



## Screen Barriers Protect Orange County Firehouses

### Full Mitigation Best Practice Story

#### Orange County, Florida



**Orlando, FL** - During Hurricane Charley in 2004, Fire Station No. 66 in Orlando survived sustained winds of 55 miles per hour (mph) and gusts of 97 mph without damage to the stationhouse or equipment. Emergency readiness was never compromised thanks to the installation of a flexible, wind abatement system that protected the large, bay doors from high wind, and windborne debris.

Some stations had no shielding screens. At Fire Station No. 76, winds from Hurricane Charley ripped away two bay doors, allowing wind and rain to enter the building. If the building envelope is breached, sudden pressurization of the interior can cause major structural damage (e.g., roof loss) and significant interior and content damage from wind-driven rain.

In 1992, many Miami-Dade fire stations lost roofs, equipment, files and furniture to Hurricane Andrew’s fierce winds. Debris-laden winds penetrated aluminum-framed glass doors, lifting roofs away. “Everything inside -- equipment, computers, files and furniture was blown away,” said Lt. R.W. “Bob” Saunders. “Firehouses were rendered useless in a time of public crisis.”

Orange County did not want to face the same circumstance. They needed an easy-to-assemble and operate, flexible barrier that could withstand hurricane force winds and windborne debris. According to Lt. Saunders, lessons learned from Hurricane Andrew influenced the decision to install polypropylene screen barriers on Orange County fire stations and Emergency Operations Center. The screens and shutters were funded by a grant from FEMA under the Hazard Mitigation Grant Program (HMGP). Total cost of barrier screens for six, 12 feet by 14 feet fire station bay doors was \$13,260.

The barrier screens are polypropylene, woven monofilament, geotextile fabric, customized for an exact fit at each opening. They are engineered to reduce wind speed and water penetration by 90 percent, and prevent windborne debris from impacting the doors. “Other great advantages of the screen barriers are that they allow us to see outside, have fresh air and a cooling breeze,” said firefighter/paramedic, Dan Bracewell. Screens, at Fire Station No. 66, slope away 2 feet from the base of the bay doors. This helps to channel wind and rain away from the building. The flexibility of the material absorbs the impact of windborne debris and keeps it from hitting the doors. Bolted top and bottom, to rustproof metal anchors, the screens flex, but stay secured. When not in use, the screens are rolled up and secured above the door.

Daryl McCarthy, Orange County Project Officer involved in the grant application 5 years ago, said no failures of the hurricane-proof screens had been recorded. Of the County’s 33 fire stations, 12 now have protective screen barriers. “We are, today, in the process of preparing another mitigation grant application to safeguard the remaining 21 firehouses.”

“Our stations were built in the 1960s and 1970s when building codes did not require hurricane resistant structures. Once barrier screens are installed, we are assured of maintaining operational readiness during and following severe weather. Barrier screens are our most cost-effective way of achieving this goal,” McCarthy said.

#### Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region IV**

State: **Florida**

County: **Orange County**

City/Community: **Orlando**

### Key Activity/Project Information

Sector: **Public**  
Hazard Type: **Hurricane/Tropical Storm**  
Activity/Project Type: **Retrofitting, Non-structural**  
Activity/Project Start Date: **09/1999**  
Activity/Project End Date: **09/2003**  
Funding Source: **Hazard Mitigation Grant Program (HMGP)**  
Funding Recipient: **Critical Facility - Police/Fire**  
Funding Recipient Name: **Orange County fire stations and Emergency Operations Center**

### Activity/Project Economic Analysis

Cost: **\$4,420.00 (Actual)**  
Non FEMA Cost:

### Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster? **Yes**  
Federal Disaster #: **955 , 08/24/1992**  
Value Tested By Disaster? **Yes**  
Tested By Federal Disaster #: **No Federal Disaster specified**  
Year First Tested: **2004**  
Repetitive Loss Property? **No**

### Reference URLs

Reference URL 1: <http://www.floridadisaster.org/BRM>  
Reference URL 2: <http://www.nhc.noaa.gov/>

### Main Points

- Installed easy-to-assemble and operate, flexible barrier that could withstand hurricane force winds and windborne debris.
- The barrier screens are polypropylene, woven monofilament, geotextile fabric, customized for an exact fit at each opening. They are engineered to reduce wind speed and water penetration by 90 percent, and prevent windborne debris from impacting the doors.
- When not in use, the screens are rolled up and secured above the door.

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Firefighter Dunn unfurls the screen



Fire Station No. 66 firefighter screws metal eyebolts into imbedded anchor sites in the cement driveway,