

**ROOFING APPLICATION STANDARD (RAS) No. 119**  
**INSTALLATION OF MECHANICALLY FASTENED ROOF TILE SYSTEMS**  
**Direct Deck & Horizontal Battens Only**  
(Preformed Metals With Edge Returns)

**1. Scope**

This application standard covers the procedures for installation of mechanically fastened roof tile systems on direct deck or horizontal battens only. This standard shall be used in conjunction with the tile manufacturer's Product Approval and RAS 127.

NOTE #1: The following table provides the contractor with the choices available for underlayment systems. These systems can only be used on pitches designated in the table below:

**2. Definitions**

For definitions of terms used in this application standard, refer to ASTM 1079 and the *Florida Building Code, Building*.

Roof Pitch	Battens or Direct Deck	Choice of Underlayment	Plastic or Compatible Roof Cement at Nails Penetrating Underlayment	Reference
4:12 or greater	Either	1. ASTM D 226 Type II (#30) or ASTM D 2626 (#43) organic base sheet nailed to deck, min. ASTM D 6380, Class M, or WS Type II (#90) organic cap sheet set in Type IV hot asphalt.	Required	3.01 A
	Either	1. Any Product Approved underlayment system with a mechanically fastened base sheet, and cap sheet set in hot, cold, or self-adhered.	Per Product Approval	3.01 B, C, or D
	Either	3. Product Approval listed nail-on single ply underlayment	Per Product Approval	3.01 E

NOTE #2: All tiles shall be interlocking with waterlocks.

NOTE #3: All approved tiles with integral batten-lugs used on slopes greater than 7:12 shall be installed on horizontal battens.

This Roofing Application Standard covers flat, low and high profile roof tiles, using a minimum 3 in. tile headlap, or design limited headlap as specified in the tile manufacturers Product Approval, on minimum <sup>15</sup>/<sub>32</sub> in. solid decking nailed in compliance with Chapter 23 (High-Velocity Hurricane Zones) of the *Florida Building Code, Building*.

**PART I - GENERAL**

1.01

- A. Tiles shall not be installed over wet underlayment where moisture prohibits adhesion of mastic, mortar, or adhesive.

**PART II - MATERIALS**

2.01 Fasteners:

A. Tiles Fasteners

- 1. All roof tile nails or fasteners, except those made of copper, monel, aluminum, or stainless steel, shall be tested for corrosion in compliance with TAS 114 Appendix E, Section 2 (ASTM G 85), for salt spray for 1000 hrs. Tile fasteners used in coastal building zones, as defined in Chapter 16 (High-Velocity Hurricane Zones), *Florida Building Code, Building* shall be copper, monel, aluminum, or stainless steel.
- 2. All roof tile fasteners shall be of sufficient length to

penetrate a minimum <sup>1</sup>/<sub>2</sub> in. through the thickness of the deck or batten, whichever is less, or to penetrate into a 1 in., or greater, thickness of lumber not less than 1 in.

- 3. Storm clips and storm clip fasteners – refer to Product Approval with fastener penetration as above.

B. Underlayment Fasteners:

- 1. Fasteners shall be in compliance with Section 1523 of the *Florida Building Code, Building* (Herein referred to as “Approved Fasteners.”)

(aa) Nails shall be minimum 12 gage, annular ring shank nails having not less than 20 rings per inch; heads not less than <sup>3</sup>/<sub>8</sub> in. in diameter; and lengths sufficient to penetrate through the plywood panel or wood plank decking not less than <sup>3</sup>/<sub>16</sub> in., or to penetrate into a 1 in., or greater, thickness of lumber not less than 1 in. Nails shall be hot dipped; electro or mechanically galvanized to a thickness sufficient to resist corrosion in compliance with Appendix E of TAS 114. All nails shall be Miami-Dade listed for corrosion resistance. All nail cartons or carbon labels shall be labeled to note compliance with corrosion resistance requirements. No roof material shall be fully or partially ad-

hered (not to include mechanically attached) directly to a nailable deck.

(bb) Such fasteners shall be applied through "tin caps" not less than 1<sup>5</sup>/<sub>8</sub> in. and not more than 2 in. in diameter and of not less than 32 gage (0.010 in.) sheet metal. All tin caps shall be Miami-Dade listed for corrosion resistance.

(cc) Prefabricated fastener systems complying of the *Florida Building Code, Building* with Section 1517.5, may be used, provided they are Miami-Dade listed for corrosion resistance.

2.02 Metal Flashing:

A. Flashing materials shall comply with the requirements set forth in Chapter 15 (High-Velocity Hurricane Zones) of the *Florida Building Code, Building*.

