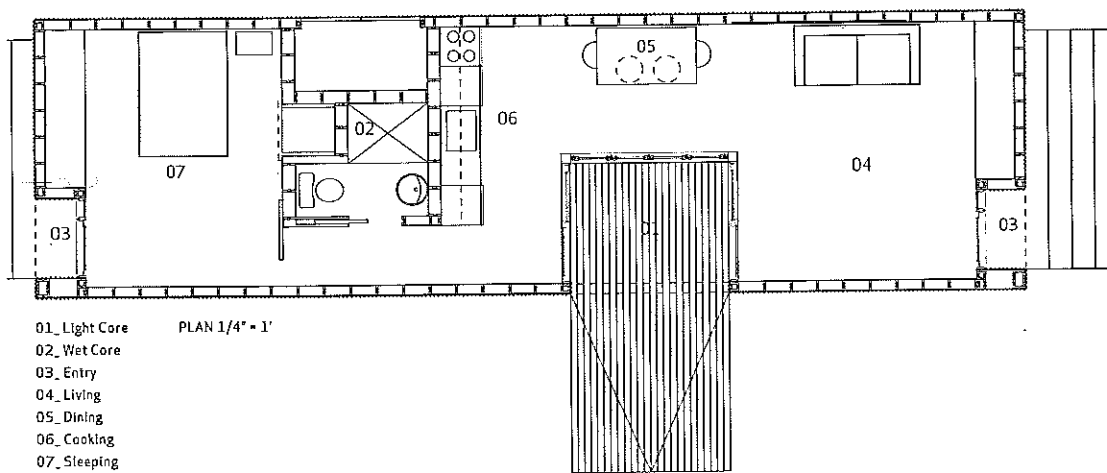


TOP: Solar Decathlon house, rendered view of the entrance and light core.

BELOW: Plan.



- 01_ Light Core
- 02_ Wet Core
- 03_ Entry
- 04_ Living
- 05_ Dining
- 06_ Cooking
- 07_ Sleeping

INNOVATION

ON BUDGET OFF GRID

Solar Power Made Affordable

WITH GLOBAL WARMING AND ENERGY SECURITY TOPPING the headlines, and the extended power outage following Hurricane Ike, local interest in solar-powered homes is ripe. But can it be done affordably in Houston's climate?

Students at the Rice School of Architecture have worked on just that question for three years in preparation for the Department of Energy's 2009 Solar Decathlon. Held once every two years, the decathlon is an international student design competition that challenges teams to build a functional and beautiful house run entirely off of solar power. The Rice team was one of 20 selected out of 40 proposals and the only Texas school represented.

"We wanted to do a project rooted in the community. We could have built a morphogenetic blob wrapped in a solar skin that soaked up the sun like a

raisin, but what we did is look at affordable housing and prefabrication," said David Dewane, a second-year Rice architecture graduate student. The concept was inspired by the 99K Competition sponsored by the Rice Design Alliance and AIA Houston. Nonya Grenader and Danny Marc Samuels serve as faculty leads. The goal is to keep the total cost of the building itself to \$99,000 and \$140,000 with the panels and hot-water system.

Though many universities budget regular funds for faculty-driven proposals for the solar decathlon, the Rice team got started through the initiative of students collaborating across the architecture and engineering schools. As a freshman, Roque Sanchez launched the Solar Decathlon Club, which morphed into for-credit classes. Now a Civil Engineering senior and student lead, he speaks passionately about a "wet core" that packages systems needed for cooking, plumbing, and air-conditioning into a tiny 8x10 foot space at the center of the home. It would ultimately be made in a factory and dropped into the relatively easy to construct frame.

The "light core," which is an unconditioned extension of the living space shaded by a cantilevered awning topped by a custom-designed solar water heater, is like a porch but attempts to go further in blurring the boundaries of the inside and outside spaces. "Other than Summer," Dewane noted, "Houston's climate is often pleasant and lends itself to exterior living."

Additional energy saving strategies include good insulation, dimmer lights, and separate thermostats that enable occupants to condition only the rooms they are occupying. To keep

costs low, the team is also considering bare bones approaches such as line drying clothes.

The Department of Energy provides a \$100,000 grant for non-material related costs, and the team is currently seeking support for their remaining expenses. They have to transport the built home to Washington, D.C. where they will undergo three weeks of performance testing and student-led public tours at the "Solar Village" on the National Mall from October 9 to 18, 2009.

Although over 125,000 people viewed the 2007 competition, many decathlon projects do not become real homes. "We are working with Project Row Houses to find a client," Sanchez said. The team will present a scheme dubbed "Ze-Row: Zero Energy Rowhouse" to place the building in the Third Ward.

-Raj Manjari