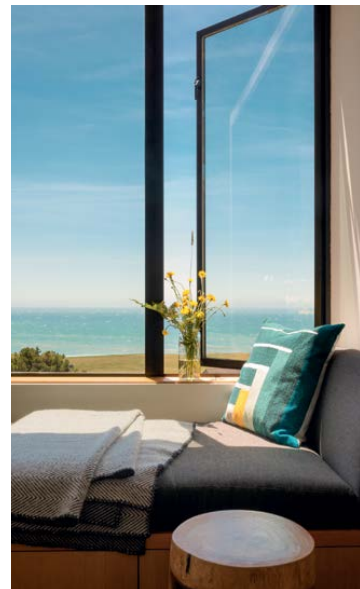


**SMALLER, ENVIRONMENTALLY-FRIENDLY HOMES—
FOR PEOPLE WHO VALUE EXPERIENCES MORE THAN STUFF**
Twenty-six houses provide inspiration for new builds, remodels, and ADUs.



Sheri Koones is an award-winning author and a recognized authority on home construction. She is the author of nine books on sustainable building, and a freelance writer and speaker.



Jacketless Hardcover
8 1/2 x 11 in, 224 Pages
200 Color Photographs
Pub Date: March 2022

\$35.00 U.S.

ISBN 978-1-4236-5845-0



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KOONES

BIGGER THAN TINY, SMALLER THAN AVERAGE

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SMALLER THAN AVERAGE



SHERI KOONES



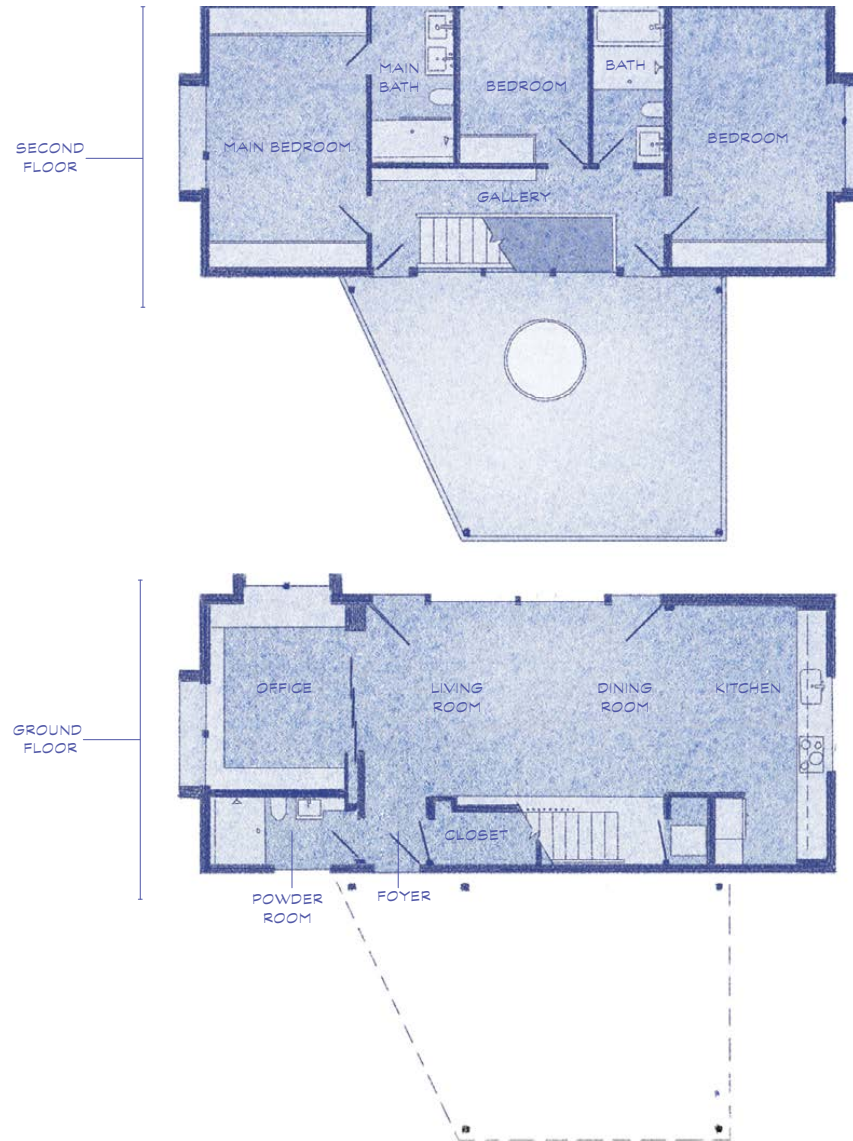
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PASSIVE HOUSE LA

