

DOE Zero Energy Ready Home

Tech Training Webinar Series

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



Going Green and Building
Strong: Building a FORTIFIED
Home – Part II



The Home of the Future....Today



Website

- www.buildings.energy.gov/zero/
- Events:
 - Upcoming in-person ZERH Trainings
 - Technical Training webinars
 - Conference Presentations
- Partner Locator
- Program Specifications
- Webinar Recordings



Building America Solution Center

- <http://basc.pnnl.gov/>

Thank You



For More Information:

www.buildings.energy.gov/zero

Email:

zero@newportpartnersllc.com



Going Green and Building Strong: Building a FORTIFIED Home™ Part 2

Fred Malik, Director of FORTIFIED
Programs

June 5, 2014



DOE Challenge Home Value

- > Energy Prices
- > Energy Efficiency
- > Builder Risk
- < Health Concerns
- < Renewable Cost
- > Water Crisis
- < Water Flow
- > Extreme Weather
- > Disaster Risk
- > Innovation
- > Informed Buyers
- > Hsg. Stock Age

Lives Better

- Engineered Comfort
- Healthier Living
- Solar Ready
- Long-Term Warranty

Works Better

- Ultra-Low Utility Bills
- Advanced Technology
- Water Efficient
- Black-Out Power

Lasts Better

- Quality Construction
- More Durability
- Disaster Resistant
- Lower Cost Insur./Mort.

Building a FORTIFIED Home™ :

Part 1 - Why build FORTIFIED

- Who is IBHS?
- Definitions
- Why FORTIFIED?
- Building and Wind Interactions



Building a FORTIFIED Home™ :

Part 2 – How to build FORTIFIED

- **Technical Requirements Overview**

- Most Vulnerable Systems
- Different Standards for Different Risks
 - Hurricane - Coastal
 - High Wind – Inland
 - High Wind & Hail – Inland
- FORTIFIED Home™ Upgrades
- Keys to Success

- **Recognition**



FORTIFIED Home™



Designation Basics

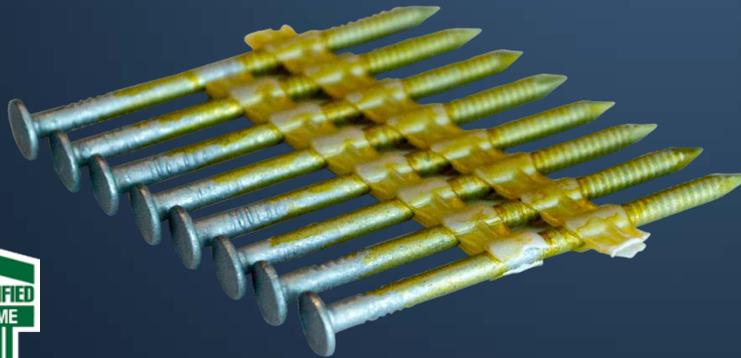
- Independent Verification is Required
 - Certified FORTIFIED Home Evaluator
- Designations valid for 5-years (**driven by roof covering condition**)
- Automatic reminders sent to registered owner prior to expiration
- Re-designation focuses on the roof, requires evaluation by certified FORTIFIED Home Evaluator



Why FORTIFIED?



...Because Little Things Matter



Water Intrusion Highlights



Sealed Roof Deck Demonstration:



© Insurance Institute for Business & Home Safety

**Sealed roof deck
damage estimate**

\$5,408^{.59}

**Unsealed roof deck
damage estimate**

\$16,935^{.23}



© Insurance Institute for Business & Home Safety



Choosing different materials, doesn't guarantee resilience; installation is an important factor as well



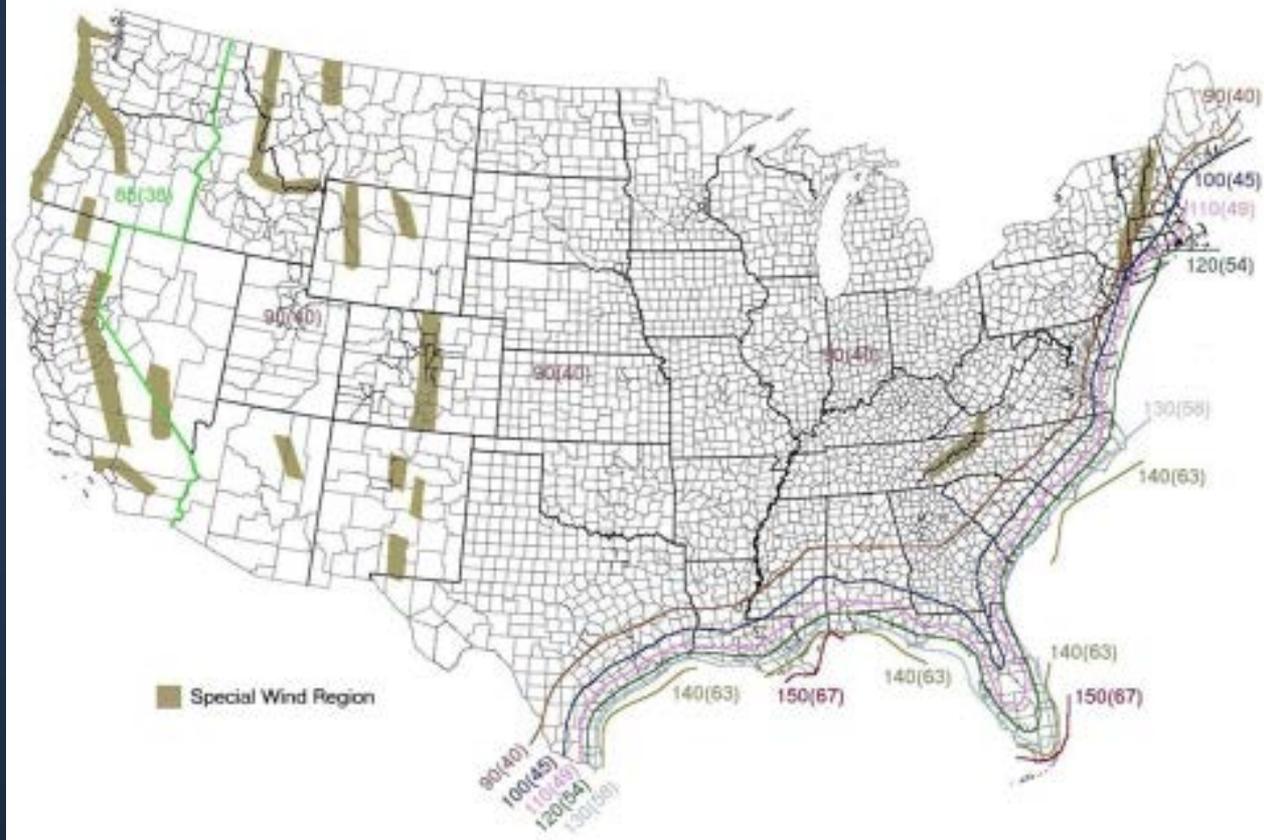
Why FORTIFIED? - Builders

- Build trust with customers
- Offer Protection for What is Priceless
- Differentiation and Recognition
- Use the FORTIFIED Home™ mark
- Point of Sale Collateral
- Control the process
- Growing Demand

