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NEW CONSTRUCTION

Peng/Green Residence

THE BEAUTY OF STRAW BALE

An El Sobrante couple turn straw bales, reclaimed wood and earth plasters into a tranquil haven



The straw bale walls of Erica Peng and David Green’s home shelter a serene oasis. Throughout the home, unique touches reveal how much creativity and care went into its design and construction, from a stair railing built from a walnut sapling harvested from the property to inviting salvaged redwood window seats set into the thick walls.

Peng and Green built the house themselves, taking care to use locally produced, salvaged and recycled materials whenever possible. Since they were handling everything that went into the building, they were particularly conscious of the importance of choosing healthier materials. Also, as avid gardeners with plans to start a food-producing garden on the property, they were careful not to bring on site any materials that might contaminate the soil.

“We had heard the theory behind high-insulation walls — that the structure would maintain its temperature well and that we wouldn’t need as much energy to cool or heat the house. We have not been disappointed. The house actually outperforms our expectations. Our January 2005 PG&E bill was \$19.95.”

—Erica Peng

STRAW BALE DESIGN

Resource efficient, energy efficient construction. To help design their home, the couple brought on board architect Janet Johnston of Skillful Means, an expert in designing and building straw bale structures. Straw bale construction isn’t likely to become a mainstream building technology, but for custom-built homes it offers many advantages. The bales provide superior insulation, creating a home that’s quiet, comfortable and energy efficient. The thick bales lend themselves to unique designs such as curved walls, deep-set windows and rounded corners. And using straw bales puts waste to good use: unlike hay, straw has no nutritional value — it’s what’s left over after grains are harvested.

GREEN at a GLANCE

ENERGY & SYSTEMS

- Passive solar design
- Straw bale construction
- Designed to be comfortable without central heat or air conditioning
- Cellulose insulation in ceiling (Cocoon)
- Fiberglass insulation with no added formaldehyde over crawl space (Johns Manville)
- Tankless water heater (Takagi)
- Low-e windows (Marvin Integrity)
- Energy Star® dishwasher, refrigerator and clothes washer (Maytag)
- Compact fluorescent light bulbs

MATERIALS & PRODUCTS

- 50% flyash concrete in driveway; 25% flyash concrete in foundation
- Wood I-Joists for floors and ceiling (Trus Joist)
- Extensive use of reclaimed wood (Whole House Building Supply)
- Salvaged MDF built-ins (linen closet, altar, bathroom cabinet, shoe cubbies)
- Earth plaster and lime plaster on interior walls and ceilings
- Bamboo flooring upstairs (Caldwell’s)
- Recycled copper pipe for bathroom hardware
- Bamboo trim harvested from friend’s property

OTHER GREEN FEATURES

- Mature deciduous trees kept on south and west sides
- Pre-plumbed for solar hot water, hot water circulation pump, and graywater conversion

Wall finishes. Exterior walls are finished with a cement and lime stucco and a lime wash. Instead of painting the interior walls, the couple applied an earth plaster that they mixed from clay soil, sand, water, bits of straw and rice flour. “Since natural materials like earth plaster change and behave differently in different conditions, it’s as if you are working with a living material,” says Peng. “You are in relationship and engaged with the material rather than simply applying it.”

PASSIVE SOLAR DESIGN

Orientation, shading and good heat circulation. The home is oriented to the southwest for passive solar heating. Large deciduous trees on the south and west sides provide summertime shade. In the winter, the only heat source, besides heat gain from the passive solar design, is an EPA-certified wood-burning stove. A two-story atrium allows heat to rise to second-floor bedrooms.

RESOURCE CONSERVATION

Salvaged and recycled materials. The decking was milled from a cypress taken down in the Bay Area. The exterior siding is reclaimed cedar. The floor is reclaimed Douglas fir, as is much of the interior trim. Window seats are reclaimed redwood. Doors are seconds purchased from Bay Area building salvage companies. Shower rods are custom-made from salvaged copper pipes. The kitchen backsplash is made with salvaged ceramic tiles.

YEAR BUILT: 2005

SIZE:
2,100 SF

ARCHITECT:
SKILLFUL MEANS

OWNER/DESIGNER:
ERICA PENG

OWNER/BUILDER:
DAVID GREEN

