Design Considerations For Withstanding Hurricane Forces

Frank L. Bennardo, P.E.

Basic Facts

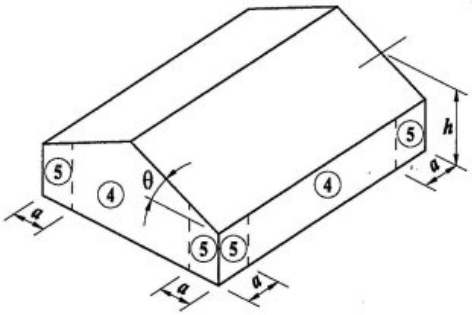
- Wind velocity ≠ wind pressure
- Wind pressure increases exponentially with wind velocity
- Wind pressure is also a function of roof height, building geometry, exposure conditions, topography, structure type and importance, among other factors

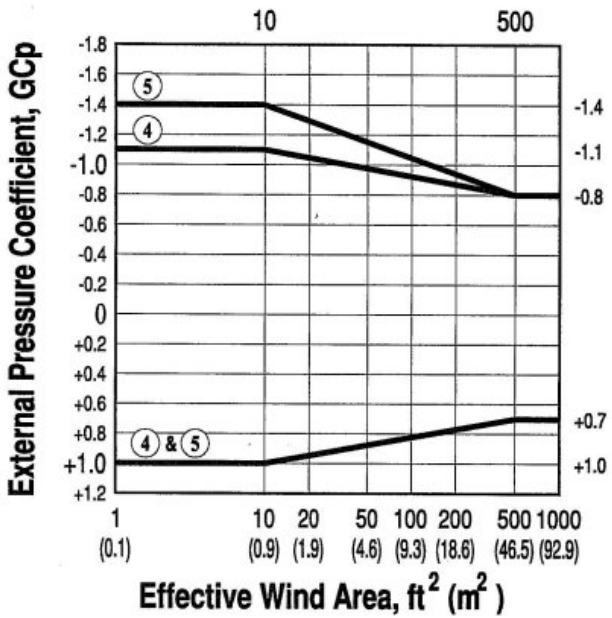
$$Pressure_z = 0.00256 K_z K_{zt} K_d V^2 I$$

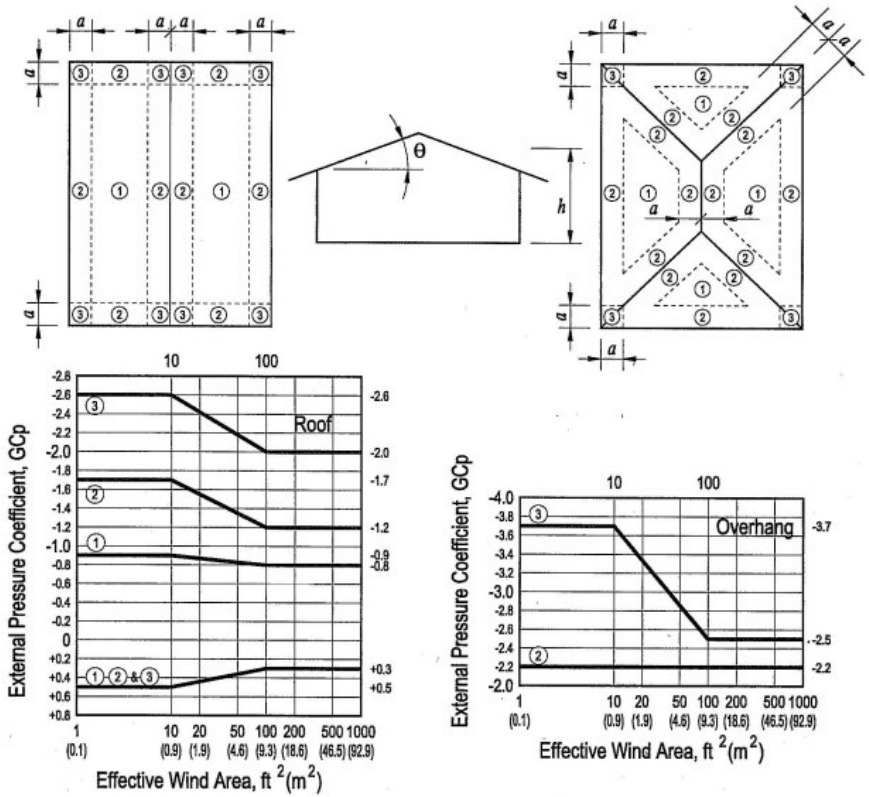
ASCE-7

Design for overall stability - Main Wind Force Resisting System (MWFRS)
and Components and Cladding (C & C)

