

COASTAL CONSTRUCTION CODE SUPPLEMENT

For Adoption by Communities Affected By Hurricanes



A supplemental code to the International Residential Codes®
2012, 2015, 2018, and 2021 editions.



The purpose of the Code Supplement is to increase community resilience and reduce future damage from hurricanes, high winds, and wind-driven rain. Adoption has many benefits, including reducing losses during severe weather events, significantly reduced damage, and lowered insurance costs. A recent study shows that a FORTIFIED Home™ designation increases the resale value of a property¹. Additional benefits from using and enforcing this supplemental code are increased numbers of FORTIFIED Home™ designations and reduced storm debris cleanup costs.

Adopting the Code Supplement closes the gap between existing "I Codes®"² and the Insurance Institute for Business and Home Safety's (IBHS) FORTIFIED Home™ Technical Standards. The Code Supplement is adopted and enforced in addition to local building codes. IBHS provides technical input to keep the Code Supplement current. The Supplement is based on the latest research and testing conducted at the IBHS Research Center and in the field. To connect with communities enforcing this supplemental code, please contact us 1.855.742.7233 or info@smarthomeamerica.org.

Additionally, Smart Home America strongly advises adopting the 2018 IRC/IBC flood-resistant construction standards. Flooding is one of the most devastating and shared hazards facing communities today. By incorporating added steps to mitigate against wind and flood hazards, the durability and strength of homes can be increased while bolstering the safety of residents.

NOTE: By adopting this Supplemental Code, municipalities and jurisdictions recognize that individual homes built, re-roofed, or otherwise permitted under this code will be constructed to beyond-code standards but will not be designated as a FORTIFIED Home™. To be identified as a FORTIFIED Home and issued a Designation Certificate, a homeowner, or the builder, must voluntarily contract the services of a Certified FORTIFIED Evaluator. They are the only professionals able to inspect and collect relevant documentation confirming that a home meets all the requirements of the IBHS FORTIFIED Home™ Hurricane program

This public resource is maintained by Smart Home America and is available at:
SmartHomeAmerica.org/resources/code-supplement

¹ https://aciir.culverhouse.ua.edu/wp-content/uploads/sites/26/2018/12/FORTIFIEDReport_V2_2_.pdf

² The International Code Council (ICC) develops and maintains the International Codes® or I-Codes®. They provide minimum safeguards for people at home, at school, and in the workplace. The I-Codes are a complete set of comprehensive, coordinated building safety and fire prevention codes. www.ICCsafes.org

COASTAL CONSTRUCTION SUPPLEMENT

S1 Roof Coverings

Roof coverings and their attachment shall be rated for the ASCE 7 design wind speed or corresponding wind and uplift pressures for the site location of the building and shall be installed in accordance with the manufacturer's recommendations for high-wind regions.

S1.1 Asphalt Shingles:

Asphalt shingles shall be tested in accordance with ASTM D7158 or ASTM D3161, and meet Class H or F requirements. Their packaging shall be labeled to indicate compliance with ASTM D7158 Class H or ASTM D3161 Class F.

S1.1.1 Shingle attachment:

Shingles shall be installed using the number of fasteners required by the manufacturer for high wind fastening. In areas where the local building code requires more fasteners than required by the manufacturer, fasteners shall comply with the local building code.

S1.1.2 Drip Edge Installation

A metal drip edge (minimum 26-gauge steel) shall be installed over underlayment along all eaves and gable rake edges. Drip edge flange shall extend a minimum of $\frac{1}{2}$ inch below the sheathing. Drip edge shall be attached at 4 inches on center using roofing nails in a staggered pattern along the length of the drip edge. Drip edges shall be overlapped a minimum of 3 inches and secured with 2 nails at overlaps.

