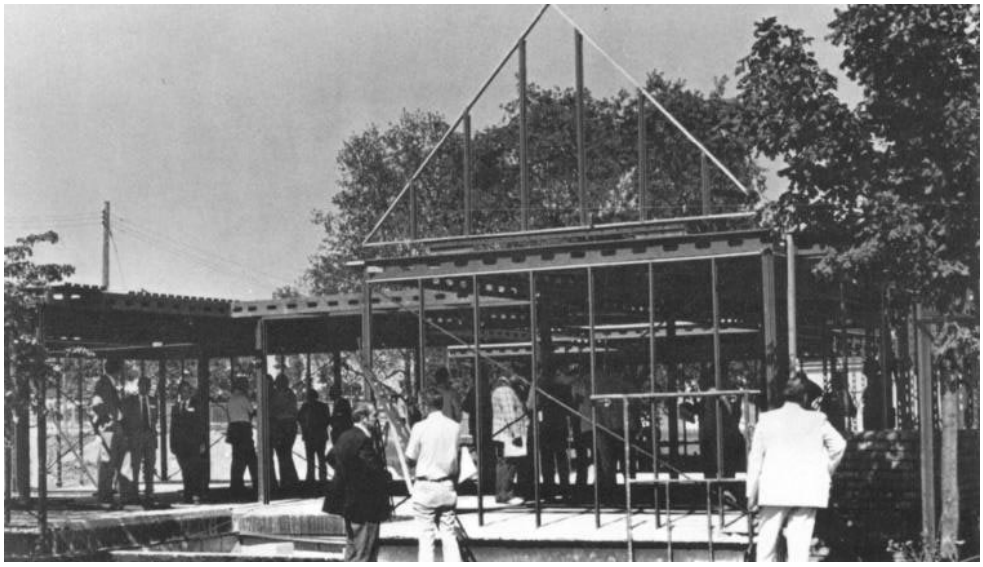
Solar House:
An Experiment in Building

Using Lightweight Steel Framing and Drywall, a Single House Goes up Quickly, Easily

Built as a liveable laboratory in energy conservation, this pacesetting four-bedroom, 2,200 sq.ft. Solar Home, designed by Ohio State University, and erected on Ohio State Fair Grounds, will be home to a family over the next several years as the OSU Mechanical Engineering Department tests efficiency of its design, which limits window area to "Strip" vision strips. On roof is shown part of the array of 19 heat collecting panels which transfer solar heat to a fluid network to provide heating, cooling and hot water needs of the steel frame and drywall home.



With lightweight steel framing nearing final-stage of erection, the experimental Solar Home was previewed by participating manufacturers and suppliers at site on Ohio State University Fairgrounds. Wheeling Steel Framing, steel floor, and roof deck, provide strength to structure to carry three-section array of fluid-filled solar collecting panels on peak-like framework shown here just getting underway.

Lightweight steel framing and drywall played major roles in demonstrating that an energy-saving SOLAR HOUSE — a practical, liveable single-family residence — can be designed and built quickly and easily with "off-the-shelf" materials.

The Solar Home, designed by Ohio State University and constructed on the Ohio State Fair Grounds at Columbus has already showed to more than 60,000 visitors that "free" energy from the sun not only is readily adaptable but also readily available to modern living: from materials within easy reach.

The Solar Home is described as "innovative academic and industrial cooperative effort on the part of organizations which believe that it is time to introduce a viable alternative to conventional home energy systems."

Available Components

A vital criterion of the project, the designers and builder added, was that all cooperating suppliers and components manufacturers "committed themselves to building a solar home using only currently available materials," of which each element is an "off-the-shelf" item.

An array of southward-facing solar heat collecting panels are the visible and dominant feature of the unique home. Collectively, the three-section roof-top array is designed to produce and store sufficient fluid heated by sunlight to 200 degrees F. to provide 75 to 90 percent of all heating, cooling and hot water needs of the home, and to reduce energy costs of these necessities by as much as 90 percent.

The one floor, four bedroom, 2-½ bath dwelling (2,200 sq.ft. of living space) will be home to a family during a two to three year research period intended to prove the practicality of every day living within its walls.