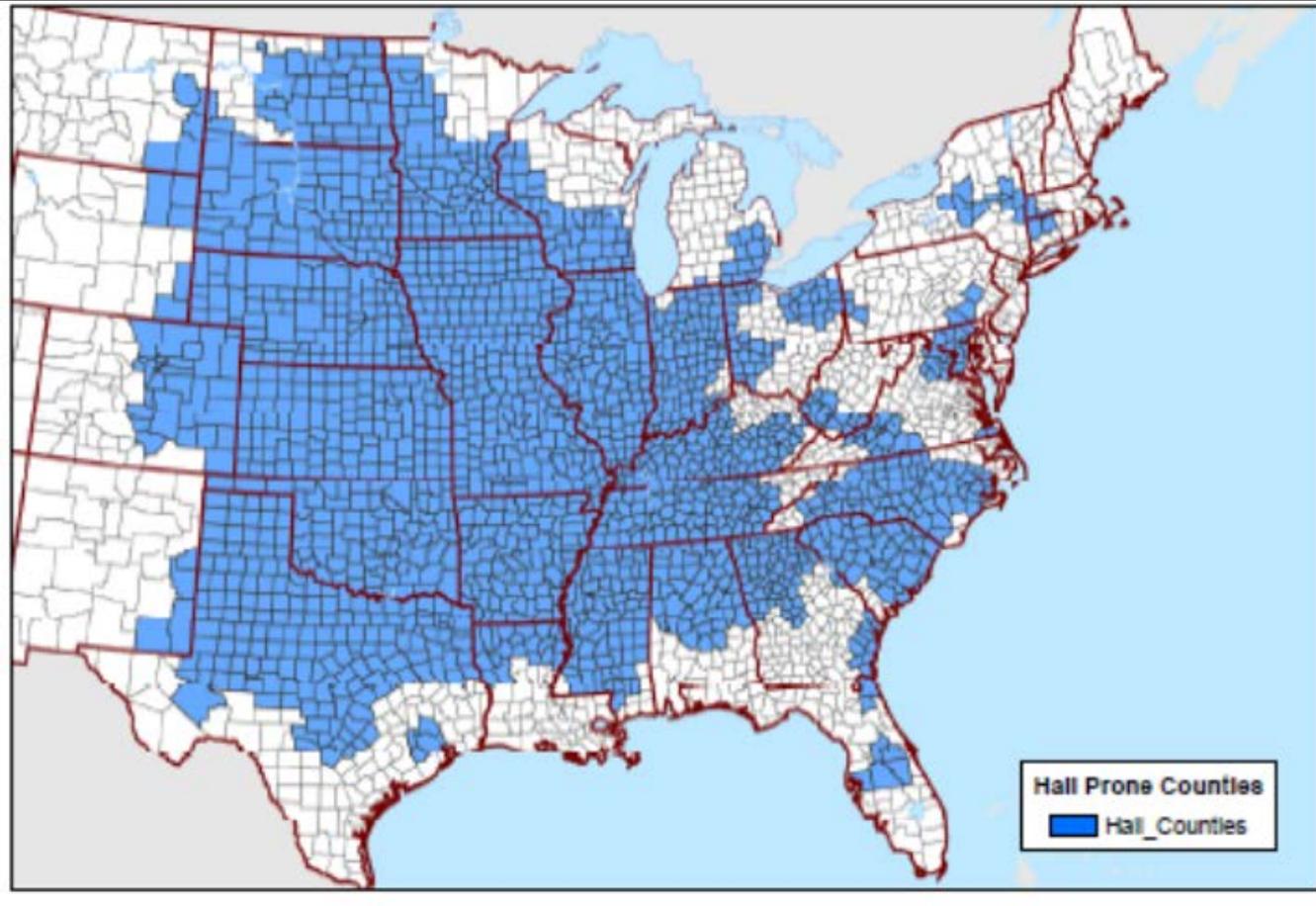


Design Wind Speed Determines FORTIFIED Home Standard to Use

Gust Wind Speed ASCE 7-05



Hail Prone Counties (Inland)



Hail Research



Designation Level Basics

Hurricane



FORTIFY Roof and Attic Ventilation System



FORTIFY Openings



FORTIFY Structure



High Wind and Hail

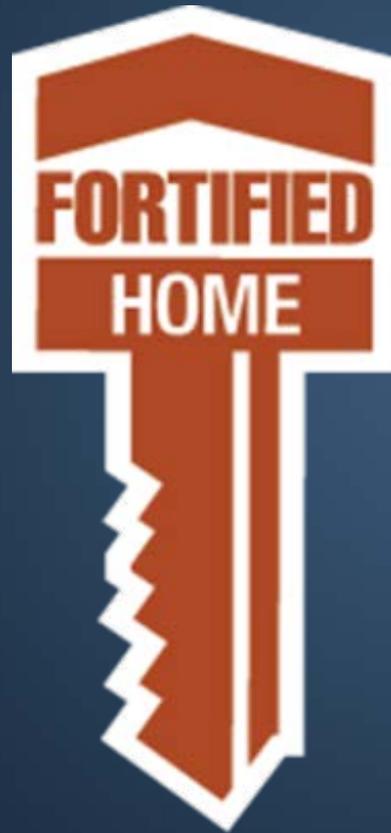


FORTIFY Roof

FORTIFY Gables, Porches, Carports and Chimneys

FORTIFY Garage Doors and Structure (CLP)

FORTIFIED Roof System



Bronze



FORTIFIED Roof

Roof Deck Thickness



- Minimum 7/16" OSB/Plywood;
- 19/32" is **recommended**



FORTIFIED Roof

Roof Deck Attachment



New Roofs: 8d ring shank nails at 6-in on center over the entire roof (closer spacing may be required at corners)

Existing Roofs: If staples or 6d nails, re-nail with 8d ring shank

If 6-in on edges, 12-in. in the field, add an 8d ring shank nail in between existing fasteners.



FORTIFIED Roof

Roof Deck Attachment



New Roofs: 8d ring shank nails at 6-in on center over the entire roof (closer spacing may be required at corners)

Existing Roofs: If staples or 6d nails, re-nail with 8d ring shank >6-in at edges or >12-in in field, add nail

If 8d common or better at 6-in on center over entire roof, OK.



Sealed Roof Deck



Mandatory for all roofs



© Insurance Institute for Business & Home Safety



Mandatory ONLY when installing new roofing



© Insurance Institute for Business & Home Safety



Sealed Roof Deck (full membrane option)



© Insurance Institute for Business & Home Safety



Sealed Roof Deck (synthetic underlayment; install for **high wind** and **prolonged exposure**)



© Insurance Institute for Business & Home Safety

Sealed Roof Deck (closed-cell, 2-part polyurethane foam adhesive)



© Insurance Institute for Business & Home Safety

FORTIFIED Roof - Roof Coverings



Hurricane - Shingles

ASCE 7-05 Wind Speed (V_{asd})	ASCE 7-10 Wind Speed (V_{ult})	Shingle Wind Testing Standard/Classification
100 MPH	129 MPH	ASTM D3161 (Class F) or ASTM D 7158 (Class G or H) ¹
110 MPH	142 MPH	ASTM D3161 (Class F) or ASTM D 7158 (Class G or H) ¹
120 MPH	155 MPH	ASTM D 7158 (Class G or H) ¹
130 MPH	168 MPH	ASTM D 7158 (Class H) ¹
140 MPH	180 MPH	
150 MPH	194 MPH	

¹ **Note:** When used in Exposure D locations, shingles must pass both ASTM D3161 Class F **and** ASTM D7158 Class H testing standard.



