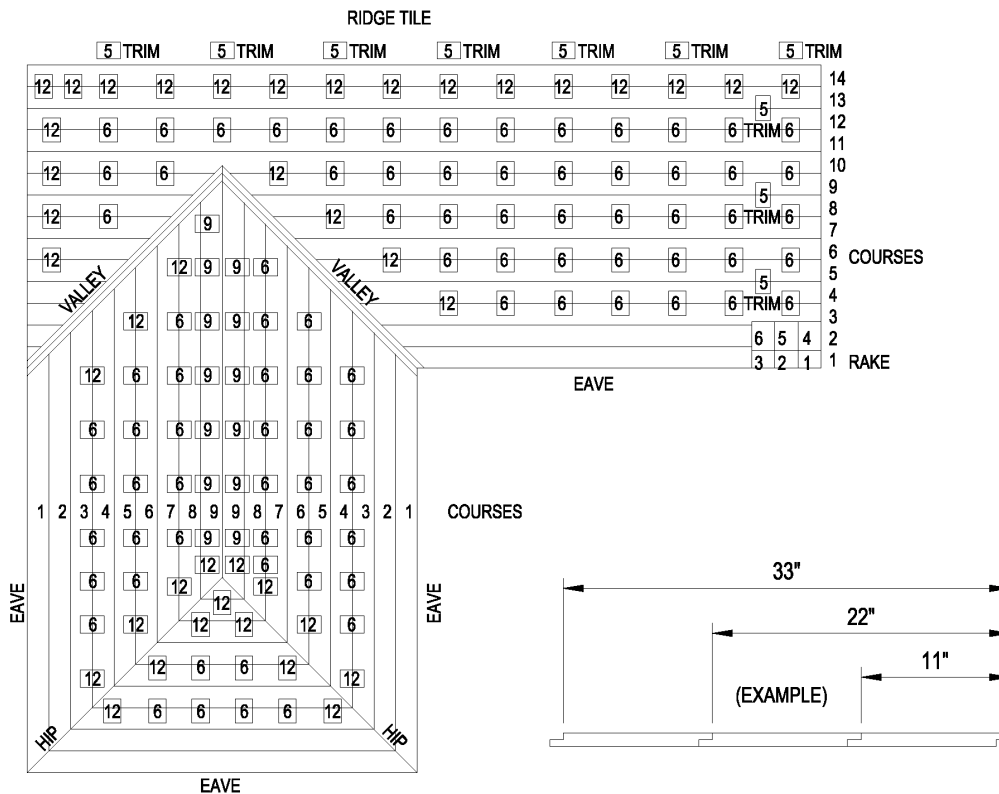


LOADING GUIDE (EXAMPLE)

MC-09

The method of roof loading shown on this page represents the method of tile placement for efficient application, but is not intended to suggest that this is the only method that will work. Each applicator will have personal preferences for the stack location and spacing. The important aspect of the tile loading is to spread the load evenly across the roof while using the proper increments that assure that the proper amount of tile is loaded on roof.



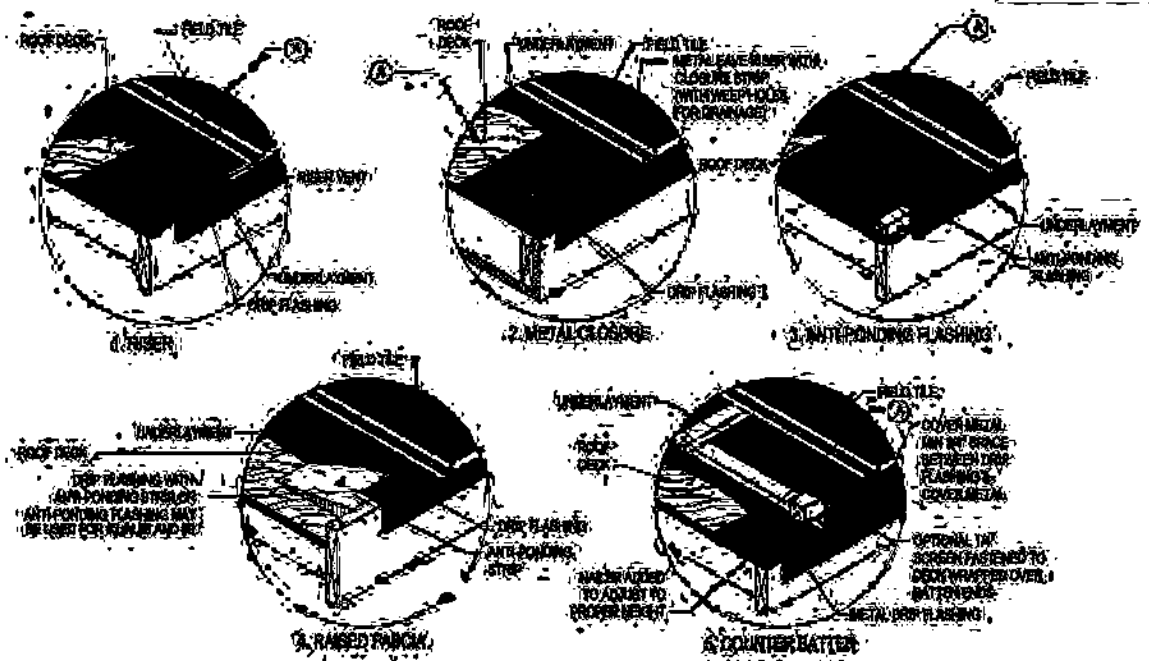
1. Course lines should be measured and chalked according to the roof layout recommendations before loading the tile.
2. Determine the approximate number of tiles needed for each section of roof.
3. Spacing of the tile stacks is determined by the width of the exposed tile times the number of tiles being fed per course, e.g. in the attached schematic, each stack of tiles will feed two courses, three tiles wide. If each tile is exposed 11", then the stack will be placed 33" o.c. If the stack feeds three courses, two tiles wide, then the stack would be 22" o.c.
4. Starting with the third course from the eave, and continuing with alternate courses, distribute tiles (usually 6 per stack) over the roof leaving approximately 20" from gable ends and between stacks.
5. When total number of courses is an even number, stack 12 tiles on ridge stacks. When total number of courses is an odd number, stack 9 tiles on ridge stack.
6. On right side of the hips and valleys, stack 12 tiles. Maintain at least 24" between tile stacks and left side of valley. Reverse for tiles layed left to right.
7. Distribute trim tiles when loading field tiles. Trim tiles are in stacks of 5 at 70" o.c. Load ridge tile on side of roof to be applied last.
8. To achieve a pleasant, random blend of color for your job, care should be taken upon loading to mix the tiles.

Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

Appendix A

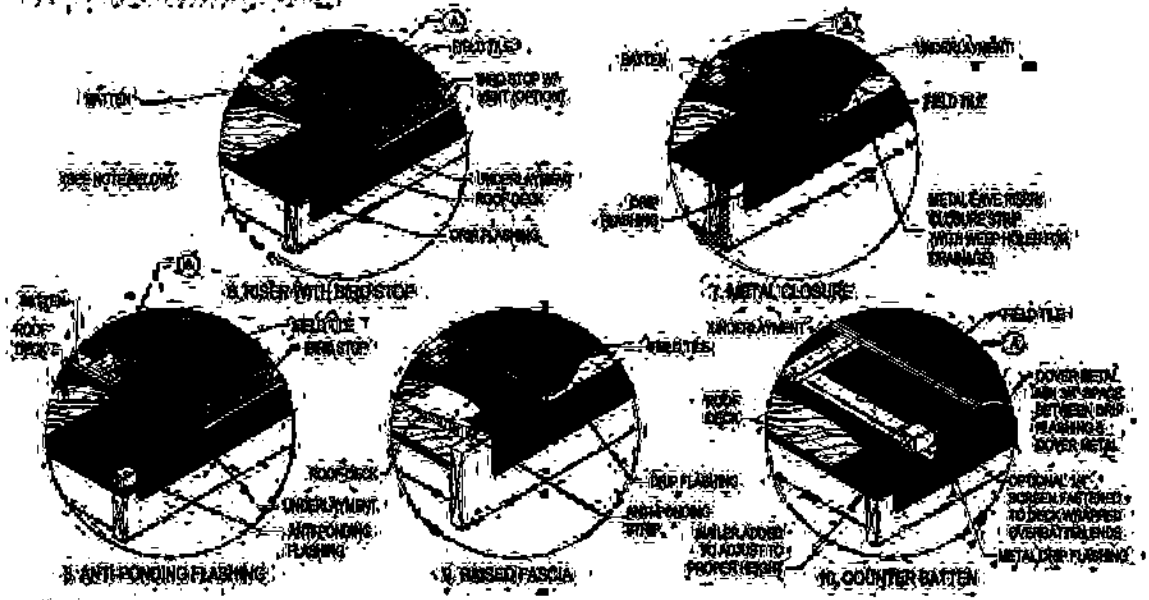
DOWN SLOPE EAVE DETAILS

MC-10



LOW FLAT PROFILE TILES

MEDIUM AND HIGH PROFILE TILES

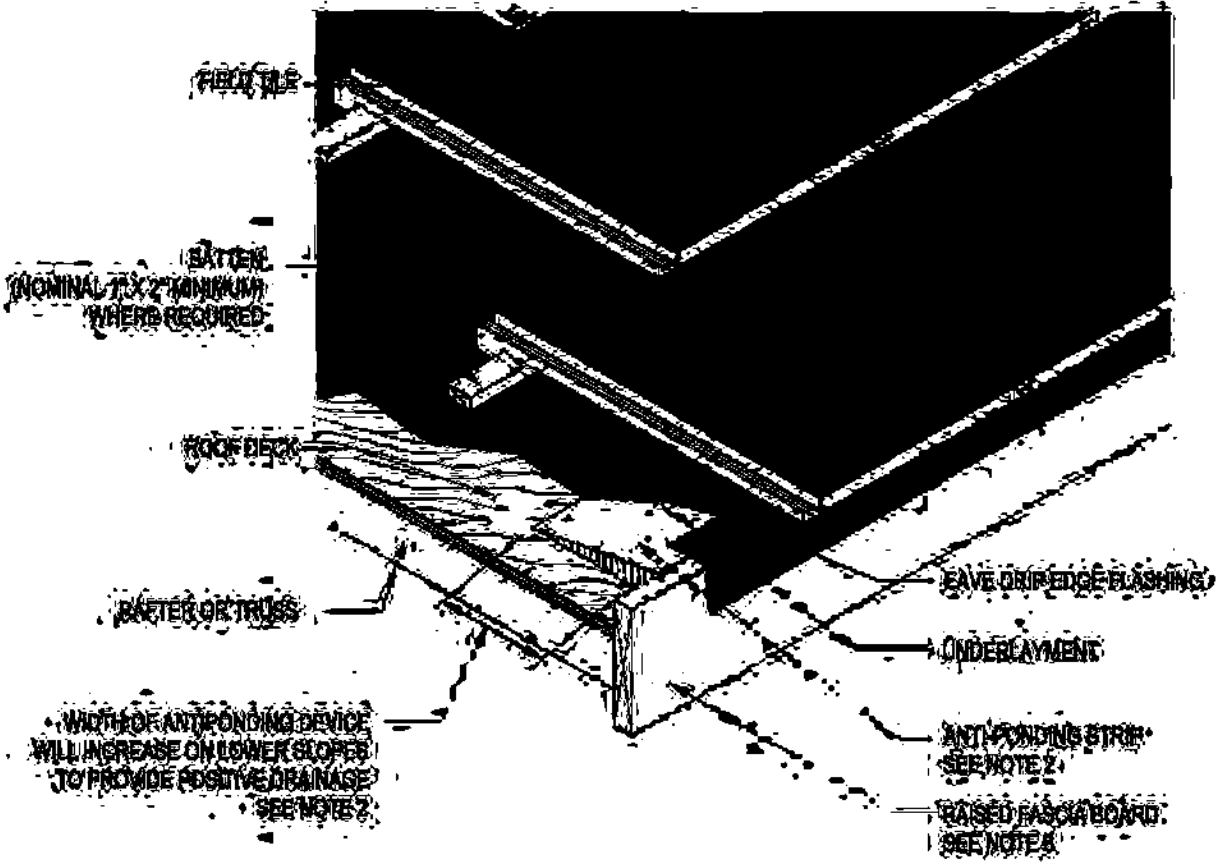


- Notes:
- 1. Bird stop is required on High profile tile and optional on Low and Medium profile tile unless required by local building official.
 - 2. Bird stop may be either solid or vented.
 - 3. Optional Separator ply or sheet of No. 15 (asphalt saturated felt or other appropriate material).

Drawing shows details for application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

RAISED FASCIA

MC-10A



• WIDTH OF ANTI-RACKING DEVICE WILL INCREASE ON LOWER SLOPES TO PROVIDE POSITIVE DRAINAGE. SEE NOTE 2.

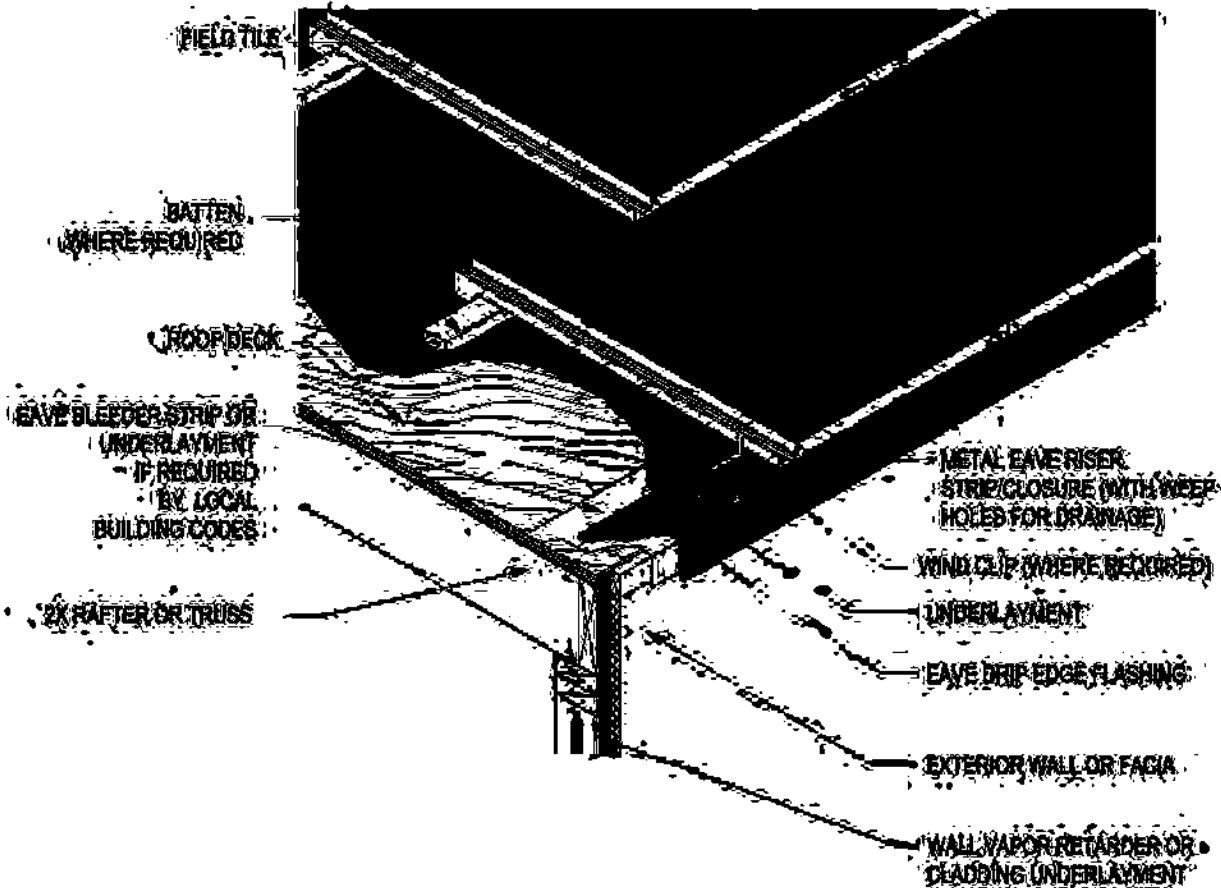
- Notes:**
1. For recommended underlayment and fastening requirements, see Tables A and B.
 2. An anti-racking device such as a bonded cant strip or shop formed sheet metal is required at all raised fascia conditions to support the underlayment and provide positive drainage.
 3. The tile and/or batten fasteners must penetrate a minimum of 2/4" into dimensional wood decking or pass through solid panel sheathing which ever is less. Once the batten is installed, it becomes part of the "deck" or substrate for the fastening proposed.
 4. Raise fascia board above roof deck to height equal to combined thickness of batten system and thickness of one course of tile.
 5. Dimensions shown are minimums and are intended to be appropriate to allow for reasonable tolerances due to field conditions.
 6. When raised fascia and under strips create the same type of water dam situation, they both require an anti-racking system to allow water to flow off the roof.

