

ROOFING APPLICATION STANDARD (RAS) No. 150
PRESCRIPTIVE BUR REQUIREMENTS

1. Scope

1.1 This application standard shall be used where the authority having jurisdiction has adopted its use, and in accordance with the provisions of this code.

2. Definitions

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

3. Built-up and Prepared Roof Covering Application

3.0 General

3.1 DECK PREPARATION: Before starting the roof covering:

3.1.1 All roof decks shall be broom-cleaned and dry.

3.1.2 Where practicable, eaves; parapet walls; vertical walls; penthouses and similar structures above the roof level shall have been completed.

3.1.3 Cant strips, where provided, shall extend at least three inches (3 in.) up vertical surfaces.

3.1.4 All eaves shall provide firm, nailable backing for the secure attachment of gravel stops and eave and gable drip.

3.1.5 All precast and prestressed concrete roof components shall be provided with insulation, or other leveling fill, where such component edges are more than one-half inch ($\frac{1}{2}$ in.) from being flush.

3.2 ATTACHMENT: All roof coverings shall be attached to the various types of decks by mopped-on adhesives or by mechanical fastening as set forth herein, or by other approved materials or methods.

3.3 ADHESIVES:

3.3.1 Bituminous compounds shall be asphalt (ASTM D 312), coal tar pitch (ASTM D 450), modified bitumen, or cold-applied roofing cement (ASTM D 4586 or ASTM D 3019, Type III).

3.3.2 Hot asphalt shall be applied in a quantity not less than 25 pounds plus or minus 15 percent per roofing square per ply and 60 pounds plus or minus 20 percent per square for flood coats and at a temperature recommended by the manufacturer for the system being installed. However, kettle or tanker temperatures should not exceed the following:

Type I Asphalt: 475 °F

Type III & IV Asphalt: 525 °F

NOTE : Asphalt can be heated to within 25°F below the actual flash point, but this temperature limitation should never be exceeded.

3.3.3 Coal tar pitch shall be applied in a quantity not less than 25 pounds plus or minus 15 percent per roofing square per ply and 70 pounds plus or minus 20 percent per square for flood coats and at a temperature of not less than 275 nor more than 350 °F (350 to 400 °F in the kettle).

3.3.4 Where roof incline exceeds two inches (2 in.) per foot, bituminous

compounds shall be steep asphalt Type III or Type IV.

NOTE : Coal tar pitch not to exceed a slope of one-half inch ($1/2$ in.) per foot with organic felts, if using glass felts or tar coated felts, slope not to exceed one-quarter inch ($1/4$ in.) per foot.

3.3.5 Adhesive compounds other than bitumen may be applied subject to manufacturer's specifications.

4. BUILT-UP ROOF COVERING:

4.1 Materials: All materials used in the assembly of fire-retardant and ordinary built-up coverings shall bear the label of the Underwriter's Laboratories, Inc., and be compatible with Class A, Class B, or Class C roofing. Material shall be deliv-

ered in original packaging bearing the manufacturer's labels.

4.2 ANCHOR SHEET: The anchor sheet, as defined herein, shall be a minimum one #30 felt lapped two inches (2 in.) and turned up vertical surfaces a minimum of four inches (4 in.) and secured as set forth herein.

4.3 WOOD DECKS:

4.3.1 Fasteners securing the anchor sheet to nominal one inch (1 in.) lumber or to wood based structural-use panels three-quarters inch ($3/4$ in.) or more in thickness shall be noncorrosive smooth shank nails with a shank diameter of a minimum of 0.118 inches or 11 gage, heads not less than three-eighths inches ($3/8$ in.) (0.375) diameter and not less than one inch (1 in.) in length; or non-corrosive 12 gage wire ring-shanked nails having

TABLE 1 ⁽³⁾		
FOR MINIMUM BASE SHEET ⁽⁵⁾ 1 LAYER, TYPE #30, ASTM D 226 - TYPE II		
Mean Roof Height (Ft.)	Fastening Pattern ⁽¹⁾	
	Perimeter Edge ⁽²⁾	Field ⁽⁴⁾
0-30	6 in. @ laps, 2 rows @ 6 in. midsheet	6 in. @ laps, 2 rows @ 12 in. midsheet
40	6 in. @ laps, 2 rows @ 6 in. midsheet	6 in. @ laps, 2 rows @ 9 in. midsheet
FOR MINIMUM BASE SHEET ⁽⁶⁾ 1 LAYER, TYPE #43, ASTM D 2626 - TYPE 1		
Mean Roof Height (Ft.)	Fastening Pattern ⁽¹⁾	
	Perimeter Edge ⁽²⁾	Field ⁽⁴⁾
0-30	12 in. @ laps, 2 rows @ 15 in. midsheet	12 in. @ laps, 2 rows @ 18 in. midsheet
40	12 in. @ laps, 2 rows @ 12 in. midsheet	12 in. @ laps, 2 rows @ 18 in. midsheet

FOOTNOTES:

(1) See section 4 for fasteners.