1. Metal accessories for roofs shall be not less than 26 gage galvanized, 28 gage stainless steel, 16 ounce copper, 0.024 inch (0.61 mm) thick aluminum, lead sheet with a minimum 2.5 lb/sf or equivalent noncorrosive lead metal alloys or composite materials manufactured for use as roof termination. All composite and nonmetallic flashing materials shall have Product Approval.

2. Metal accessories may be of a manufactured, shop fabricated or field fabricated type, provided the materials and fasteners are in compliance with the minimum requirement of this Code and shall be installed in compliance with methods set forth in RAS 111.

2.03 Asphaltic Adhesive:

A. Asphalt plastic roof cement - conforming to ASTM D 4586, type II, nonasbestos, non-running, heavy body material composed of asphalt and other mineral ingredients.

B. Cold process modified bitumen roofing mastic - conforming to ASTM D 3019, Type III.

C. Asphalt - conforming to ASTM D 312, Type IV.

2.04 Adhesive/Sealant:

A. Structural bonding adhesive - conforming to ASTM 3498.

2.05 Mortar:

A. Materials:

1. Roof tile mortar shall either be a premixed unit having Product Approval and tested in compliance with TAS 123 or a job site mix approved by the building official and in compliance with RAS 113.

B. Mixes:

1. Sand/cement mixes, job mixed or premixed, shall meet ASTM C 270 re-

quirement for Type M mortar (2.25 to 2.5:1 sand to cement ratio).

- 2. Lightweight aggregate/cement mortar must be premixed and bagged.

NOTE #4: Anchor/base sheet shall have a minimum of two plies in the valleys. A No. 30 or No. 43 can be used as a dry in prior to installing the underlayment with this system.

2.06 Eave Closure - CHOOSE ONE of the following:

- A. Prefabricated EPDM synthetic rubber conforming to ASTM D 1056.
- B. Prefabricated metal eave closure must contain minimum  $\frac{3}{8}$  in. diameter weepholes, spaced not more than 12 in. apart, flush with the underlayment.
- C. Prefabricated concrete or clay eave closure.
- D. Mortar (color optional) on granular surface underlayments only.
- E. Antiponding drip edge.

- A. Hot Mop 30/90, Hot Mop 43/90 (see Drawing 1). A No. 30 or No 43 anchor/base sheet ASTM D 226, Type II, or ASTM D 2626 Shall be mechanically attached to the wood deck with approved fasteners spaced in a 12 in. grid staggered in two rows in the field, and 6 in. on center at the laps. Extend anchor/base sheet a minimum of 4 in. up vertical surfaces. Anchor/base sheet end laps shall be a minimum of 6 in. and head laps shall be a minimum of 4 in. Over installed anchor/base sheet, apply one layer of mineral surfaced cap sheet ASTM D 6380 in full 25 #/sq.  $\pm 15\%$  mopping of asphalt. End laps shall be a minimum of 6 in.; head laps shall be a minimum of 3 in. and backnailed 12 in. on center with approved nails through tin caps or by Miami- Dade listed prefabricated fasteners.

2.07 Sheathing Material shall conform to APA rated sheathing, in compliance with Chapter 23 (High-Velocity Hurricane Zones) of the *Florida Building Code, Building*.

NOTE #5: The above system may be upgraded by hot mopping an interply of ASTM listed fiberglass or perforated organic felt to the anchor sheet before applying the cap sheet. Asphalt application shall be per above specifications.

- A. Battens-material to be decay resistant species or pressure treated in compliance with AWPA C2.
  - 1. Battens shall not be bowed or twisted.
  - 2. Horizontal battens shall be a minimum nominal 1 in. by 2 in.

- B. Hot Applied Product Approved Underlayment System (see Drawing 1). An anchor/base sheet shall be mechanically attached to the wood deck with approved fasteners spaced in a 12 in. grid staggered in two rows in the field, and 6 in. on center at the laps or as specified in the underlayment manufacturer's Product Approval. Anchor/base sheet end laps shall be a minimum of 6 in. and head laps shall

**PART III - EXECUTION**

3.01 Underlayment Applications - CHOOSE ONE of the following:

be a minimum of 4 in. Over installed anchor/base sheet, apply one layer of cap sheet in a full 25#/sq.  $\pm$  15 percent mopping of asphalt. End laps shall be a minimum of 6 in. on center; head laps shall be a minimum of 3 in. and backnailed 12 in. on center with approved nails through tincaps or by prefabricated fasteners in accordance with *Florida Building Code, Building* 1517.5.1 and 1517.5.2.

