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MSU Study Supports Mississippi Building Code

A team of civil engineering faculty from the Bagley College of Engineering and research faculty from the GeoResources Institute at Mississippi State University recently completed a study of coastal storm surge and winds generated from Hurricane Katrina. In addition, building systems and material performance were evaluated from visual inspections of damage. Subsequently, an assessment was made of building codes and their application relative to the conditions imposed on the Gulf Coast and inland Mississippi by Hurricane Katrina.

“The start of hurricane season is only four months away and projects are underway to repair, reconstruct and develop the Gulf Coast area,” said Dr. Thomas White, Professor and Head of Civil Engineering. “If homes and buildings are not designed for potential hurricane effects they will be in jeopardy every hurricane season and represent a serious, continuing liability. In addition to land use planning to mitigate storm surge and flood damage, adoption by local jurisdictions of model building codes like the International Building Code (IBC) and International Residential Code (IRC) would greatly reduce wind damage on the coast and else where in the state. Hurricane Katrina is the most recent experience with high, wide spread winds over most of the state.

These model codes represent the wealth of knowledge our nation has for design and construction of homes and buildings. They are being considered by the legislature as part of a state building code law. “Although this study focused on Katrina, we can’t forget about other areas of our state that have potential for natural disaster,” said Dr. Harry Cole, Professor of Civil Engineering. “We have the potential for hurricanes, flooding, tornados, and earthquakes. When combined with some of the nation’s worst soils for construction, the state of Mississippi becomes the poster child for potential natural disasters.” Model building codes can provide minimum standards to help protect our families and property from these forces of nature but only offer this protection to citizens of cities and counties that have adopted these model codes.

The study includes an evaluation of wind loads and storm surge. “The wind loads recorded during Katrina compare reasonably well with design wind speeds included in the IBC and IRC,” said Dr. Christopher Eamon Professor of Civil Engineering. This means that if homes and buildings were constructed according to minimum requirements of the IBC and IRC we would have experienced much less wind damage to structures located in the path of Katrina. Design wind speeds were exceeded by Katrina in a relatively narrow swath of land in the southeast part of the state. The maximum difference in the measured wind speeds and the design wind speeds found in the IBC and IRC was 30 MPH. “It is important that cities and counties have authority to adopt more stringent requirements than a minimum state building code in order to incorporate lessons

learned from experiences like Katrina,” said Eamon. All of the Design Flood Elevations evaluated in the study were exceeded by Katrina’s storm surge

A structural damage survey is also included in the study and was conducted along highway 90 from Biloxi to Waveland. All cities along this route were surveyed including Waveland, Pass Christian, Long Beach, Gulfport, and Biloxi. Three general types of construction were surveyed including residential and commercial buildings and selected infrastructure such as bridges. Reinforced concrete and steel commercial structural frames in general preformed well. Light-frame wood structures on the coastline were almost entirely destroyed by the surge. Connections were the weak links in all types of buildings. “Good engineering needs to be part of rebuilding our Gulf Coast,” said White. As part of implementation of the Model Building Codes; design, supervision and inspection of development and construction should involve experienced professional engineers.

Ideally, all locations in Mississippi should be held to a consistent set of design standards for residential and commercial construction. Although design loads may vary within the standard to account for geographic variations in risk, the goal of the building code is to insure a minimum level of safety. This fundamental goal is impossible without a state building code that establishes these minimum design and construction standards.

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