FORTIFIED HOME

Technical Requirements Summary

New Residential, Single-Family Detached Homes

Hurricane

FORTIFIED HOME FORTIFIED HOME FORTIFIED HOME

FORTIFIED is a program of the Insurance Institute for Business & Home Safety

Insurance Institute for Business & Home Safety

FORTIFIED HOME™
Technical Requirements
New Home

INTRODUCTION

The Insurance Institute for Business & Home Safety's FORTIFIED Home™: Hurricane Standard helps homeowners in coastal areas strengthen their houses against these powerful storms. Incorporating FORTIFIED features when repairing, rebuilding or renovating your single-family home will transform your house into a more a resilient and durable property.

The FORTIFIED features focus first on strengthening and protecting the roof because it is the home's first line of defense against severe weather events. This can include things like sealing the roof deck to prevent wind-driven rain from getting inside, using roof covering that is rated for the wind speeds in your area to reduce the chances it will lift up or blow off during high winds, and using soffit vents that resist water intrusion. Protecting the openings in the house, such as doors and windows, also is important. One of the most effective FORTIFIED features you can incorporate when rebuilding is to think of your house as a system and create a continuous load path by tying the structural elements of the building together. Tying the roof to the walls, the walls to the floor and the floor to the foundation will significantly strengthen your home when Mother Nature strikes.

For more detailed information about how to make your home stronger, safer and more hurricane-resistant, please visit www.DisasterSafety.org/FORTIFIED. Also, follow us on Twitter at @DisasterSafety and on Facebook at www.facebook.com/buildfortified.

Hazard: Hurricane

Locations where the design wind speed exceeds 90 mph as determined in ASCE7-05

Construction Type: New residential, single-family detached homes

FORTIFIED Home™: Hurricane Bronze Requirements:

- Roof deck must be a minimum of 7/16 in. OSB or Plywood.
- Roof deck must be attached with 8d ring shank nails, spaced nominally at 6 in. o.c. along the edges and in the field; unless engineering analysis or local code requires more fasteners at the corners.
- Roof deck must be sealed with a qualified system. There are three qualified methods for sealing from the top side (described below).
    - Cover the entire roof deck with a full layer of self-adhering polymer modified bitumen membrane meeting ASTM D1970 requirements. It is recommended that the membrane is covered with 15# felt before shingles are applied to provide bond break, and to keep shingles from fusing with the self-adhering membrane.
    - Apply a self-adhering polymer modified bitumen flashing tape, which is at least 4 in. wide, directly to the roof deck to seal the horizontal and vertical joints. Next, apply a code-compliant 30-pound ASTM D226, Type II underlayment over the self-adhering tape. This underlayment must be attached using annular ring or deformed shank roofing fasteners with minimum 1 in. diameter caps at 6 in. o.c. spacing along all laps and at 12 in. o.c. in the field, or a more stringent fastener schedule, if required by the manufacturer for high-wind installations. Horizontal laps shall be a minimum of 2 in. and end laps shall be a minimum of 6 in. Nails with plastic or metal caps are allowed in areas where the design wind speed is less than 140 mph. Metal caps are required for areas where the design wind speed is greater than or equal to 140 mph.

- Apply reinforced synthetic roof underlayment that has an ICC approval as an alternate to ASTM D226 Type II felt paper. The synthetic underlayment must have minimum tear strength of 20 lbs. per ASTM D1970 or ASTM D4533. This underlayment must be attached using annular ring or deformed shank roofing fasteners with minimum 1 in. diameter caps at 6 in. o.c. spacing along all laps and at 12 in. o.c. in the field, or a more stringent fastener schedule, if required by the manufacturer for high-wind installations. Metal caps are required for areas where the design wind speed is greater than or equal to 140 mph.

- A drip edge must be installed (at eaves and rakes) with 3 in. laps. Drip shall extend ½ in. below sheathing and extend back on the roof a minimum of 2 in. Drip edge at eaves shall be permitted to be installed either over or under the underlayment. Drip edge at gable rake shall be installed over the underlayment. The drip edge shall be mechanically fastened to the roof deck at a maximum of 4 in. o.c.

