

Purpose and Background



The purpose of this document is to summarize the observations, conclusions, and recommendations that were obtained during post-disaster assessments sponsored by the FEMA Mitigation Division in response to Florida's 2004 hurricane season. More than ten rapid response teams and two Mitigation Assessment Teams (MATs) were deployed to document observations and provide recommendations.

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The rapid response data collection teams focused on coastal high water marks, inland wind effects, residential and commercial building performance, critical and essential facility performance, and mitigation program effectiveness. The MATs assessed damage to the built environment and relied on the perishable data, such as high water marks, collected by the rapid response teams to quantify flood and wind effects of the hurricanes.

The MATs are composed of national experts in hazards (wind and flood), coastal processes, and buildings codes. The experts are engineers, architects, policy makers, code specialists, and building officials. MATs are sent out after disaster events for which the damage summaries and subsequent conclusions and recommendations are likely to have national implications. Assessment and documentation of the performance of buildings constructed to the Florida Building Code (FBC) has national significance because the State of Florida enacts some of the most stringent coastal construction codes and regulations for wind and flood. Therefore, if buildings built in accordance with Florida's codes and regulations perform well, then the FBC stands as

a good model for other coastal communities. However, if new building envelopes are damaged by a wind or flood event that is below the design level event in the FBC, then this indicates a significant problem for many coastal communities because even the most restrictive code in use is inadequate.

Building codes and standards, and floodplain regulations are adopted and enforced to regulate construction in at-risk areas. In Florida, the Standard Building Code (SBC), and the South Florida Building Code—both with local amendments—were used to regulate construction in Florida until early 2002 at which time the Florida Building Code (FBC) 2001 Edition was adopted statewide. The FBC is administered by the Florida Building Commission and governs the design and construction of residential and non-residential (commercial, industrial, essential/critical facilities) structures. The FBC 2001 is based on SBC; however, Florida has completed updates to the 2001 Edition and will release a 2004 Edition of the code for adoption in July 2005. The 2004 edition is based on the International Building and Residential Codes (IBC and IRC).

In Alabama, which adopts building codes on a statewide basis only for state-owned buildings; jurisdictions have traditionally adopted editions of the SBC, however, the City of Orange Beach adopted the 2003 IBC in the summer of 2004 and the City of Gulf Shores adopted it as an emergency measure after Hurricane Ivan. Other affected communities, such as those in unincorporated Baldwin County, still enforce the SBC.

For flood hazards, FEMA establishes by regulation the minimum floodplain management requirements that communities must adopt and enforce in order to participate in the NFIP (44 CFR Section 64.3). These requirements are the basis for the other codes and standards that are used to regulate floodplain construction. FEMA studies the impacts of hurricanes and tropical storms on coastal buildings to determine if its minimum requirements are effective in reducing flood damages. If problems are identified through a MAT or other evaluation, they can be addressed through regulatory changes to the NFIP, proposing changes in building code requirements, or through technical guidance and training.

MATs were deployed after Hurricanes Charley and Ivan for the following reasons:

- **Hurricane Charley MAT (FEMA 488).** A MAT was deployed in Florida to observe the first major design level wind event to strike the U.S. mainland since Hurricane Andrew. The MAT assessments

illustrate the progress made in building performance and highlight needed improvements.

- **Hurricane Ivan MAT (FEMA 489).** A MAT was deployed in Florida and Alabama in response to a code level flood event with near code level winds. This storm allowed for evaluation of both the building code and flood ordinances and regulations governing coastal construction. When significant flood events occur—such as those associated with Hurricane Ivan where flood levels exceeded the 100-year flood elevations—it is important to assess and evaluate the accuracy of the models used to analyze and prepare the flood maps as well as the accuracy of the existing maps (if conditions have changed since the maps were developed).
- **Hurricane Frances Hazard Mitigation Technical Assistance Program Report.** Following Hurricane Frances, a team of structural and building envelope experts was deployed to assess damage to critical and essential facilities to help determine the extent of damage, the mode of failure, and what types of eligible mitigation projects could minimize damage to these buildings in the future.
- **Hurricane Jeanne High Water Level Report.** To document the severity of riverine flooding after Hurricane Jeanne, a field study was conducted to collect and survey riverine and coastal high water marks in affected Florida counties.

This summary document consolidates and presents the findings of the MATs and the supporting tasks and provides guidance to state and local governments to improve the reconstruction process and advise policy-makers during their upcoming Legislative and State Building Code update cycles. This Summary Report describes building performance for hurricane winds (Charley, Frances, and Ivan) and hurricane-related flooding (Ivan) in Florida and Alabama only, even though other states were impacted by the hurricanes. The conclusions presented in this report are based on the MAT's observations, evaluations of relevant codes, standards, and regulations, and meetings with state and local officials, building associations, contractors, and other interested parties. These conclusions are intended to assist the States of Florida and Alabama, communities, businesses, and individuals in the reconstruction process and to help reduce future wind and water damages promoting the economic well being of the nation.