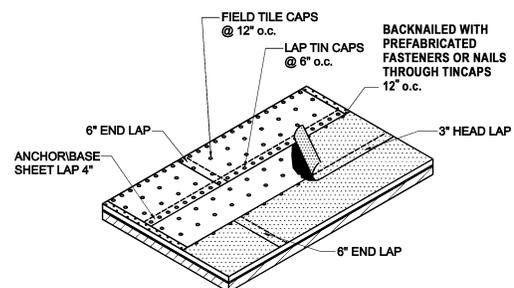
- C. Cold-Applied Product-Approved Underlayment System (See Drawing 1). An anchor/base sheet shall be mechanically attached to the wood deck with approved fasteners spaced in a 12 in. grid staggered in two rows in the field and 6 in. on center at the laps or as specified in the underlayment manufacturers Product Approval. Anchor/base sheet end laps shall be a minimum of 6 in. and head laps shall be a minimum of 4 in. Over anchor/base sheet, apply one layer of cap sheet in a continuous layer of cold process adhesive at the rate of 1.5 gallons per 100 sq. ft. or at the rate if so stated in the Product Approval. Adhesive shall be applied uniformly in accordance with the Product Approval with a squeegee or knotted brush. Cap sheet side laps shall be a minimum of 6 in.; head laps shall be a minimum of 3 in. and backnailed 12 in. on center with approved nails through tincaps or by prefabricated fasteners in accordance with *Florida Building Code, Building* 1517.5.1 and 1517.5.1.

- D. Product-Approved Anchor/Base Sheet / Self-Adhered Underlayment System. The roof cover is terminated at approved metal flashings. Any approved anchor/base sheet as listed in the

Product Approval shall be mechanically attached to the wood deck with approved fasteners spaced in a 12 in. grid staggered in two rows in the field and 6 in. on center at the laps or as specified in the underlayment manufacturers Product Approval. Anchor/base sheet end laps shall be a minimum of 6 in. and head laps shall be a minimum of 4 in. Over anchor/base sheet, apply one layer of any Product Approved, self-adhered underlayment in compliance with the self-adhered underlayment manufacturers' approval/requirements.

- E. Self-Adhered Underlayment (Single Ply). A single ply underlayment system utilizing any Product approved self-adhered underlayment. The roof cover is terminated at approved metal flashings. Apply one layer of any self-adhered underlayment in compliance with the underlayment manufacturers' approved/requirements.

3.02 Drip Edge Metal - CHOOSE ONE of the following:



**DRAWING 1**  
**TYPICAL 30/90 HOT MOP**

NOTE #6: Drip edge deck flange shall be primed with ASTM D 41 asphalt primer.

A. Two-ply underlayment systems. (See Drawing 2)

1. Drip edge metal shall be installed over anchor/base sheet, fastened 4 in. on center with approved 1 1/4 in. roofing nails or approved fasteners. All joints shall be lapped a minimum of 4 in. ensuring water shedding capabilities and apply approved plastic roof cement between laps.

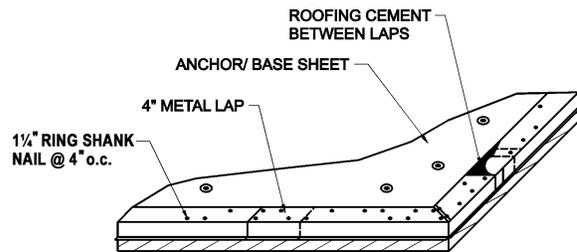
B. When drip edge metal shall be installed at eaves and gables over a two ply underlayment system: The metal profile shall be placed in a minimum 3/16 in. bead of continuous ASTM D 4586 plastic roof cement and fastened 4 in. on center with approved 1 1/4 in. roofing nails or approved fasteners. All metal joints shall be lapped a minimum of 4 in. ensuring water shedding capabilities and apply approved plastic roof cement between laps. The metal profile and cap sheet shall be joined with a two ply application of cotton or fiberglass fabric reinforcement, both set in a full bed of approved plastic roof cement. As an alternate, the metal may be stripped in with a 6 in. strip of torch, hot asphalt or cold adhesive polyester reinforced modified bitumen. Joints shall be feathered with cold adhesive, hot asphalt or a torch to enhance water flow across the "backlap."