Roof pitch 2:12 or greater:

- Shingle roof covers: Seal the drip edge over the underlayment and install the starter strip at the eave and rake by applying an 8-inch-wide layer of compatible flashing cement with $\frac{1}{8}$ -inch maximum thickness over the drip edge and underlayment or install a manufacturer-approved ASTM D1970 fully adhered (peel-and-stick) starter strip with asphaltic adhesive strip at eave and rake.
- Metal roof covers: Apply a compatible manufacturer-approved sealant between the drip edge and adjacent underlayment or use a manufacturer-approved 4-inch-wide self-adhered seam tape.
- Roof pitch less than 2:12: Refer to manufacturer's drip edge installation requirements.

S1.1.3 Installation of starter strips at eaves:

Starter strips at eaves shall be set in a minimum 8-inch-wide strip of flashing cement. Maximum thickness of flashing cement shall be $\frac{1}{8}$ inch or a shingle manufacturer-approved ASTM D1970 fully adhered (peel-and-stick) starter strip with asphaltic adhesive strip at eave.

S1.1.4 Attachment of shingles at intersections, valleys, rakes and gable ends:

S1.1.4.1 Attachment of Shingles at Intersections and Valleys:

Shingles installed at all intersections and both sides of open valleys shall be set in a minimum 8-in.-wide strip of flashing cement. The maximum thickness of flashing cement shall be $\frac{1}{8}$ in. Cut side of closed valleys shall be set in a minimum 2-in.-wide, $\frac{1}{8}$ -in.-thick strip of flashing cement. Woven valleys to be installed according to the manufacturer's specifications.

S1.1.4.2 Attachment of Shingles at Rakes:

Manufacturer-approved starter strips at rakes shall be set in a minimum 8-in.-wide strip of compatible flashing cement. Maximum thickness of flashing cement shall be $\frac{1}{8}$ in or install a shingle manufacturer-approved ASTM D1970 fully adhered (peel-and-stick) starter strip with asphaltic adhesive strip at rake. Fasten starter strips parallel to the rakes according to the manufacturer's specifications. Position fasteners to ensure they will not be exposed. Starter strips and shingles must not extend more than $\frac{1}{4}$ in. beyond the drip edge.

S1.2 Metal Panel Roof Coverings:

Metal panel roofing systems shall be installed in accordance with the manufacturer's installation instructions and shall provide uplift resistance equal to or greater than the most critical design uplift pressure for the roof based on the site design wind speed, mean roof height, slope, and exposure category.

Products shall be tested in accordance with UL 1897, UL 580, or TAS 125, incorporating a 2.0 safety factor, and have evaluation reports from one of the following:

- ICC-ES Evaluation Report
- Florida Product Approval
- Miami-Dade County Notice of Acceptance (NOA)
- Texas Department of Insurance (TDI) Evaluation Report

The metal panels shall be installed over continuous decking and one of the acceptable sealed roof deck underlayment options (See Section S2).

S1.3 Clay and Concrete Roof Tiles:

Clay and concrete roof tiles shall be installed in accordance with manufacturer's installation instructions, manufacturer's product approval, and FRSA/Tile Roofing Institute Florida High Wind Concrete and Clay Tile Installation Manual (5th edition for ASCE 7-10) or (6th edition for ASCE 7-16). Clay and concrete roof tile systems shall be installed over continuous $\frac{15}{32}$ " thick plywood roof decking and one of the acceptable sealed roof deck underlayment options (See Section S2). Clay and concrete roof tile systems and their attachment shall meet the requirements of the site design wind speed and exposure category. Hip and ridge structural supports shall be attached to the roof framing to resist the uplift pressure for the site design wind speed and exposure. Hip and ridge tiles shall be secured to the hip and ridge structural supports with mechanical fasteners and/or an approved roof tile adhesive to resist the uplift pressure for the site design.