Predominant among many of the relatively new construction concepts inherent in the Solar Home is lightweight steel framing, manufactured by Wheeling Corrugating Company, a division of Wheeling-Pittsburg Steel Corporation which

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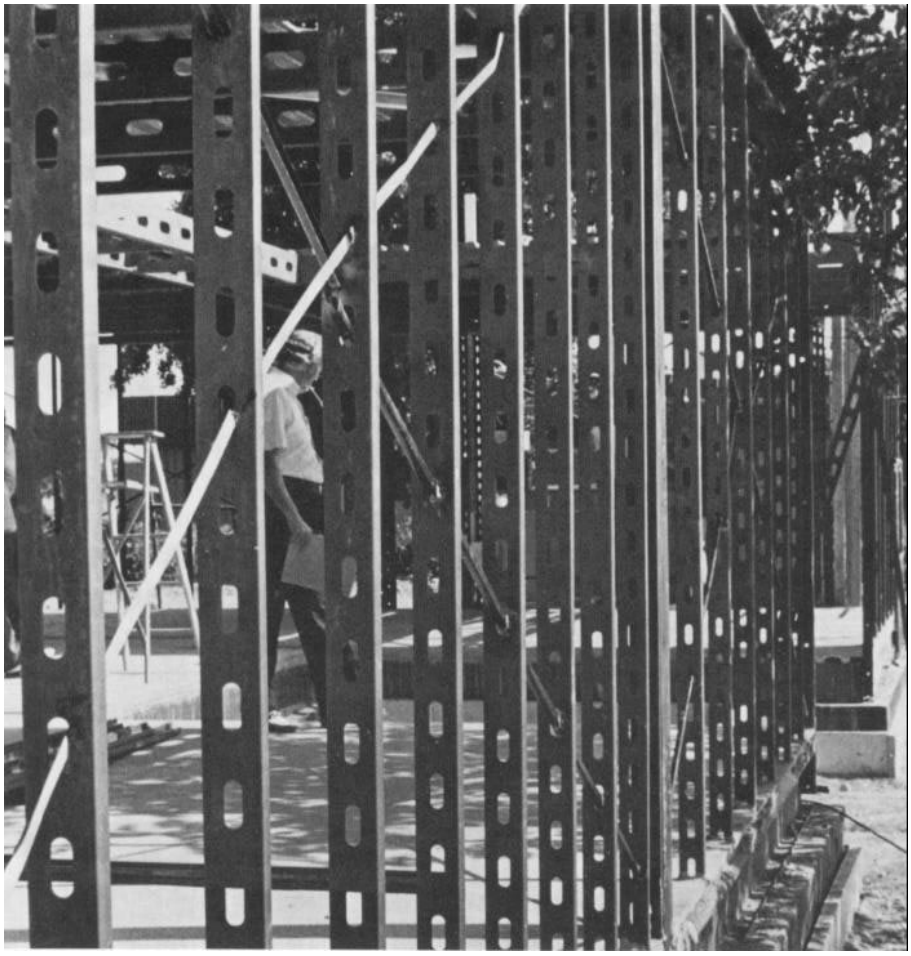
also supplied the home's steel floor and roof deck.

Some 7,300 linear feet of steel framing from the strong rigid frame of the structure, while more than 6,000 square feet of Wheeling Super-Bond Floor Deck and Super-Rib Roof Deck carry the dwelling's poured concrete floor and roof.

Steel framing was selected for the project to assure the structure of a non-combustible, non-warping, light and rigid frame which could be easily and quickly assembled and erected, and finished with conventional finishing materials.

Prof. George Clark, whose graduate students in the School of Architecture produced the Solar Home as a project in design development, pointed out that the dwelling "could not have been built the way it has been without lightweight steel framing, because of the greater spacings and longer spans required by its 14-foot modular design."



Assembled on-site in 14-foot modules and erected quickly and easily by an untrained crew of three, steel studs await application of insulating panelsand lightweight foamed concrete exterior finish. Lightweight steel joists, studs, track and bridging were selected for the four bedroom, single story residence to assure a non-combustible, non-warping and rigid frame. The house's exterior is stucco finished.

The builder, Homewood Corporation, of Columbus, Ohio, had only conventional "stick" construction experience prior to the Solar Home project, but the steel framing presented no problems. It was assembled in modules and erected without special tools by a construction crew without steel framing experience either.

Three-Man Crew

Homewood's architect, Mickey Melregon, under whose guidance the experimental home was built, explained that the lightweight steel framing was quickly erected by a crew of three men.

With all Cee-studs and Cee-joints delivered to the job site ready-cut to necessary length, the Solar Home's 14-foot modular framing wall and roof sections were assembled and arc-welded on site, he said. Furthermore, he added, that with steel framing he was able to achieve flat ceilings throughout the home without headers.

"Structurally, we did things here that we could not have done with the use of conventional lumber construction. We obtained a 60-pound per square foot load factor on the roof for the strength necessary to carry the solar-hearing units installed there. And we did this with four-foot spacing of 8-inch Cee-joints."

Interior wall finishing was carried out with Georgia-Pacific drywall attached to load-bearing modules of lightweight steel studs with self-tapping screws and adhesive, he continued.

The result provides not only a non-combustible structure, but also avoids the troublesome nail-popping so often associated with drywall installations on wood framing.