SITE BUILT



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www.luxuryhomesphotography.com

ARCHITECT
Christopher Kienapfel
PARAVANT Architects
www.paravantarchitects.com
www.passivehousela.com

GENERAL CONTRACTOR
Guillermo Delgadillo and team

CERTIFIERS
CertiPHiers, Tad Everhart, CPHD/C
Silvia Wallis, CPHD/C

SIZE
1,750 square feet

LOCATION
Culver City, California

Opposite: The exterior of the house has standing seam metal siding (which is roofing material). A carport houses the electric car, the charging station (see page 19), and the battery that stores excess energy. The windows allow in natural lighting and solar gain in the cooler months. The most distinctive exterior feature is the fencing over the carport, which screens the sun and offers additional privacy.

Architect Christopher Kienapfel from PARAVANT Architects/Passive House LA wanted to build a home for his family as well as create a model to highlight the strategies of International Passive House construction that he had been exposed to as an architectural student in Germany. When he began working in California, he tried several times to complete projects using the Passive House (PH) standard, but those projects did not materialize.





Above: The exterior venetian blinds provide privacy and help block the sun during the warmer months when shade is required while also allowing in light and giving the occupants the ability to see out.

FUTURE PH PROJECTS

Kienapfel is currently working on other Passive House projects for his clients in Southern California and Australia at his architectural practice. He points out that although they are PHs, each of them is different and personalized to the occupants' needs, lifestyle, and design preferences. He sees a significant increase in interest and momentum in the International Passive House Construction Standard.

EXTERIOR VENETIAN BLINDS

Although these blinds are not yet popular in the US, Europeans have been using them for more than sixty years. These aluminum blinds help to keep the interior of the house more comfortable than is possible with interior ones. The blinds allow the house to receive natural light and see the view even when the blinds are tilted to block the sun. According to Cyril Petit of CPHBA, dealer of WAREMA, the supplier of the blinds on the Passive House LA, simulations prove that venetian blinds are three times more efficient on the outside than on the inside of the house in reducing solar gain.

The blinds can be operated manually but most are motorized and connected to a smart home automation system. They are synced to a weather station usually installed on top of the roof that has a full view of the sky and is equipped with sensors collecting all necessary information—outdoor temperature, rain, brightness of the sky, wind direction and speed, and the position of the house (GPS). The indoor temperature is also measured, using another sensor often inside the control panel, depending on the system being

used. The program can automatically adjust the position of the blinds and the angle of the slats to keep the maximum natural light inside the home while preventing heat from coming in. During colder weather, the homeowner can set a comfort level with the system so the blinds will raise or orient their slats to let the sun pass through the windows and heat the room. When the comfort temperature inside the house is reached, the blinds go back down.

In freezing weather, below 32° F (0° C), ice may block the blinds and the system will send out an alert and not allow the blinds to move. The owner can cancel the alert when it is safe for the blinds to work as usual. With the slats closed during the night, an air cushion is created between the curtain and the glass that reduces energy loss. During strong winds the system will automatically raise the blinds to keep the slats from hitting the windows.

These blinds are available in fifty colors (with custom colors available) and three different finishes: satin finish, matte, or fine textured. For more information about these blinds check the website www.cphba.com