(2) Perimeter edge is measured from all roof edges and each side of ridge as follows:

The smaller of 0.10 x minimum building width or 0.40 x mean roof height, but not less than 0.04 x minimum building width or 3 feet.

(3) This table applies to roof slopes up to three inches (3 in.) per twelve inches (12 in.) (Maximum)

(4) Rows of fasteners, midsheet, shall be evenly spaced across width of sheet and staggered along length of sheet.

(5) Patterns shown require a minimum withdrawal capacity of 34 lb per fastener (unfactored.)

(6) Patterns shown require a minimum withdrawal capacity of 67 lb per fastener (unfactored.)

- not less than 20 rings per inch, not less than one inch (1 in.) in length with heads not less than three-eighths inch ($\frac{3}{8}$ in.) in diameter.
- 4.3.2 Fasteners securing the anchor sheet to wood based structural-use panels less than three-quarters inch ($\frac{3}{4}$ in.) in thickness shall be non corrosive smooth shank nails with a shank diameter of a minimum of 0.118 inches or eleven (11) gage, heads not less than three-eighths inch ($\frac{3}{8}$ in.) (0.375 in.) diameter and not less in length than will penetrate such wood based structural-use panels plus three-sixteenths inch ($\frac{3}{16}$ in.); or noncorrosive 12 gage wire ring-shanked nails having not less than 20 rings per inch, heads not less than three-eighths inch ($\frac{3}{8}$ in.) diameter and not less in length than will penetrate such wood based structural-use panels plus three-sixteenths inch ($\frac{3}{16}$ in.).
- 4.3.3 Such fasteners shall be applied through tin-caps not less than one and five-eighths inches ($1\frac{5}{8}$ in.) nor more than two inches (2 in.) in diameter and of not less than 32-gage sheet metal.
- 4.3.4 Spacing of such fasteners along the laps of sheets and both ways in the field between laps shall comply with Table 1, based upon height above grade.
- 4.3.5 Where the architectural appearance is to be preserved from below, anchor sheet shall be secured in accordance with Section 1519.5.2
- 4.3.6 Other sub-deck systems may use the spacing shown in Table 1 provided each fastener has the required withdrawal load in the particular substrate for which the fastener is designed.
- 4.3.7 Sheathing paper shall be applied on such decks where anchor sheets are pitch-tarred felts only and shall not be required under asphalt felts.
- 4.4 OTHER NAILABLE DECKS: Poured gypsum, precast gypsum planks, poured Vermiculite and Perlite (light-weight, insulating concrete), as well as foamed cellular concrete and structural wood-fiber used as roof decking are considered nailable and anchor sheets shall be attached as follows:
- 4.4.1 Poured gypsum and pre-cast gypsum planks: Use mechanical fasteners providing equal withdrawal resistance when spaced as set forth in Table 1 of this Code.
- 4.4.2 Poured Vermiculite, Perlite, foamed cellular concrete, and other light-weight, insulating concrete: Use only mechanical fasteners providing resistance to uplift not less than those shown in Table 1.
- 4.4.3 Structural wood fiber units: Use mechanical fasteners specified by the deck manufacturer, or after all joints have been stripped with six inch (6 in.) wide felt applied with approved cold adhesive, the anchor sheet may be solid mopped to such decks.
- 4.5 NON-NAILABLE DECKS: Poured concrete and precast deck units are considered non-nailable and anchor sheets shall be fastened as follows:
- 4.5.1 Such decks shall be primed with asphalt primer applied at the rate of one and one third ($1\frac{1}{3}$) gallons per roofing square, solidly on poured decks but held back four inches (4 in.) from precast unit joints.
- 4.5.2 Strip or solid mop, holding back four inches (4 in.) from precast unit joints, using dead level asphalt or coal tar pitch as the adhesive unless otherwise specified on the plans and permit and embed anchor sheet firmly in the hot bitumen lapping each sheet four inches (4 in.).
- 4.5.3 Where the incline of such decks exceeds three inches (3 in.) per foot,

anchor sheets shall, in addition to mopping, be mechanically fastened to wood strips spaced not more than 24 inches apart, cast into such decks.

4.5.4 Such wood strips shall be not less than a nominal one by two inches (1 in. x 2 in.), pressure treated with approved preservative, chamfered or otherwise secured flush with the deck surface.

4.5.5 Anchor sheets shall be attached to such wood strips with three-quarter inch ($\frac{3}{4}$ in.) long fasteners applied through tin caps and spaced as set forth herein.