ASCE 7-02 C & C Wall Pressure Coefficient







ASCE 7-02 C & C Roof Pressure Coefficient

Chart values are multipliers to the basic wind pressure formula to determine specific pressures for each building component

End/Corner zones = higher pressures

Negative pressures > Positive Pressures

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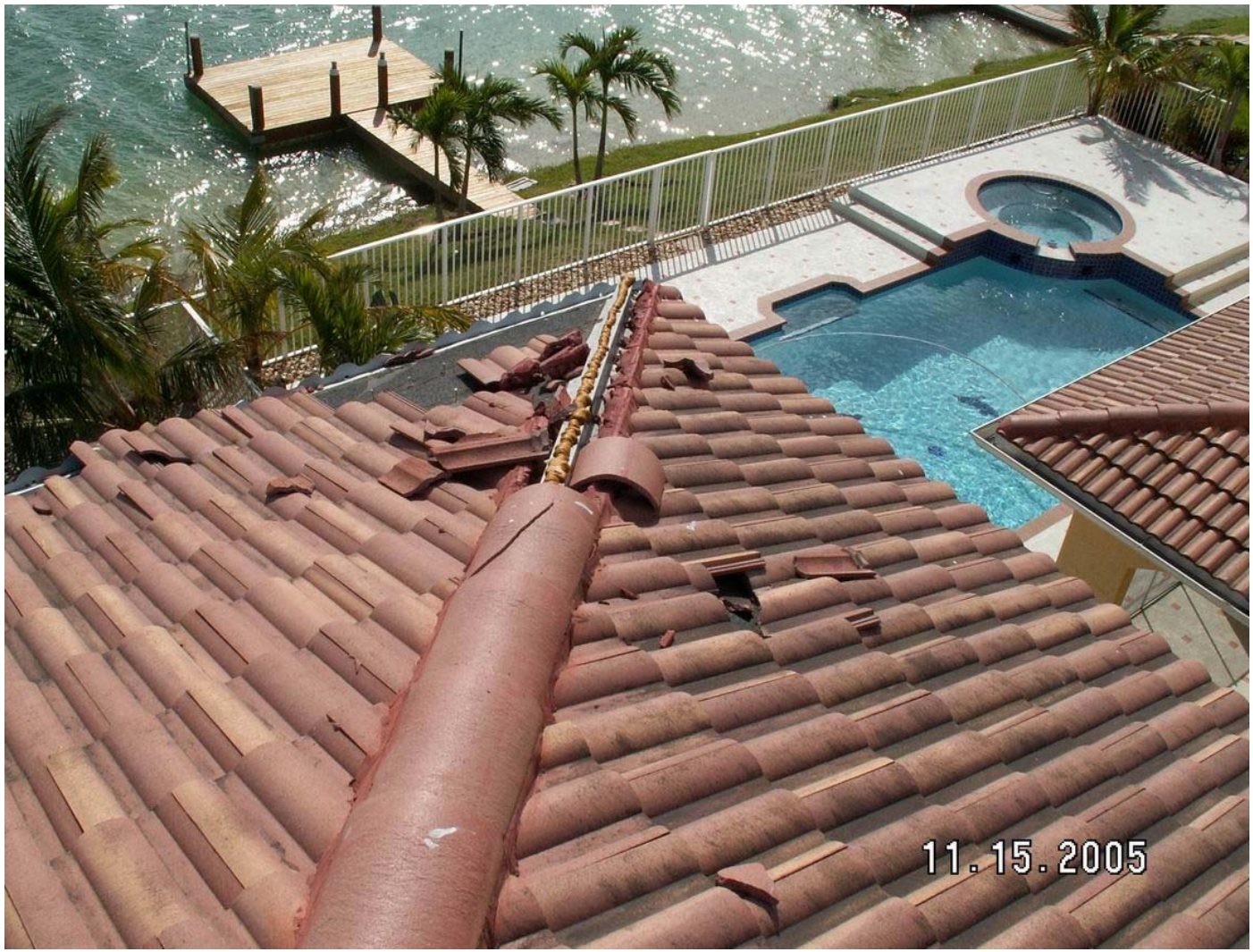
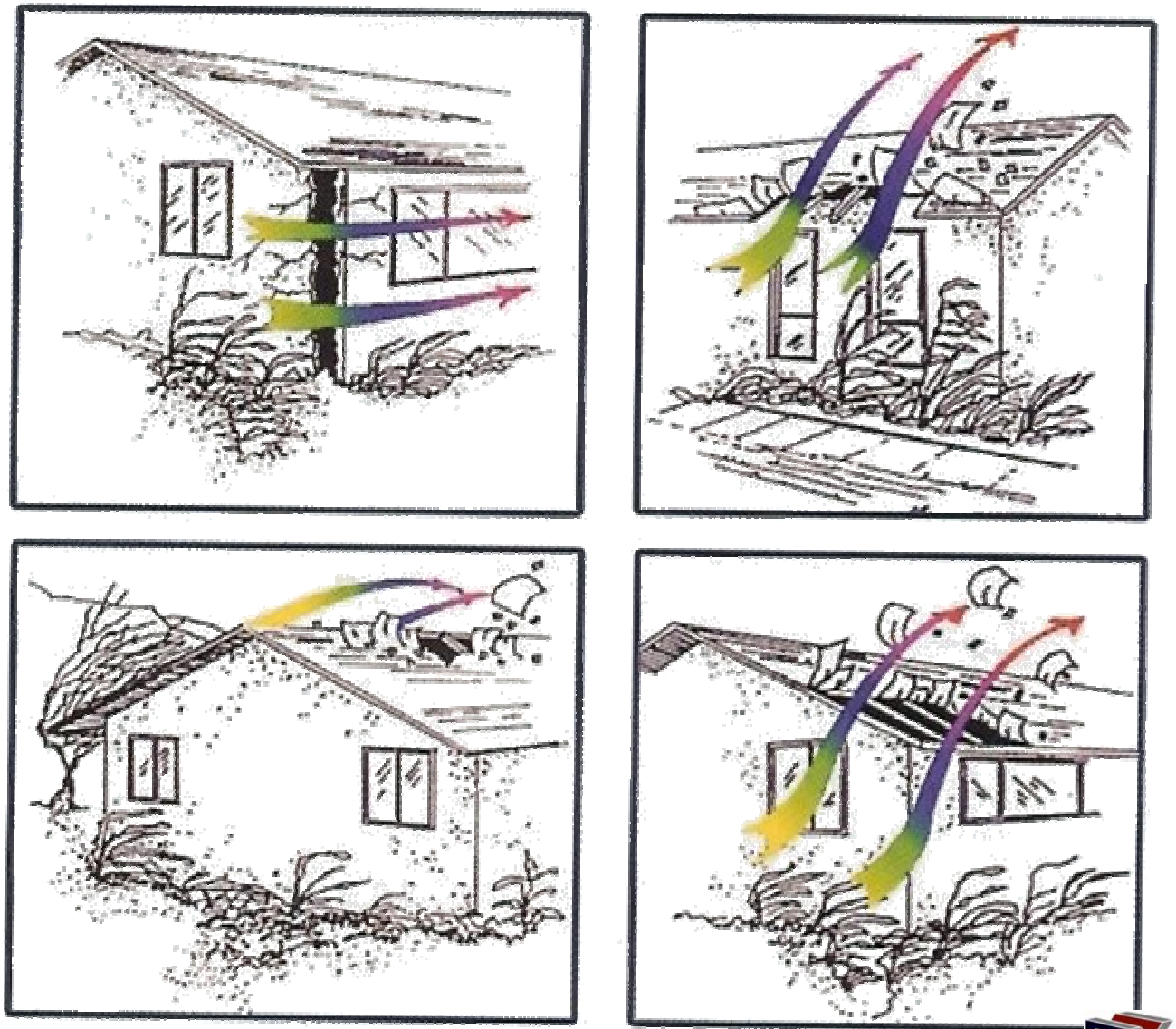
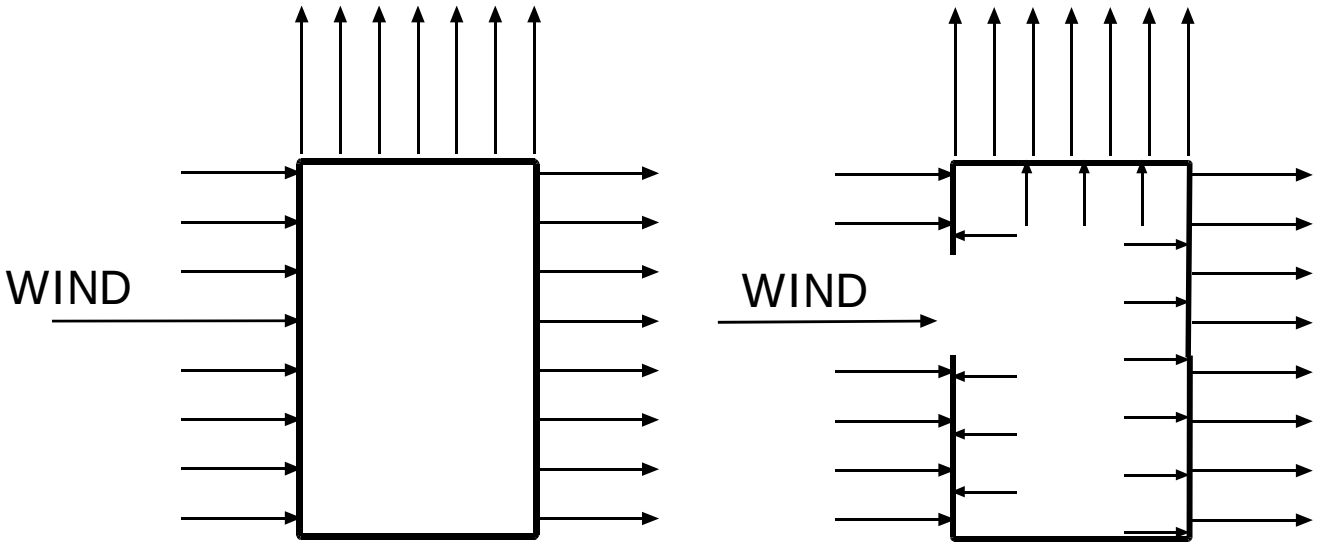
Roof Corner Zone 3 Damage