Drawing shows details for application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

Appendix A

EAVE AT FLUSH WALL OR FASCIA / ZERO OVERHANG

MC-10B

**Notes:**

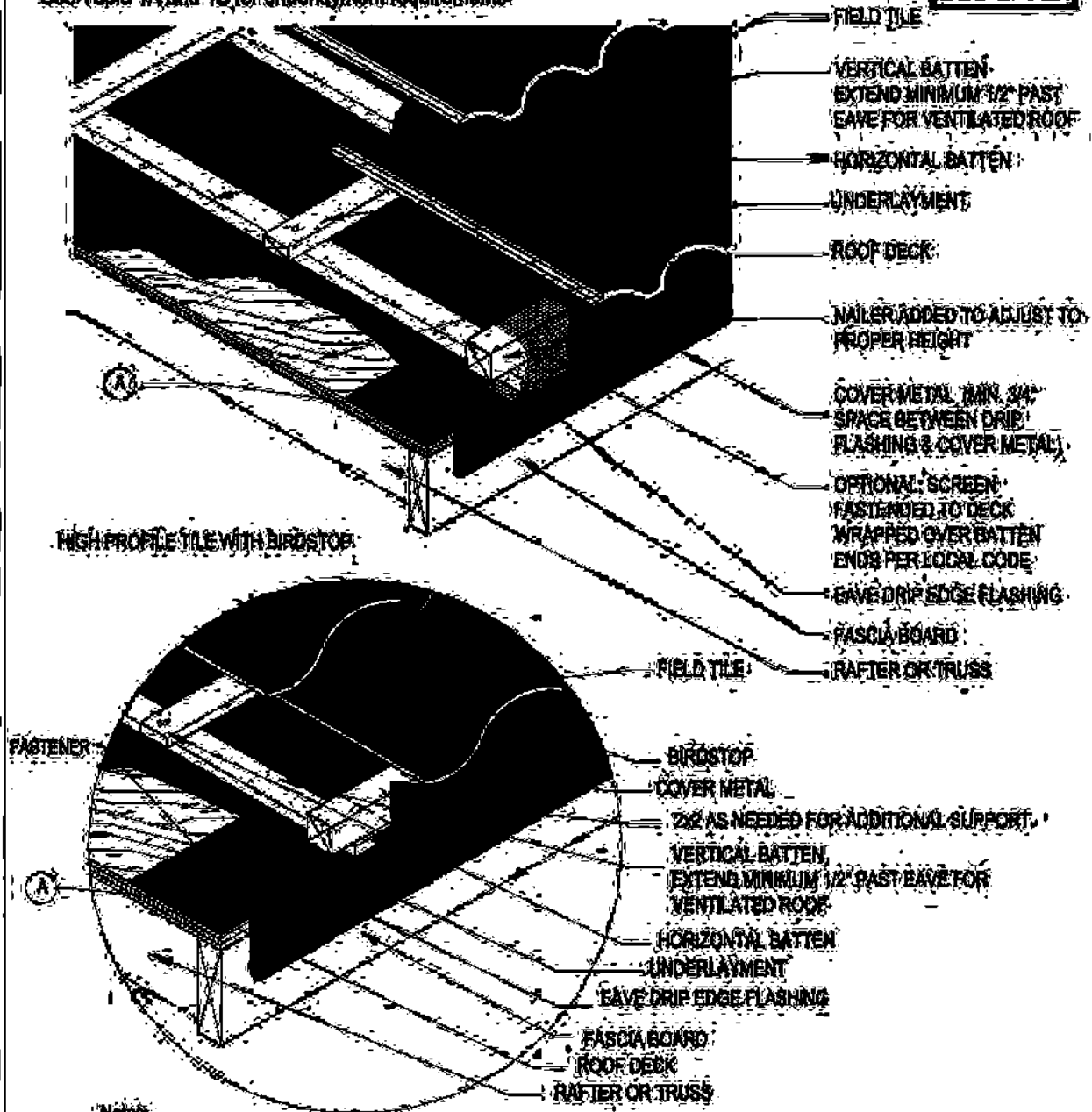
1. For recommended underlayment and batten requirements, see Tables 1A and 1B.
2. Eave drip edge flashing is required with stone fascia, EIFS (Exterior Insulated Finish System) and flush fascia perimeter edges.
3. Battens for tiles with protruding anchor legs are optional for slopes between 3:12 and less than or equal to 7:12. Direct overlapping attachment of tile may be permissible.
4. Eave closure should be of height equal to combined thickness of batten system and thickness of one course of tile.
5. Dimensions shown are minimums and are intended to be approximate to allow for reasonable clearances due to field conditions.

Drawing shown depicts the application of all tile profiles. If used otherwise noted it would apply to other concrete or clay tiles.

LOW SLOPE / VENTILATED ROOF EAVE DETAIL

MC-10C

See Table 1A and 1B for underlayment requirements.



HIGH PROFILE TILE WITH BIRDSTOP

Notes:

