



Stefano Paltera / For The Times

Designer Jennifer Siegal holds a structurally insulated panel, or SIP, in front of her prefab SwellHouse in Venice.

THE HOUSE

SwellHouse: Building by numbers

Using insulated 'building blocks' and a meticulously plotted design, Jennifer Siegal can eliminate waste in construction.

By Jeff Spurrier, Special to The Times
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IF Jennifer Siegal has her way, new homes won't be constructed anymore. They'll be *installed*.

That's the philosophy behind her recently completed Venice SwellHouse, a 3,130-square-foot, two-story residence assembled out of prefabricated structural insulated panels, or SIPs. The panels forming the walls, floors and ceilings were trucked in pre-cut, cored for

wiring or plumbing, and numbered -- ready to be snapped together and attached to the steel frame.



Open plan

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"It's more like a jigsaw puzzle than Lego," says Siegal, who founded the Office of Mobile Design and has long received attention for her prefab work. The building is a spinoff of her SwellHouse design created for a Dwell magazine contest a few years ago. "I had been working in prefab but more with steel boxes that were built in a factory and brought in. Here I was looking for a system with a kit of parts, component pieces."



Building block

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The components in this case turned out to be SIPs, 12-by-12-foot panels of foam core sandwiched between oriented stand board, or OSB, that emitted no volatile organic compounds. Assembly was startlingly fast and resulted in about one-third less materials waste; a reduced threat of mold growth in exterior walls; and an enviable R-value, the thermal signature of the structure's skin, helping the structure to stay cool in summer and warm in winter.

There was no need for joists, studs or insulation. SIPs also provided soundproofing, a factor important to the owner, a music producer.



The bedroom

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"Depending on how tricked out you wanted a house -- your finishes and details -- you could assemble a house in a week," Siegal says.

That's if you have the permits.

Although SIPs have been around since the 1930s, the Venice SwellHouse represents the first time the panels have been permitted for residential use in Los Angeles, Siegal says. Getting the building and safety department to

sign off on their residential use added a few months to the timeline. One of the first plan checkers told Siegal that he would "never" permit SIPs as a building material. "You should be building this out of wood 2-by-6s," she remembers him saying disapprovingly.

"When someone is introducing something new to you -- a food or even a style of clothing -- you have to open your mind," she says. "It's always this way with a prototype."

The contractor, Hinerfeld-Ward, also had to be brought up to speed on the proper way to snap together the panels' male-female connectors. It took a crew of five about three days to put up the walls and ceilings.

The construction materials for the house consist primarily of steel, glass, concrete and SIPs manufactured by Premier Panels of Phoenix. Inside, the space is white-on-white, with color accents coming from Brazilian cherry stairs, ipe wood decks and exposed beams of glulam, small timbers that have been glued together and laminated. Steel I-beams also are exposed, their heft balanced with floor-to-ceiling doubled-paned windows.

Split into two structures with a courtyard in between, the open-plan design feels loft-like, with 12-foot-high ceilings. Glass doors slide open to provide passive cooling, courtesy of ocean breezes. In winter, the radiant tube system in the concrete floor will keep the temperature comfortable.

The house was designed on a 12-foot-square grid system: The front house is 24 feet by 36 feet, and the rear structure, a garage and recording studio, is 24 by 24. Siegal says the configuration was developed with carbon footprints in mind -- not only from the materials used in construction but also the transportation required to bring all the pieces together.

"When you're moving something down the road, the greatest width allowed in California is 16 feet," she says. "Twelve feet is not oversized, and since everything was in this 12-by-12-by-12 module, then we could move it down the road without any extra costs and do it more efficiently."

In the design stage, she says, there was no guessing about how much material was needed. Channels for pipes and wiring were plotted out ahead of time and cut in the factory.

"I know how every square inch of SIPs gets used," she says. "There's no waste. On a typical construction site, about 30% of material gets tossed into the dumpster. When I'm ordering the panels, I know exactly the dimensions."

Siegal puts the price of construction in the ballpark of \$300 per square foot, which isn't outrageous but certainly isn't cheap. And once the design has been approved, clients cannot change their minds.

"It's set in stone," Siegal says, "or actually, set in SIPs."