High Wind and Hail - Shingles



TABLE B-03: WIND SPEED AND IMPACT RESISTANCE CLASSIFICATIONS FOR SHINGLES TO BE USED IN FORTIFIED HIGH WIND AND HAIL DESIGNATED HOMES

Design Wind Speed	Shingle Wind Testing Standard/ Classification	UL 2218 Impact Resistance Classification/ Hail Risk
110 mph	ASTM D3161 (Class F) or ASTM D7158 Class G or H	Class 4



Design Wind Speed Resource



ATC
Applied Technology Council
WINDSPEED BY LOCATION

[Home](#) [About This Site](#) [Lat/Long Finder](#) [Related Resources](#) [Sponsors](#) [About ATC](#) [Contact](#)

The purpose of the "Wind Speed Web Site" is to provide users with a site specific wind speed using the GPS coordinate system. On this website, users can retrieve wind speeds from ASCE 7-10, ASCE 7-05 and ASCE 7-93. Wind speeds are also provided for serviceability purposes for 10, 25, 50 and 100-year return periods.

The reason this utility is needed is that the spatial resolution of the wind speed maps that are displayed in ASCE 7 are not sufficient to determine a site specific wind speed. There are no reference city or town locations on the ASCE 7 maps and while county boundaries are shown, the resolution is affected when the maps are expanded large enough to distinguish the boundaries and approximate the city locations.

To find the windspeed for a specific area, select one of the following methods:

1. Click the radio button for decimals and enter latitude and longitude in the spaces in decimal form and select "Get Windspeed" or
2. Click the radio button for address and enter the desired address; Select "Find" to auto-populate the latitude and longitude and select "Get Windspeed" or
3. Find the site on the map, right click the mouse and the latitude and longitude will be displayed in decimals. The coordinates auto-populate in the decimal location. Select "Get Windspeed" or

Decimal (Enter Decimal Value)

Latitude	Longitude
28.0543255	-82.4050646

Address (Enter Complete Address Below)

4775 East Fowler Avenue, Tampa, FL

US Virgin Islands

Guam

American Samoa

Hawaii

Visit Our Partners



Design Wind Speed Resource

WINDSPEED BY LOCATION

Home About This Site Lat/Long Finder Related Resources Sponsors About ATC Contact

Search Results

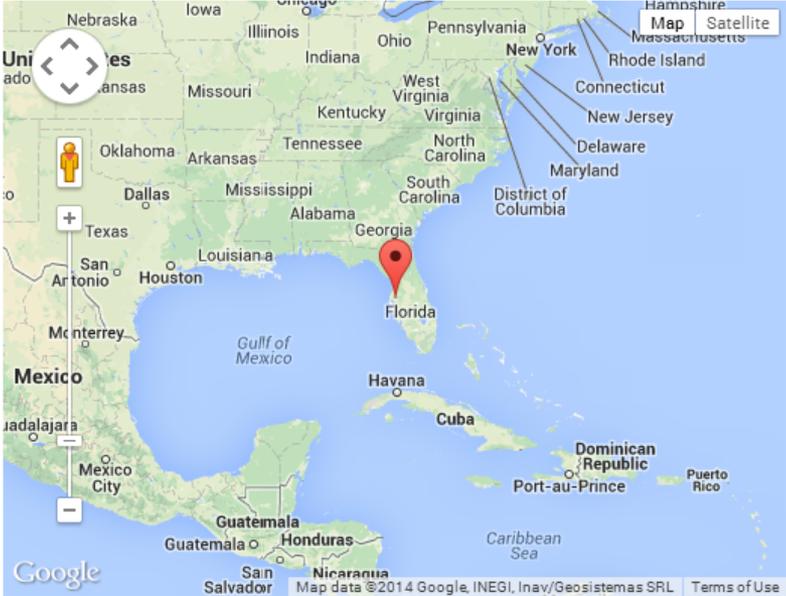
Latitude: 28.0543
Longitude: -82.4051

ASCE 7-10 Wind Speeds
(3-sec peak gust MPH*):

