



Photo: Mark Johnston, 2005; diagram courtesy RISD Solar

## prefabrication

# RISD SOLAR HOME

**Prefabrication's centralized manufacturing increases building efficiencies and decreases waste, ultimately lowering the overall cost of construction.**

**PROJECT** 2005 Solar Decathlon Competition Entry  
**LOCATION** Providence, Rhode Island  
 + Rhode Island School of Design

Manufactured housing and prefabricated construction carry a stigma of cheap construction. But over the past decade prefabrication has emerged as a viable means to deliver high quality construction. Prefabrication can also produce more sustainable buildings because its centralized manufacturing process creates the opportunity to build in a controlled environment and decrease waste.

### HOW IT WORKS

In 2005, RISD entered a prefabricated house in the United States Solar Decathlon. The Decathlon is sponsored by the US Department of Energy to spur research in the design and fabrication of energy efficient buildings. RISD's 800-square-foot solar home reimagines two features of prefabrication—the service core and the pre-constructed skin—to maximize the building's energy performance.

The building is very well insulated, allowing the heating and cooling systems to be half the size that would normally be required. In the core, a solar hot water system is used to heat the space, and water stored beneath the building is used to cool it. These mechanical systems work in conjunction with a louver system on the surface of the building that moves with the sun to control the amount of solar gain. In the winter, the louvers open to allow the sun's warmth to hit the building, and in the summer, they are turned to reflect heat and light away.

### BENEFITS

Most prefabricated or manufactured homes are aimed at the single-family market. RISD's solar house is designed to permit individual units to be put together to create compact solar villages. This sophisticated design and its small footprint make it appropriate for both infill urban developments and suburban neighborhoods.

The building is currently being installed at the Portsmouth Abbey School where it will serve as faculty housing.

- + Provides controlled environment for precision construction
- + Reduces material waste
- + Reduces construction costs

The RISD solar house was displayed on the Washington Mall, where it was seen by 200,000 people. The louver system and accessible green roof are shown at right. Heating and cooling systems converge in the central core. (bottom)