- Shingle roof covering must be high-wind rated (Class F or higher) based on design wind speed. See chart below:

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	H	

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

- Concrete and clay tile systems and their attachment shall meet the requirements of the site design wind speed and exposure category.
- Metal panel roof systems and their attachment shall be installed in accordance with the manufacturer's installation instructions and shall provide uplift resistance equal to or greater than the design uplift pressure for the roof based on the site design wind speed and exposure category.
- Gable walls must have minimum of 7/16 in. structural sheathing (OSB or Plywood).
- Gable overhangs must not be vented.
- Gable wall vents must be protected against water intrusion.
- Gable overhangs framed using outlooker framing must have adequate connection at gable wall and at roof framing members. Connection can be determined by structural engineer or by using IBHS prescriptive connection detail (see page 19 of the FORTIFIED Home™: Hurricane Standards, http://disastersafety.org/wp-content/uploads/fortified-hurricane-standards_IBHS.pdf).
- Box type soffit overhangs (eave) and gable overhangs with a depth greater than 12 in. (measured from the back of fascia to exterior wall surface) and covered with aluminum or vinyl material, must have a center brace installed mid-span.
- Roof-mounted vents, including but not limited to ridge vents, off-ridge vents and turbines, must meet Florida Building Code TAS 100(A).

Hurricane Silver Requirements:

- All Bronze requirements must be satisfied.
- Gable end walls on gables greater than 48 in. in height must be braced.
- Porches and carports must have adequate connections for uplift pressures based on site design wind speed and exposure category. Connections must be provided from the roof framing to the beam/wall, from beam to column and column to structure below.
- Garage doors must be pressure rated for pressures associated with site design wind speed and exposure category.
    - Exception: if garage door has glazing, door must be pressure rated and impact rated, or pressure rated and protected with a qualified impact-resistant system.
- All window, exterior door and skylight openings must be protected with qualified opening protection systems.
    - Qualified opening protection systems must have passed an ASTM E 1996 and E 1886 impact test for large missile "D".

Hurricane Gold Requirements:

- All Bronze and Silver requirements must be satisfied.
- Chimneys must be adequately connected to the roof structure to resist loads based on site design wind speed and exposure category.
- Windows, skylights and glass doors: Windows and glass doors must be rated for the design pressures appropriate for the exposure category, wind speed, window size, and window location on the building. See Appendix C of the FORTIFIED Home™: Hurricane Standards, http://disastersafety.org/wp-content/uploads/fortified-hurricane-standards_IBHS.pdf.
- A continuous load path must be designed and installed providing connection from roof to wall, wall to floor and floor to foundation.
- Walls must have minimum of 7/16 in. structural sheathing (OSB or Plywood).

NOTICE: ALL OF THE ABOVE MUST BE DOCUMENTED PRIOR TO BEING CONCEALED BY FINISHED MATERIALS. TAKE PHOTOGRAPHS OF THE IMPROVEMENTS WHILE THE HOME IS UNDER CONSTRUCTION. A COMPLETE PHOTO FILE SHOULD BE PRESENTED TO THE FORTIFIED EVALUATOR WORKING ON THE PROJECT.

In addition, certification letters from a structural engineer will be required to satisfy the documentation requirements for outlooker framing, gable framing and bracing, porch/carport connections, chimney connections and load path design. Copies of these letters can be obtained from IBHS or your FORTIFIED Evaluator.

Insurance Institute for Business & Home Safety

4775 East Fowler Ave., Tampa, FL 33617

DisasterSafety.org

FORTIFIED HOME

Technical Requirements Summary

Existing Residential, Single-Family Detached Homes

Hurricane

FORTIFIED is a program of the Insurance Institute for Business & Home Safety

Insurance Institute for Business & Home Safety

FORTIFIED HOME™
Technical Requirements
Existing Home

INTRODUCTION

The Insurance Institute for Business & Home Safety's FORTIFIED Home™: Hurricane Standard helps homeowners in coastal areas strengthen their houses against these powerful storms. Incorporating FORTIFIED features when repairing, rebuilding or renovating your single-family home will transform your house into a more a resilient and durable property.

