

# MSU Building a House for Southern Climates

By Karen Brasher

According to the National Association of Home Builders, Hurricane Katrina destroyed some 275,000 homes in Alabama, Louisiana and Mississippi.

High-wind events, including hurricanes, are just one of the items being addressed by Mississippi State University's Southern Climatic Housing Research Team—a unique collaboration of personnel in forest products, architecture, landscape architecture, civil engineering, electrical engineering and mechanical engineering, along with the USDA Forest Service Forest Products Laboratory in Madison, Wis.

"All of these disciplines contribute some aspect to the building process, yet never have they worked together to address housing problems unique to the Southeastern region," said Terry Amburgey, professor in the Forest and Wildlife Research Center.

The team is in the planning stages of constructing a research/demonstration house on the MSU campus. Architectural models have been developed, and the blueprints are being drawn.

"We are convinced that housing research must be regionalized rather than trying to develop a 'one size fits all' structure," Amburgey added.

With approximately 70,000 new homes being built each year in the Southeast, there is a need to study housing problems unique to the region.

"Our approach couples designs for energy efficiency with biological and structural durability issues, while improving indoor air quality for houses built in the region," Amburgey said. "Each discipline contributes a distinctive component to the research effort."

The warm and humid environment in the Southeast results in high potential for wood deterioration. Decay fungi and termites are the most destructive wood pests of homes in this region. Research in forest products is addressing durability issues, including moisture control for foundations, walls and windows, as well as construction and chemical strategies for termite infestation.

Scientists in civil engineering are researching structural responses to high force wind loads, including tie-down systems for foundations, walls, and roofs.

"Mississippi has tremendous exposure to hurricane and tornadic winds that cause significant property damage and loss of life each year," said Thomas White, a professor in civil engineering and team member. "Civil engineering has devel-



oped important testing and analysis capabilities for wind loading on structures."

Researchers in mechanical engineering are studying incorporation of hygroscopic materials and low-velocity ventilation for maintaining air quality. According to the American Academy of Allergy, Asthma and Immunology, more than 50 million people in the United States suffer from asthma and allergies. The goal of the MSU research is to find ways to prevent dust mites, pollen and other allergens. They also are researching ways to limit relative humidity in homes to 45 percent and to limit volatile organic chemicals, which are emitted as gases from certain solids and liquids.

Architecture and landscape architecture personnel are developing low-energy and power-producing systems for residences, as well as regenerative processing characteristics of a surrounding ecological system. Concurrently, electrical engineers at MSU are studying advanced wiring and utility systems for single-family homes.

"The MSU house will have an immediate reduction in energy requirements by 75 percent compared to homes typically built in this region," Amburgey said. "This will be accomplished through the use of long overhangs, trellises, outdoor living, tall ceilings and cross ventilation in every room."

The goal is to illustrate to the public that durability, energy efficiency and air quality do not have to be compromised by lifestyle, spatial needs or the looks of a house.

"The house will be dynamic, rather than static, and will be altered as new data are generated and additional research is initiated," Amburgey said. "It will serve as a teaching facility for MSU students, as well as faculty and students from other universities and nonacademic visitors."