C. Single-Ply Underlayment Systems:

1. Drip edge metal shall be installed at the eave, over the underlayment or in accordance with the underlayment manufac-

turer's Product Approval. The metal shall be fastened 4 in. on center with approved 1 1/4 in. roofing nails or approved fasteners of compatible metals. All joints shall be lapped a minimum of 4 in. ensuring water shedding capabilities and apply approved plastic roof cement between laps.

2. Strip-in metal with minimum 6 in. strip of the single ply underlayment or in accordance with the underlayment manufacturer's Product Approval, using primer and/or approved compatible mastic if so directed by single ply manufacturer requirements.



**DRAWING 2  
DRIP EDGE INSTALLATION**

3.03 Gable Treatment — CHOOSE ONE of the following:

A. Underlayment Wrapped Gable. (This option shall not be used without installing rake tiles on all rakes.)

1. Trim underlayment at fascia or barge board. Install a peel-and-stick underlayment extending underlayment beyond rake/gable end. Fold down and seal

onto fascia or barge board maximum 2 1/2 in. Additionally secure with approved fasteners through tin caps or approved preassembled cap nails in accordance with Section 1517.5 of the *Florida Building Code, Building* spaced at a maximum of 12 in. on center.

B. Metal Finish.

Drip edge metal shall be installed at the gable, over or between the underlayment plies. The metal shall be installed per choices listed above (3.02) to ensure water shedding capabilities of all metal laps.

3.04 Valleys - CHOOSE ONE of the following:

NOTE #7: Where special conditions exist, it may be necessary to increase the width of the valley metal and/or panflashing.

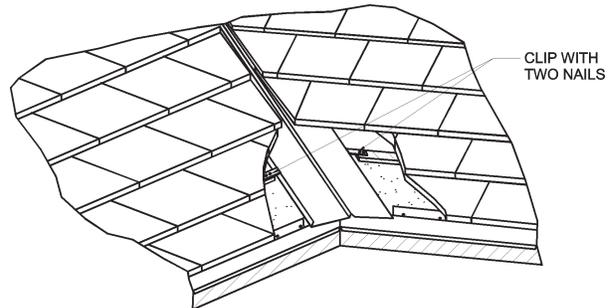
A. Over underlayment install preformed closed valley of a minimum width of 16 in. (24 in. stretch-out) with a minimum 2 1/2 in. high center diverter and minimum 1 in. metal edge returns. All joints shall be lapped a minimum of 6 in. ensuring water shedding capabilities and apply approved plastic roof cement between laps (see Drawing 3).

B. Over underlayment install performed open valley with a

minimum of 16 in. (24 in. stretch-out) with a minimum 1 in. high twin center diverter and minimum 1 in. metal edge returns. All joints shall be lapped a minimum of 6 in. ensuring water shedding capabilities and apply approved plastic roof cement between laps (see Drawing 4).

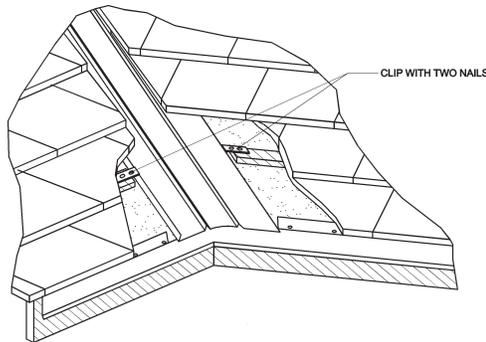
1. Secure with approved clips fabricated from similar or compatible material. Clip 1 in. metal edge returns to either deck or batten strip with 2 approved 1 1/4 in. roofing nails through metal strap set in plastic roof cement when clip is direct to deck. Spacing of clips to be maximum 12 in. on center or fastened to each batten.

2. Trim metal at all valley/ridge junctions, ensuring water shedding capabilities onto the valley.



**DRAWING 3  
PERFORMED CLOSED VALLEY  
(NAIL-ON SYSTEM)**

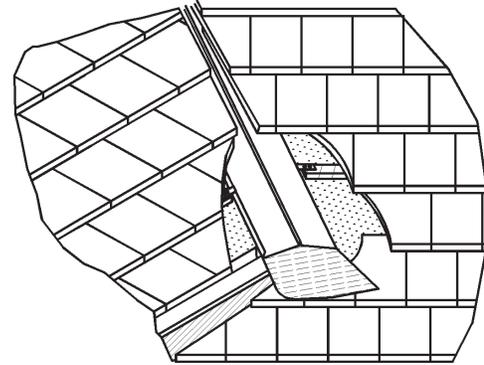
3. Install lead soaker at all valley/ridge junctions. Turn lead up a minimum of 1 in. to create a water diverter, ensuring water shedding capabilities onto the valley.



