

DESIGNhabitat 2

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Since 2001, the School of Architecture at Auburn University has collaborated with Habitat for Humanity affiliates across Alabama to improve the energy performance and design quality of Habitat homes. Building on the success of the first round of this collaboration, David Hinson, director of the DESIGNhabitat Program, approached the Alabama Association of Habitat Affiliates (AAHA) with a proposal to study ways to integrate factory-based production into the volunteer-builder culture of Habitat affiliates.

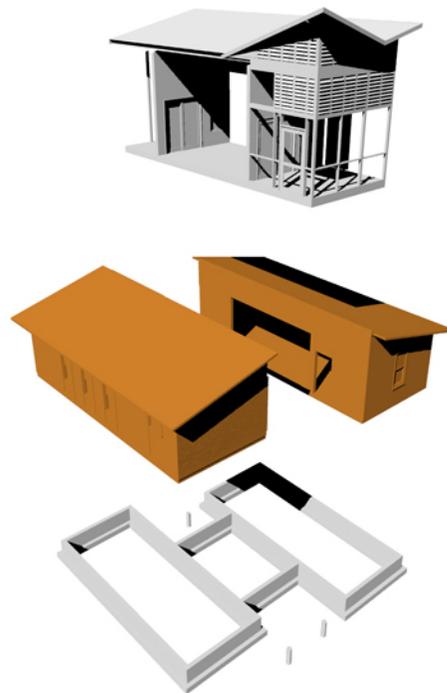
Initial research pointed toward modular construction as the most promising strategy, and in 2005 the "DESIGNhabitat 2" initiative began. In this initiative, a team of architecture students¹ and faculty (Hinson and Stacy Norman) at Auburn partnered with a modular housing production company, Palm Harbor Homes, to design and build a modular Habitat home.

The DESIGNhabitat 2 initiative was designed with five objectives:

1. To capitalize on the systems-built industry's expertise re: production process, resource efficiency/conservation, and quality control;
2. to build on the design-quality advances realized by recent designer-led/ academy-based modular design and construction initiatives;
3. to integrate the energy performance expertise developed in the prior phases of the DESIGNhabitat program into the DESIGNhabitat 2 home;

4. to explore how this approach might benefit Habitat affiliates that struggled to build homes due to limited volunteer resources, and

5. to immerse students in the challenges and opportunities associated with affordable housing design, and to cultivate an ethic of service and community engagement as an integral part of their strategy of response.



Axon illustrating site & factory built components

The students began the project with a semester-long pre-design research effort intended to immerse the team in the specific design opportunities and constraints associated with factory-based construction. The students also sought to identify the “leading edge” of design innovation (including energy-performance, materials and construction systems, and building configuration) relative to modular design and construction – both inside the industry and within the professional design community². Perhaps the most important area of pre-design exploration involved a careful study of how this approach could be integrated within Habitat’s traditional site-built, volunteer-builder culture.

The team began the next semester with a month-long charrette intended to generate alternative prototype home proposals incorporating the lessons of the fall research phase. In mid-February, five proposals were presented to a panel of project advisors (Habitat leadership, modular industry representatives, and faculty) who selected one of the schemes to advance to design development and construction.

The selected scheme was chosen by the advisors because of its energy conserving design features, the clarity of its plan and because the scheme offered the most clearly identifiable site built features (the central connecting space and porches) – an important consideration in Habitat’s volunteer builder-centered culture.



Pre-fab module in production line

As the project moved in to design development, Habitat for Humanity International was working to develop a viable strategy for responding to the impact of Hurricanes Katrina and Rita.

The impact of these two disasters on the gulf coast states of Texas, Louisiana, Mississippi, and Alabama dramatically re-framed the DESIGNhabitat 2 initiative. Within the span of a few weeks, the condition envisioned in Goal 4 - small, often rural HFH affiliates with money but fewer human resources - became the reality for Habitat affiliates across the four-state gulf coast region. Facing a need for over 20,000 homes and a human resource capacity of (at best) 1,000 houses a year, Habitat for Humanity International realized that this emergency demanded new ways of approaching the construction of Habitat homes. Modular production quickly emerged as one of the “alternative” strategies that Habitat’s “Operation Home Delivery” (OHD) leadership wanted to evaluate.

With support from the OHD program, the DESIGNhabitat 2 project team partnered with a new Habitat affiliate in Hale County, AL, one of the western AL counties most affected by hurricane Katrina. The Hale Co. HFH affiliate quickly identified a family displaced by Katrina as the future homeowners for the DESIGNhabitat 2 home.



