

## Wind Design and Wind Damage

### Analysis to Roof Systems #1

Grayco Roofing Consultants utilize and are well versed in the most current and up to date wind resistance and uplift engineering techniques now implemented in the design and forensic evaluations of residential, commercial and industrial roof systems. These wind evaluation techniques and engineering standards comply with:

- American Society of Civil Engineering or ASCE 7-05
- 2003 and 2006 Editions of the International Building Codes
- ANSI-SPRI ES-1 for proper roof edge detailing and wind uplift resistance of perimeter edges
- FM Global 1-29 with 2006' Industry Changes
- South Florida Miami/Dade/Broward County's Hurricane Zone Wind Codes
- Research of older implemented wind codes on pre-existing buildings roofed prior to the employment of the current more restrictive wind codes.

Grayco Roofing Consultants has extensive experience in the evaluation of wind damages and high wind events and has been on the front lines as first responders to major hurricane events of the Gulf Coast and South Florida, high straight line coastal wind events occurring in the upper Northwest and severe tornadic outbreaks occurring in "Tornado Alley" spreading from Texas to Nebraska and from Colorado to Illinois.

Some of these events include:

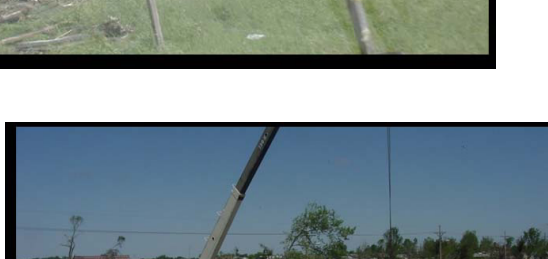
- Hurricane Charlie 2003, West Florida coast and northern Florida
- Hurricane Francis 2004, Southeast and east Florida coast
- Hurricane Jeanne 2004, Southeast and east Florida coast
- Hurricane Katrina 2005, South Florida (first landfall)
- Hurricane Katrina 2005, New Orleans and the Gulf Coast (second landfall)
- Hurricane Dennis 2005, Gulf Coast of Florida
- Hurricane Wilma 2005, landfall on Florida S. West Coast causing damages through the everglades through the mainland and out and up the S. East coast of Florida
- F-3 tornado outbreaks occurring in southwest Missouri in 2003 causing severe damages in Stockton, Pierce City and Carl's Junction Missouri
- F-2 and F-3 tornado outbreaks in west and west central Missouri causing widespread devastation from St. Joseph Missouri, on the Kansas border, across state, to Springfield Illinois May 24, 2004.
- F-2 and F-3 tornado outbreaks 1-7-08 which stretched across Missouri from N. East Oklahoma to northern Illinois.



Catastrophic damages sustained by F-3 tornadoes in Stockton Missouri in 2003.



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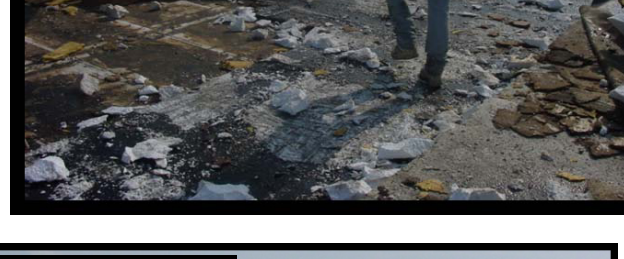
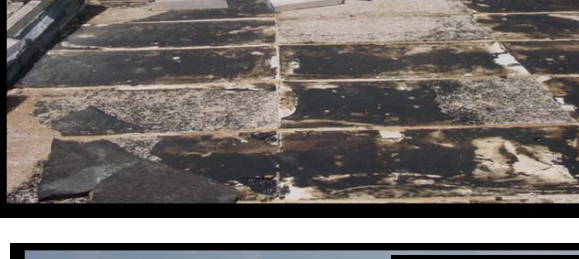
Catastrophic roof damages sustained by F-3 tornadoes in Carl Junction Missouri in 2003.