BOHICKET HOME

PREFABRICATED STEEL FRAME AND PANELS

PHOTOGRAPHER

Tripp Smith
www.trippsmithphotography.com, unless
otherwise noted

ARCHITECT

Woollen Studio Architecture + Design
www.woollenstudio.com

MANUFACTURER

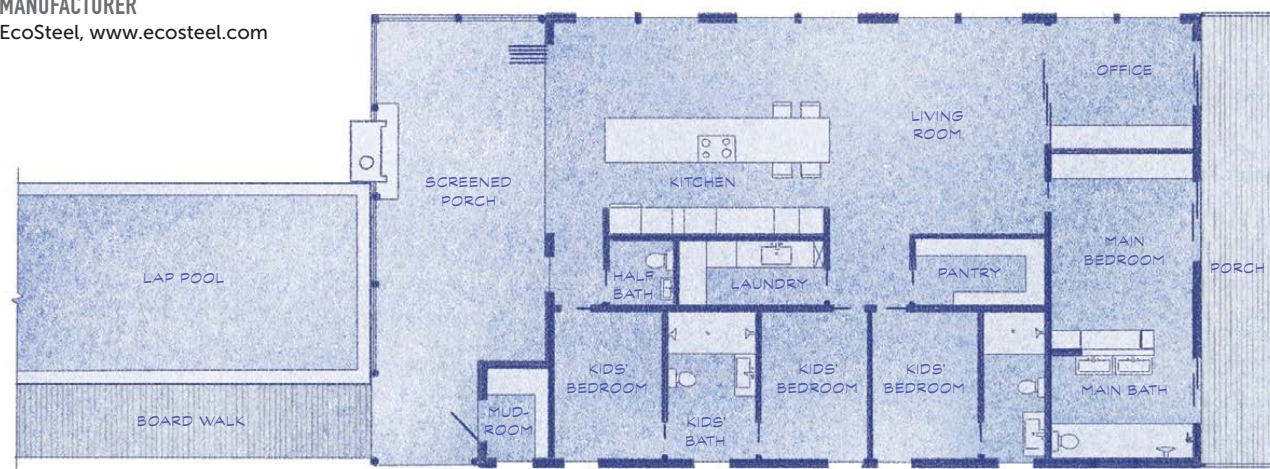
EcoSteel, www.ecosteel.com

SIZE

1,800 square feet
(680 square foot ADU)

LOCATION

Johns Island, South Carolina



Opposite: The lap pool was added when the house was completed. It is between the main house and the ADU. The dock can be seen going to the river where the family goes to fish. (Photo courtesy of the owner.)

After seven years of living in a one bedroom, two-bath, 800-square-foot beach villa on Seabrook Island, this family of five needed more space. They bought an eight-and-a-half-acre riverfront property on the Bohicket River on Johns Island with beautiful water views. They had many ideas of how their new house should be built. Having lived in a very small space previously, they were well aware of the size of rooms they needed, and how they could avoid wasted space.

In this very traditional neighborhood, they opted to build a very modern and minimal house. In this area where many residents build large homes, they choose to build a far smaller one. They also decided to build the house with nontraditional building materials that would be perfect for this property close to the water. The house was designed with large windows encompassing seventy percent of the walls so the family could have outside views from everywhere in the house. Ninety percent of the furniture is built-in to save space.



BUILDING A HURRICANE AND EARTHQUAKE RESISTANT HOME

The steel construction was a perfect solution for providing a durable, safe home that is flood and hurricane resistant. By building with steel, which can support strong wind loads, they were able to have large, impact-rated glass windows to provide magnificent views of the Kiawah River. These strong windows are transparent barriers protecting them from the elements no matter what weather conditions occur.

The house is built on concrete pilings to keep it above water in this marsh area and lift it up to provide excellent views. The twelve-foot ceilings and exposed steel beams support the wind loads and add to the interesting modern look of the house. The family of five moved in just days before Hurricane Florence hit their area in September

2018. They chose to shelter in place, and their modern steel home came through unscathed.

The house was built to be as independent as possible with a backup generator for emergencies and a shallow well system. The water is purified and oxygenated, supplying all the water needs for the house. Photovoltaic panels on the EcoSteel standing seam roof panels provide most of their electrical needs. The family is also able to provide for much of their food supply with their vast garden, eggs from a multitude of free-range chickens, fish from the river, and an apple orchard on their property.

The owners say the best things about their home are the simplicity, the multitude of windows, and its open and welcoming features. After the couple completed the house, they added a lap pool, with a black pearl pebble finish to reflect the sky and match the nearby river water.



Above: The main house is close to the ADU, which is used as a schoolhouse for the couple's three children and a guest house. Both structures are on concrete pilings to keep them above rising water.

PREFABRICATED STEEL STRUCTURES

Steel is used for home construction instead of wood because it is stronger, it can span larger spaces without requiring load-bearing walls in between, and it doesn't shrink, warp, or twist. A large percentage of steel can be recycled, and the parts can be recycled again when the structure is at the end of its life, making it a greener material. Additional advantages to using steel are its resistance to mold, rot, termites, and fire. Because steel doesn't have to be treated for insects, it also creates a healthier indoor space. When building with steel, construction time, waste, and labor costs are all reduced, and steel requires minimal maintenance. EcoSteel, the manufacturer of the Bohicket House, says the house was built with a custom-engineered structural steel frame and wrapped with an insulated roof and high-performance insulated wall panels. The prefabricated components arrived at the site ready for assembly and then all parts and pieces were bolted together like an erector set. EcoSteel's systems meet or exceed

local building codes while resisting earthquakes, hurricanes, floods, and wildfires. Their systems have been used in California, which has been devastated by wildfires, and in coastal regions such as South Carolina's coastal barrier islands, where the Bohicket house is located. Their systems are engineered to secure the interior's climate regardless of exterior weather conditions.



