Wind Damage to Residential Structures

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You know how to whistle don't you? Just put your lips together and blow.

— Lauren Bacall to Humphrey Bogart, in *To Have and Have Not*
Warner Bros. Pictures, 1945

2.1 Code Requirements for Wind Resistance

Most nationally recognized U.S. building codes, such as the Unified Building Code (UBC) and the Building Officials and Code Administrators (BOCA) code require that buildings be able to withstand certain minimum wind speeds without damage occurring to the roof or structure. In the Midwest, around Kansas City for example, the minimum wind speed threshold required by most codes is 80 mph. For comparison, hurricane level winds are considered to begin at 75 mph.

According to the National Oceanic and Atmospheric Administration (NOAA) weather records, the record wind speed to date measured at the weather recording station at Kansas City International Airport is 75 mph. This occurred in July 1992. Considering together the Kansas City building code requirements and the Kansas City weather records, it would appear that if a building is properly "built to code" in the Kansas City area, it should endure all winds except record-breaking winds, or winds associated with a direct hit by a tornado.

Unfortunately, many buildings do not comply with building code standards for wind resistance. Some communities have not legally adopted formal building codes, and therefore have no minimum wind resistance standard. This allows contractors, more or less, to do as they please with respect to wind resistance design. This is especially true in single-family residential structures because most states do not require that they be designed by licensed architects or engineers. Essentially, anyone can design and build a house. Further, in some states, anyone can be a contractor.

It is also likely that many older buildings in a community were constructed well before the current building code was adopted. The fact that they have survived this long suggests that they have withstood at least some

Plate 2.1 Severe wind damage to structure.

severe wind conditions in the past. Their weaker contemporaries have perhaps already been thinned out by previous storms. Most codes allow buildings that were constructed before the current code was adopted and that appear to be safe to be "grandfathered." In essence, if the building adheres to construction practices that were in good standing at the time it was built, the code does not require it to be rebuilt to meet the new code's requirements.

Of course, while some buildings are in areas where there is indeed a legally adopted code, the code may not be enforced due to a number of reasons, including graft, inspector malfeasance, poorly trained inspectors, or a lack of enforcement resources. Due to poor training, not all contractors know how to properly comply with a building code. Sometimes, contractors who know how to comply, simply ignore the code requirements to save money. In the latter case, Hurricane Andrew is a prime example of what occurs when some contractors ignore or subvert the wind standards contained in the code.

Hurricane Andrew struck the Florida coast in August 1992. Damages in south Florida alone were estimated at $20.6 billion in 1992 dollars, with an estimated $7.3 billion in private insurance claims. This made it the most costly U.S. hurricane to date. Several insurance companies in Florida went bankrupt because of this, and several simply pulled out of the state altogether. Notably, this record level of insurance damage claims occurred despite the fact that Andrew was a less powerful storm than Hugo, which struck the Carolinas in September 1989.