



Cal Poly's goal is to create a beautifully concise home tuned to the climate, detailed for modern living, proportioned and sized to travel across the country pulled by a single truck; to reduce our household's footprint on the land and make the most effective use of space and resources. Simple. Fundamental. Elegant.

Dwelling

Livability. Buildability

Simplicity and sufficiency were guiding design principles for the Solar CalPoly project. From the project's inception, the students' design proposals for the house were modestly sized, challenging contemporary residential trends. The resulting design is 650 square feet of conditioned living space, thoughtfully designed and detailed to house two individuals. The team strove to design the house from the inside-out with the same care as designing a sail boat, a functionally elegant vessel with architecturally integrated elements, furnishings, and storage, making every detail and space count. Transparency, access to adjoining outdoor spaces, and use of a portion of the roof as an outdoor room expands both the virtual and actual size of the house while keeping its ecological and spatial footprint small.

Within the modest footprint, the interior spatial layout is intended to be flexible and fluid. This allows the inhabitants to define and use the spaces according to fluctuating personal needs and desires. By anchoring the "utility" pieces (the kitchen, the bathroom, the mechanical space) on the east and west ends, the team left the space in between predominantly open to allow for this flexibility. Spatially and socially, the kitchen/dining/living/working spaces flow seamlessly from one to the next. At the same time, the team determined that some spatial demarcations were necessary and these are intentionally subtle. The kitchen is discreetly defined by a small change in ceiling elevation, adding a sense of intimacy to the cooking/eating space. This dropped ceiling is also an indicator of the roof deck that sits above the kitchen. The team designed a translucent movable privacy barrier to delineate the bedroom space, which is also flexibly furnished and designed to support auxiliary activities (beyond simply sleeping).

A fluid inside/outside relationship is integral to the project, with sliding doors, consciously placed windows (for light, air, and view), ample decks, and a supplemental roof deck. This interior/exterior spatial relationship is essential given the project's economical space. The intention was to project a feeling of expansion from the inside by providing a strong visual and physical connection to the greater outdoors.

The materials palette of the Solar CalPoly project supports the team's underlying theme: simple, fundamental, elegant. The team chose "longevity" as a material characteristic for the predominant finish material on the exterior and interior of the project. "Trespa" is a wood fiber, paper and resin based composite wall panel system. The choice of this material met the team's environmental, aesthetic, and practical goals (it contains recycled materials, requires minimal maintenance, and will withstand the elements; it supports the project's contemporary sensibility; and it is designed to withstand the stresses of a 4,788 roundtrip road journey). On the exterior, the three-color scheme was conceived to communicate the internal spatial uses, from hot to warm to cool (from "hearth" kitchen to daily living to support/comfort systems, moving from east to west). The additional screen on the "hearth" kitchen section also connects this project to its point of origin: California. The team used the



redwood screen not only as a textural expression for this essential section of the dwelling but also to showcase a thoughtful use of a sustainably harvested native material. On the interior, the dominance of light colored finishes are intended to elicit an expansive feeling in a necessarily economical space. The supporting interior finishes were also chosen for their environmental properties, longevity, and contemporary design aesthetic (bamboo flooring, Richlite countertops, contemporary cabinetry and furnishings, certified organic textiles). The architectural lighting is designed to be efficient, effective, and non-intrusive: ambient luminescence with a touch of focal glow. In addition, any features requiring operation are intentionally straightforward and user friendly (operable windows and doors, privacy screen, shading device, and so on).

Livability. Buildability

Transportation across the country and set-up time in Washington D.C. were major design drivers for the Solar CalPoly team. Because the house had the longest land mass travel distance of any of the 2005 Solar Decathlon entries in order to get to the National Mall and because of our desire to minimize our use of fossil fuel, the team agreed on a “one truck” solution. The result was the design of a simple, straightforward architectural volume which could be pulled by a single semi tractor/trailer. The team used pre-fab construction not only to minimize construction logistics on the Mall, but also because Solar CalPoly’s pre-fab prototype could serve as a useful example of alternative housing, particularly in the state of California.

Responding to the climate architecturally before relying on mechanical means for thermal comfort was also fundamental to our design process. The Solar CalPoly dwelling is intended to be “switch-rich,” providing opportunities for user control to “sail” the building in *open mode*, collecting and retaining energy in *closed heating mode* and rejecting unwanted heat gains and using stored “coolth” in *closed cooling mode*. Fixed, operable, and deciduous shading devices are employed to optimize solar gain in the winter and minimize unwanted heat gains in the summer.

“Switch-rich” strategies not only help users adapt the building to seasonal variations but they also support the mass production feasibility of this prototype project to adapt to various climates. As further support for its mass production potential, the Solar CalPoly team designed the project such that it might be applicable, appropriate, and adaptable to meet the needs of a variety of household types.

The project’s potential “marketability” can be inferred from its central mission: simple, fundamental, elegant. As one of its essential principles, the Solar CalPoly project embraces simplicity in a time of increasing complexity. Simultaneously, it is through the project’s fundamental simplicity that the team seeks to achieve elegance. With conscientious attention to materiality and detail, the project presents an alternative to our culture’s increasingly large, over-commodified dwelling spaces. In this way, it seeks to be a socio-political statement, to remind us that we don’t necessarily need more in order to live well.



Simple. Fundamental. Elegant.