Risk Category I: 130
Risk Category II: 140
Risk Category III-IV: 149

MRI** 10 Year: 79
MRI** 25 Year: 94
MRI** 50 Year: 105
MRI** 100 Year: 116

ASCE 7-05: 113
ASCE 7-93: 99

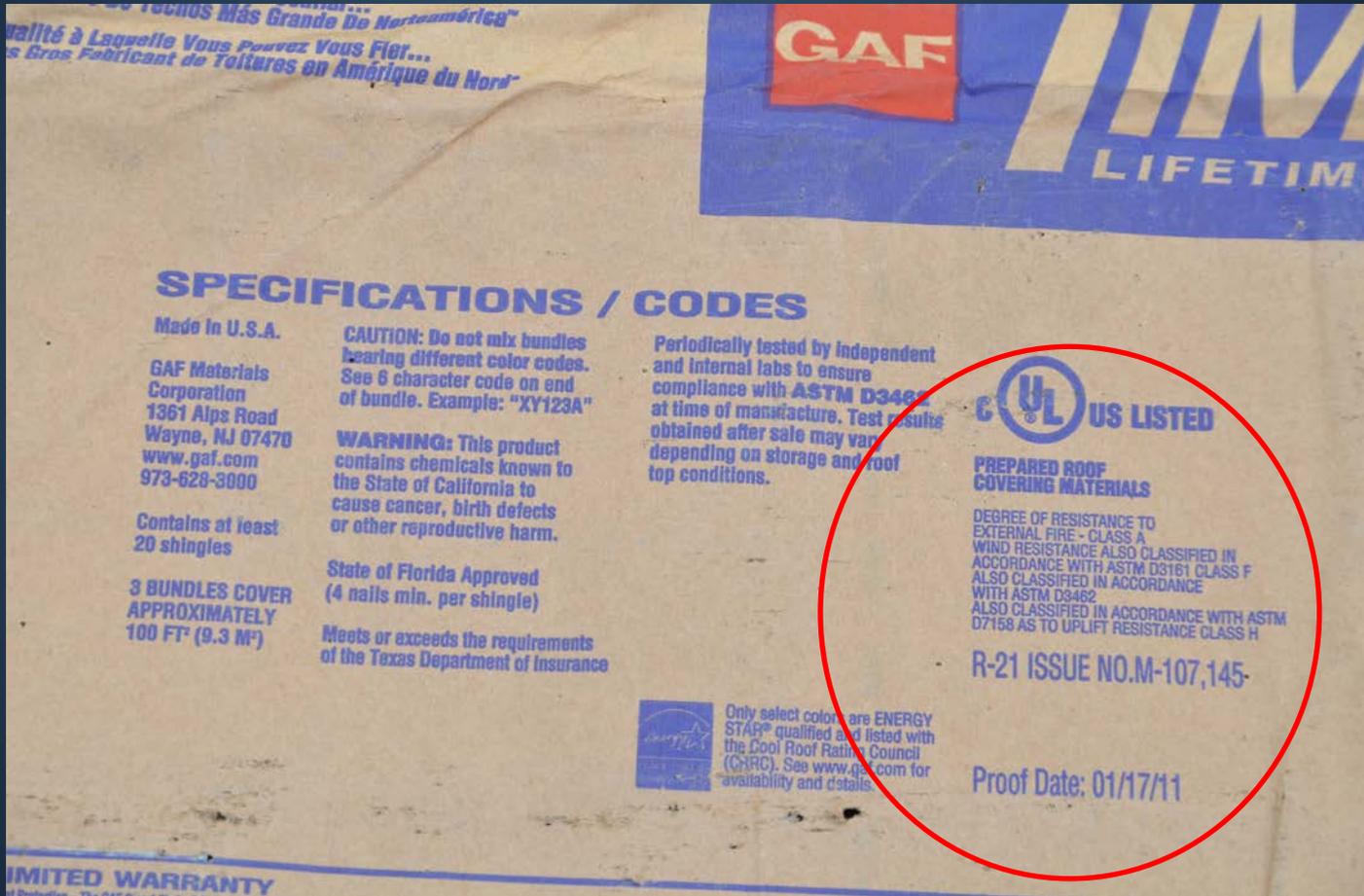


*MPH(Miles per hour)
**MRI Mean Recurrence Interval (years)

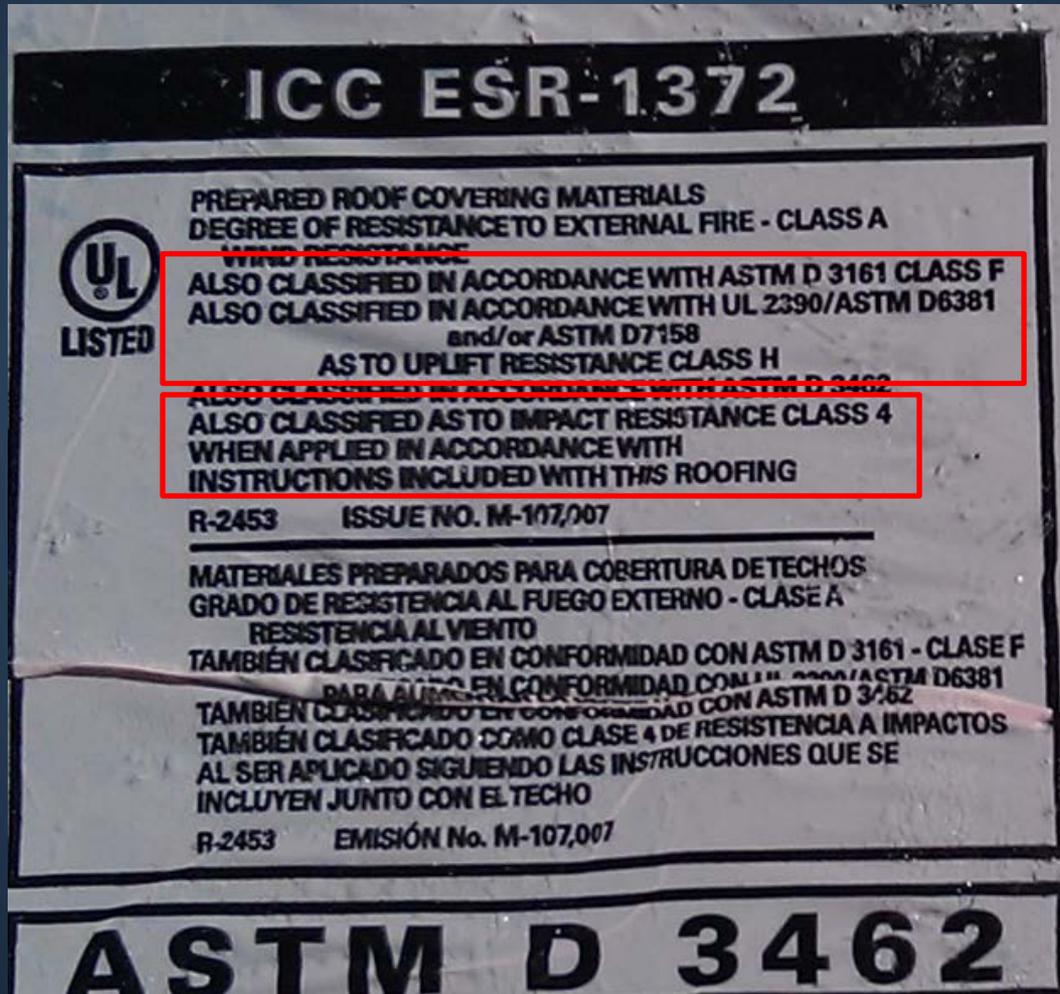
Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.



FORTIFIED Roof – Roof Covering Shingles



FORTIFIED Roof – Roof Covering Shingles



FORTIFIED Roof – Shingles: Drip Edge



Hurricane - Metal



FORTIFIED Roof – Metal Roof Example

26 GA. 3/4" RIB ROOF PANEL LOAD TABLE OVER 15/32 PLYWOOD

BAKER METAL
WORKS

Buildings having a Roof Mean Height \leq 20'-0"; Roof Slope: 2"/12" -6"/12" Gable or Hip Roof
Wind Speeds 150-180 mph, Exp C, Risk Category II, Enclosed Bldg. based on FLORIDA BUILDING CODE 2010

26 GA. 3/4" RIB PANEL FASTENER SPACING

ZONE	FASTENER	SUBSTRATE	WIND SPEED ZONE			
			150	160	170	180
			ON CENTER SPACING	ON CENTER SPACING	ON CENTER SPACING	ON CENTER SPACING
ZONE 1	#9-15-1-1/2"	15/32" PLYWOOD	24" TYPE 1	24" TYPE 1	24" TYPE 1	24" TYPE 1
ZONE 2	#9-15-1-1/2"	15/32" PLYWOOD	24" TYPE 1	24" TYPE 1	24" TYPE 1	12" TYPE 2
ZONE 3	#9-15-1-1/2"	15/32" PLYWOOD	12" TYPE 2	12" TYPE 2	12" TYPE 2	12" TYPE 2



FORTIFIED Roof – Tile & Metal High Wind & Hail



TABLE B-04: DESIGN WIND SPEED /TILE
IMPACT RESISTANT CLASSIFICATION

Design Wind Speed	FM 4473 Impact Resistance Classification/ Hail Risk
110 mph	Class 4 or Class 3

