



Hurricanes and Manufactured Housing



Destroyed Pre-1976 Mobile Homes 2 miles from Ventura Lakes

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The nagging question about mobile homes: Are they safe? The short answer is, it depends which mobile homes you are talking about. The manufactured homes industry has maintained that manufactured homes built to the standards of the late 90s are just as safe as “stick built” housing. The disasters of a quadruple hurricane season have put this question to the test.

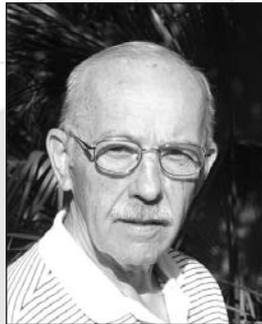
The U.S. Department of Housing & Urban Development, the Florida Department of Highway Safety and Motor Vehicles, the Florida Manufactured Housing Association, and the Institute for Business and Home Safety are busy pouring over data collected during on-site inspections following Charley and Frances. Teams of experts from these organizations have visited manufactured home parks throughout the track of the hurricanes for the purpose of documenting the damage and the characteristics of the housing units. More data will be collected in the Florida panhandle communities ravaged by Ivan.

The evaluation of performance centers on the age of the manufactured units relative to major changes in the building codes which dictate how units are produced and tied down:

- **Units produced before 1976.**
- **Units produced after 1976 when the Federal Manufactured Home Construction and Safety**

Standards (FMHCSS) were adopted by Congress. Manufactured units produced under the Standards became known as “HUD-Code” units.

- **Units produced after 1994 when the FMHCSS were updated following Hurricane Andrew in order to reflect increased wind-load requirements.**
- **Units produced and set after 1999 when Florida issued more stringent installation and tie-down standards and licensing of installers.**



A team from the Manufactured Housing Institute (MHI) accompanied the HUD damage inspection team following Hurricane Charley when they inspected six manufactured housing communities near Punta Gorda. In *MHI's Just the Facts* published August 23, 2004 it was reported that the wind speeds in the six communities ranged from 100 to 145 mph depending on the location. The homes built

prior to the 1976 HUD Code did not perform well in two of the communities. The damages were attributed to inadequate anchors, corroded anchors, or penetrations of the exterior walls and windows of the units by wind-borne debris. Car ports that had been attached to the units failed due to wind forces and tore off portions of the walls and roof. These wall penetrations and those resulting from wind-borne debris allowed internal pressure to increase and destruction of the home resulted. The only homes that survived without considerable damage were protected by nearby tree lines. →



Ventura Lakes is located in Punta Gorda, directly in the path of the eyewall.



Ventura Lakes Home – No Damage. Indicative of the entire Ventura Lakes Community.

The Budweiser Plant photographed is about 1/4 mile from Ventura lakes and was built to the new Florida Commercial Building Code



Most of the damage experienced by manufactured units built according to the 1976 HUD Code, but before the 1994 changes, was related to the failure of attached carports that peeled away siding and roof covering exposing the home to increased internal pressure. Wind-borne debris impact was also observed as a cause of damage. A small number of homes were observed to have shifted off their foundations. Many homes were saved from serious damage by being equipped with hurricane shutters. In general, it was concluded that most of the homes could be repaired and would still be livable.

Homes that were built after the 1994 HUD Code, with its wind-load updates, performed well. Most of the units had storm shutters that likely prevented buildup of internal pressure. Wind-borne debris damage was observed on siding and roofs. Where attached garages failed, collateral damage to the units was limited to small wall or roof areas. Movement on the foundation was observed in very few units and was considered to be easily repairable.

No homes built after the 1994 HUD Code updates and in accordance with the 1999 Florida installation standards were found displaced from their foundations. The tougher installation and tie-down safety standards for Florida’s mobile homes required the use of more tie-downs. Today, a typical manufactured home might have as many as 45 tie-downs compared with just 10 for a pre-Andrew manufactured unit. Most damage that was observed was related to the loss of attached carports, the impact of wind-borne debris, or siding failure.

The summary statements published by the MHI stated: “Overall, performance of homes built to the post-1994 HUD Code wind changes was very good. Homes built to the pre-

1994 HUD Code fared well. Homes built to the 1976 HUD Code failed at an alarming rate.”

Another damage assessment of the manufactured home damage related to Hurricane Charley was conducted by the Florida Department of Highway Safety and Motor Vehicles, Division of Motor Vehicles. This team visited 77 manufactured housing parks and assessed the damage to 11,800 housing units located in Polk, Charlotte, DeSoto, Hardee, Lee, Highlands and Orange Counties. The goal of the team was to assess the effectiveness of the 1994 HUD Code with its updates to improve the wind resistance of the units. Out of all the units observed, 2,422 (20.5%) were either destroyed or damaged to the point of not being repairable. Focusing only on the 2,883 post-1994 HUD Code homes that were observed, none of the units were seriously damaged. The damage observed to these units was related to the loss of attached carports and screen rooms, siding and shingle loss, broken windows, and siding/roof damage caused by wind-borne debris or falling trees.

SUMMARY

The findings reported by the damage assessment teams indicate that the strengthened Federal Manufactured Home Construction and Safety Standards are improving manufactured housing structural performance during high-wind events. Similarly, the administrative rules implementing a mobile home installation standards, materials testing, and installer training and licensing program has had a positive effect on the stability of manufactured units during high-wind events.

A comprehensive report of the HUD damage assessment teams is anticipated to be published later this year. 