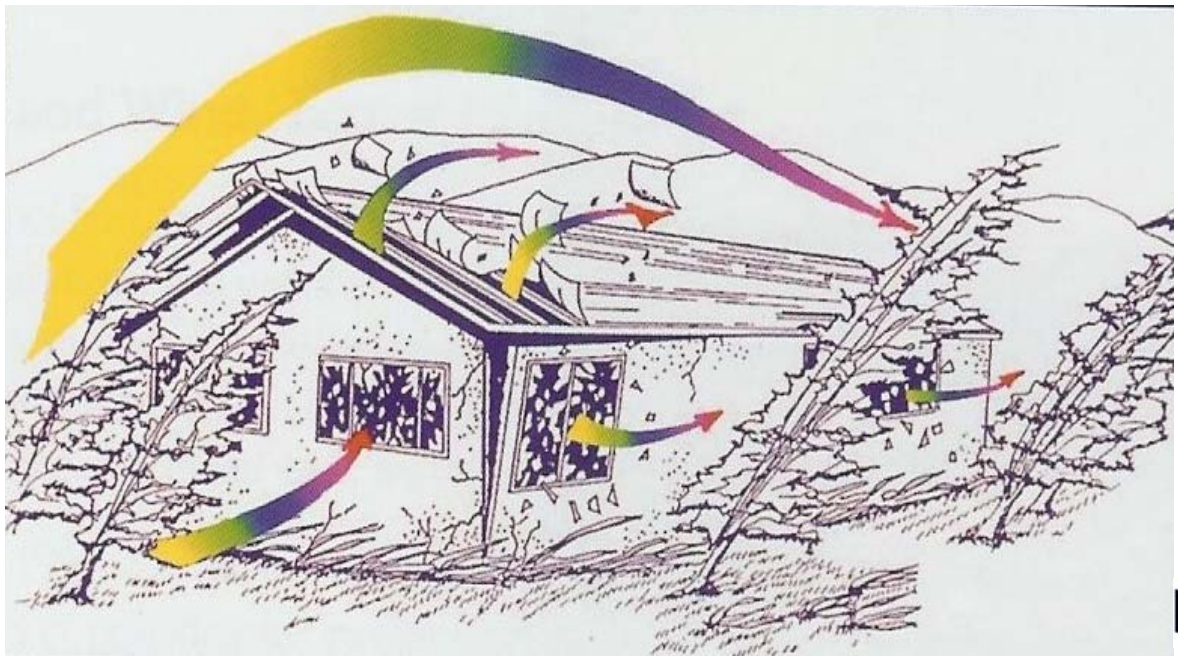


Localized High Pressures



Internal Pressurization





Building Failures

Soffit,
Siding,
Roofing

(Pressure)

Windows & Doors
(Pressure, Impact)

Every and
Any Piece
Contributes
To Building
Failure

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Design Resources

- Building Codes: IBC & Florida Building Code –searchable online
- Product Testing and Approvals For Building Components
- Impact, Uplift, and Abatement Protection Devices
- Economical Building Components
- Advanced Design Applications & Calculators Allow More Accurate Design
- www.engexp.com > resources

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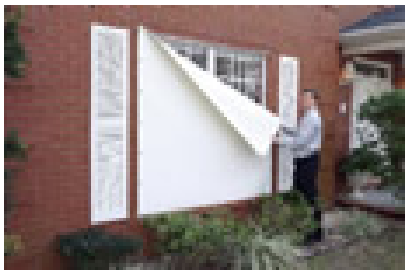
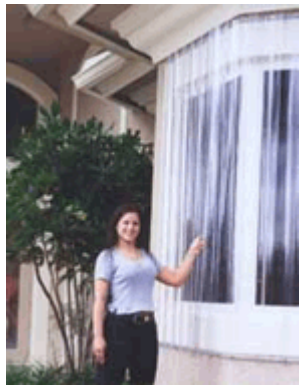
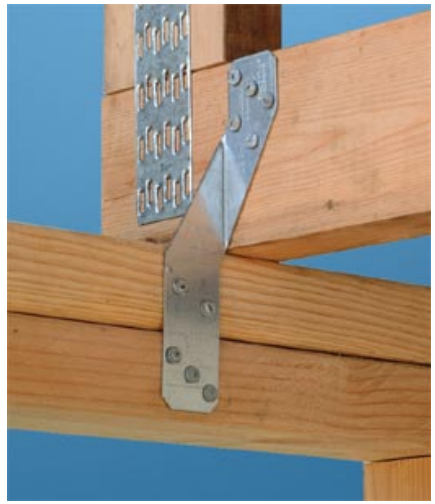
New Technologies





- Innovations in anchors and connectors



- Fabric, Panel, and similar glazing protection

- Retrofit bracing systems

- Encapsulating Hurricane Netting System

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Online Resources

- www.miamidade.gov (Product Approvals)
- www.floridabuilding.org (Product Approvals)
- Straps – Simpson, USP, etc.
- Anchor Websites & Calculators
  Hilti / Powers, etc.
- Norbord OSB Sheathing and Related
- Engineering Express Flash Calculators