Above: The frame was installed atop the pilings prior to the insulation and metal panels. (Photo courtesy of EcoSteel.)

M'S HOUSE

SITE BUILT

PHOTOGRAPHER

David Paul Bayles
www.davidpaulbayles.com, unless
otherwise noted

ARCHITECT

Studio.e Architecture
www.studioearchitecture.com

BUILDER

Stonewood Construction
www.stonewoodconstruction.com

STRUCTURAL ENGINEER

Mortier Ang Engineers
www.mortierang.com

LANDSCAPE ARCHITECTURE

Lovinger Robertson Landscape Architects
www.lovingerrobertson.com

SIZE

1,268 square feet

LOCATION

Eugene, Oregon



Melinda Bruce was looking to downsize from the home she had lived in for thirty years. She wanted a small, single-story, forever-designed home. It had to have open interiors that afforded lots of light, plenty of wall space for her artwork, and a kitchen large enough to indulge her love of cooking and entertaining. Vast space was less important than comfort and good design.



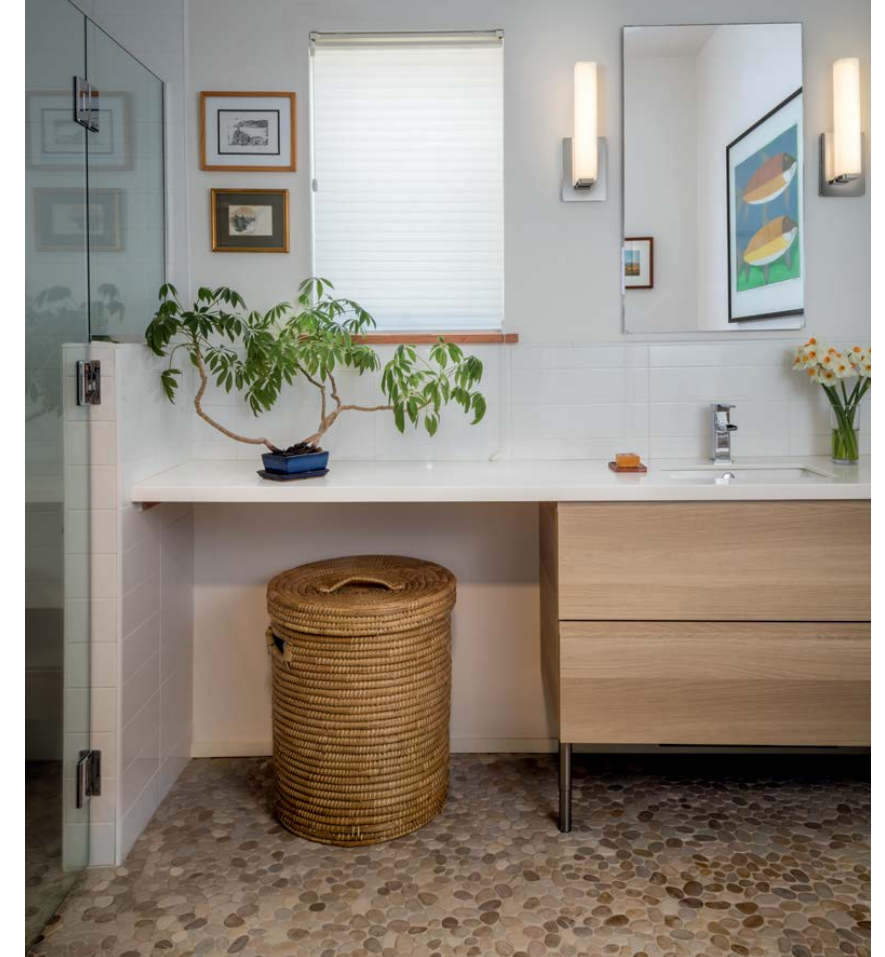
Above: The exterior of the house has fiber cement siding, which is long lasting and low maintenance. (Photo courtesy of Aaron Montoya, www.themontoyacollective.com.)



