

Benefits and challenges of full-scale testing in a large wind facility

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Who is IBHS?

**Insurer-funded non-profit
Promotes Resilient Construction
through
Research & Communications**



Benefits of Full-Scale Testing

Failure Modes

Failure Sequence

System Performance

Evaluate Simplified Test Standards



Benefits of Full-Scale Testing

Full-Scale Components

Real-World Connections

Fluid Component Interaction

Demonstrate Benefits of Mitigation



Failure Modes Attached Aluminum Structure

- Damage or poor connections of posts supporting eave of carport
- Buckling of roof deck pans at mid-span
- Failure of connection to home
- Buckling of beam supporting eave
- Failure of connection between roof deck and supporting beams and channels
- Cracking of roof pans caused by vibrations



- Weak or Damaged Posts -



- Damaged, Corroded or Poor Connections to Slab/Foundation -



System Performance – Benefits of Mitigation

Conventional Construction Versus Wind Resistant Construction



Mitigation Measures

- Strapping of Connections
- Ring-shank Nails
- Wind Resistant Roof Cover
- Wind Resistant Vinyl Siding



System Performance – Benefits of Mitigation

Water Intrusion Mitigation Measures



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Sealed Roof Deck Demonstration



Wildfire Ember Attacks

Ember entry through vents

Ember accumulation

Local ignition initiation



Challenges

Design tests based on facility limits

Test for basic phenomenon – not
variability of products, materials or
installation



Challenges

Improve/develop simplified tests
that reflect real-world performance

Use facility to evaluate engineering
design approach/assumptions





Thank You.

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