The FORTIFIED features focus first on strengthening and protecting the roof because it is the home's first line of defense against severe weather events. This can include things like sealing the roof deck to prevent wind-driven rain from getting inside, using roof covering that is rated for the wind speeds in your area to reduce the chances it will lift up or blow off during high winds, and using soffit vents that resist water intrusion. Protecting the openings in the house, such as doors and windows, also is important. One of the most effective FORTIFIED features you can incorporate when rebuilding is to think of your house as a system and create a continuous load path by tying the structural elements of the building together. Tying the roof to the walls, the walls to the floor and the floor to the foundation will significantly strengthen your home when Mother Nature strikes.

For more detailed information about how to make your home stronger, safer and more hurricane-resistant, please visit www.DisasterSafety.org/FORTIFIED. Also, follow us on Twitter at @DisasterSafety and on Facebook at www.facebook.com/buildfortified.

Hazard: Hurricane

Locations where the design wind speed exceeds 90 mph as determined in ASCE7-05

Construction Type: Existing residential, single-family detached homes

FORTIFIED Home™: Hurricane Bronze Requirements:

- Roof covering condition must be evaluated. If roof covering is determined to have more than five years of usable life remaining, re-roofing is not required. If roof covering has five years or less of remaining useful life, then roof cover must be replaced.
- Roof deck must be a minimum of 7/16 in. OSB or Plywood.
- Deck must be attached with 8d ring shank nails, spaced nominally at 6 in. o.c. along the edges and in the field; unless engineering analysis or local code requires more fasteners at the corners.
- If existing deck does not have the required fastener type and/or spacing, the typical retrofit when re-roofing would be to add an 8d ring shank fastener between existing fasteners.
- If existing roof covering is NOT being replaced, supplemental attachment can be achieved using a qualified two-part, closed-cell, polyurethane foam adhesive applied to both sides of each roof framing member at the deck from within the attic.
- The roof deck must be sealed with a qualified system. Described below are three qualified methods for sealing from the top side when re-roofing. This is not generally required by the model building codes.
    - The entire roof deck shall be covered with a full layer of self-adhering polymer modified bitumen membrane meeting ASTM D1970 requirements. It is recommended that the membrane be covered with 15# felt before shingles are applied to provide bond break and so that the shingles don't become fused to the self-adhering membrane.

- Apply a self-adhering polymer modified bitumen flashing tape that is at least 4 in. wide directly to the roof deck to seal the horizontal and vertical joints in the roof deck. Next apply a code compliant 30-pound ASTM D226, Type II underlayment over the self-adhering tape. This underlayment must be attached using annular ring or deformed shank roofing fasteners with minimum 1 in. diameter caps at 6 in. o.c. spacing along all laps and at 12 in. o.c. in the field, or a more stringent fastener schedule if required by the manufacturer for high-wind installations. Horizontal laps shall be a minimum of 2 in. and end laps shall be a minimum of 6 in. Nails with plastic or metal caps are allowed in areas where the design wind speed is less than 140 mph. Metal caps are required for areas where the design wind speed is greater than or equal to 140 mph.

- Apply reinforced synthetic roof underlayment which has an ICC approval as an alternate to ASTM D226 Type II felt paper. The synthetic underlayment must have minimum tear strength of 20 lbs. per ASTM D1970 or ASTM D4533. This underlayment must be attached using annular ring or deformed shank roofing fasteners with minimum 1 in. diameter caps at 6 in. o.c. spacing along all laps and at 12 in. o.c. in the field, or a more stringent fastener schedule if required by the manufacturer for high-wind installations. Metal caps are required for areas where the design wind speed is greater than or equal to 140 mph.

- If not re-roofing, sealing the roof deck can be done from within the attic using qualified closed-cell foam applied to all horizontal roof deck seams and along all roof framing members.

