

## **BUILDING CODE TRIAGE TEAMS AFTER ACTION REPORT HURRICANE IVAN**

### **I. PROCEDURES FOLLOWED:**

1. **DEPLOYMENT:** The deployment of the Building Code Triage was accomplished under a Tracker 2000 Mission Number, input by the Infrastructure Branch Chief (POC: Dean Griffin, DEM).

2. **NOTIFICATION:** The notification of DCA team members was accomplished internally and augmentation by retired CBO Red Wilkes, President of the Suwannee River BOAF Chapter and Chuck Anderson, P.E. and a representative of the glass industry.

3. **ACTIVATION:** The activation of the team was accomplished by telephone tree, and rendezvous was accomplished at the hotel on Sunday afternoon (09/19/04) in Crestview, FL (nearest hotel with electricity).

4. **TRANSPORTATION & LOGISTICS:** The logistics of transportation for the DCA members of the team was provided by the Team Leader's crew cab pickup truck and team member's pickup truck.

### **II. FINDINGS:**

1. **SANTA ROSA COUNTY:** The Triage Team deployed initially to Milton, FL in Santa Rosa County on Monday morning (09/20/04) and tried to contact the CBO, but he was unavailable. Santa Rosa County was a beehive of activity and traffic jams were prevalent due to power outages. I-10 was closed to both east and westbound traffic due to bridge failure, making HW-90 the major corridor. The Triage Team stopped at a Real Estate office and obtained a map and information of the local area residential developments and commenced our surveys of the impacted areas.

NOTE: Based on the above experience, Real Estate offices are an excellent source of maps and local information on residential developments when the building official is not available.

The Triage Team examined over 100 individually damaged homes and an estimated 300 area surveyed [undamaged] homes in Santa Rosa County that were subjected to Category II or greater winds. Most damage to FBC built residences was due to trees uprooting or losing large branches that caused structural damage to roofs.

**FLORIDA BUILDING CODE (FBC) AND CODE COMPLIANCE:** Code compliance is being vigorously enforced in Santa Rosa County, which accounts for the minimal damage to homes built to the FBC (since March 01, 2001) and the adequacy of the FBC, except for tree damaged roofs. Substantial roof damage was observed in this county to both pre-FBC built residences and older mobile homes.

Almost total destruction of any aluminum pool coverings, lanais, sheds and carports was observed, with some anchoring bolts actually pulled from the concrete decking and aluminum vertical support members sheared off at the base. In cases where these accessories were attached to the roof, this ultimately led to partial roof failure where the aluminum attachment was attached to the roof.

Some damage was observed to unprotected openings, while other sustained no damage. Most protected openings performed well, if installed properly. Improper installation of the anchoring system led to the failure of some steel shutters.

2. **ESCAMBIA COUNTY:** The Triage Teams split into two teams to cover both coastal and inland residential areas on 09/21 & 21/04 because of the major traffic congestion on HW-90, which was the only access to Escambia County from our hotel in Crestview. Traffic was down to one lane each way (East & West) with power outages and no traffic signals. It took approximately 1 hour to go 4 miles across upper Escambia Bay on HW-90 due to the I-10 bridge failure. The teams surveyed over 400 homes and approximately twenty-five commercial buildings, including high-rise buildings on the barrier islands.

NOTE: The Triage Team observed a significantly different type construction method for soffits that explained the general lack of soffit failures in this area as compared to previous soffit damage in other parts of the state in the 2004 hurricane season. A 2x4 ledger was fastened to the wall, to which the soffit was attached. This method of construction afforded a much more substantial structural member for the soffit attachment to the wall, which prevented the winds from uplifting the soffit into the attic space. Methods used in other areas of the state utilized an aluminum rail for the soffit attachment to the wall, which proved insufficient to resist the uplifting force of the winds.

NOTE: Escambia County barrier islands and beaches experienced extreme storm surges, with buoy-recorded 50 feet waves offshore. These waves caused major structural damage to all type beach construction, resulting in the loss of life for several residents who had decided not to evacuate. These waves were the apparent cause of the Escambia Bay I-10 bridge failure, which also caused the loss of life before the bridge could be closed.

NOTE: This area has numerous homes that have been instrumented under the Coastal Monitoring Program at the University of Florida, so some very accurate data will be available for actual wind measurement at specific sites.

NOTE: Power outages were experienced by most residents due to major damage to the grid in Escambia County by falling trees. Gasoline powered electric generators were at a premium and were sold out in all major stores in a three state area. Some price gouging was found and prosecuted by local government and state officials. Gasoline lines in excess of one mile long were observed in Escambia County due to power outages and limited filling stations with electric generators.

**FLORIDA BUILDING CODE (FBC) AND CODE COMPLIANCE:** Residences built to the FBC (since March 2001) survived the storm with little or no damage (except

storm surge or tree damage), attesting to the vigorous code enforcement by the County and City Building Officials and the adequacy of the FBC.

Most of the damage to residences occurred due to either major storm surge on the barrier islands and beach areas, flooding in the low-lying areas or tree damage to roofs by large Oak and Pine trees uprooting or losing large branches. Roofs with three tabs, composite asphalt-fiberglass shingles, when properly installed (and not otherwise damaged by debris), survived the major hurricane force winds very well.

Almost total destruction of any aluminum pool coverings, lanais, sheds and carports was observed, with some anchoring bolts actually pulled from the concrete decking and aluminum vertical support members sheared off at the base. In cases where these accessories were attached to the roof, this ultimately led to partial roof failure where the aluminum attachment was attached to the roof. Galvanized connectors do not perform well in this salt environment, leading to the conclusion that only stainless steel should be used.

Some damage was observed to unprotected openings, while other sustained no damage. Most protected openings performed well, if installed properly. Improper installation of the anchoring system led to the failure of some steel shutters.

END OF REPORT