**DRAWING 4  
VALLEY METAL DETAIL  
(NAIL-ON SYSTEM)**

- 3.05 Valley Termination onto Roof Plane
- A. When valley terminates onto roof plane, install in accordance with standard valley flashing procedures:
    1. Apply a lead soaker/skirt underneath the eave end of valley to carry water off the valley back onto the field tile (see Drawing 5).
    2. If lead skirt is not used, extend complete width of valley metal to carry water off the valley back onto the field tile.

NOTE #8: Where linear footage exceeds 20' it may be necessary to increase the width of the valley metal and/or pan flashing. In all

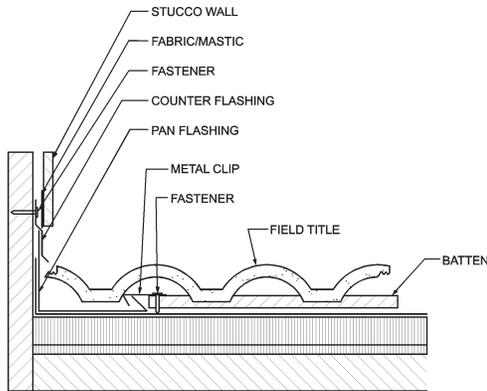


**DRAWING 5  
NAIL-ON VALLEY SYSTEM  
VALLEY METAL OVER TILE**

cases, flashing shall be designed to adequately direct water back onto the tiles.

3.06 Flashing and Counterflashings at Wall Abutments (see Drawing 6).

- A. Install preformed metal wall tray 5 in. vertical flange, 6 in. base flange with 1 in. metal edge return flush to base of walls over underlayment. Start at lower portion and work up to ensure watertight application.
- B. Secure with clips fabricated from compatible material maximum 12 in. on center or spacing of battens. Clip 1 in. metal edge return to deck or batten strip with approved 1<sup>1</sup>/<sub>4</sub> in. roofing nails through the metal strap. Seal all penetrations with plastic roof cement.
- C. Fasten vertical metal flange 6 in. on center with approved nails within 1 in. of outside edge. Lap joints a minimum of 4 in. and seal joints with plastic roof cement.
- D. Seal along entire edge of vertical metal flange, covering all fastener penetrations with flashing cement and membrane.



**DRAWING 6**  
**WALL FLASHING DETAIL**  
**(NAIL-ON SYSTEM)**

- E. Metal counterflashing shall be installed: lap top flange of base flashing a minimum of 3 in. Fasten metal within 1 in. of outside edge a minimum of 6 in. on center or set metal into reglets and seal thoroughly. Lap joints a minimum of 4 in. ensuring water shedding capabilities and apply plastic roof cement or sealant between the laps.
- C. Secure with approved fasteners 6 in. on center, ensuring fasteners will be covered by skylight/hood vent flange.
- D. Continue with flexible or rigid flashing on both sides of the curb working up toward ridge. Trim as necessary to ensure water shedding onto field tile.
- E. Secure with approved fasteners 6 in. on center.
- F. The flexible or ridged flashing at ridge end (upper side) of curb shall extend a minimum 6 in. past each side of curb and shall at least cover the full width of the side flashing immediately below.
- G. Seal all fastener penetrations, at skylight or hood vent joints with approved sealant.

NOTE #9: For self-curbing or prefabricated skylights, curb height shall be min. 6 in. and min 2 in. above most adjacent finished tile surface and installation shall be in accordance with skylight manufacturer's Product Approval. For turbines and other Product approved accessories, refer to the accessory manufacturer's Product Approval.

### 3.07 Head & Apron Flashing.

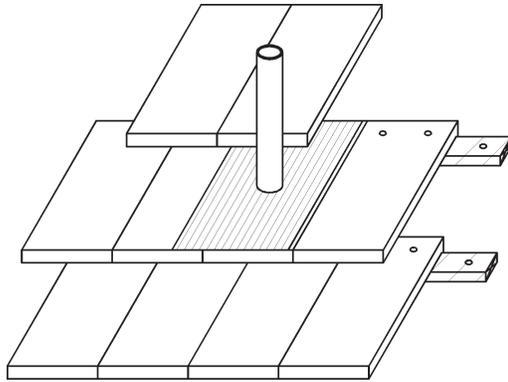
- A. Install apron flashing a minimum 4 in. on tile surface. Fasten vertical flange of flashing within 1 in. of metal edge with approved fasteners 6 in. on center. Seal along entire edge of vertical metal flange, covering all fastener penetrations with flashing cement and membrane.