4.5.6 Anchor sheet attachment shall satisfy the resistance to uplift requirements of Section 4.3.6 herein.

4.6 METAL DECKS: Metal decks shall be covered with mechanically fastened roof insulation.

4.7 OTHER DECKS: Attachment of the anchor sheet to decks other than those specifically provided for herein shall be as approved by the building official.

4.8 ADDITIONAL SHEETS:

4.8.1 Each additional sheet above the anchor sheet shall be lapped a minimum of two inches (2 in.) over the preceding sheet and shall be thoroughly mopped between sheets with a bituminous compound, or other approved adhesive providing equivalent bond, so that in no place felt touches felt.

4.8.2 Sheets shall be embedded without wrinkles or buckles.

4.8.3 Each sheet, like the anchor sheet, shall be turned up vertical surfaces a minimum of four inches (4 in.).

4.8.4 (aa) Polymer modified bitumen membranes may be applied as a single ply over a mechanically fastened anchor sheet without additional plies where slopes exceed one eighth inch ($\frac{1}{8}$ in.) per foot. An additional ply is required for slopes less than $\frac{1}{8}$ in. per foot. Slope requirement applies to new roofs, recover roofs and reroofs.

4.8.5 Polymer modified bitumen membranes shall not be applied to slopes exceeding three inches (3 in.) per foot. At slopes exceeding one inch (1 in.) per foot, they shall be backnailed four inches (4 in.) from the upper edge at maximum twenty-four inches (24 in.) on center.

4.8.6 Polymer modified bitumen must be applied utilizing hot or cold adhesives as specified in Section 3.2.

4.9 FELT FLASHINGS:

4.9.1 Flashing used in the construction of built-up roof coverings shall be carried over cant strips, where provided, and turned up all walls and other vertical surfaces a minimum of eight inches (8 in.) and maximum of twenty four inches (24 in.).

4.9.2 Each layer of flashing shall be uniformly mopped with hot asphalt applied in a quantity not less than 25 pounds plus or minus 15 percent per roofing square for each mopping, or attached with approved cold adhesive providing equivalent bond.

4.9.3 Flashing turned up vertical surfaces shall be not less than one #30 felt starting four inches (4 in.) out from the cant strip and carried up such vertical surfaces not less than six inches (6 in.), and one mineral surfaced felt starting six inches (6 in.) out from the cant strip and carried up a minimum of eight inches (8 in.) above the top of the cant.

- 4.9.4 Such flashing shall be fastened to the wall one and one-half inches (1½ in.) down from the upper edge every six inches (6 in.) after which the top edge shall be finished with a three inch (3 in.) strip of membrane set in roofing cement (ASTM D 4586).
- 4.10 VALLEYS:
- 4.10.1 Valleys shall be metal, as set forth in Section 1517.6, *Florida Building Code, Building*.
- 4.11 PARAPET WALLS: Built-up roof covering felts shall not wrap over walls more than 24 in. in height above the deck and, where wrapped, shall be applied as follows:
- 4.11.1 Flashing turned up vertical surfaces shall be not less than one #30 felt starting four inches (4 in.) out from the cant strip and carried up the face over the top of the parapet, and one mineral surfaced rolled roofing (ASTM D 249) starting six inches (6 in.) out from the cant strip and carried up and over the parapet to within three inches (3 in.) of the outside edge and fastened six inches (6 in.) on center.
- 4.11.2 The resulting edge shall then be finished with either a three inch (3 in.) strip of membrane set in roofing cement (ASTM D 4586) and painted with aluminum paint or coping installed in accordance with Section 1517.6 of the *Florida Building Code, Building*.
- 4.12 INSULATION: Roof insulation may be applied under or over an anchor sheet and, where provided shall be attached as set forth in Section 5 herein.
- 4.13 SURFACING:
- 4.13.1 Mineral surfaced roofing shall not be applied on inclines one-half inch (½ in.) or less per foot and, where used, shall be applied only over anchor sheets and mopped in as provided in Section 4.8 herein, and on inclines five inches (5 in.) or more per foot, such caps shall be backnailed 18 inches on center.
- 4.13.2 Cap-surfacing with smooth or mineral surfaced felts of glass, or modified bitumen of SBS shall not be limited to slope requirements and may be:
- 4.13.2.1 One layer of mineral surfaced fiberglass felt.
- 4.13.3 COATINGS
- 4.13.3.1 Coatings shall be applied no later than 60 days after installation of membrane. Surface shall be clean and dry when coating is applied. Roof to be coated shall not be glaze coated. Coatings shall be applied in a uniform coverage with no asphalt showing through.
- 4.13.3.2 Aluminum pigmented coatings conforming to ASTM D 2824, Type I or III shall be applied at a minimum rate of 1.5 gallons per 100 square feet.
- 4.13.3.3 Emulsion coatings conforming to ASTM D 1227, Type III or IV shall be applied at the minimum rate of 3 gallons per 100 square feet.
- 4.13.3.4 Acrylic coatings shall not be applied on slopes less than ¼ in. per foot, and when used, shall be

applied at the rate recommended by the coating manufacturer.