Opposite: The open space has a multitude of windows and doors for natural lighting and ventilation. The fireplace is a modern gas inset.

Right: The bathroom combines affordable IKEA casework with a solid surface countertop and LED sconce lights for a clean and modern aesthetic.

Below: The house is open concept with all the living areas open to each other, allowing the transfer of heat and ventilation. The flooring is highly sustainable stranded bamboo engineered hardwood.



GREEN FEATURES

- Stormwater filtration planter
- Highly durable fiber cement siding
- Low-flow faucets and shower
- Siding installed as a ventilated rainscreen to promote durability of the building envelope

ENERGY FEATURES

- Multiple insulation layers on walls, roof, and floor
- Heat recovery ventilator
- High-efficiency ductless mini-split heat pump
- On-demand gas water heater
- ENERGY STAR appliances
- LED lighting
- Large window overhangs

FINDING JUST THE RIGHT PLACE TO LIVE

Bruce was unable to find just the right place until she came across a new townhouse development under construction in a neighborhood near her home. She liked the design and neighborhood although she didn't want a townhouse or a multistory home. She approached the on-site contractor and told him what she was looking for. He and his development partners were in negotiation on a nearby property that would accommodate three small, single-family houses adjacent to another of their townhouse projects. That sounded exactly what Bruce was looking for. When the lots were available, she purchased the middle lot which looked onto, but was not a part of, the townhouse common area. This location was ideal because she wanted to be in a developed area where she would not be isolated. She asked Jan Fillingner, a principal architect at Studio.e Architecture working on the two developments, to design her home. He designed the house to be compatible with the nearby townhouses and offered Bruce the opportunity to be part of that community.





GREEN FEATURES

- Metal roofing with recycled material
- Natural materials
- Fiber cement siding
- Quartz countertops

ENERGY FEATURES

- Hydronic in-floor radiant heat
- Concrete floors
- Energy recovery ventilator (ERV)
- Structural insulated panels (SIPs)
- High performance windows
- Powered blinds
- Clerestory windows

Above: Kitchen appliances are all ENERGY STAR rated and the countertops are quartz, a highly sustainable material.

BUILDING PREFAB

The couple specifically wanted to build the house with prefab construction as long as they had the flexibility to customize the house to their needs. FabCab was happy to work with the homeowners to personalize it and they designed the house to be one level for accessibility since the couple wanted this to be their forever home. The couple also wanted lots of storage, an open concept, connection to outdoors in all seasons, and accessible routes between the garage, the home, and the ADU.

Because the connection to the exterior and the beautiful views was so important, the house has a bifold door system (see sidebar on page 195) which opens most of the southwest side of the house and leads to the covered patio.

DESIGNING THE HOUSE TO FEEL LARGER

To make the house feel more spacious, the architects designed the house with an open floor plan, soaring vaulted ceilings, flexible spaces, and ample daylighting. The bifold doors vastly extend the living space with almost no separation between the interior and exterior when the doors are open. The outdoor living spaces extend the living area with several outdoor areas, such as the firepit and bocce court.



Above: The timber frame construction can be seen throughout the living area. The sweeping ceiling elevated to the rear of the house creates a more expansive space and allows for added light into the house via clerestory windows.

Below, left: Stunning Padilla Bay can be seen from the front door through the interior to the glass bifold doors on the other side of the house.

Below, right: The small breakfast nook off the kitchen is light filled with three sides of windows, and is in addition to the dining area between the kitchen and living room.





BUILDING THE HOUSE TO BE ENERGY EFFICIENT

Every effort was made to make the house as energy efficient as possible. The concrete floors add thermal mass for passive solar gain, as well as adding an aesthetically pleasing and low maintenance feature to the home. The concrete floors also do not scratch, an additional bonus since

there are pets in the house. In-floor radiant heat uses less energy than many other types of systems and provides an even, comfortable heating. The mini-split units, mainly for air-conditioning, can also provide supplemental quick heat, if the radiant system is ever turned off. The energy recovery ventilator (ERV) keeps the air healthy in the house while also conserving energy.

Above: Floor-to-ceiling windows can be seen in the rear of both the house and the ADU. There are several seating areas in the exterior to expand the space of the house. The extended roofline protects the house and controls the sunlight and solar gain in both summer and winter.