### 3.08 Standard Curb Mounted Skylights, Chimneys, etc.

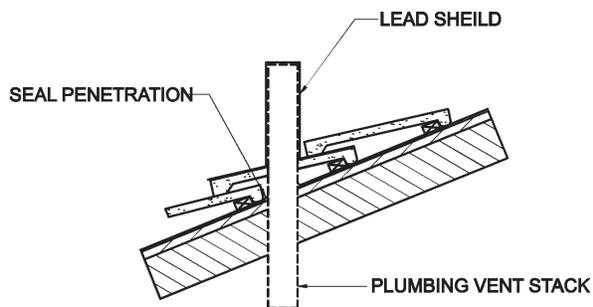
- A. Curbs shall be a minimum of 2 in. x 6 in., and a minimum 2 in. above upper-most adjacent finished tile surface.
- B. Install a minimum 12 in. width lead at eave end of each curb.

### 3.09 Pipes, Stacks, Vents, Etc. (see Drawings 7 and 8).

- A. Seal around penetration with plastic roof cement or approved sealant.
- B. Apply skirt flashing over last field tile cut previously installed extending under the course of tile above the penetration.
- C. Flashing shall be 18 in. x 18 in. minimum and be of sufficient



**DRAWING 7  
PLUMBING STACKS  
(NAIL-ON SYSTEMS)**



**DRAWING 8  
PLUMBING STACKS FLASHING  
(NAIL-ON SYSTEMS)**

width to redirect the water away from penetration.

- D. Seal flashing to tile with approved sealant.

NOTE #10: Profile specific ventilators shall be installed as per manufacturer's installation instructions.

### 3.10 Batten Installation:

Four-foot horizontal battens are required. When utilizing battens, preformed metal flashing with metal edge returns must be used.

NOTE #11: Battens are optional from 4:12 up to and including 7:12 pitch.

- A. Install top edge of horizontal batten to horizontal line. Horizontal battens shall be a minimum nominal 1 in. x 2 in.
- B. Fasten and secure maximum 24 in. on center with screws or fasteners of sufficient length to penetrate through the sheathing a minimum of  $\frac{3}{4}$  in. or to penetrate into a 1 in., or greater, thickness of lumber not less than 1 in.
- C. Leave  $\frac{1}{2}$  in. space between batten ends.

### 3.11 Tile Installation.

- A. Eave Treatment - CHOOSE ONE of the following:

NOTE #12: All fastener Penetrations shall be sealed.

1. Prefabricated EPDM Synthetic Rubber - Install closure strip along eave. Fasten insert each piece at 12 in. on center (see Drawing 9 all fastener penetration shall be sealed with compatible material).
2. Metal Eave Closure - Install closure strip eave. Fasten a minimum 12 in. on center with approved fasteners. If metal is inclusive of drip edge, fasten 4 in. on center. (see Drawing 10).
3. Raised Fascia/Wood Starter Strip when using a  $\frac{3}{4}$  in. raised fascia, a nominal 2 in. x 2 in. wood starter strip must be installed behind fascia. Choose one of the following:

- (aa) Install fascia board approximately  $1\frac{1}{2}$  in. above roof deck

or a nominal 2 in. x 2 in. wood starter strip at roof edge (see Drawing 11).

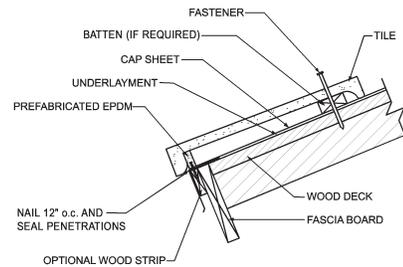
- (bb) Install 8 in. tapered cant strip at eave behind fascia and/or starter strip to support metal flashing. Install a minimum 8 in. wide anti-ponding metal flashing to ensure positive drainage over fascia/starter strip. Fasten top edge of flange onto roof and fasten eave edge to raised fascia detail with approved fastener 4 in. on center.

4. Prefabricated Concrete or Clay Eave Closure — fastened in accordance with manufacturer's Product Approval with approved fasteners.
5. Mortar Application - Install mortar to elevate eave edge.

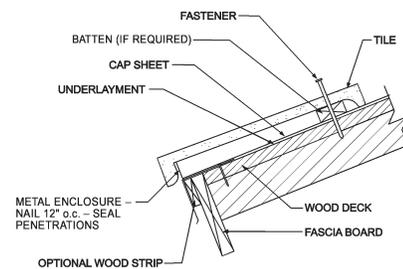
- (aa) Apply mortar along the eave edge, applying enough mortar to elevate the eave end of the tile to be on profile with the remaining roof tile.