5.1.3 Insulation may be fully mopped to an anchor sheet on a nailable deck without any fasteners in the insulation.

5. ROOF INSULATION

5.1 Application: Roof insulation shall provide an acceptable base for built-up, polymer-modified bitumen, or single-ply roof coverings, or shall become a part of such roof coverings as follows:

5.1.1 Over Wood Decks: Roof insulation shall be mechanically fastened directly to wood decks or shall be solidly mopped over an anchor sheet as set forth in Section 4.2 herein.

5.1.2 Over Other Nailable Decks: To reduce moisture absorption from the deck and preserve the insulating effectiveness, roof insulation shall be applied over an anchor sheet.

5.1.4 Over Nonnailable Decks:

5.1.4.1 Roof insulation shall be solid-mopped as provided in Sections 4.5 and 4.6 herein for anchor sheet attachment to nonnailable roof decks.

5.1.4.2 Insulation used over structural or precast concrete deck shall be a maximum of 4' x 4' and fully mopped to the deck.

5.1.4.3 Over metal decks, roof insulation shall be mechanically attached per Table 2.

5.1.5 Over Anchor Sheet: Roof insulation applied over anchor sheets, attached as set forth in Section 4

TABLE 2 MECHANICALLY FASTENED INSULATION FOR BUILDINGS 40 FEET OR LESS IN HEIGHT			
FASTENERS PER BOARD ^{1,5,6}			
BOARD SIZE	FIELD	PERIMETER ²	CORNERS ³
WOOD FIBERBOARD			
2 x 4 1 inch minimum	2	3	4 ⁽⁴⁾
2 x 4 1 inch minimum	4	6	8 ⁽⁴⁾
4 x 8 1 inch minimum	8	12	16 ⁽⁴⁾
FIBERGLASS			
4 x 4 ³ / ₄ inch minimum	5	8	11
4 x 4 1.5 inch minimum	4	6	8
PERLITE			
2 x 4 1 inch minimum	4	6	8 ⁽⁴⁾
ISOCYANURATE			
4 x 4 1.3 inch minimum	5	8	11
4 x 4 1.5 inch minimum	4	6	8

FOOTNOTES

(1) Minimum 3-inch plates must be used

(2) Perimeter: Defined as the first board or a minimum of 4 feet from the roof edge.

(3) Corners: Defined as 8 feet in from each side.

(4) If the building has parapet walls 36 inches or higher around the entire roof perimeter, use the number of fasteners for the perimeter.

(5) Wood and Steel decks use a minimum #12 screw and penetrate through the deck a minimum of ¹/₂ inch.

(6) The installation of Polymer Modified Bitumen as a single-ply directly applied over mechanically fastened insulation requires DOUBLE the amount of fasteners in the field, perimeter and corners.

herein shall be solid-mopped in as provided in Section 8 herein.

lapped 4 inches, solidly mopped to anchor sheet.

5.1.6 Under Anchor Sheet:

5.1.6.1 Where more than one layer of roof insulation is provided, each successive layer shall be solid-mopped in and all joints shall be staggered.

5.1.6.2 Anchor sheets applied over such insulation shall be solid-mopped thereto, or mechanically fastened through the insulation to nailable decks with approved fasteners spaced as set forth in Table 1 and the mechanical fastening of the insulation may be omitted.

5.1.6.3 Additional built-up roofing above the anchor sheet shall be mopped in place as provided in Section 4.8 herein.

5.1.6.4 Attachment of other roof coverings over roof insulation shall comply with the specific provisions set forth in this RAS.

7.2 Over nonnailable decks, vapor retarders shall be not less than two #15 pound felts, lapped 19 inches, shingled in and solidly mopped with hot bitumen.

8. **Mopping:** Solid mopping shall be hot bitumen applied in a quantity of not less than 25 pounds per roofing square at temperatures as set forth in Section 3.3 and roof insulation shall be laid with staggered joints and pressed firmly into position while such mopping is hot.

6. **Roof Incline:**

6.1 Roof insulation applied to roof with inclines of 3 or more inches per foot (1 inch per foot on steel decks) shall be nailed, screwed or bolted through tin-caps spaced not more than 12 inches on centers both ways.

6.2 Only ASTM D 312 Type III or IV asphalt shall be used on such applications.

7. **Vapor Retarders:** Where vapor retarders are specified, they shall be as follows:

7.1 Over wood and other nailable decks, vapor retarders shall be not less than two #15 felts lapped 19 inches, or one #30 felt