TABLE B-05: DESIGN WIND SPEED /METAL
ROOF IMPACT RESISTANT CLASSIFICATION

Design Wind Speed	UL 2218 Impact Resistance
110 mph or less	Class 4

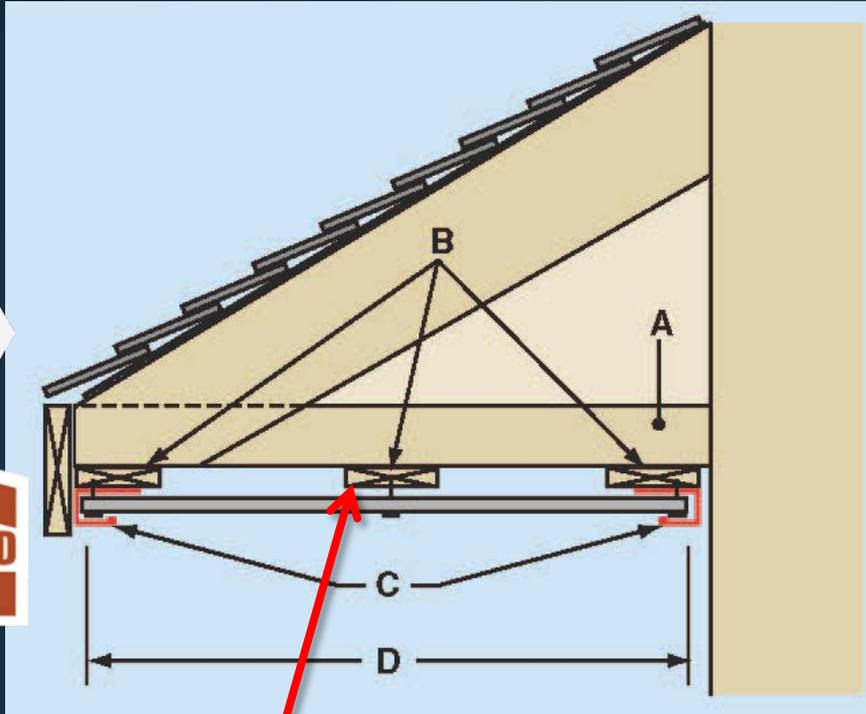


FORTIFIED Roof - Attic Ventilation

Ridge vents with a “lip” on the roof surface side are more resistant to water intrusion



FORTIFIED Soffits



- A. Horizontal wood support
- B. Nailing strip for soffit attachment
- C. Continuous J-channel or F-channel to cover the ends of soffit panels
- D. Soffit Depth exceeding 12" must have intermediate nailing strip.

Intermediate nailing strip.

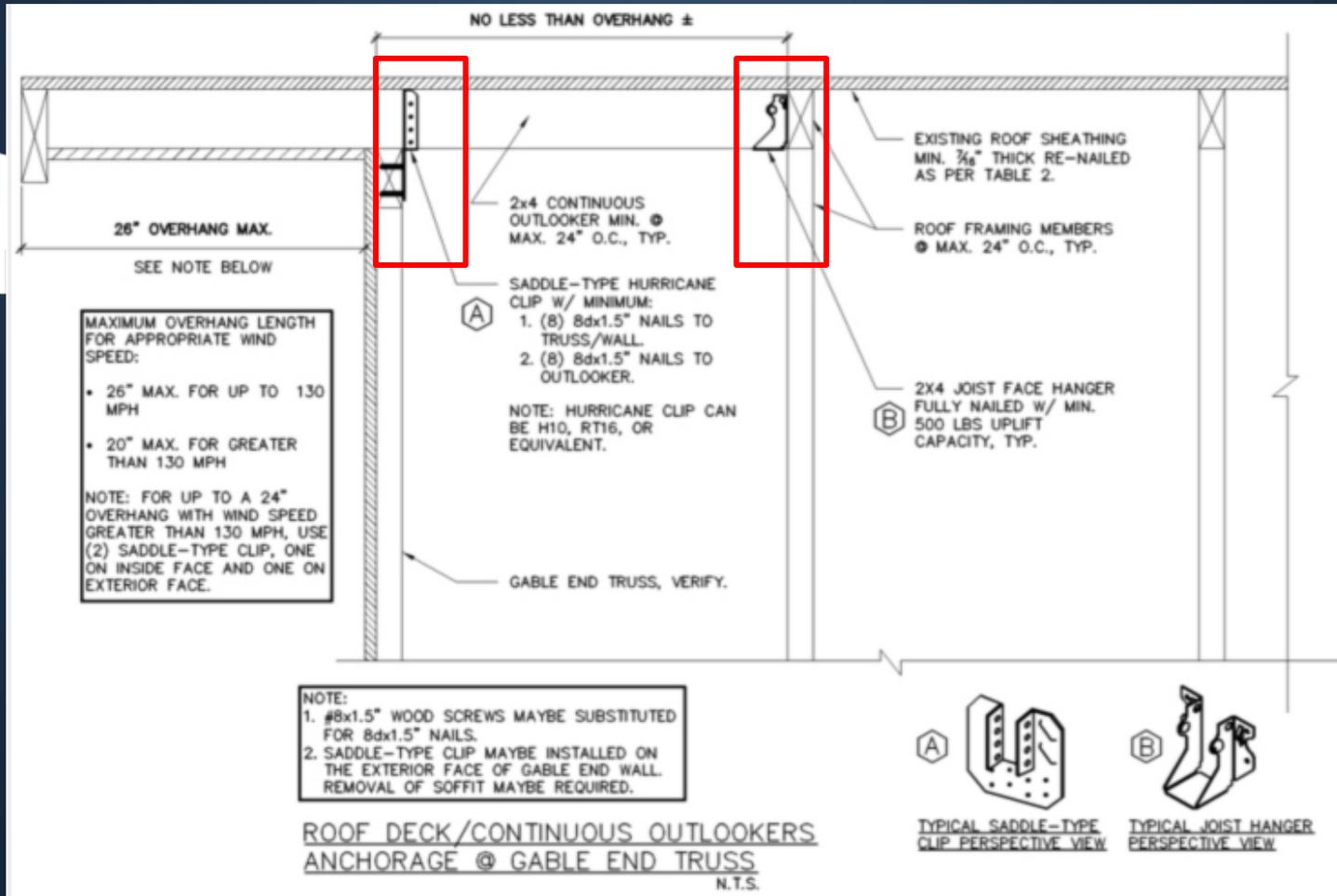


FORTIFIED Soffits



FORTIFIED Roof : Gables w/Outlookers

Do this



FORTIFIED Roof : Gables w/Outlookers

To avoid this



© Insurance Institute for Business & Home Safety



FORTIFIED Roof – Attic Ventilation



FORTIFIED Gable End Walls – Structural Sheathing

Meets standards



Roof Compliance Form (RCF1)



Search for FORTIFIED Home Compliant Product Documentation

approvalzoom.com/find/products/?autostart_fortified

APPROVALZOOM Corporate Account

Search Products & Companies 24 results (0.005 seconds)

[Go to FORTIFIED Search](#)

Agency Name
FL Product Approval 19
Texas Approval 1

Company Name
Company Name

Approval Status
Approved 19
Superseded 3
Not Approved 2

Category
Doors 3
Impact Protection Devices 21

Certification Methods
Evaluation Report from a Registered

APPROVAL ZOOM

Search Product, Company

Share Search Results Clear Search

Current Filters
Is Fortified: Yes

View results as: Tiles List Sort by: Listing Relevance

FL12856.2-R3
FLORIDA BUILDING COMMISSION
Safety Edge Storm Panels, 26ga (0.018") Steel, 0.022" Alum (Perf and Non-Perf), Clear
By Town & Country Industries

FL11398.3-R2
FLORIDA BUILDING COMMISSION
2" X 12" ALUMINUM STORM PANEL
By Town & Country Industries