S1.4 Other Roof Coverings:

For all other roof coverings, the designer must provide documentation showing the roof covering and the attachments were designed for the component and cladding wind pressures corresponding to the site design wind speed. All roof coverings, regardless of type, shall be installed in accordance with the manufacturer's installation guidelines for the appropriate design wind speed. When applicable (e.g., wood shakes, slate roofs), the roof deck shall be sealed using one of the options provided in Section S2 that is compatible with the manufacturer's installation requirements for the roof covering selected.

S1.5 Residential Re-roofing:

Re-roofing of residential structures shall meet the requirements of this section for roof sheathing replacement, roof sheathing attachment, and roof covering; and Section S2 for Sealed Roof Deck. Existing roof coverings shall be removed to expose the roof deck. An inspection shall be conducted at this point to determine the condition of roof decking in accordance with section S1.5.1. The inspection shall also determine the adequacy of the roof deck attachment and the existing decking. Any replaced decking shall be fastened in accordance with Section S1.5.2 or Section S1.5.3 as appropriate for the type and thickness of the roof decking.

S1.5.1 Deteriorated or damaged roof deck:

Damaged or deteriorated decking will generally be marked by one or more of the following characteristics: soft or spongy wood, wood swelling or buckling, delamination (plywood), or crumbling and flaking wood. If deteriorated or damaged roof decking is identified, the decking shall be replaced.

S1.5.2 Attachment of wood boards/lumber (Roof Decking):

Up to 8" Width - Add fasteners as required to ensure that the decking is secured with at least two nails, having a minimum diameter of 0.131 inches, and penetrate a minimum of 1-5/8 inches into the roof framing (minimum length of nail - 2 1/2")

Wider than 8" - Three nails to each framing member it crosses, having a minimum diameter of 0.131 inches and penetrate a minimum of 1 5/8 inches into roof framing (minimum length of nail - 2 1/2"). Framing members shall be spaced no more than 24 inches apart. Clipped-head, D-head, or round-head nails shall be acceptable provided they have the required minimum diameter and length.

S1.5.3 Attachment of wood structural panel (plywood or OSB) Roof Sheathing:

Re-nailing requirements are based on using ring-shank nails with the following characteristics and dimensions.

- Ring shank nails conforming to ASTM F1667
- Minimum 8d (0.113-inch minimum shank diameter)
- 2 3/8-inch minimum nail length
- Full round head diameter (no clipped head nails allowed)

TABLE S1. ROOF SHEATHING AND ATTACHMENT

ASCE Edition	Minimum Roof Sheathing Thickness ^{1,2,3}	Minimum Nail Size/Type ³	Maximum Nail Spacing (All Roof Areas)
ASCE 7-10	$\frac{7}{16}$ inch	RSRS-01; 0.113" dia.x $2\frac{3}{8}$ " Roof Sheathing Ring Shank Nail	4-inch o.c.
ASCE 7-16	$\frac{15}{32}$ inch		

Notes for Table S1:

1. For concrete and clay tile roof coverings, minimum thickness is $\frac{15}{32}$ "
2. For metal roof coverings, verify manufacturer's sheathing thickness requirements are met
3. Full round head diameter nails; no clipped-head nails; no common nails; no staples

S2 Sealed Roof Deck

For all new construction and re-roofing applications, a sealed roof deck shall be constructed using one of the methods specified in Sections S2.1, S2.2, S2.3, or S2.4 for roofs with 2:12 pitch or greater. For roof slopes less than 2:12, a low-slope roof cover system that meets required site design uplift pressures shall be installed per manufacturer instructions.

S2.1 Self-adhering Polymer-Modified Bitumen Membrane:

The entire roof deck shall be covered with a full layer of self-adhering polymer-modified bitumen membrane ("peel and stick") conforming to ASTM D1970 requirements. In applications where membrane adhesion to OSB is marginal, apply a primer to the OSB panels to ensure the proper attachment of the self-adhering membrane to the sheathing

S2.2 Tape Seams Between Roof Deck Wood Structural Panels:

Apply a 4-inch-wide ASTM D1970 compliant self-adhering polymer-modified bitumen flashing tape or a $3\frac{3}{4}$ -inch wide AAMA 711-13, Level 3 (for exposure up to 80oC/176oF) compliant self-adhering flexible flashing tape to seal all horizontal and vertical joints in the roof deck. In applications where flashing tape adhesion to OSB is marginal, apply a manufacturer-specified compatible primer to the OSB panels where the tape will be used to ensure the proper attachment of the self-adhering tape to the sheathing.

