

GreenSource

THE MAGAZINE OF SUSTAINABLE DESIGN

Best Green Houses

Multiplicity: A city residence is equipped with systems and materials that wear many sustainable hats.

Farr Associates

September 2010

By David Sokol



Image courtesy Christopher Barrett

Michael Yannell is a hands-on client. When the Chicago-based pharmacist and animal-rights activist tapped local architecture studio Farr Associates to design a sustainable home, he had already carefully winnowed several sites from his realtor's long list of options, basing his shortlist on solar access. He and Farr Associates then selected a north- and west-facing corner lot in Chicago's middle-class Ravenswood neighborhood that also abutted an alleyway permitting good southern exposure...

GreenSource IMAGE GALLERY



Best Green Houses: Multiplicity

Farr Associates

...The collaboration ultimately resulted in a 2,675-square-foot LEED-Platinum home that is also Chicago's first net-zero-energy building...

Image courtesy Christopher Barrett

© 2010 The McGraw-Hill Companies, Inc. All Rights Reserved |



Best Green Houses: Multiplicity

Farr Associates

...To make best use of the abundant sunshine, the design team conceived a solar bar scheme in which two narrow volumes run along parallel east-west axes. They sandwich a courtyard garden (whose habitat is certified by the National Wildlife Federation) and are connected by an entry corridor...

Image courtesy Christopher Barrett



Best Green Houses: Multiplicity

Farr Associates

...“We were trying to keep it completely unconditioned to save energy for the home,” Farr Associates project manager April Hughes, Assoc. AIA, LEED AP, says of that low-slung volume; “We ended up using radiant heat in that space for winter.” Those floors are serviced by a geothermal system...

Image courtesy Christopher Barrett



Best Green Houses: Multiplicity

Farr Associates

...In another major move, each bar is topped by a 16-degree butterfly roof, the south-facing halves of which feature 10 kilowatts of photovoltaics, which produce 11,500 kilowatt-hours of electricity annually, as well as four evacuated-tube panels that provide all domestic hot water. The solar system is actually oversized, and the excess heat is siphoned into the geothermal well, so that there's additional heat to tap come wintertime. Overall the house produces 42 percent more energy than it needs, for which Yannell gets a check in the mail...

Image courtesy Christopher Barrett



Best Green Houses: Multiplicity
Farr Associates

...In addition to mounting PVs and solar tubes, the butterfly roofs express the house's rainwater reclamation. It is collected in a cistern for irrigation purposes, and the cache is run through a decorative fountain in the courtyard in order to prevent stagnation. In a Chicago first, laundry wastewater is collected and filtered for reuse in dual-flush toilets...

Image courtesy Christopher Barrett



Best Green Houses: Multiplicity
Farr Associates

...The roof and courtyard fountain are but two examples of design decisions that do double and triple duty. Hughes names several other salient multitasking features: Although the project's 110 windows are triple-glazed, argon-filled, and low-e coated twice, for the interior Farr Associates specified R-7 honeycomb shades whose insulating properties equate energy savings of 500 kilowatt-hours per year...

Image courtesy Christopher Barrett



Best Green Houses: Multiplicity

Farr Associates

... The southern bar building contains the kitchen, dining, and living rooms, and its regionally available porcelain-tile flooring provides thermal mass, cleans up easily, and promises better indoor air quality than materials that trap contaminants...

Image courtesy Christopher Barrett



Best Green Houses: Multiplicity

Farr Associates

... And the north wing's flooring—engineered planks made from post-industrial recycled veneer scrap—is not only extracted and manufactured within 500 miles of Chicago, but also it is best suited to clad a radiant system...

Image courtesy Christopher Barrett



Best Green Houses: Multiplicity

Farr Associates

...For the Yannell Zero Net Energy Residence, Farr Associates smartly chose the sustainable options on the marketplace that hit many marks. The studio also tried its own innovation in that same vein, by inverting the typical wall section of both north elevations and thereby relocating the masonry wall from the exterior to the interior face of the structure. Positioning the 8-inch CMU burnished-block wall toward the interior contributes to thermal mass, supports the glulam beams above, and requires no extra finishing...

Image courtesy Christopher Barrett



Best Green Houses: Multiplicity

Farr Associates

...Behind the CMU wall, Farr Associates detailed a 6-inch airspace and created a void at the intersection between it and the butterfly roof, allowing air to circulate. That leaves the insulating wall to the building exterior, which is protected by a batten-mounted rainscreen. By separating building components with strategically placed channels, and including closed-cell polyurethane spray insulation as a vapor barrier to prevent moisture from infiltrating, the wall design ensures that all building materials have plenty of room to expand and contract with time.

Image courtesy Christopher Barrett