the importance of good design to help towns embrace unconventional ideas for new housing.

Increasing density

Despite the inaugural failure, a local developer liked the idea of cottage courts. Higher-density development uses resources more efficiently, reduces costs, and helps maintain a profit margin while

lowering purchasing costs for homeowners. The developer got approval for a six-house neighborhood by subdividing two undeveloped lots in an existing neighborhood. With the permit approved, he approached Lindsey Love and Lindsay Schack of Love Schack Architecture to design a small pocket neighborhood. They devised a plan for a group of modest, high-performance houses that rely on a common footprint for efficient construction. The schedule was such that a new house was started every two to three weeks, and the trades moved sequentially from project to project over the nine months it took to finish the houses.

Love Schack's design convinced the zoning board to reconsider this type of development, which has since become permissible—albeit with a more stringent design review process than was conducted the first time around. Since the neighborhood—christened Cloverleaf Cottage Court—was completed, the firm has been approached by



What are pocket neighborhoods?

What defines a pocket neighborhood is its orientation around a common space, whether it be a community garden, picnic area, courtyard, or the like. The term was coined in the mid 1990s by architect Ross Chapin, author of *Pocket Neighborhoods* (The Taunton Press, 2012). According to Chapin, the ideal pocket neighborhood comprises six to 16 households—sometimes clustered into a few groups—located within a larger neighborhood context. The concept evolved in response to the fact that over 60% of the housing stock in most communities has just one or two occupants, yet the primary housing option is a family-size standalone house. Conversely, pocket neighborhoods accommodate diverse occupant needs. Houses are closely nestled together, which makes creating privacy key. In Chapin's houses there are no windows looking into a neighboring house, and he uses structure and plantings to transition between one's own home and the active shared spaces.

other developers about using this design concept, which means more pocket neighborhoods are likely to be added to the area.

Driving the aesthetic

One of the first design challenges the duo faced was the exterior volume. There is market demand in Teton Valley for smaller, more modern homes, but the reality of the cold climate and heavy annual snowfall demands structures that perform well in harsh weather. And, of course, the houses needed to be built relatively inexpensively. Flat roofs and cubist shapes were not going to work on either count. A less-expensive shed roof, however, would deal appropriately with snow and moisture and also allow for substantial light and ventilation on the high-side elevation. This shape also balances the openness of the living room and kitchen with more sheltered space that works for bedrooms, bathrooms, and a utility room.

Simple rectangles can be beautiful, but it's critical to get the proportions right, especially with small 1140-sq.-ft to 1500-sq.-ft. structures. The first drawings of the single-story houses were too narrow and suggested mobile homes. Casting an eye toward local farm buildings, Love Schack decided on a steeper roof and clerestory windows. By playing with alternating roof pitches, they broke up the long volume and added space for solar panels. As they homed in on the right proportions, the designers had to keep in mind how the general shape could be expanded or modified—to add architectural interest and/or an additional bedroom without changing the essential construction for the builder.

Materials such as heavy timber and stone, made popular by the oversize lodges common in the region's luxury market, were out of reach financially and inappropriate for the scale of the houses. But rough-sawn wood and metal cladding link back to the vernacular agricultural buildings the designers referenced for the rooflines. "Form followed function explicitly," says Love. "Those simple volumes are inspirational and relatable—even today, and especially in places with that heritage."

Balancing community and privacy

Building in close quarters is a balancing act between private spaces and communal areas. The largest swath of shared space in this neighborhood is located at the back of

A PLAN FOR COLD CLIMATES

Typically, driveways (and hence, vehicles) are kept to the periphery in a pocket neighborhood—but with 110 in. of annual snowfall in Victor, the designers knew the houses had to have attached garages and nearby parking spaces for the winter months. To accommodate the climate, they routed driveways between the houses and designated spaces for piling snow. To retain the communal focus, they kept the central grassy common area free of vehicles.

Special considerations. *Roofs, driveways, porches, and the landscape were driving design factors. The houses and infrastructure needed to perform in cold-climate conditions as well as foster neighborliness.*

Site plan: Patrick Welsh

"Engaging all of the trades and asking for their input made for a better house than any one of us could have created individually."

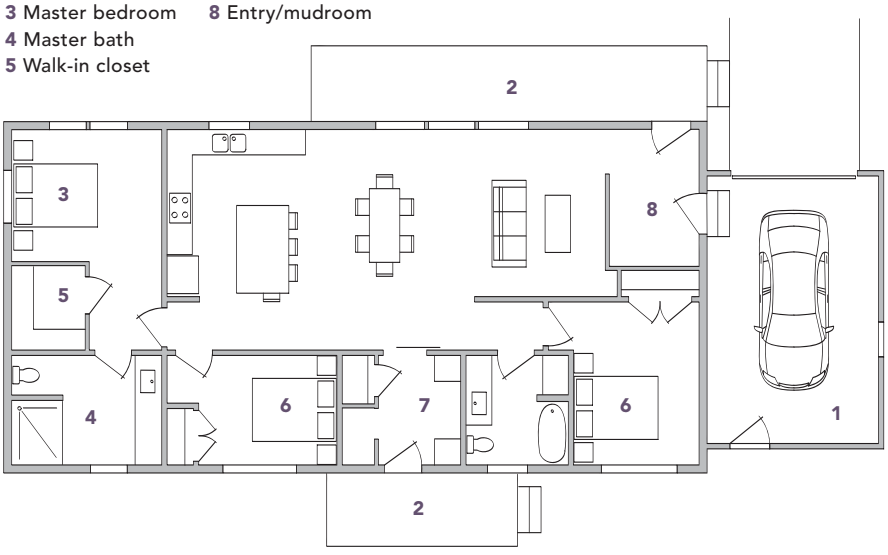
—BRADY BARKDULL, BUILDER

Passive strategies. *House orientation and window placement help to control daylighting and solar heat gain, and the open-concept floor plan optimizes the spread of natural light.*