Cover the entire deck with one of the following underlayment options over the self-adhering tape:

- ASTM D226 Type II (#30)
- ASTM D4869 Type III or Type IV (#30)
- ASTM D6757 (for asphalt shingle roof covers)
- ASTM D8257 (standard for polymeric underlayment)

S2.2.1 Underlayment Installation:

Underlayment shall be attached using corrosion-resistant annular ring or deformed shank roofing nails (0.083-inch minimum diameter and penetrate $\frac{3}{4}$ inch through roof sheathing) with minimum 1-in.-diameter caps (button cap nails) at 6 in. o.c. spacing along all laps and at 12 in. o.c. vertically and horizontally in the field or a more stringent fastener schedule if required by the manufacturer for high-wind and prolonged exposure installations. Horizontal laps shall be a minimum of 4 in., and end laps shall be a minimum of 6 in. Weave underlayment across valleys. Double-lap underlayment across ridges (unless there is a continuous ridge vent). Lap underlayment with minimum 6-in. leg "turned-up" at wall intersections; lap wall weather barrier over turned-up roof underlayment.

S2.3 Two Layers of Underlayment:

Install two (2) layers of ASTM D226 Type II (#30) or ASTM D4869 Type III or IV (#30) underlayment in a shingle fashion, lapped 19 in. on horizontal seams (36-in. roll), and 6 in. on vertical seams. Create a starter course of felt by cutting 17 in. off one side of the roll and install the remaining 19-in.-wide strip of underlayment along the eave, safely tacked in place. Install a 36-in.-wide roll of underlayment over the 19-in.-wide course of underlayment along the eave. The same procedure shall be followed for each course, overlapping the sheets 19-in. (leaving a 17-in. exposure).

The underlayment shall be fastened with annular ring or deformed shank nails with 1-in.-diameter caps at 6-in. o.c. along the laps and at approximately 12-in. o.c. in the field of the top sheet between the side laps. For sites with ultimate design wind speeds less than 160 mph (ASCE 7-10 or 7-16), annular ring or deformed shank nails with 1-in.-diameter caps (button cap nails) shall be allowed. For sites with ultimate design wind speeds greater than or equal to 160 mph (ASCE 7-10 or 7-16), annular ring or deformed shank nails with 1-in.-diameter thin metal disks ("tincaps") shall be used.

Note:

- Weave underlayment across valleys.
- Double-lap underlayment across ridges (unless there is a continuous ridge vent).
- Lap underlayment with minimum 6-in. leg "turned up" at wall intersections; lap wall weather barrier over turned-up roof underlayment.

S2.4 Combination Roof Sheathing and Roof Underlayment:

An ICC Evaluation Service AC266-rated system consisting of wood structural sheathing with an integrated water-resistive barrier such as Huber Zip System Roof Sheathing Panels can be used in combination with approved tape to seal the roof deck seams.

S3 Aluminum/Vinyl Soffit

Aluminum/Vinyl Soffit covering are limited to a maximum of 12 inches between support members and must be installed in accordance with the soffit manufacturer's instructions. Aluminum soffit covers shall not be used within 3000 ft of the coast.

S4 Roof Deck Attachment

Roof sheathing thickness and attachment shall be in accordance with Section S1.5.3.

S5 Roof Vents

Roof Vents shall be designed for the applicable wind load; ridge and off ridge vents shall be tested in accordance with the Florida Building Code Testing Application Standard or TAS 100(A) for high wind and be labeled for verification of compliance. All roof vents shall be installed in accordance with the manufacturer's installation instructions for the appropriate wind load.