- If re-roofing, a drip edge must be installed (at eaves and rakes) with 3 in. laps. Drip edge shall extend ½ in. below sheathing and extend back on the roof a minimum of 2 in. Drip edge at eaves shall be permitted to be installed either over or under the underlayment. At gable ends drip edge shall be installed over the underlayment. The drip edge shall be mechanically fastened to the roof deck at maximum of 4 in. o.c.

- If re-roofing with shingle roof covering, shingles must be high-wind rated based on design wind speed. See the chart below:

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.

- Concrete and clay tile systems and their attachment shall meet the requirements of the site design wind speed and exposure category.
- Metal panel roof systems and their attachment shall be installed in accordance with the manufacturer's installation instructions, and shall provide uplift resistance equal to or greater than the design uplift pressure for the roof based on the site design wind speed and exposure category.
- Gable walls must have minimum of 7/16 in. structural sheathing (OSB or Plywood).
- Gable overhangs must not be vented.
- Gable wall vents must be protected against water intrusion.

- Gable overhangs framed using outlooker framing must have adequate connection at gable wall and at roof framing members. Connection can be determined by structural engineer or by using IBHS prescriptive connection detail (located in the FORTIFIED Home™: Hurricane Standards, http://disastersafety.org/wp-content/uploads/fortified-hurricane-standards_IBHS.pdf).

- Box type soffit overhangs (eave) and gable overhangs with a depth of greater than 12 in. (measured from the back of fascia to exterior wall surface) and covered with aluminum or vinyl material, must have a center brace installed mid-span.

- Roof mounted vents, including, but not limited to ridge vents, off ridge vents, and turbines, must meet Florida Building Code TAS 100 (A).

Hurricane Silver Requirements:

- All Bronze requirements must be satisfied.

- Gable end walls on gables greater than 48 in. in height must be braced.

- Porches and carports must have adequate connections for uplift pressures based on site design wind speed and exposure category. Connections must be provided from the roof framing to the beam/wall, from beam to column and column to structure below. ***Certification by a professional engineer is required when connections are concealed by finished materials.***

- Garage doors must be pressure rated for pressures associated with site design wind speed and exposure category.

- Exception: If garage door has glazing, door must be pressure rated and impact rated, or pressure rated and protected with a qualified impact-resistant system.

- All window, exterior door and skylight openings must be protected with qualified opening protection systems.

- Qualified opening protection systems must have passed an ASTM E 1996 and E 1886 impact test for large missile "D."

Hurricane Gold Requirements:

- All Bronze and Silver requirements must be satisfied.
- Chimneys must be adequately connected to the roof structure to resist loads based on site design wind speed and exposure category. ***Certification by a professional engineer is required when connections are concealed by finished materials.***
- Windows, skylights and glass doors: Windows and glass doors must be rated for the design pressures appropriate for the exposure category, wind speed, window size, and window location on the building (see Appendix C of the FORTIFIED Home™: Hurricane Standards, http://disastersafety.org/wp-content/uploads/fortified-hurricane-standards_IBHS.pdf).
- A continuous load path must be designed and installed providing connection from the roof to wall, wall to floor and floor to foundation. ***Certification by a professional engineer is required.***
- Walls must have minimum of 7/16 in. structural sheathing (OSB or Plywood).

NOTICE: ALL OF THE ABOVE MUST BE DOCUMENTED PRIOR TO BEING CONCEALED BY FINISHED MATERIALS. TAKE PHOTOGRAPHS OF THE IMPROVEMENTS WHILE THE HOME IS UNDER CONSTRUCTION. A COMPLETE PHOTO FILE SHOULD BE PRESENTED TO THE FORTIFIED EVALUATOR WORKING ON THE PROJECT.

In addition, certification letters from a structural engineer will be required to satisfy the documentation requirements for outlooker framing, gable framing and bracing, porch/carport connections, chimney connections and load path design. Copies of these letters can be obtained from IBHS or your FORTIFIED Evaluator.

Insurance Institute for Business & Home Safety

4775 East Fowler Ave., Tampa, FL 33617

DisasterSafety.org