



HURRICANE MICHAEL WIND DAMAGE ASSESSMENT

Executive Summary

Introduction

Hurricane Michael made landfall on October 10, 2018, near Panama City, Florida, with sustained winds of approximately 160 mph. Winds speeds of such magnitude are enough to collapse structures and cause major damage. Maximum wind speeds near the landfall area were at or above the state's current design standards, significantly testing building construction in the Florida Panhandle. Hurricane Michael caused upwards of \$25 billion dollars in damages with over 54,000 structures damaged or destroyed.

Post-event observations reinforced the concept that typical building codes are not designed to prevent all losses and that extra measures beyond standard code requirements are necessary to further mitigate damages. The use of sealed roof decks can minimize damage, as the loss of roof covers is the most frequent damage in major wind events. Roof cover loss leads to water intrusion, jeopardizing a building's interior.

The IBHS damage assessment team deployed to the initial landfall location, near Panama City, Florida. The team assessed structural performance of 186 residences. While there were few FORTIFIED homes in the path of Hurricane Michael, examinations show the effectiveness of constructing homes to code-plus standards such as the IBHS FORTIFIED Home™ program or the Habitat for Strong Residences program (a part of Habitat for Humanity International).

Key Findings

- Both FORTIFIED and Habitat Strong structures, built to exceed code, performed better than the surrounding structures built to standard codes at the time of construction. These successes show that it is possible for all homes, regardless of home value, to be built in ways that decrease losses and allow homeowners to return to their homes as quickly as possible.



- Roof cover loss occurred in all wind speed bands. Most homes with asphalt shingles experienced damage, while less than half of homes with metal roofs were damaged. All homes with 3-tab shingles that were investigated were damaged.
- Evidence of water intrusion was present for many houses that lost roof cover and underlayment, highlighting the importance of a sealed roof deck in mitigating this type of loss.



- Increasing levels of damage were observed as wind speeds increased, starting with roof cover, wall, soffit and fascia damage (>110 mph), and progressing to roof decking (>130 mph), roof structural damage (>140 mph), and total collapse (>150 mph).
- Hip roofs performed better than gable or combination gable-hip roofs, which is consistent with findings from past hurricane investigations (Brown-Giammanco et al. 2018).
- Where it was possible to discern, newer asphalt shingle roofs generally performed better than older asphalt shingle roofs within the same neighborhood.
- Damage to protected windows was less frequent and occurred at higher wind speeds than damage to unprotected windows.
- For external doors, sliding doors were the most frequently damaged, followed by double-entry glass doors.
- External wall coverings were often damaged, with vinyl siding having the highest damage frequency and stucco the least. The amount of damage observed makes it clear that more focus is needed regarding the resiliency of wall coverings.