“The home’s beauty is testimony to the architect’s ability to poetically weave ecological objectives into a comfortable, livable respite from the busy beach environment outside.”

4. Recycled content wall and floor tiles line the master bathroom.
5. 100 percent recyclable concrete fiber panels.
6. Floor-to-ceiling sliding glass doors open living space completely to the outdoors.
7–9. Section drawings reveal an eastern wall untouched by second- and third-story floor plates, allowing vertical passage of air between floors.
A complete palette of sustainable materials complements structural considerations: Cumaru flooring—a fast-growing Brazilian teak that is environmentally certified for its sustainability—is used throughout the home's upper floors and finished with a water-based urethane. Dunn-Edwards Ecoshield paints, containing almost no petrochemical products and none of the toxic solvents found in most other paints, are used for interior walls. Appliances and lighting fixtures are energy efficient, the home's aluminum siding is made from 100 percent recycled material, and the insulation is made from recycled blue jeans. South and north-facing exteriors are clad in 100 percent recyclable corrugated aluminum panels made from 85 percent recycled content, and concrete fiber panels are also 100 percent recyclable. The integral colored, polished concrete floors require no sealers, and solar panels supply between 70 and 80 percent of the home's energy requirements. A port in the garage provides electricity for an electric car. Two tankless, or "on demand" hot-water heaters supply all of the home's hot-water needs—one for the residential plumbing functions and the other for servicing the radiant heating system.

Two rails, 16 feet apart, hang suspended solar panels like louvers above the roof. Invisible from below, externally the panels integrate subtly with the modern structure and framing of the home. Like all of the other sustainable features of the Manhattan Beach Residence, the panels are a subtle reminder that ecological priorities can be integrated quietly and poetically into a beautiful piece of architecture.

2 Extended north and south walls of recycled aluminum provide passive shading to west-facing terraces
3 High clerestory windows provide natural lighting and ventilation to bedrooms while maintaining privacy
Manhattan Beach Residence

Manhattan Beach, California
Architect: LeanArch

At once subtle and radical, every detail of the three-story, three-bedroom Manhattan Beach Residence was designed with energy efficiency and long-term ecological concerns in mind. The home’s beauty is testimony to the architect’s ability to poetically weave ecological objectives into a comfortable, livable respite from the busy beach environment outside.

The small home’s western elevation takes full advantage of its location across from the Pacific Ocean. Two large steel moment frames support 35 feet of floor-to-ceiling glass across the middle and top floor—the largest residential span of glass in the City of Manhattan Beach, and the most distinctive feature of the house. In another structural feat, the contrasting mass of the eastern wall rises, untouched by second- and third-story floor plates, as a 24-foot vertical channel of natural light and ventilation. A teak stairwell lines the wall, and as one climbs upward to the second and third floors, an exquisite visual drama unfolds. Thirty-five-foot windows and decks, playfully cantilevered to soften the modern design, span the entire west side of the home. The 180-degree view of the ocean includes large measures of beach, sky, water, and the Manhattan Beach pier.

Outdoor deck projections are seamless extensions of the floor plates, slivers that extend just beyond the window wall. Fully extended, aluminum-clad north and south walls frame the decks and provide protection from the low summer sun, minimizing heat gain through the west-facing glass. Inside, electronic Mecho shades on an astrological timer diffuse light according to seasonal needs.

During summer months, small side vents inside the home open to allow rising hot air to exit, drawing cooler air up from the basement’s concrete floor. During cooler months, the system works in reverse, assisted by concrete fiber panels lining the eastern wall interior. The panels absorb heat from the skylight above, and provide additional radiant heat throughout during cooler months. These panels were originally designed to line kiln ovens, to retain and distribute heat evenly.

A thermal heating system is embedded in the second and third floors and controlled via thermostat from independent zones in the house. The product conducts heat via aluminum sheeting underneath the home’s second- and third-story hardwood floors more efficiently than through concrete, the material more commonly associated with radiant heating.

1 Radiant heat warms the home through rich, sustainable Cumaru flooring.