- (bb) Point and smooth finish flush to eave line.

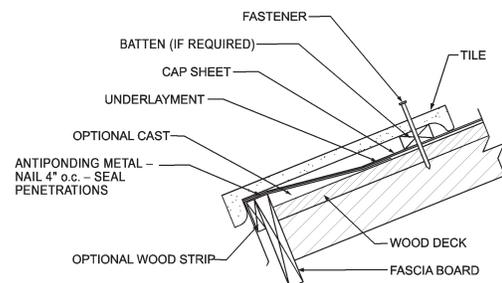
- (cc) Apply minimum  $\frac{3}{8}$  in. weephole flush with the roof underlayment shall be formed at the



**DRAWING 9  
EAVE TILE DETAIL  
(NAIL-ON EPDM EAVE ENCLOSURE)**



**DRAWING 10  
EAVE TILE DETAIL  
(NAIL-ON METAL EAVE ENCLOSURE)**



**DRAWING 11  
EAVE TILE DETAIL  
(NAIL-ON ANTIPONDING ENCLOSURE)**

spacing of not less than one weephole per tile.

- (dd) Mortar eave closures shall only be used with granular surface underlayment.

- B. Storm Clips. Storm clips shall be required at the first course of tile. The use of other alternatives including an adhesive is an acceptable means for fastening the first course of tile as long as it is part of an approved roofing system and meets the requirements for Chapter 16 of the *Florida Building Code, Building* for wind resistance.

NOTE #13: Tile shall be attached to resist the design pressures for the building. See Chapter 16 (High-Velocity Hurricane Zones) of the *Florida Building Code, Building* and RAS 127. See Tile manufacturers Product Approval for attachment resistance values, which must exceed the required calculated design pressures of the structure.

3.12 Valleys - CHOOSE ONE of the following:

NOTE #14: It may be necessary to remove the lugs from the field tile and/or install batten extenders at wall and valley flashings for proper positioning of cut field tiles and to facilitate water flow.

- A. Preformed Metal With 1 in. Returns:
  - 1. Closed Valley - Miter tile to form straight border on either side of water diverter (see Drawing 5).
  - 2. Open Valley - Miter tile to form straight border on ei-

ther side of two water diverters (See Drawing 4).

3.13 Hip and Ridge Nailor Boards or Preformed Metal Channel (See Drawing 12 - Details 1, 2, 3 and 4 are also accepted methods of installing Hip and Ridge Nailor Boards.)

- A. Wood nailers or preformed metal channel shall be attached in compliance with Chapter 16 (High-Velocity Hurricane Zones) of the *Florida Building Code, Building*.

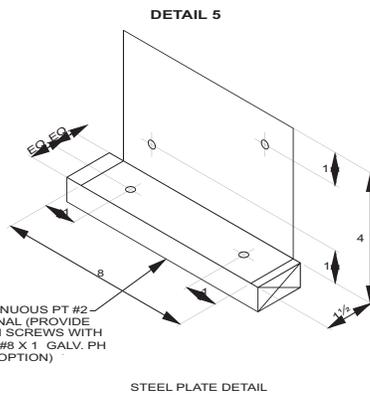
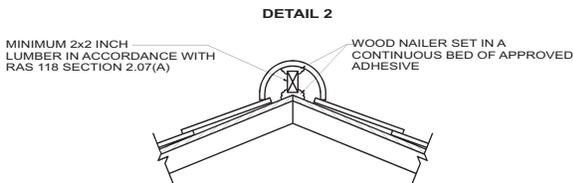
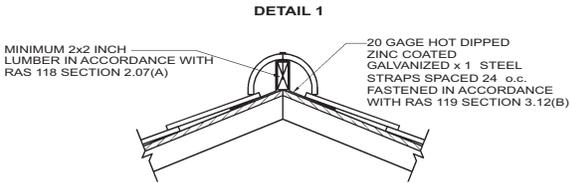
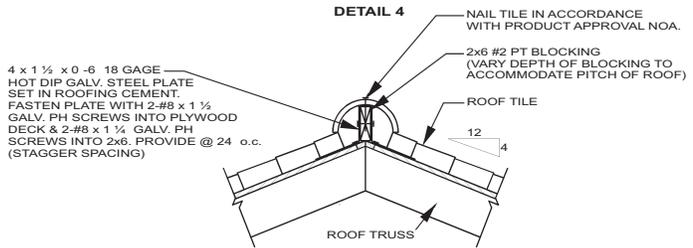
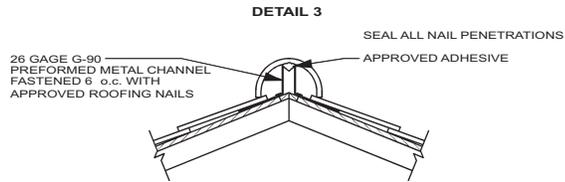
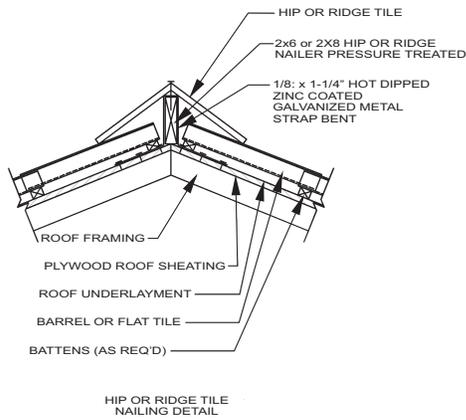
- B. Wood nailer boards shall be secured with hot dipped zinc coated galvanized steel straps of a minimum thickness of  $\frac{1}{8}$  in. by  $1\frac{1}{4}$  in. wide. The galvanized steel straps shall be installed at a maximum spacing of 12 in. on center along the length of the ridge nailer boards. Steel straps shall be bent to fit over the ridge nailer boards, and shall be secured to the sheathing with a minimum of six #6-#8 corrosion resistant screws per strap, at a maximum spacing of 4 in. on center.

