

# Biloxi Treehouse Project

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## Abstract

*When a group of students and designers took on the task of rebuilding Patricia Broussard's East Biloxi home, they knew that building an elevated home to a high standard of quality and sustainability on a very limited budget would require a new approach. The project, known as "the treehouse," became a laboratory for collaboration among students, designers, construction professionals, and volunteers seeking new solutions to these problems. The techniques explored and lessons learned will contribute to a higher standard for rebuilding along the Gulf Coast.*

Trees and grass have begun to overgrow some of the East Biloxi, Mississippi, lots where rows of traditional shotgun houses and Creole cottages once lined the streets. Hurricane Katrina's storm surge, floodwaters, and wind destroyed many of these homes or damaged them beyond repair. Although the debris piles have been cleared, many homeowners have so far been unable to return; others live in trailers while their houses are repaired or rebuilt. On one of these quiet blocks, rising above this transformed landscape among the live oak and poplar trees, is Patricia Broussard's future home—which many local residents have begun to call simply "the tree house."

This house among the trees, elevated 13 feet from grade to floor level (see exhibit 1), draws stares for its height and its unconventional looks, but it is also unusual in ways that are not immediately visible. The project has acted as a laboratory for a number of approaches to coastal rebuilding. First, a collaborative design process drew on the ideas of the homeowner, architects, sustainable design experts, and a diverse body of students and volunteers. Second, its construction combined students' design/build work with contracted work and volunteer labor. (To see photos of the architect, design students, and AmeriCorps volunteers, visit [www.huduser.org/periodicals/cityscape/vol10num3/cs\\_images.html](http://www.huduser.org/periodicals/cityscape/vol10num3/cs_images.html).) The designers aimed for environmental certification in the pilot Leadership in Energy and Environmental Design (LEED) for Homes program by improving efficiency and durability and minimizing the adverse effects of construction. Finally, the project addressed the challenges of hurricane reconstruction through features intended to increase the longevity and safety of the structure, in ways that typically exceed local standards.

Ms. Broussard's house was built through a collaborative project undertaken by community-based organizations, universities, professionals, and the homeowner. Two organizations initiated the

## Exhibit 1

### East Biloxi Treehouse and FEMA Trailer



*Patricia Broussard's new East Biloxi house rises behind the Federal Emergency Management Agency's (FEMA's) trailer in which she has lived since Hurricane Katrina damaged her home. Photo credit: Vincent Baudoin.*

project: (1) the Hamer Center, a sustainable-design center at Pennsylvania State University, and (2) the Gulf Coast Community Design Studio (GCCDS), a Biloxi-based outreach and research arm of Mississippi State University, which is partially funded by a grant from the U.S. Department of Housing and Urban Development's Universities Rebuilding America Partnerships program. Brad Guy of the Hamer Center, Bryan Bell of the architecture nonprofit Design Corps, and Sergio Palleroni of the University of Texas at Austin brought together a group of architecture students to design and build the house. These professionals instructed the students to consider the homeowner's needs, the community context, and the necessity of hurricane-resistant construction. Other groups contributed expertise or resources: Southface Energy Institute offered environmental consultation, the Salvation Army provided materials, and AmeriCorps and several faith-based groups contributed hundreds of volunteer hours.

The design team worked closely with Ms. Broussard, learning from her significant knowledge of the neighborhood, her requirements, and her love of gardening and trees. Architect David Perkes of the GCCDS contributed his engineering expertise to the bracing design. Other members of the GCCDS and its partner community organization, the East Biloxi Coordination, Relief, and Redevelopment Agency, contributed construction expertise. Volunteers, ranging from those with no experience but plenty of enthusiasm to construction professionals, gave thousands of hours

of labor. Local contractors performed parts of the framing, roofing, plumbing, electrical, and mechanical work.

Design team members Jason Pressgrove and Jami Primmer, a LEED Accredited Professional, helped coordinate the architecture, site design, construction, material and fixture choices, and other aspects that contribute to the overall environmental sustainability of the project. Students collected salvaged materials from nearby sites (see exhibit 2), such as an art museum designed by Frank Gehry that was destroyed by Hurricane Katrina, and from sites as far away as New Orleans. The design, which incorporates these salvaged materials, also includes a south-facing porch (see exhibit 3) and an extended south overhang for shading and high-albedo finishes, including a galvanized aluminum roof that reflects sun, to minimize heat gain.

Because the nearby trees have weathered numerous hurricanes, the “treehouse” is designed to be similarly resilient. Like other houses being planned in the area, it is elevated above FEMA’s advisory flood elevation, approximately 13 feet. At this height, the house must be strongly braced to resist hurricane-force winds. The bracing members branch in multiple directions across the underside of the house, further extending the metaphor of the tree. The supports are a hybrid system of reinforced concrete columns supporting treated wood posts. This design keeps all wood above ground and eliminates the need to drive piles. A series of ties between footing, column, post, rim joist, wall, and rafter ensures a continuous vertical structure that should protect against uplift.

## **Exhibit 2**

### **Salvaged Materials in East Biloxi Treehouse**

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*Left photo: A window box projects from the west side of the house, clad in stainless steel panels salvaged from architect Frank Gehry’s nearby art museum, which had been destroyed during Hurricane Katrina. Right photo: Bracing branches out from a center column made from a salvaged telephone pole. Photo credit: Vincent Baudoin.*

Other questions have yet to be addressed: the difficulty, for instance, in installing hurricane shutters on windows 16 feet above ground. The lessons learned from this project will inform the design and construction of other elevated houses planned for Biloxi and the rest of the Gulf Coast.

### Exhibit 3

#### Details From the East Biloxi Treehouse



*Clockwise from top right photo: The front porch space with French doors looking out toward the Gulf of Mexico; the custom-built kitchen cabinets and tile counter already being personalized; openness found in a view from the bedroom across the breezeway; the shower in which broken-tile mosaic incorporates remnants of dishes and other pre-Hurricane Katrina possessions. Photo credit: Vincent Baudoin.*

### Author

Vincent Baudoin is a Design Corps fellow working with the Gulf Coast Community Design Studio in Biloxi, Mississippi.