EFFICIENT LIVING

The build was kept simple, from the single-floor plans to the economical finishes. The high-performance building envelopes are the most complex part of the project, and include double-stud 8¼-in.-thick walls. Shown here is one of three floor plans derived from a base model.

1 Garage
2 Patio
3 Master bedroom
4 Master bath
5 Walk-in closet
6 Bedroom
7 Laundry
8 Entry/mudroom



Floor-plan drawing: Patrick Welsh. Drawing facing page: Martha Garstang Hill.

Base plan. *This semi-custom structure features key components of all six houses. Each has a shed roof, an attached garage, wood screening, a combination of metal and clapboard siding, drought-tolerant foundation plantings, and at least one outdoor living space.*

the property between the houses and a river. Love Schack's intention was for the residents to use this space and the areas around their houses for gardening.

All of the houses have at least one porch or patio—four of the houses have two. When this outdoor space is on the east or west elevation, it's covered to control solar gain. The porches run the length of the house and face the shared driveways and adjacent house, so while they are sheltered, they also encourage neighborliness. Screening near the front doors adds a layer of privacy by limiting views through the entry sequence.

Making modifications

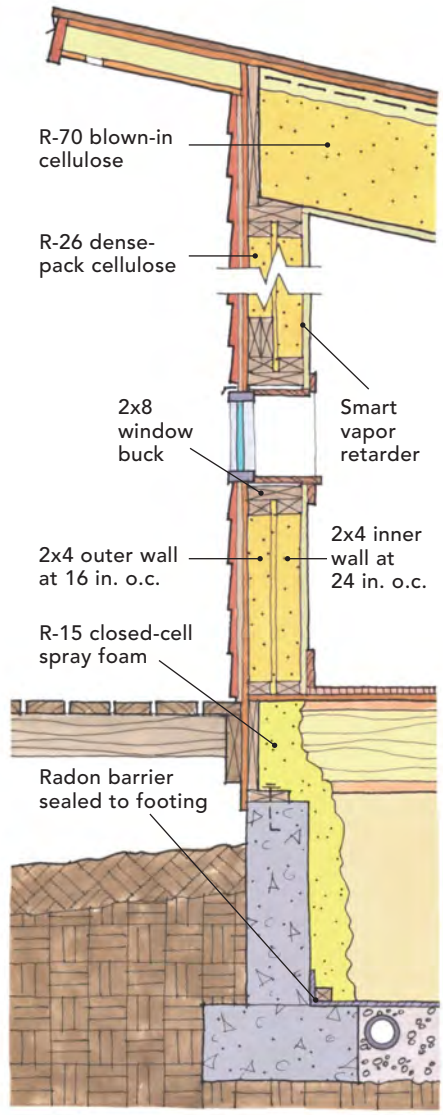
Part of Love Schack's intent was to design houses of various sizes that could be easily replicated in future net-zero neighborhoods. The structures are based on a 1140-sq.-ft. two-bedroom plan with an attached garage. All have an open space for the kitchen, eating area, and family room, and they can be modified in several ways. The garage, for example, can be placed on either the short or the long side, and the house can have one or two patios. The footprints of two of the houses were stretched to add a third bedroom; one gained 336 sq. ft., the other grew by 375 sq. ft. By tweaking different components of the base plan, the designers ended up with three different floor plans—all of which are efficient to build.

Tight envelopes and affordability

With offices in Driggs, Idaho, and Bozeman, Montana, Love Schack has been working to raise the bar for high-performance houses in these regions by hosting trainings that include Passive House courses. For Cloverleaf Cottage Court, they received certification through the Department of Energy's (DOE) Zero Energy Ready Homes program. Typically a qualifying house is roughly 50% more energy efficient than a code-minimum house. A builder can meet the standards through either a prescriptive path or a performance path.

For this project, Love Schack designed all-electric houses with tight envelopes for a few reasons. First, doing so was a wise use of resources. Second, there's an inherent global-warming-potential reduction when building this way. And third, as operating costs are critical, energy-efficient strategies must be part of building affordable homes. Energy modeling indicates that owners should be able to make these homes net-zero with a PV array for about $4000, which is roughly $20 per month when wrapped into a 30-year mortgage. Clearly, the team has hit multiple target points en route to their goal of developing affordable, energy-smart housing for locals. □

Sean Groom is a contributing editor.
Photos by Aaron Kraft.



COLLABORATION IMPROVES PERFORMANCE

Love Schack brought the builder and the mechanical team into the project during the design phase—a move that promoted efficiencies during construction and helped meet house-performance goals. One change that came out of these early meetings was the design of the window bucks, which are inserted into the rough openings of the double-stud walls to attach the windows. They were originally planned as plywood, but during the design review, it became clear that 2x8 bucks were a better option because they offer solid backing for nailing the window flanges.