- C. Preformed Metal Channel

Preformed Metal Channels shall be secured 6 in. on center with approved fasteners. All fastener penetrations shall be sealed with plastic roof cement.

- D. Hip and Ridge Tile Installation - CHOOSE ONE of the following:

- 1. Self-adhered Membrane
  - (aa) Install self-adhered membrane over nailer board and seal to tile surface per membrane



**DRAWING 12  
HIP RIDGE TILE  
NAILING DETAIL**

manufacturer's recommendation.

- (bb) Install hip and ridge tiles with corrosion resistant approved nails or screws of sufficient length to penetrate a minimum of  $\frac{3}{4}$  in. into nailer lapping tile a minimum of 2

in. (Approved adhesive, in lieu of nails or screws, is permitted when using Detail 2 and 3. When using adhesive, hip and ridge tiles shall be installed in accordance with the adhesive manufacturer's Product Approval).

- (cc) Use approved adhesive or clips at overlaps.
  - 2. Mortar
    - (aa) Set hip and ridge tile in a continuous bed of mortar, lapping tile a minimum 2 in. Ensure bed of mortar does not protrude in center of hip or ridge junction. Approximately 1 in. of field tile shall extend beyond bed of mortar.
    - (bb) Install hip and ridge tiles with approved corrosion resistant nails or screws of sufficient length to penetrate a minimum of  $\frac{3}{4}$  in. into nailer board. (Approved adhesive, in lieu of nails or screws, is permitted when using Details 2 and 3. When using adhesive hip and ridge tiles shall be installed in accordance with the adhesive manufacturer's Product Approval.)
    - (cc) Point mortar to finish surface.
- 3.14 Rake/Gable Tile - CHOOSE ONE of the following:
- A. Rake/Gable Tile
    - 1. Install first rake tile to exposed length of first course of field tile with factory finish of rake tile towards the eave.
- 2. Fasten rake tile with a minimum two 10D nails of sufficient length to penetrate the framing a minimum of  $\frac{3}{4}$  in.
  - 3. Abut each succeeding rake tile to the nose of the tile above and maintain a constant headlap.
- B. Mortar Finish:
- 1. Place mortar bed along roof edge.
  - 2. Point smooth to a straight edge finish.
- C. Metal Finish
- 1. Install prefabricated gable metal with 1 in. water return.
  - 2. Fasten by clipping 12 in. on center or spacing of battens.
- NOTE #15: Rake tile application at finishing end may need special consideration to provide proper drainage, i.e. flashing or sealant may be needed.
- 3.15 Wall Abutments:
- A. Cut tile to fit approximately  $\frac{1}{2}$  in. to base of walls. Point up mortar is optional.
- NOTE #16: It may be necessary to remove the lugs from the field tile and/or install batten extenders at wall and valley flashings for proper positioning of cut field tiles. For tiles installed at headwalls, tile shall be installed with approved roof tile adhesive. Fill void at headwall with mortar and point to finish.