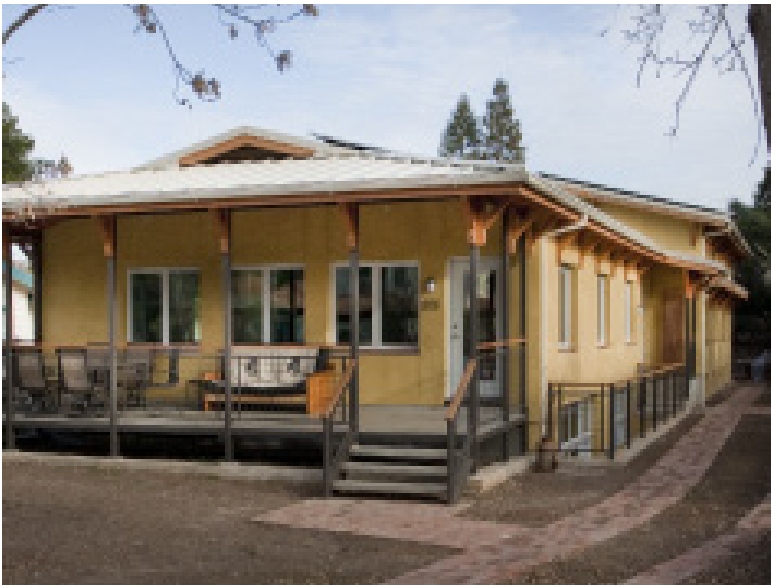

A Better Home

Ecologically Informed Design for Cooperative Living

MAGIC

ecomagic.org

Valuescience for common good

A Better Home: Ecologically Informed Design for Cooperative Living

Since 1972, people making Magic, a Palo Alto-based charitable organization, have been shaping and realizing a vision for ecologically informed living. Important elements of that vision include: (1) individual health and self-awareness, (2) cooperative social organization and action, (3) a natural environment conducive to human well-being, and (4) a built environment compatible with (1)-(3). With A Better Home we take a significant step toward more fully living this vision.

We have designed and built with an eye to a burgeoning human population putting devastating pressure on the global ecosystem, and to a growing number of people—especially individuals working in less remunerative fields like creative arts and public service—living, or wanting to live, in the Bay Area and finding housing prohibitively expensive.

With A Better Home we provide modest personal space and generous shared space to create a context for rich, convivial living, working, and playing at less than half the dollar capital cost, and a fraction of the lifecycle ecological costs of housing, office space, and recreational facilities in our locale.

Design Criteria

A Better Home is one of three adjacent residences housing a service-learning community sponsored by Magic. Residents come from around the nation and the world to live together and support each other in learning how we may more effectively apply science to more accurately discern and to more successfully further common interests of humankind.

With design, construction, and operation of this building, we're aiming to demonstrate on the basis of inclusive ecological construction and operation costs how humans can obtain more use value (e.g., home, workplace, recreational facility, social gathering space) per unit of resource depletion and environmental degradation.

We're constrained by climate; by size, shape, and orientation of the lot; by extensive and restrictive local ordinances rigorously enforced; by respect for neighbors whose homes are in many cases among their most valuable assets; and by our limited resources as a small public service entity.

We've endeavored to use readily available materials and equipment and proven building techniques selected for durability, ease of maintenance, healthfulness, and performance. In some instances we've incorporated reclaimed materials, or components manufactured from scrap or waste.

We've also designed with an eye to optimal human functioning and comfort, giving careful attention to lighting and space conditioning, and to making both solitude and social interaction readily available.

Features

In response to these criteria we've incorporated into A Better Home a number of features unusual for a newly constructed Palo Alto residence:

• single-storey construction - although the rear half of the building accommodates a storage loft above each bedroom, overall building height is only 20', 10' fewer than permitted by code and a substantial enhancement of neighbors' privacy and daylight access

• earth-sheltering - half of floor area is three-quarters below grade, increasing quiet and thermal stability, and reducing envelope maintenance

• air-tightness - simple building geometry, eaves supported without penetration of building envelope, foam and tape sealing, high-performance door and window gasketing, and monolithic concrete walls meeting Passive House air-tightness criterion (.6 air changes/hour at 50 Pascals)

• super-insulation - 2.5" foam inside and outside walls, 1" additional foam below grade to protect waterproofing, foam filled (9.25" or 11.25") roof cavity, triple-glazed inert gas-filled fiberglass windows and doors

• high efficiency space conditioning - heat recovering ventilation with bypass delivers fresh, filtered air to each room using low-power, high-efficiency fans; heat pumps heat and cool space; glazing is selectively coated to limit solar gain and other heat transfer through building envelope

• water heating - rooftop evacuated-tube solar provides 80%; back-up heat pump captures surplus heat from internal loads to cool living space

• lighting - 6" post-tensioned concrete slab finished floor and finished ceiling reduces between-storey floor section by more than 50%, propor-

tionately increasing vertical dimension of lower level glazing; light wells adjacent to nearly all lower storey rooms; light tunnels, skylights, glazed interior transoms, glazed interior doors, and triple-pane fiberglass-framed exterior windows and doors; all-LED artificial lighting

• on-site electricity generation - 15kW solar PV sufficient to power A Better Home and two adjacent homes housing Magic service-learning community, all-electric appliances

• flexibility to evolve - four load bearing columns in basement, one sheer wall and two load bearing posts in first storey

• enhanced acoustic privacy - sound-attenuating gypsum board, interior wall insulation, gasketed and drop-sealed interior doors

• reclaimed and repurposed materials - fly ash in concrete, re-used lumber millwork, salvaged brick paving, rubber flooring, used appliances

Team

A Better Home is a result of a collaborative design process spanning two decades. With deep gratitude we acknowledge here principal design and construction professionals and a handful of others who played key roles.

Conceptual design: John Northway, Arch., AIA (Stoecker & Northway), Elena Campagna, Arch., AIA (Stoecker & Northway), Tony Carrasco, Arch., AIA (Carrasco & Associates), Grace Lee, Arch., AIA (Carrasco & Associates), Kathleen Liston, Ph.D., Arch. (Moderna Homes), Pearl Renaker, Arch. (Tektive Design)

Design and design development: Roy Pertchik, NYS Arch., NCARB Cert.

Architect of record: Joshua Moore, Arch. (RED Company)

Energy analysis: Allen Gilliland (One Sky Homes), Pearl Renaker, Arch. (Tektive Design), Matthew Groves (Zehnder), Luke Morton

HVAC design and installation: Allen Gilliland (One Sky Homes)

Engineering: Jo Crosby, Ph.D., P.E. - geotechnical; Dan Dyckman, P.E. - grading/drainage; Bijan Aalami, Ph.D., M.ASCE (ADAPT Corporation) - structural concrete; Jim Dillingham, P.E. (D&Z Engineering)) and Mark Brehmer P.E. (D&Z Engineering) - structural wood and steel

Construction: Dan Fulga (Axiscom) - general contractor; James Witt (James Witt Construction), John Suppes (Clarum Homes) - consulting. ❧

For more information about A Better Home, email hilary@ecomagic.org. (v.1.5)