Gable vents shall be provided with a removable cover that can be attached from the outside made of plywood or a nonporous type of shutter that will prevent water from entering through the gable end vent. Wood structural panels with a minimum thickness of 7/16 inch and a maximum span of 4 feet shall be used as a gable end cover. Panels must be pre-cut so that they can be attached to the framing surrounding the gable vent. Panels shall be pre-drilled as required for the anchorage method, and all required hardware shall be provided. Permanent corrosion-resistant attachment hardware with anchors permanently installed on the building shall be provided. The attachment schedule shall be in accordance with Table S5.

TABLE S5. GABLE END COVERING FASTENER SCHEDULE

Fastener Type	Fastener Spacing (inches) ¹
¼-inch diameter Lag Screw ² based anchor with 2-inch embedment length 2 and 1" diameter washer	16

Notes for Table S5:

1. Fasteners shall be installed at opposing ends of the wood structural panel and have a 2-inch minimum penetration into the building framing through veneers. Attachment to veneers is not acceptable.
2. Where screws are attached to masonry or masonry/stucco, they shall be attached using vibration-resistant anchors having a minimum withdrawal capacity of 1500 lb.

S6 Gable End Bracing

Gable end wood structural panel wall sheathing shall have a minimum thickness of 7/16 inch. Unless balloon framed, gable ends over 3-ft high shall be braced using the method specified in S6.1, S6.2, or S6.3 or per 2018 IEBC, Appendix C, Chapter C1 "Gable End Retrofit for High Wind Areas."

S6.1 Gable End Bracing Option 1:

Gable end framing, connections, and bracing shall be designed by a professional engineer for the appropriate exposure category, design wind speed, mean roof height, and location on the building to resist the appropriate positive and negative lateral wind loads and wind uplift.

S6.2 Gable End Bracing Option 2:

A minimum 2-inch x 6-inch horizontal strong-back shall be installed at the midpoint of the vertical height of the gable end wall. Strong-back shall be attached to each framing member it crosses using metal straps with 3- 8d x 1-1/2-inch-long nails at each end of the strap. Minimum 2 x 4 diagonal bracing not to exceed 45 degrees or 4 feet o.c. shall be installed on top of strong back and face nailed with 4-10d nails into the side of gable wall framing studs. The other ends of diagonal braces shall be toenailed to roof rafters or top chords or trusses and connected with a metal strap with 4-8d x 1-1/2-inch long nails at each end of strap or face nailed with 4-10d nails into sides of ceiling joists when they run perpendicular to the gable wall or into the sides of 2-inch x 4-inch x 8-foot lateral braces connected to tops of ceiling joists or truss bottom chords when ceiling joists run parallel to the gable wall.

In addition, when ceiling joists run parallel to the gable end wall, a minimum 2-inch x 4-inch x 8-foot lateral brace shall be installed at a maximum of 6 feet o.c. on top of ceiling joists or truss bottom chord and gable top plate, aligned with a wall stud below and nailed with 2-10d nails at each support. Metal 20-gauge straps shall be installed on top of 2-inch x 4-inch lateral brace and over gable top plate into stud below using 10- 8d nails top and bottom (into the lateral brace and into the wall stud below). Install minimum 2 x 4 blocking under lateral braces in the bay between the gable wall framing and the first ceiling joist or truss with four (4) 10d nails.

S6.3 Gable End Bracing Option 3:

When ceiling joists or trusses run parallel to the gable end wall, continuous 2-by-4 lateral braces shall be installed on the top edges of ceiling joists or the top edges of truss bottom chords from the gable end truss/framing at a maximum of 6-feet o.c. and aligned with a wall stud below. The lateral braces shall be attached to each truss bottom chord/ceiling joist with 2-10d nails. The braces shall extend back from the gable truss/framing at a distance equal to 90% of the building width. Each lateral brace shall have a minimum 20-gauge metal strap connected to the lateral brace that wraps over the bottom chord of the gable end wall plate/truss, over the top plate of the wall below, and connected to a stud in the wall below. Straps shall be connected with ten (10) 8d nails at each end. Install minimum 2 x 4 blocking under lateral braces in the bay between the gable wall framing and the first ceiling joist or truss with four (4) 10d nails.