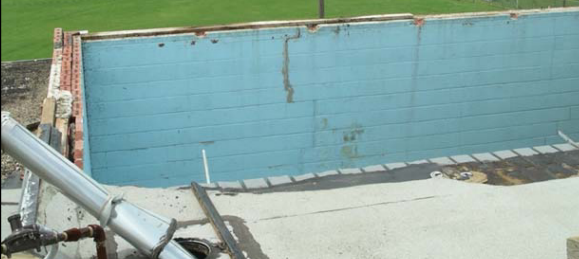
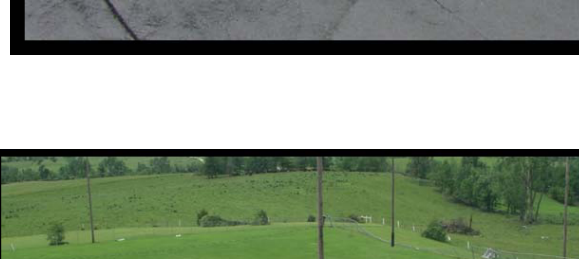
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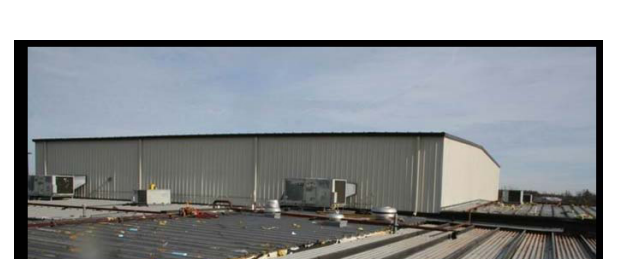
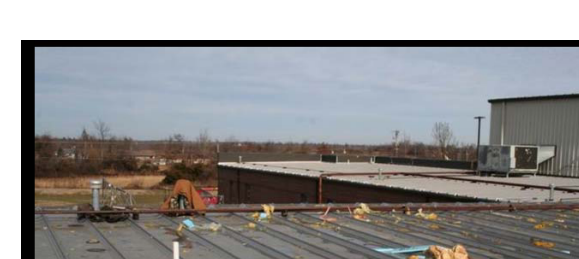
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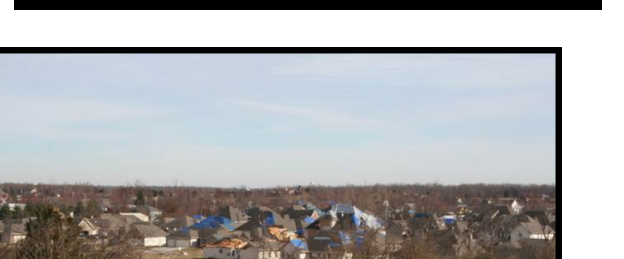
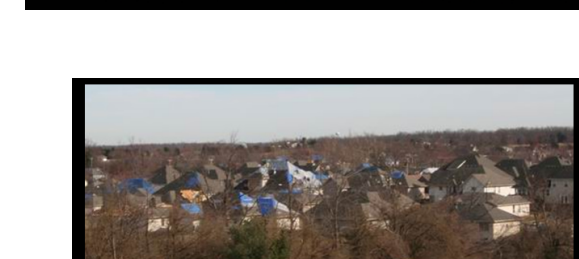
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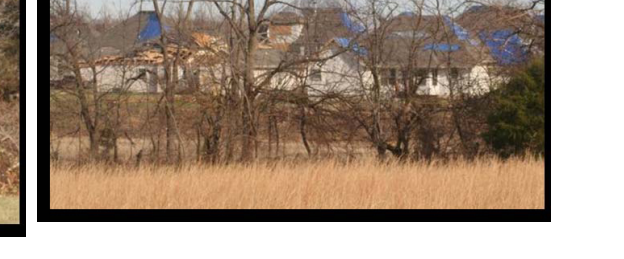
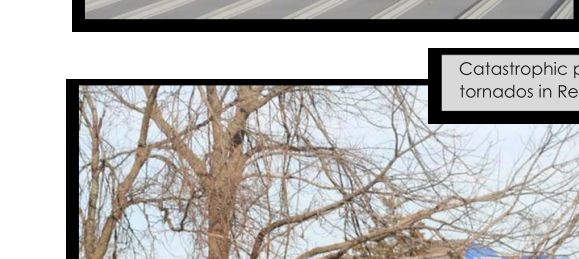
Catastrophic roof damages sustained by F-3 tornadoes in New Cambria Missouri in 2004.



Catastrophic roof damages sustained by F-2 tornadoes in Republic Missouri in January, 2008.



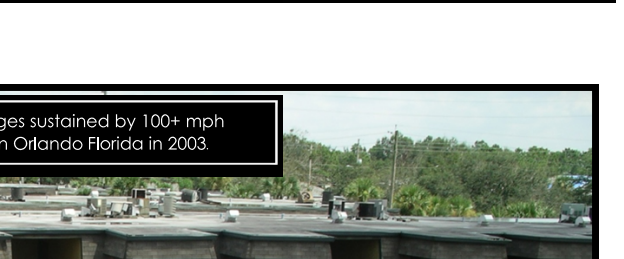
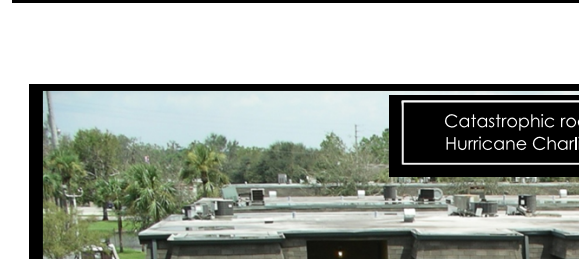
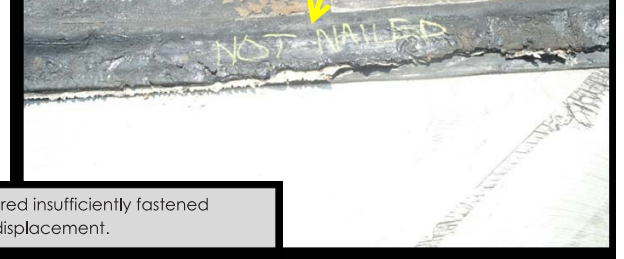
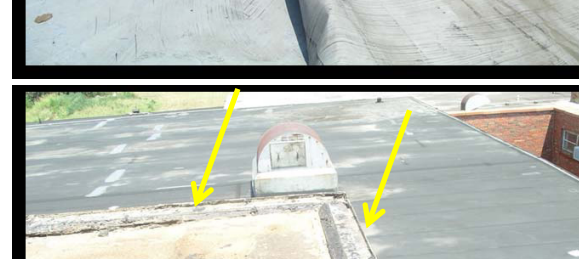
Catastrophic property damages sustained by F-2 tornadoes in Republic Missouri in January, 2008.



Catastrophic roof damages sustained by 90 mph straight-line winds in St. Louis Missouri in 2006.



Catastrophic roof damages sustained by 100+ mph Hurricane Charley winds in Orlando Florida in 2003.



Catastrophic roof damages sustained by 90 mph straight-line winds in St. Louis Missouri in 2006.



Roof edges were discovered insufficiently fastened initiating roof displacement.