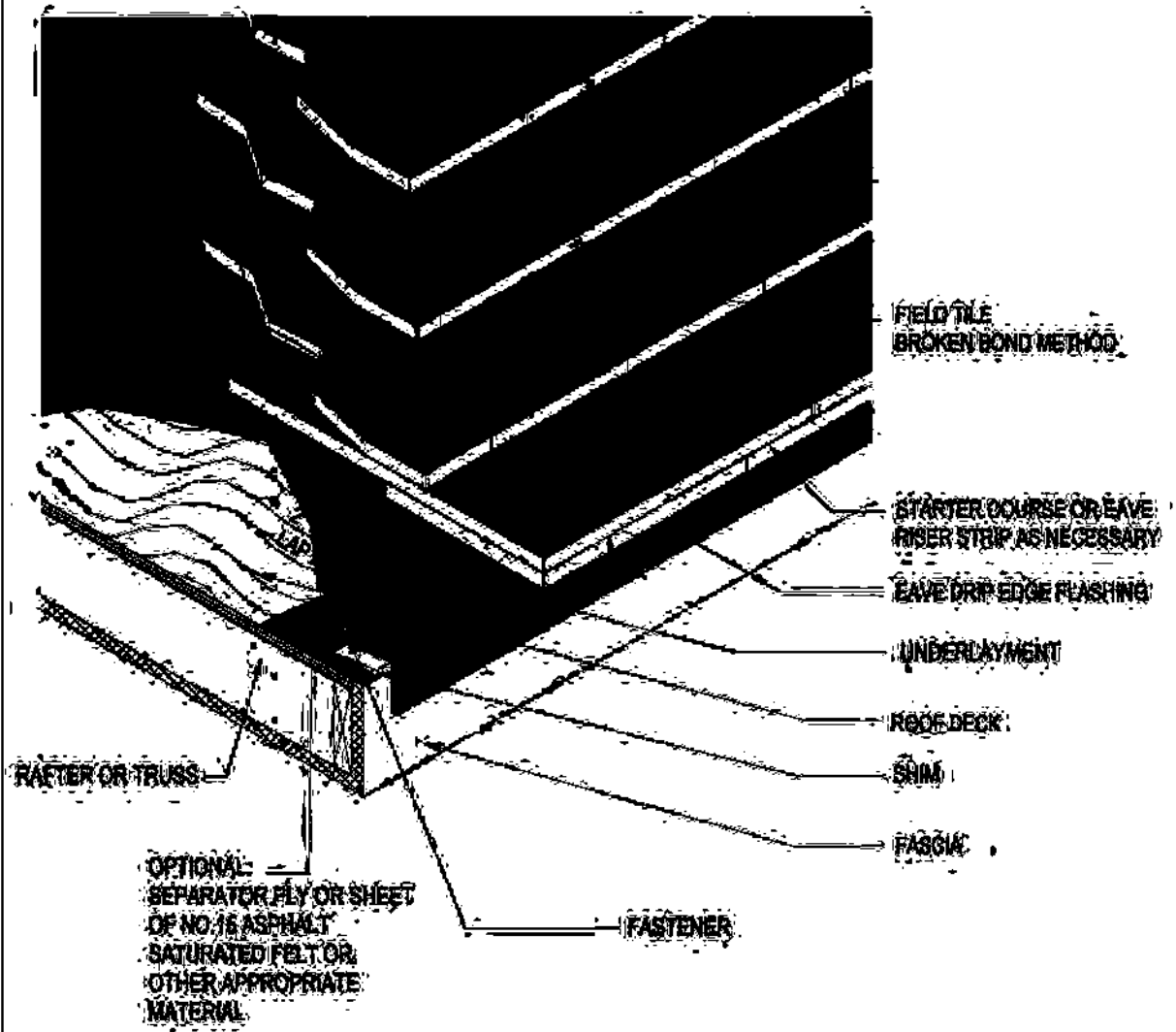
1. For recommended underlayment and fastening requirement, see Table 1A and 1B.
 2. A eave drip edge flashing is required at all downslope perimeter edges.
 3. Eave drips shall be of height equal to combined thickness of batten system and thickness of one course of tile. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions.
- A. For extended eave optional separator, ply or sheet of No. 15 asphalt saturated felt or other appropriate material.

Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

Appendix A

DOUBLE LAP TILE (NON-INTERLOCKING)

MC-100



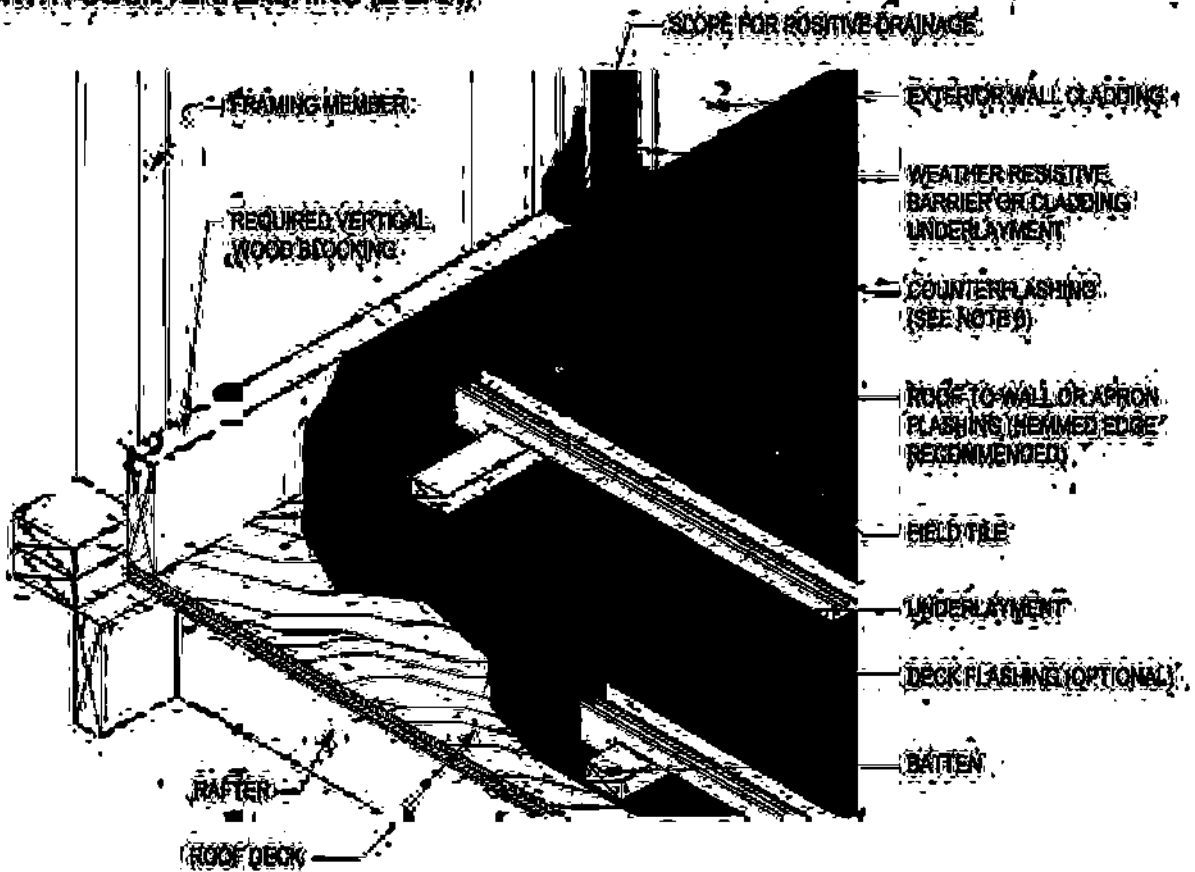
Notes

1. For recommended underlayment and fastening requirements, see Table 1A and 1B.
2. A eave drip edge flashing is required at all down slope perimeter edges.
3. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions.
4. Standard head lap equal to tile length minus 2" divided by 2.

Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

HEAD WALL FLASHING

WITH COUNTERFLASHING (Z BAR)



Notes:

- Openings at hips, ridges and head walls including chimneys, skylights, solar panels, and downslope horizontal abutments shall be filled with weather blocking material to keep water on the surface of the field tile. Other methods approved by local building official will be allowed. See Technical Bulletin at www.tileroofing.org.

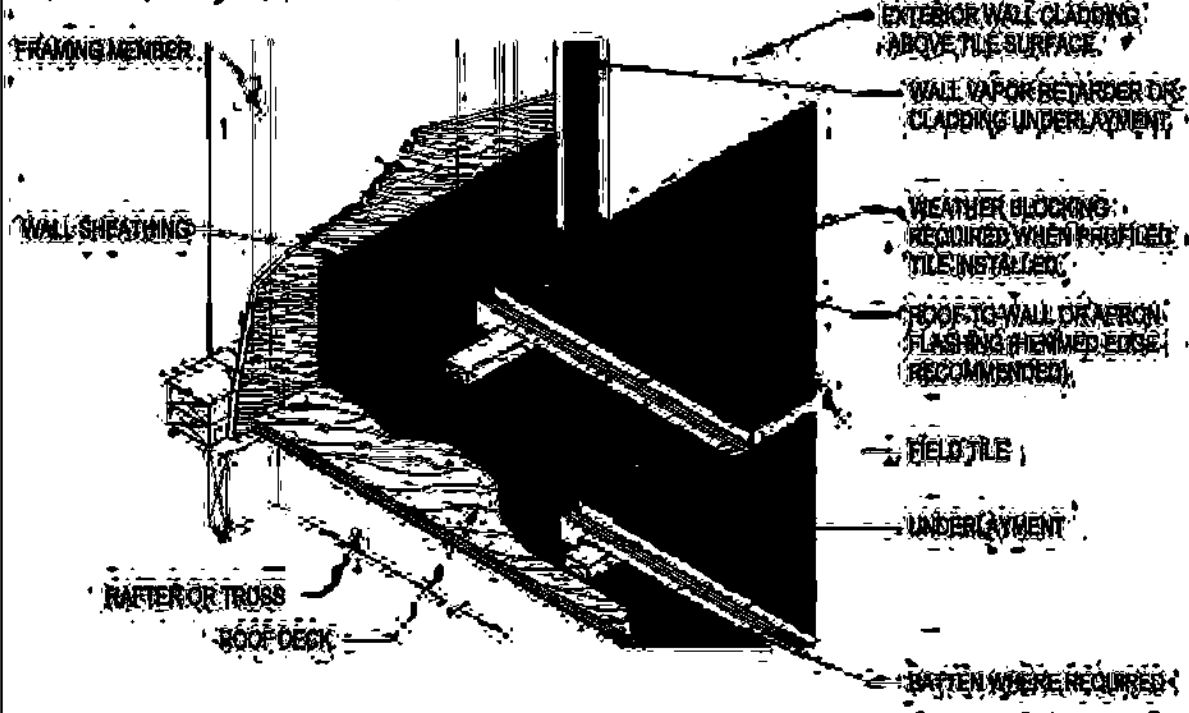
Notes:

1. For recommended underlayment and fastening requirements, see Table 1A and 1B.
2. Underlayment shall extend a minimum of 4" up vertical wall blocking or wall.
3. Apron flashing or other roof-to-wall closure material is necessary at roof-to-wall intersections. Roof-to-wall/apron flashing should extend a minimum of 2" up vertical walls, and provide a minimum of 3" overlap headlap on tile. This apron flashing is required to be overlapped a minimum of 2" by sheet metal counterflashing or wall cladding.
4. Solid wood blocking is required behind Z-metal counterflashing applications.
5. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions and area practices.
6. The bottom edge of the counterflashing height settings shall be set above the roof deck a minimum of 4" for flat tile, 6" for low profile tile, and 8" for high profile tile.
7. All roof flashing shall be a minimum of (No. 26 galvanized steel gauge) not less than 0.019 inch corrosion resistant metal (CR). See Table 6 for additional options.

Drawing shows details for application of all tile profiles. Unless otherwise noted, all walls apply to all tile systems or clay tiles.