FORTIFIED Openings, Attached Structures and Gable Ends

SILVER



FORTIFIED – Opening protection



FORTIFIED - Garage Doors

Pressure Rating



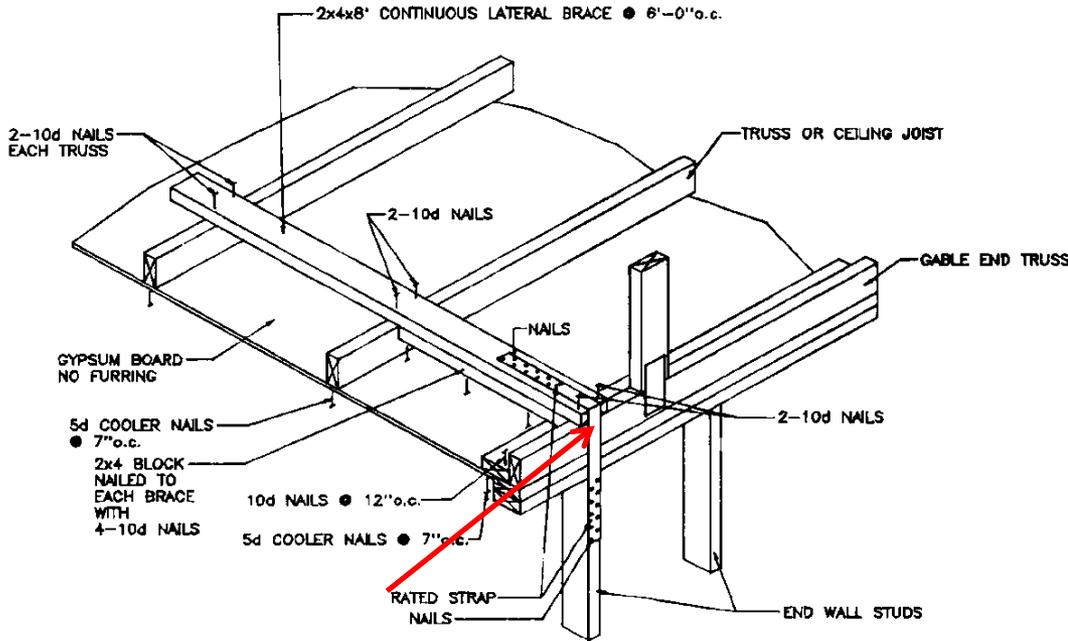
FORTIFIED - Garage Doors

Impact Rating

Applies to
Glazed
Doors ONLY



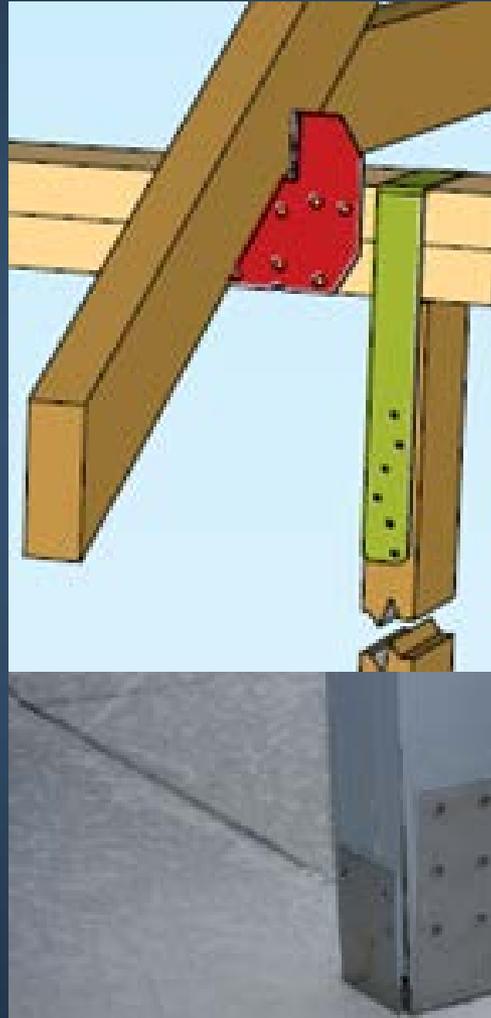
FORTIFIED – Gable end bracing



Note Metal Strap
8 foot 2x4 on TOP of bottom chords



FORTIFIED – Attached structures



FORTIFIED Continuous Load Path and Opening Design Pressures

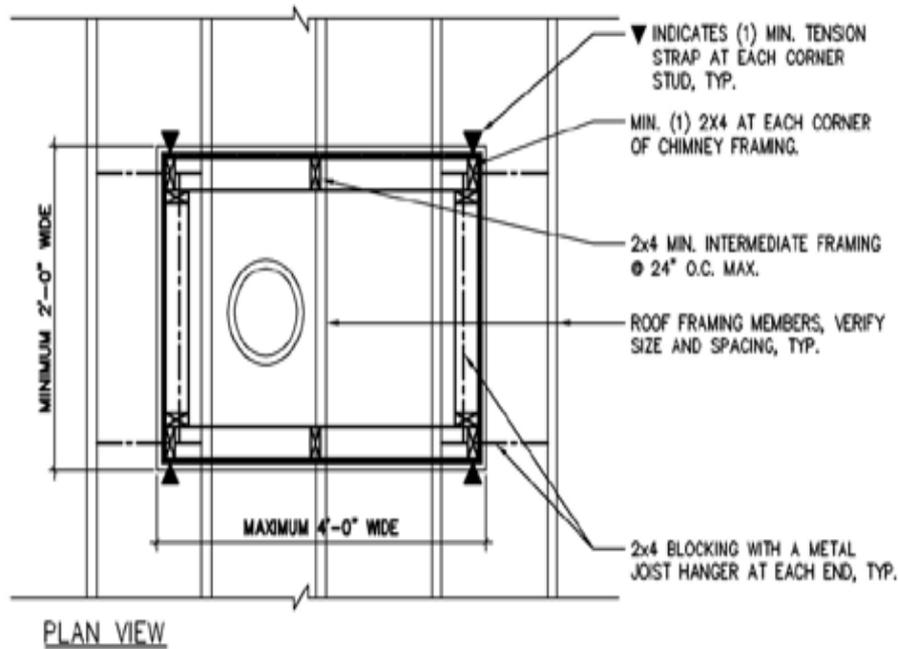


FORTIFIED – Openings (Design Pressure Ratings)



