

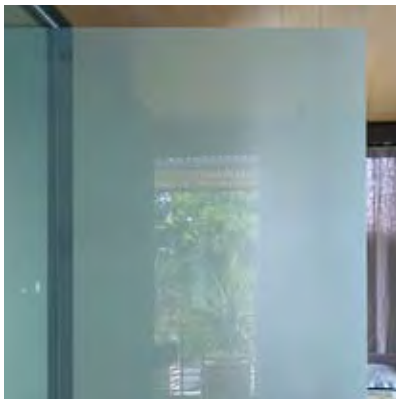


KIPLING TREEHOUSE

Palo Alto, California

The Kipling Treehouse is a single-family home which is not only meaningful at the larger scale of the city, but also at the more detailed scale of the hand, all encompassing a sustainable expression for a residence. This project unifies a site with two other structures, which already existed on the site to form a tri-compilation balance between open and structured spaces.

A model for excellence in energy performance, this 2,100 sq ft single-family home was developed and designed by the building's primary occupant, an architect. Each level contains a large flexible room across three floors including a light filled basement. A glass-walled living space with a foldaway kitchen island occupies the first floor and connects to the original existing house through an passive breezeway with operable glazing. The lower level includes a bedroom, media room, and light well with a vision window to the pool. Upstairs the master bedroom is designed as a loft space with an open island bathroom, views of the trees, and a southwest facing shaded balcony.



To preserve a large mature oak on the site, the house was designed to celebrate dwelling within the tree canopy. By creating a house with a small footprint, we were able to preserve the existing landscape. This landscaping connects the site to the park across the street and to the larger California landscape through the use of local grasses and trees, which require minimal water. A fence of steel woven fabric filled with gravel reflects the prior farm vernacular of the region. The building's small footprint, form, setbacks, and surrounding landscaped courtyards of gravel are designed to restore hydrologic flows and nurture the existing oak and redwood trees. This project is meant to convey a sense of openness and vitality through its engagement with the surroundings and through the tactile experience of the materials.



Natural ventilation/ passive cooling and heating:

- The concrete structure acts as a thermal mass to slow heat transfer in the summer and store solar energy in the winter.
- High performance insulated glazing, with a U-value of 0.61 and SHGC of 0.312 prevents heat gain.
- Large operable glazing enables cross ventilation and exhaustion of warmer air
- The staircases through to the basement are designed as a solar chimney with west-facing operable glazing at the top to create a circulation current that draws cooler air in through the operable north-facing windows at the bottom.
- Curtain tracks are embedded into the concrete structure to support seamless floor-to-ceiling 100% cotton drapery for acoustical enhancements as well as privacy. Moving the curtain to adjust one's thermal comfort is part of the daily rituals of the homeowner, emphasizing a philosophical awareness inherent in the design.

- The therapy pool in the front assists in cooling, in addition to wellness.
- The large oak and redwood trees and the trellises shade the southern façade of the house.

Energy:

- Radiant floor heating provides an even distribution of temperate air throughout all levels via embedded water pipes in the 8” poured-in-place concrete structural slab.
- 2.5kW photovoltaic array produces over 60% of the building’s annual electricity load. Solar panels are integrated with the shading trellis over the second floor balcony, displaying a celebration of renewable energy to the street. Metering shows energy generated by the sun in real time.

Natural light

- The house is oriented with consideration for the sun’s path in order to maximize natural light. The 8’ wide angled lower patio along the southeast side features extensive glazing and allows daylight to reach deep into the basement. A secondary glass wall in the basement abuts the pool, providing indirect daylight through the water like a subterranean aquarium.

Materials

- The palette is one of honest, untreated materials; the project uses no pigmented paints or gypsum board.
- Integral colored concrete embraces the color of tree bark. The concrete contains fly ash to reduce carbon emissions and local stone and aggregates.
- White Alaskan cedar cladding is weathered to a natural gray.
- Gravel beds around the house and near the oak trees provide for a breathable landscape.
- Glazing, both full height and operable are placed throughout the entire home of varying transparencies depending upon the solar orientation and privacy needs, all dual glazed.
- The structure is fully expressed and generates an organizing device throughout.
- Materials were selected for their weather resistance, low maintenance needs, compatibility with the surrounding nature, and atmospheric impact.



Although the house exemplifies excellence in sustainable design, we chose not to pursue LEED certification for the sole reason of cost savings. As an alternative of investing funds for documentation, we instead improved upon the environmental aspects of the home. Because the building uses concrete as a major building material, current energy models and energy codes (Title 24) do not take the savings from this material’s unique and intrinsic thermal qualities into account. Therefore the building is 26.4% better than the standard “Title 24” requirement. As such the 2.5kW photovoltaic system provides 60% of the electricity required, plus passive solar orientation enhances this performance. Such a dramatic reduction is the culmination of a design process focused on the simple goals of reducing the need for energy consumption and maximizing the use of passive strategies. A minimum “200-year” building methodology was also accomplished. ■