HEAD WALL FLASHING WITHOUT COUNTERFLASHING

MC-11A



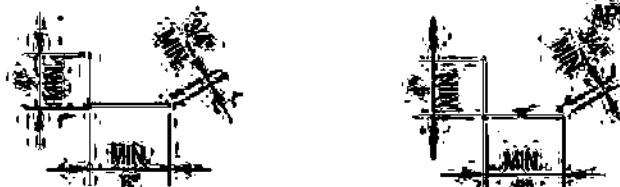
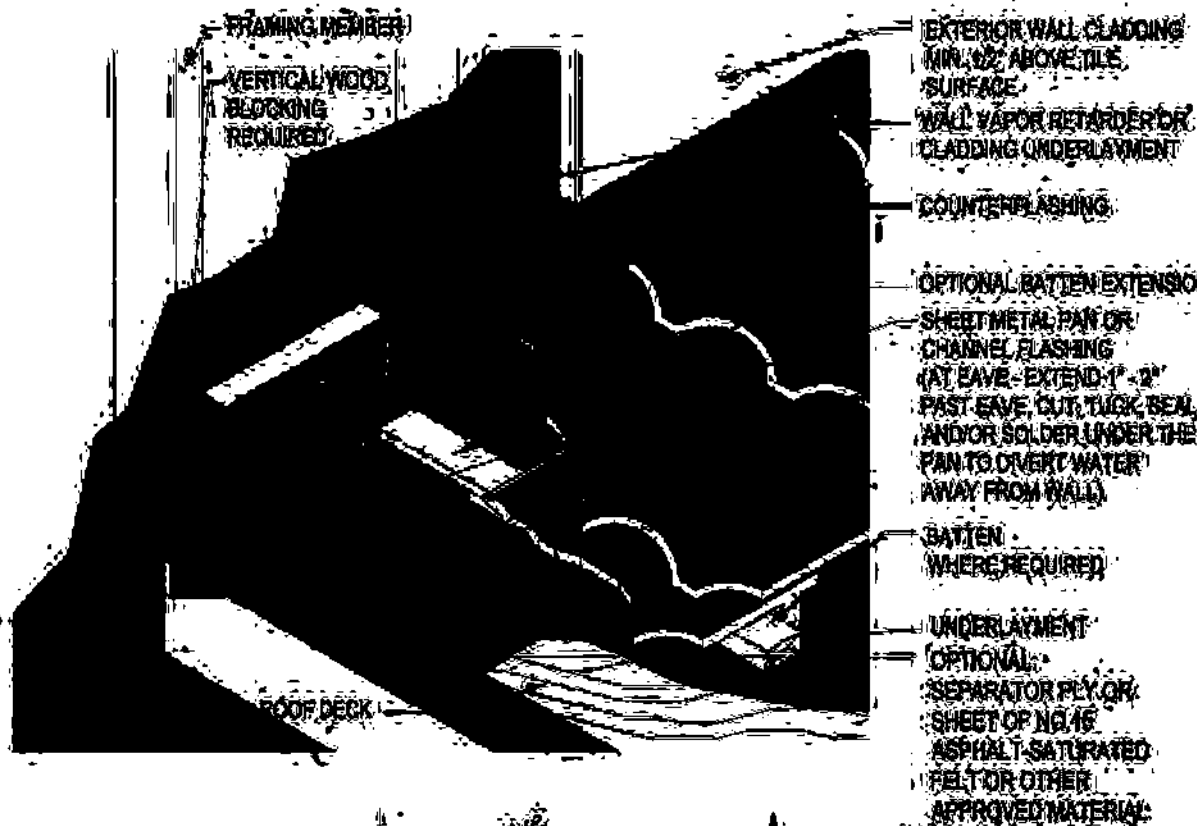
Notes:
 1. Openings at hips, ridges and head walls (including chimneys, skylights, solar panels, and downspouts) horizontal abutments shall be filled with weather blocking material to keep water on the surface of the field tile. Other methods approved by local building official will be allowed. See Technical Bulletin at www.tileroofing.org

- Notes:**
1. For recommended underlayment and fastening requirements, see Table 1A and 1B.
 2. Underlayment shall extend a minimum of 6" up vertical wood blocking or wall, and is subjected to extend above wall flashing.
 3. Apron flashing or other roof-to-wall drainage material is necessary at roof-to-wall intersections. Roof-to-wall apron flashing should extend a minimum of 2", with 4" preferred, up vertical walls, and provide a minimum of 6" overlap/overlap onto tile. The apron flashing is required to be overlapped a minimum of 2" by sheet metal counterflashing or wall sheathing.
 4. Dimensions shown are minimum and are intended to be approximate to allow for reasonable tolerances due to field conditions.
 5. The bottom edge of the counterflashing height settings shall be set above the roof deck a minimum of 6" for flat tile, 5" for low profile tile, and 8" for high profile tile.
 6. All roof flashing shall be a minimum of No. 26 galvanized steel (gauge) not less than 1/8" thick dimension resistant metal (G90). See Tables A-1 for additional options.

Diagram shown depicts the installation of all the profiles. Details may vary based on what is applied to other climates or city codes.

PAN FLASHING AT ROOF-TO-SIDEWALL
 Where Wall Extends Past Eave With Counterflashing (Z-Bar)