FORTIFIED - Chimneys

Do this



FORTIFIED - Chimneys

So this
doesn't
happen



FORTIFIED - Continuous load path



Roof to Wall Connection

Upper Wall to Lower Wall Connection

Lower Wall to Foundation Connection



FORTIFIED Home: Hurricane™

Methods of Verifying Compliance



Inspection Based









FORTIFIED Home™

Creating a Documentation File



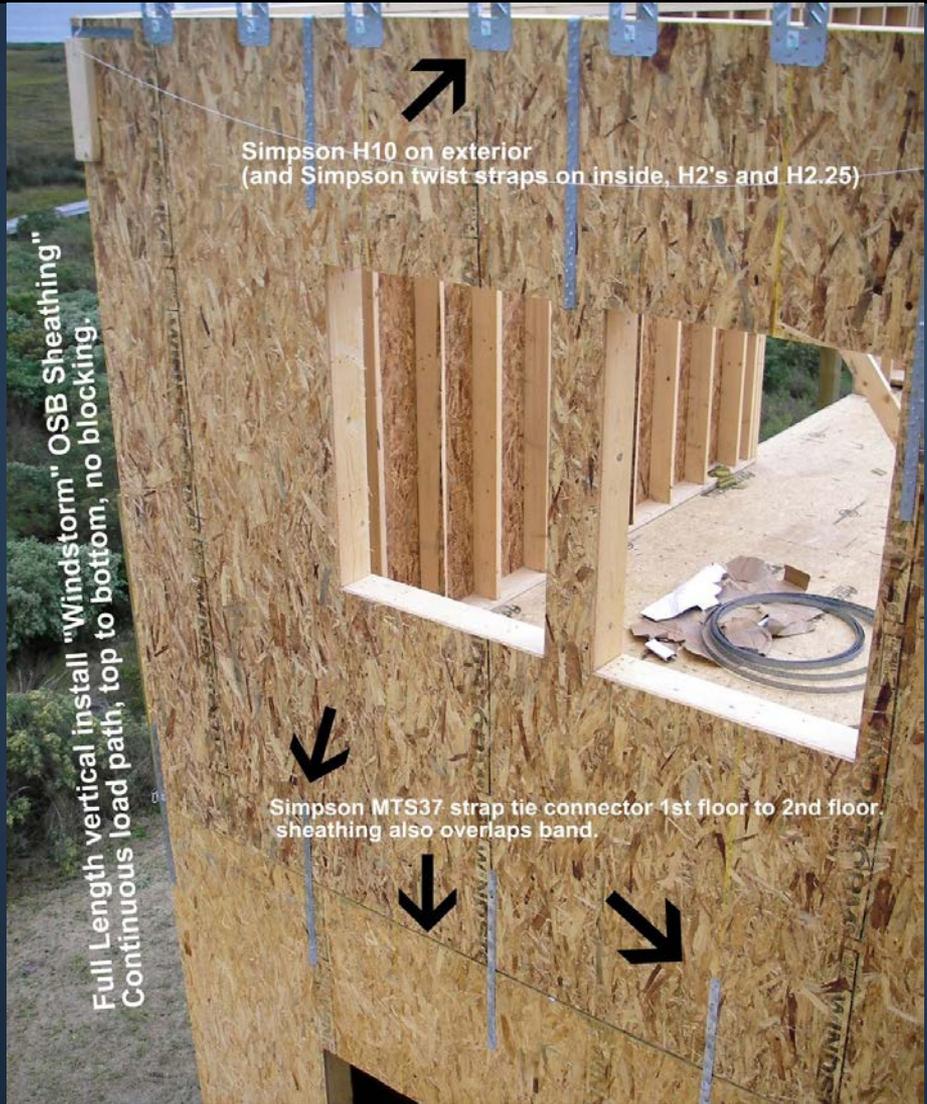
Documentation



Documentation



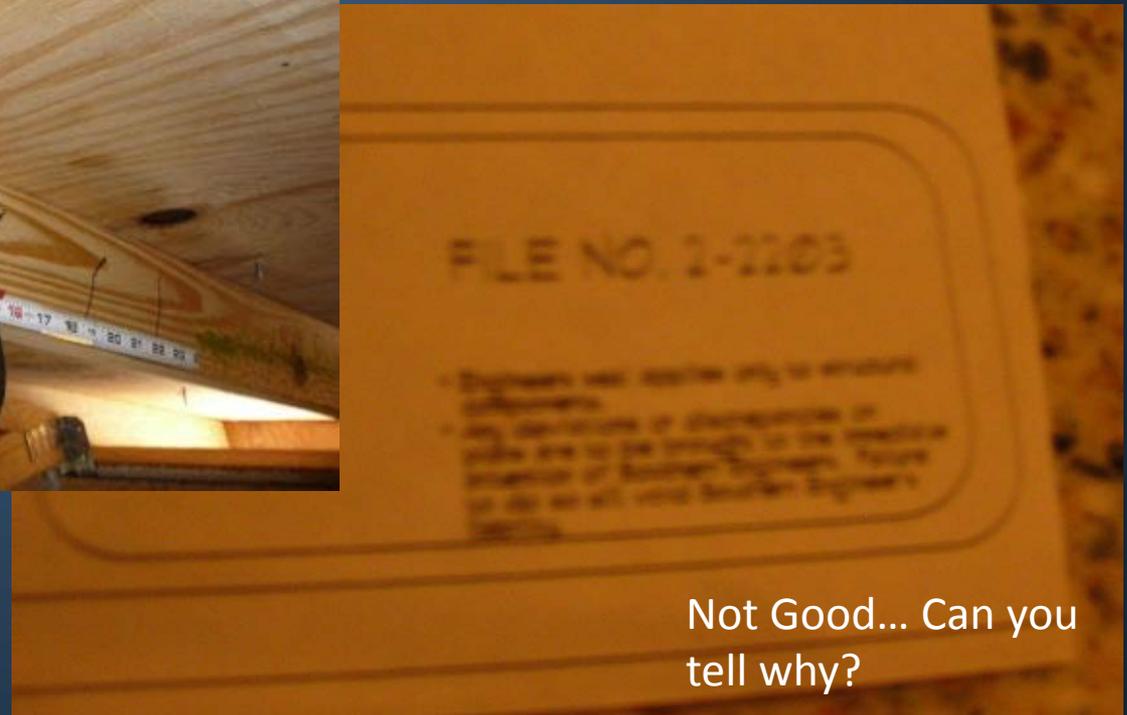
Documentation



Exceptional!



Documentation



How Do Insurers and Other Stakeholders Verify that a Home is FORTIFIED?

- Certificates issued by IBHS



Bronze Certs



Bronze

This designates that the residence located at
1234 Sample Street
Tampa, Florida 33617

has been awarded a
FORTIFIED Home: Hurricane
designation on
8/08/2013



Fred Malik, FORTIFIED Program Manager

EXISTING ROOF

FORTIFIED ID: FEH201303361701000
DESIGNATION EXPIRES ON 4/1/2018

A program of the Insurance Institute for Business & Home Safety



Bronze

This designates that the residence located at
1234 Sample Street
Tampa, Florida 33617

has been awarded a
FORTIFIED Home: Hurricane
designation on
8/08/2013



Fred Malik, FORTIFIED Program Manager

NEW ROOF

FORTIFIED ID: FEH201303361701000
DESIGNATION EXPIRES ON 4/1/2018

A program of the Insurance Institute for Business & Home Safety



Silver Certs



FORTIFIED HOME

Silver

This designates that the residence located at
1234 Sample Street
Tampa, Florida 33617

has been awarded a
FORTIFIED Home: Hurricane
designation on
8/08/2013

Fred C. Malik
Fred Malik, FORTIFIED Program Manager

EXISTING ROOF

FORTIFIED ID: FEH201303361701000
DESIGNATION EXPIRES ON 4/1/2018

A program of the Insurance Institute for Business & Home Safety



FORTIFIED HOME

Silver

This designates that the residence located at
1234 Sample Street
Tampa, Florida 33617

has been awarded a
FORTIFIED Home: Hurricane
designation on
8/08/2013

Fred C. Malik
Fred Malik, FORTIFIED Program Manager

NEW ROOF

FORTIFIED ID: FEH201303361701000
DESIGNATION EXPIRES ON 4/1/2018

A program of the Insurance Institute for Business & Home Safety



Gold Certs



FORTIFIED HOME

Gold

This designates that the residence located at
1234 Sample Street
Tampa, Florida 33617