Setting modules on the foundation



Center bay under construction

The student-designed DESIGNhabitat 2 home went into production April 18th in Palm Harbor Home's plant in Boaz, AL and was shipped to the home site in Greensboro, AL the following week. Under the direction of Hinson and Norman, the architecture students responsible for the design then began a two-week "blitz build" to complete the site-built components of the home. The keys to the DESIGNhabitat 2 House were turned over to Dorinda Crews and her three children on June 23rd, 2006.

The construction of this home was supported via a grant from HFHI's Operation Home Delivery program, in-kind donations from Palm Harbor and other product vendors, and a generous grant from a private foundation. The home was constructed for approximately \$60,000 (including the value of donated materials and services).

While the DESIGNhabitat 2 program builds on the prior (and on-going) work of professional designers and academy-based modular initiatives, it also moves this work forward. Most significant among these accomplishments are:

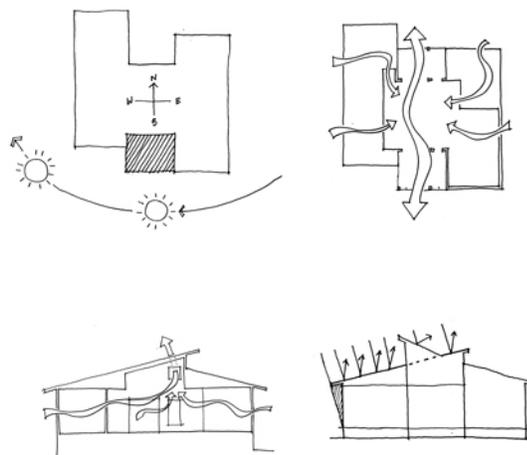
- The DESIGNhabitat 2 home is among the first homes completed for Habitat for Humanity in the region to integrate this particular mix of design quality and energy-performance objectives with the modular construction process. As such, it offers valuable lessons for Habitat regarding the integration of design quality objectives, climate-appropriate design features and energy performance into their efforts to re-

think their delivery model in the wake of the Gulf Coast disasters.

- The DESIGNhabitat 2 home is among the first academy-based modular home design initiatives to be built via direct collaboration with a *production modular builder* - integrating the industry's experience with prefabrication and the innovation and imagination of a faculty/student design team. Together with recent and on-going academy-based initiatives involving prefabrication³, this project offers valuable lessons for future research and design.

The DESIGNhabitat 2 home offers significant evidence that the gap between the design and energy performance potential of factory-based construction and the realities of affordable housing.

Beyond these accomplishments, the DESIGNhabitat 2 program's integration of design/build and service-learning teaching methods has provided the students involved with a powerful model for meaningful action in the face of a natural disaster of overwhelming magnitude. In the process of creating a building of high design quality for a client type rarely served by the profession, they have developed invaluable insights into the collaborative nature of effective community engagement and the critical competencies to become effective "citizen architects" in their professional lives.



Energy conservation strategies



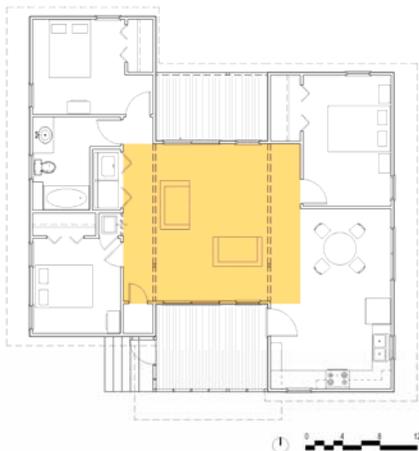
Front view of completed home



Front view of completed home



Interior view



Floor plan

Endnotes

¹ The DESIGNhabitat 2 team student team included: Joey Aplin, Samuel Bassett, Cayce Bean, David Davis, Danielle Dratch, Joey Fante, Betsy Farrell, Russ Gibbs, Jennifer Givens, Simon Hurst, Walter Mason, Bill Moore, Matt Murphy, Ryan Simon, and Mackenzie Stagg.

² The design precedents studied by the DESIGNhabitat 2 team included the work of Michelle Kaufmann, Resolution 4 Architecture, Charlie Lazor, Jennifer Siegal, and others. The students also studied the work of "production" manufacturers including Palm Harbor Homes, Fleetwood Homes, Patriot Homes and Royal Homes.

³ The work of Daniel Rockhill and his students at the University of Kansas and the work of John Quale and his students at the University of Virginia exemplify the excellent modular design research underway in architecture schools. The work of these design/build studios provided a valuable source of pre-design insight to the DESIGNhabitat team.