RESEARCH in Progress

Coalition for Advanced Wood Structures
a university, industry, government partnership

Research–Demonstration Test House at Mississippi State University: Phase 2—Construction

The influence of climatic parameters on the durability, energy efficiency, and livability of both residential and non-residential structures has been recognized for years but has not been emphasized by the construction trades. The Advance Housing Research Center (AHRC) and the Coalition for Advanced Wood Structures (CAWS) recognize that housing research must be regionalized rather than attempting to develop a "one size fits all" structure. With 70,000 new homes being built each year in the southeastern United States, housing problems unique to the region must be studied. The Southern Climatic Housing Research Team at Mississippi State University (MSU), consisting of research scientists in six departments, will construct a research–demonstration house on the MSU campus that will serve as the site of several interdisciplinary experiments by faculty and graduate students to determine how to build houses in this region that exhibit durability, energy efficiency, and good indoor air quality. The structure also will serve as a "classroom" for students, visiting scientists, contractors, designers, and others. This effort in the southern climatic region will serve as a template for those in other climatic regions to follow.

A research–demonstration house planned for the southern climatic region at Mississippi State University.

Background

Many homes in the southern climatic region face problems caused by deterioration of wood by decay fungi and subterranean termites. Spread of the introduced Formosan subterranean termite throughout the region will exacerbate these problems. Several attempts to increase energy efficiency in homes in this region have led to energy-efficient homes with poor indoor air quality and durability problems. Resistance to high-wind events also has been relatively poor in many southern homes. These factors drive the need to determine how to design and construct homes in the region that are durable to both biological agents and high wind, are energy efficient, and have good indoor air quality.

Objective

The objective of this phase of the project is to initiate construction of the test house, which will accommodate several interdisciplinary studies with the ultimate goal of providing architects, engineers, contractors, homeowners, and others with information necessary to design, construct, and maintain wood-frame structures in the southern climatic region that exhibit durability (to both biological ands physical deterioration), energy efficiency, and good indoor air quality. Durability studies will also be conducted at the Formosan Termite Research Facility on the MSU experiment station in McNeill, Mississippi.

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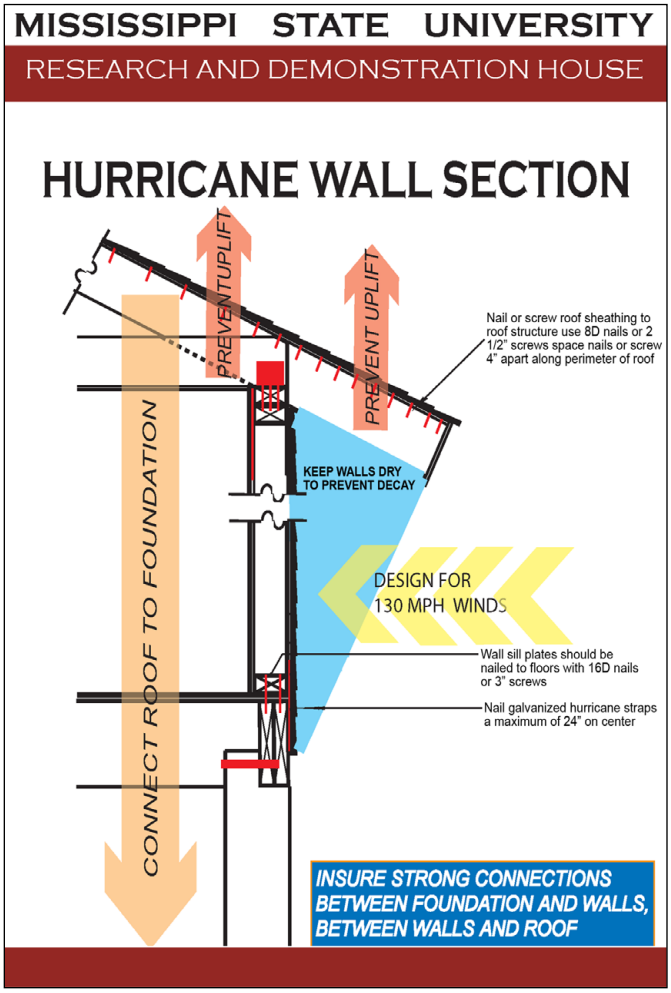

Approach

Research scientists from the departments of Architecture, Civil Engineering, Electrical Engineering, Forest Products, Landscape Architecture, and Mechanical Engineering, in collaboration with scientists at the USDA Forest Products Laboratory, will instrument the test house to provide data to evaluate the results of various interdisciplinary studies. As initial studies are completed, the test house will be "morphed" to accommodate other studies. These data will be transmitted to those who can use them through written and oral presentations, workshops, and the development of a building sciences curriculum. The AHRC will play a major role in technology transfer efforts.

Expected Outcomes

The success of this program will be seen in newly designed and constructed houses for the southern climatic region. The program will provide a template for similar housing research in other climatic regions.

Timeline

Design of the test house is complete, and construction drawings are nearing completion. Field and laboratory studies with Formosan subterranean termites are in progress. Suppliers of building materials and a general contractor for the test house are being secured. Construction of the house will begin spring 2007 and be completed by late 2007. Instrumentation of the structure for the first experiments will be in place by early 2008.

Cooperators

Mississippi State University, Forest Products Laboratory
USDA Forest Service, Forest Products Laboratory
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