has been awarded a
FORTIFIED Home: Hurricane
designation on
8/08/2013



Fred Malik, FORTIFIED Program Manager

EXISTING ROOF

FORTIFIED ID: FEH201303361701000
DESIGNATION EXPIRES ON 4/1/2018

A program of the Insurance Institute for Business & Home Safety



FORTIFIED HOME

Gold

This designates that the residence located at
1234 Sample Street
Tampa, Florida 33617

has been awarded a
FORTIFIED Home: Hurricane
designation on
8/08/2013



Fred Malik, FORTIFIED Program Manager

NEW ROOF

FORTIFIED ID: FEH201303361701000
DESIGNATION EXPIRES ON 4/1/2018

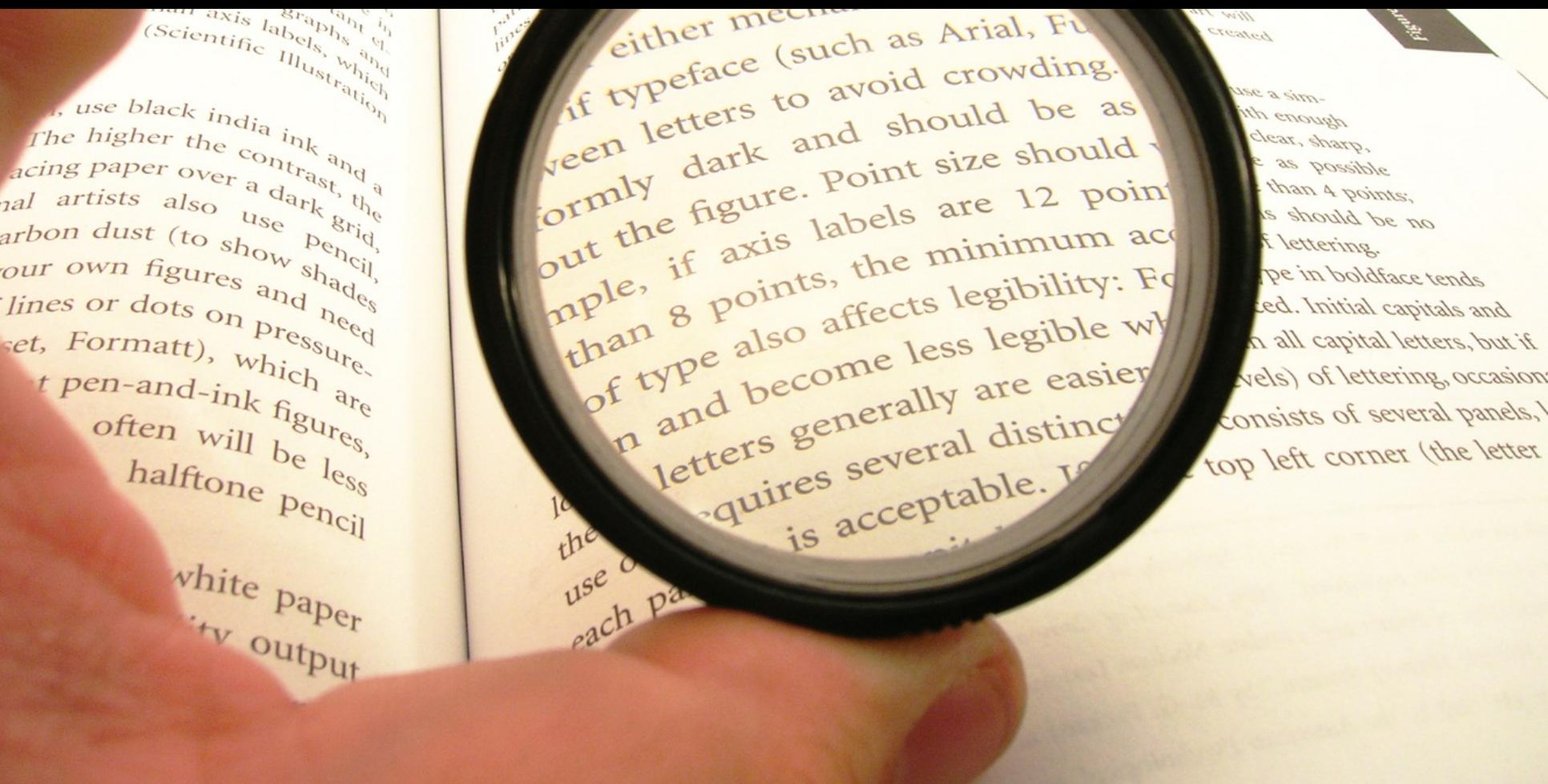
A program of the Insurance Institute for Business & Home Safety



How Can You Become Involved?



Help Bring Clarity and Focus to the Resilience Movement



What can you do, now?

Commit to building FORTIFIED

Download standards, guides and fact sheets for FREE at

www.disastersafety.org/fortified/home



Get Trained

Evaluator Training

Contractor/Builder Training

Coming this Fall ...

Become a
FORTIFIED-Wise
Contractor



Insurance Institute for Business & Home Safety
Where building safety research leads to real-world solutions.

Risks FORTIFIED Commercial Public Policy Research Media Center Blog Videos Members-only

FORTIFIED » FORTIFIED Home™ Evaluator Training

FORTIFIED Home™ Evaluator Training

[CLICK HERE FOR TRAINING REGISTRATION DETAILS](#)

FORTIFIED Home™: Hurricane is a high wind and hurricane mitigation program developed by the Insurance Institute for Business & Home Safety (IBHS). This innovative program is recognized as the premier standard for retrofitting existing and building new homes to reduce or repair damage caused by hurricanes.

IBHS has made a substantial investment in new technology that streamlines the program's evaluation and designation processes, among other things. Starting this fall, evaluations can be completed on your mobile device and no special tools are required.

[Program Handbook](#)

Next Training Dates:

2014

Evaluator Certification

- June 18 - IBHS Research Center, Richburg, SC
- August (Date to be announced) - Gulf Coast (Location to be determined)
- October 9 - IBHS Research Center, Richburg, SC

Train the Trainer

- June (Dates to be announced) - IBHS Research Center, Richburg, SC

SEATS ARE LIMITED

BECOME A FORTIFIED HOME EVALUATOR

Search DisasterSafety.org...

SHARE THIS

f t

Enter your ZIP Code below to discover the risks you face.

Search



Links & URLs

- Homeowner Application
 - <https://secure.fortifiedhome-ibhs.com/HomeOwner/>
 - Evaluator Training
 - How To Become An Evaluator
 - <http://www.disastersafety.org/disastersafety/fortified-home-evaluator-training/>
 - Registration Details
 - <https://fortified.archtest.com/>



Links & URLs (continued)

- FORTIFIED Home™ Fact Sheets
 - <http://www.disastersafety.org/fortified/home/fortified-home-fact-sheets/>
- FORTIFIED Home™ Standards, Summaries and Guides
 - <http://www.disastersafety.org/fortified/fortified-home-standards/>
- FAQs
 - <http://www.disastersafety.org/fortified/home/home-property-insurance-professionals/fortified-home-frequently-asked-questions-2/>



Thank You



disastersafety.org/fortified

facebook.com/buildfortified