

# Mitigation best practices



FEMA

## Hazard mitigation saves historic Galveston home

Laminated safety glass protects stained-glass window

### At a glance

One of Galveston's most important historic buildings was threatened by Hurricane Ike. The 1895 Moody Mansion suffered rainwater intrusion and flooding from the storm surge but survived, thanks to hazard mitigation measures that dramatically reduced disaster losses. The mitigation measures are all part of the mansion's phased, systematic, strategic approach to protecting historic resources by disaster planning, preparation, and hazard mitigation.

**GALVESTON, Texas** – When Hurricane Ike slammed ashore on Galveston Island in September 2008, the storm's 100-mph winds and 11-foot storm surge took aim at one of the most important historic buildings in Texas – Moody Mansion.

The mansion suffered some rainwater intrusion and flooding from Hurricane Ike's surge, but damage was minimized, thanks to hazard mitigation measures that dramatically reduced disaster losses, said Betty



Betty Massey and Mary Hoehne, left to right, are guardians of Galveston's historic Moody Mansion.

Massey, executive director of the Mary Moody Northen Endowment which owns the mansion. The measures are all part of the endowment's phased, systematic, strategic approach to

protecting historic resources through disaster planning, preparation, and hazard mitigation.

The mansion is, by any standard, a priceless treasure. Construction spanned three years, from 1892 to 1895. The building is crafted of red brick generously iced with limestone, sporting bold arches, towers, dormers, and a pyramidal red-tile roof. It contains 31 rooms on three floors atop a raised basement.

Perhaps the most stunning feature is a 12-foot-tall leaded, stained-glass window overlooking the landing of the finely crafted staircase in the oak-paneled central hall. The glass portrays a family greeting visitors while a banner proclaims, "Welcome ever smiles."

During Hurricane Ike, winds hurled debris broadside into the stained-glass window. Was it another tragedy of the storm? No.

"Thank heavens, we had covered this special window outside with laminated

glass to protect it in a storm,” said Mary Hoehne, Moody Mansion facility manager. The laminated glass, which had been replaced in recent years, has a network of spider cracks, clearly recording the debris’ impact. “The covering did its job. There’s no question that without the laminated glass we would have lost that window,” she said.

Broken windows would have allowed substantial water intrusion and damage throughout the home. That’s why most of the other 50-plus windows are covered with clear storm coverings of polycarbonate, a kind of plastic shield that is nearly as clear as glass.

The best of the polycarbonate glazing products are touted for their high-impact strength, flame resistance, insulation and clarity. This type of shield is often used in bus stop shelters, sky lights and similar projects that demand both transparency and extreme strength. “Placing the Lexan on the windows protects the mansion’s openings without detracting from the historic building’s façade,” Massey said. The window protection system has been a major investment that the mansion is continuing in installments as funds are available.

Moody Mansion stewards believe their responsibility to safeguard the property requires hazard mitigation measures, Massey said. Some people think historic properties cannot be protected from hazards because those protective measures could detract from the historic buildings. To the contrary, she feels hazard mitigation is imperative for historic buildings because these structures represent priceless resources that cannot be lost.

The challenge is to find creative ways to mitigate risks without sully the

historic character of the buildings. “For example, we needed to prevent water from building up and damaging the porches, but we didn’t want to detract from the beautiful archways,” Massey said.

To solve the problem and still preserve the mansion’s status on the National Register of Historic Places, the mansion’s stewards funded an engineered system of drains and removable fabric shields that



Photo: Charles Blackby/FEMA

A 12-foot-tall stained glass window welcomes visitors to the Moody Mansion.

hang from permanent fasteners. “We put on the shields before a storm,” said Hoehne. “When we take them down, no one would even know the system was there.”

Hurricane mitigation work also includes weather stripping, wooden shutters on windows without clear storm shields, and protective film applied to the inside of the windows. When one window broke, the film kept it from shattering, which in turn prevented further damage.

A humidity-control system prevents mold, a scourge of flooded homes, and

also helps keep water from wicking up the masonry walls and causing long-term damage.

Perhaps most important, a hazard mitigation plan addresses preparedness, business continuity, and hazard mitigation.

“The idea is to think things through ahead of time and have a plan, even if you can’t do it all at once. One year, we add half the protective plastic and repair the old shutters on the other windows, and next year add another quarter and so on,” Massey said. “We keep a standing item in every year’s budget for hurricane mitigation.”

Those in charge of the museum review the plan every spring before hurricane season. It includes five pages of contractors lined up in advance.

“We are keeping a recovery diary every day. This allows us to compile insurance information and also will help us analyze how everything has gone so we can continue to improve our plan,” Massey said.

Massey considers mitigation a good investment, noting that wind-driven rain through even one broken window could easily cause losses costing \$50,000 to \$60,000. “It wouldn’t take many disasters to offset the entire cost of adding the plastic shields,” she said.

Dollar estimates can never completely describe the priceless value of historic resources, she said. “Our capability to prepare for and survive a storm has been vastly improved by taking the time for up-front planning. It’s certainly worth the investment to mitigate on the front end, to lessen the chances of damage and disaster.”