

# how it works

## The structure

Anchored to its side-stacked concrete-block foundation system, the 1,000-square-foot house stands strong while minimizing its impact on the site. Sim[PLY], the structural framework of Indigo Pine, uses standard sheets of plywood cut by a CNC router into a system of specially designed framing members that fit together like a puzzle and are secured with stainless steel zip ties.

## The envelope

Indigo Pine is wrapped in aluminum composite material (ACM) siding. CNC-cut from standard sheet sizes, the self-aligning ACM pieces are folded to create an air cavity that allows heat passing through the façade to be vented out before it radiates into the interior of the house. Panels are screwed to the exterior sheathing and can be easily touched up or replaced, if necessary.

## The photovoltaic [PV] system

Designed to be installed by a pair of unskilled workers, Indigo Pine's photovoltaic system, which utilizes affordable, lightweight solar panels and micro-inverters, powers all electrical devices of the house, including lighting, the water heater, all home appliances and entertainment systems, as well as an electric vehicle charging station. The system is designed to provide both DC and AC electrical power to optimum efficiency and can produce sustainable energy for the larger electrical grid through net metering.

## The HVAC system

Using low-tech solutions to increase the efficiency of existing technology, Indigo Pine's multifunctional foundation, made with concrete blocks called CMUs, pulls unconditioned air under the house, precooling it in the summer and preheating it in the winter before it enters the HVAC system. As a result, overall efficiency is increased. Once mechanically cooled or heated, the air is ready to condition the interior spaces. An integrated control system and manually controlled dampers allow occupants to monitor indoor temperature and to control airflow distribution throughout the multiple zones of the house for comfort.

Illustration by Will Hinkley

[www.clemson.edu/indigopine/](http://www.clemson.edu/indigopine/)