S7 Continuous Load Path

A continuous load path shall be provided to transfer all lateral and vertical loads from the roof, wall, and floor systems to the foundation. All residential structures proposed for locations with an ultimate wind speed of greater than 115 mph shall have the structural design depicting the load path and all connections signed and sealed by a State-based, registered, licensed professional engineer.

S8 Glazed Openings

Glazed openings shall be designed and protected in relation to the applicable wind loads and impact resistance requirements specified in Sections S8.1 and S8.2.

S8.1 Design Pressure Requirements:

Windows, all exterior doors (including the glazing in exterior doors), and all impact protection systems shall be rated for the design pressures appropriate for the exposure category, design wind speed, opening size, and opening location on the building. The required pressure ratings shall be depicted on the building plans. Products shall be tested, at a minimum, in accordance with IRC accepted standards and installed in accordance with the manufacturer's instructions. Acceptable IRC design pressure test standards for windows and glass doors include AAMA/WDMA/CSA 101/I.S.2/A440, ASTM E330 (products shall be tested to 1.5 times design pressure). Installation of products with adequate ratings achieved using the Florida Building Code Testing Application Standard, TAS 202 shall also be permitted.

S8.2 Opening Protection Impact Requirements:

All glazing in exterior windows and doors (including sliding glass doors, garage doors, and entry doors, etc.) shall be impact rated or protected by a system that is impact-rated as defined in this section.

Where the ultimate design wind speed is 115 mph or greater (i.e., hurricane-prone regions), openings and opening covers must be impact rated in accordance with the following tests and requirements:

- Large Missile D (8 lb 2x4 impacting end on at 50 ft/sec) as defined in ASTM E1996 and ASTM E 1886 or AAMA 506 (AAMA is also known as FGIA)
- The Florida Building Code Testing Application Standards TAS 201 and TAS 203
- Where ultimate design wind speeds are less than 130 mph, protective systems that provide at least the level of protection of wood structural panels with a minimum thickness of 7/16 in. and a maximum span of 44 in. between lines of fasteners are permitted to be used as removable opening protection. Panels shall be pre-cut and pre-drilled as required for the anchorage method, and all required hardware shall be provided. Wood structural panels shall extend a minimum of 1-inch beyond the centerline of fasteners. Permanent corrosion-resistant attachment hardware with anchors permanently installed on the building must be provided. The attachment schedule must be, at a minimum, in accordance with Table S5.

S9 Garage Doors

Garage doors and their attachment system shall conform to the design wind pressure for the door size, exposure category, and design wind speed at the site. Products shall be tested and approved per ANSI/DASMA 108 or ASTM E 330 for the required design wind pressure. Garage doors and their attachment systems with adequate ratings achieved using the Florida Building Code Testing Application Standard, TAS 202 shall also be permitted. Labeling for verification of compliance is required. Garage doors with windows must also be protected from impact (either tested for impact resistance in accordance with ANSI/DASMA 115 or protected by an impact-rated cover).

S10 Chimney Chases

Wood frame chimney chases shall be structurally connected to rafters and ceiling joists. The attachment shall be detailed in the engineered plans or shall meet the minimum requirements of Sections S10.1, S10.2, and S10.3, as illustrated in Figure S10.

S10.1 Connection of Chimney structure to Roof Structure:

Each corner of the chimney structure shall have a tension strap fastened to the corner stud that continues downward to the roof support members below. The tension strap shall have a minimum tension capacity of 700 pounds and shall be connected per manufacturer installation instructions.

