

# Modern Metals®

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## Sustainable beauty

Cost-effective building system  
resists fire, storms, earthquakes





EcoSteel found architects and designers that understood the vision of making prefab structural steel frames and insulated roof and wall panels both gorgeous and functional.

# LEVERAGING EFFICIENCY

**Prefab building technology branches out from high-end luxury dwellings to affordable housing applications** BY CORINNA PETRY

Often, when developing and perfecting a new technology, you must have other experimenters, other risk-takers, buy into your vision. Such was the case with EcoSteel, which works with iconoclastic architects whose clients are clearly after sustainability as well as beauty.

Based in Laguna Niguel, California, EcoSteel's building system was used in a six-level, 9,570-square-foot home in the Russian Hill neighborhood of San Francisco that was listed last autumn for \$25 million. Indeed, EcoSteel found other architects and designers that understood the

vision of making prefab structural steel frames and insulated roof and wall panels both gorgeous and functional.

Now Phase II of the experimentation is coming to fruition. EcoSteel is focusing on another goal: to create affordable housing in regions where it is rare, like California.

Let's first review the system and its benefits. EcoSteel's construction process begins with 3D engineering/modeling and shop details. It then produces a prefabricated kit of parts that is assembled on the building site. Architects and their clients benefit financially by using prefab technology and readily available materials and labor.



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JOSS HUDSON, ECOSTEEL



# architectural design

EcoSteel helps reduce costly mistakes in the construction process by utilizing BIM/parametric engineering technology. It also eliminates subcontractors, which means fewer people to manage and fewer mistakes. The panelized/prefab construction uses an easy-to-assemble building system.

Perhaps the most noteworthy feature of this system is its compliance with green energy building codes, fire codes and wind resistance standards. A 1,900-square-foot home built with EcoSteel's prefab system on Johns Island, South Carolina, survived Hurricane Florence. The storm blew through in September 2018, three days after the owners moved in, according to an article in *Dwell* magazine.

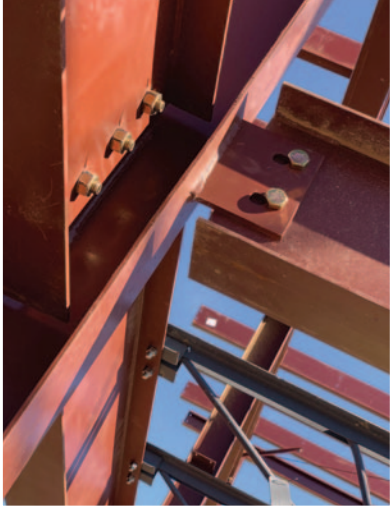
The conflagration called the Camp Fire turned the town of Paradise, California, to ashes last year. EcoSteel President and Founder Joss Hudson is among the many voices that cite outdated building codes and suburban sprawl as contributing factors to such tragedies.

Hudson says legislation has been proposed to limit building construction in zones called the Wildland/Urban Interface and to change building codes to replace cedar shingles, cedar shake siding, asphalt shingles and other petroleum-based materials with metal roof and wall systems, cement and tile roofing, and stucco board and siding.

In addition, the state of California adopted a fire code specifically for senior housing/assisted living facilities. "Any such unit over two stories can no longer be a combustible structure, so it must be concrete or steel. And you cannot have concrete without a steel frame," says Hudson. "In California, lumber construction burns so fast, and you cannot get people out of third and fourth floors. Fire will spread faster than [people] can evacuate.

"Potentially, senior housing would be a market opportunity for EcoSteel. [The United States] has an aging population and more wildfires. In addition to that code, our insulated roofing and wall paneling complies with California's energy efficiency rules for building materials."

Because EcoSteel's structural, roofing and wall systems come with their own fastened connections, very little welding of steel is required. "Steel bolted connections



EcoSteel is focusing on a new goal: to create affordable housing in regions where it is rare, like California.







EcoSteel produces a prefabricated kit of parts that is assembled on the building site.



A subfloor is laid at a home under construction using EcoSteel structural framing.

## ◀ STORM SURGE PROTECTED

EcoSteel designed a home on Cusabo Island, South Carolina, an exposed location on the Atlantic Ocean. The home employs a bolted steel frame and marine-grade steel roof and wall panels engineered for a 14-foot storm surge. The home was permitted for a site within a 14-foot FEMA flood zone. It is also hurricane rated to withstand wind speeds of 140-plus miles per hour. The plan for the materials was to accelerate any natural rusting to create a protective barrier on the surfaces, which is needed in a salt marsh environment. The remoteness of the home site required that both a barge and helicopter deliver materials, and the contracting crews traveled by small boat daily to the job site.

have higher strength capacity in wind loads and seismic loads. It bends and flexes and doesn't crack." EcoSteel systems have been used all over the country in earthquake and storm zones.

### Giving shelter

Another project is one dear to Hudson's heart. The city of Lancaster and the county of Los Angeles are developing Kensington Campus, which, according to

the city, will be a large community designed to house, employ and rehabilitate the local homeless population. Kensington Campus is scheduled to open this fall. Features will include a communal kitchen, health care clinic, laundry and an animal kennel. The city will offer mental health and substance abuse services, employment assistance and other services on the campus, the city's homelessness plan indicates.





A brewery, rebuilt after a fire, used 2 HR fire-rated panels supplied by EcoSteel.

“The homeless shelter is using insulated metal panels and steel structure systems to gain advantage over completion times,” Hudson says. EcoSteel was chosen to design, engineer and supply the steel structural systems and architectural roof and wall panels that are prefinished and pre-insulated ready for fast assembly.

“We are leveraging the same building technology for offices or factories and creating a living environment with very efficient seismic, wind and fire resistance,” he says.

With what EcoSteel is learning from its experience with the Kensington Campus shelter project, “We are working on finding a solution to build that is affordable. Our goal is to create small, minimalist modern metal homes that cost less to build and take less time to complete than standard custom homes,” Hudson says. “These warehouse, or loft-style, homes could be built faster and with a commercial steel contractor crew, rather than hiring residential contractors.

“Our goal is to have a low-budget kit of



Insulated roofing and wall panels are rated for energy efficiency. EcoSteel offers multiple color choices.



parts that we would ship to the client ready for site assembly. Everything else could be ordered at Home Depot to finish out the home—including windows, toilets, plumbing, cabinets,” says Hudson. The structural and exterior systems would have a fixed cost. “The final challenge is how to build it. We will be looking for contractor partners, including the steel unions,” he says.

Like any home building project, says Hudson, “price is a function of finishes. If we provide all exterior finishes in one panel system [and] if the client is OK with concrete floors, eliminating the interior drywall on the back side of the roof and

wall panel” and installing additional dry-wall only where building code demands it, such projects are affordable. “We can take a proven commercial-grade building system and proven assembly process and not clutter it with faux rock or wood veneer.”

Giving back has always been part of EcoSteel’s DNA. Its longstanding charitable partners are Family Assistance Ministries, Wounded Warrior Project, Envision Lead Grow, the Child Abuse Prevention Center and Siempre Orphanage in Tijuana, Mexico. ■

**EcoSteel**, Laguna Niguel, California,  
800/587-6604, [www.ecosteel.com](http://www.ecosteel.com)