S10.2 Sheathing of Chimney:

Chimney framing shall be sheathed with a minimum of 7/16-inch-thick wood structural panels on all four exterior sides.

S10.3 Support of Chimney Perimeter:

The base perimeters of chimney framing shall be continuously supported by minimum 2x4 blocking fastened to roof framing members with joist hangers.

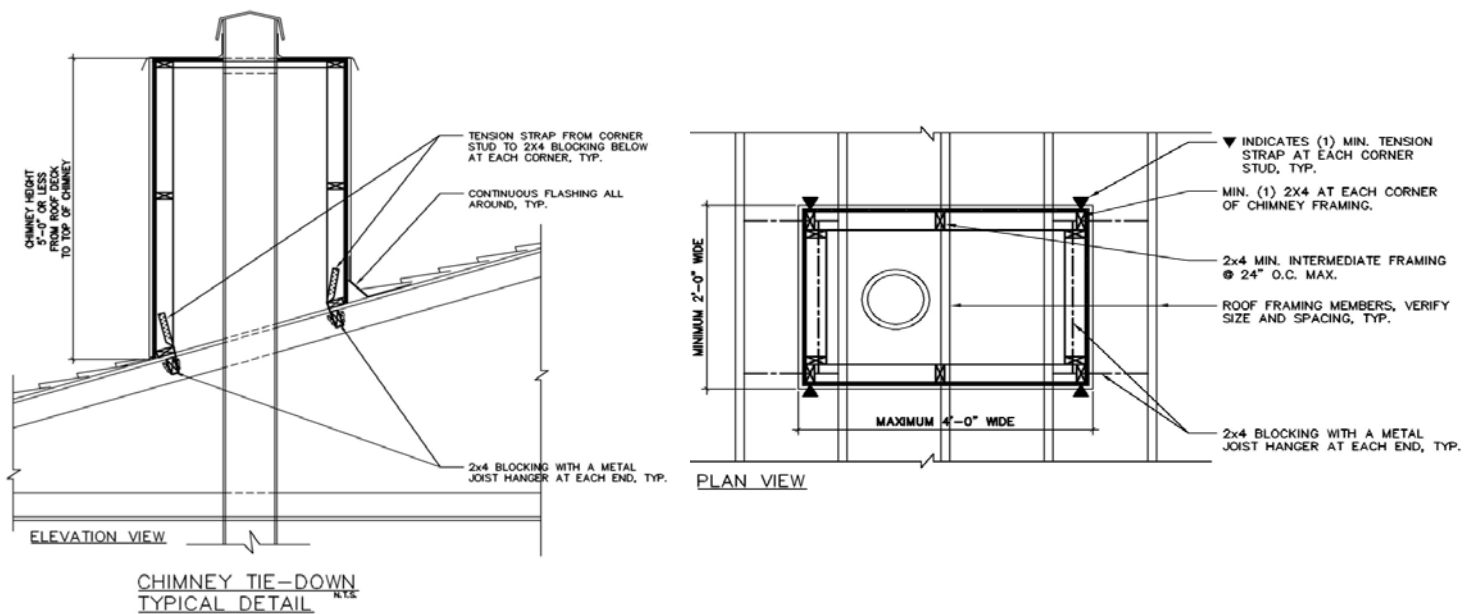


FIGURE S10. TYPICAL CHIMNEY TIE-DOWN DETAILS

S11 Braced Wall Lines / Shear Walls

Exterior and Interior shear wall and/or braced wall panel locations shall be indicated on the plans and shall be nailed in accordance with the engineered drawings but no less than 6 inches o.c. maximum spacing along all intermediate and edge framing using 8d (0.113-inch diameter x 2-3/8-inch-long) irregular shank (i.e., ring shank or spiral) nails with full round heads. Shear wall designs and hold-down connections to the foundation shall be in accordance with accepted engineering practices and meet the engineered design requirements specified in Section S7.



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