MC-12



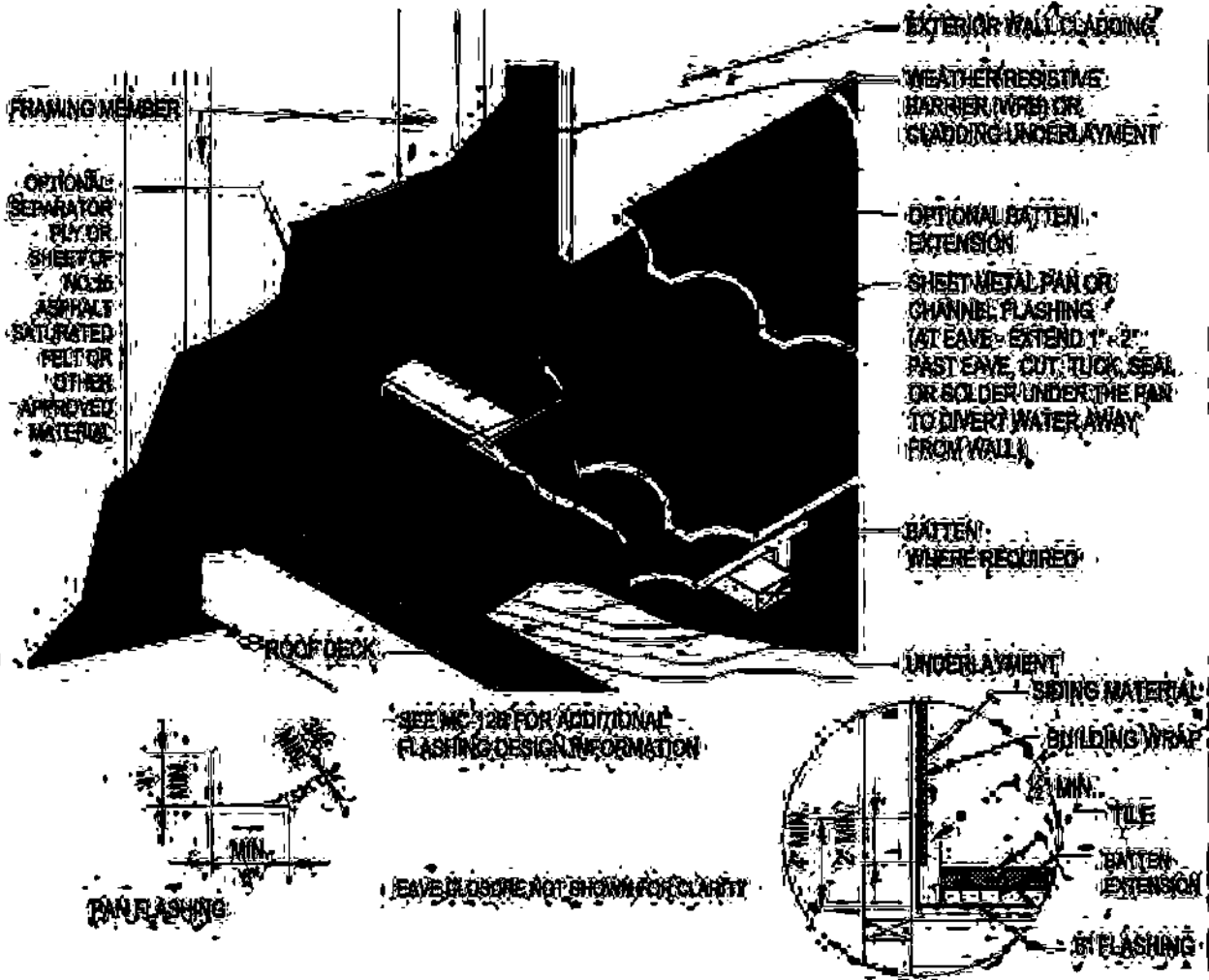
- Notes:**
1. For recommended underlayment and flashing requirements, see Table 1A and 1B.
 2. Underlayment shall extend a minimum of 4" up vertical wood blocking for wall.
 3. Sheet metal pan flashing shall extend a minimum of 4" up the vertical wall, approximately 1" out over the deck and have a minimum 2" flap upward.
 4. Solid wood blocking is required behind pan flashing and Z-metal counterflashing. Z-metal or other counter flashing shall overlap vertical flange of pan or channel flashing by approximately 2" or greater.
 5. At terminating the out head flange where they would otherwise create a snagging condition or drainage impediment, use a roof tile adhesive approved by the local building code or use wire ties or battens exterior to secure the.
 6. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions.
 7. Consideration shall be given to tributary area of roof for pan flashing design.
 8. All roof flashing shall be a minimum of (No. 26 galvanized steel gauge) not less than 0.019 inch corrosion resistant metal (G09). See Table A for additional options.

Drawing shown depicts the application of all the profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

Appendix A

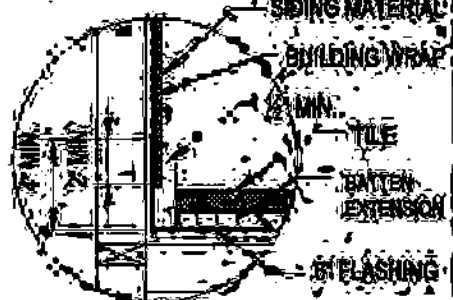
PAN FLASHING AT ROOF-TO-SIDEWALL, Where Wall Extends Past Eave

MC-12A



SEE MC-12B FOR ADDITIONAL FLASHING DESIGN INFORMATION

LEAVE GROUND NOT SHOWN FOR CLARITY



- 1. Notes
- 2. 1. For recommended fastening and fastener requirements, see Table 1A and 1B.
- 3. 2. Underlayment shall extend a minimum of 4" up vertical wood blocking or wall.
- 4. 3. Sheet metal pan flashing shall extend a minimum of 4" up the vertical wall approximately 1" out over the deck and have a minimum 3/4" return upward.
- 5. 4. All terminating tile cut heads, wherever they would otherwise create a draining condition or drainage impediment, use a roof tile adhesive approved by the local building officials or use wire ties or batten extensions to secure tile.
- 6. 5. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions.
- 7. 6. Consideration shall be given to tributary area of roof for pan flashing design.
- 8. 7. All roof flashing shall be a minimum of (No. 26 galvanized sheet gauge) not less than 0.019 inch corrosion-resistant metal (G90). See Table A for additional options.

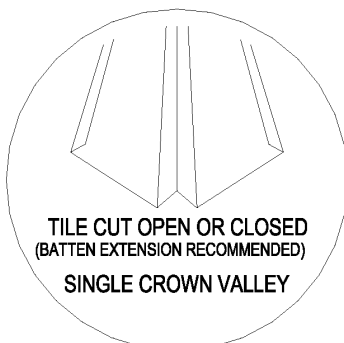
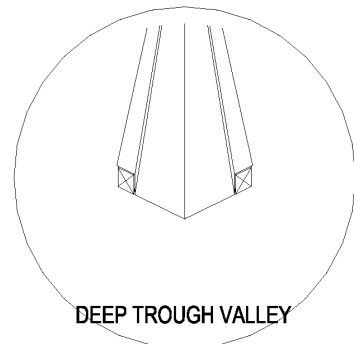
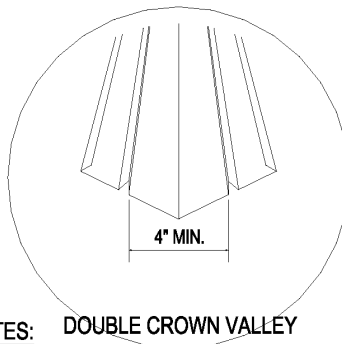
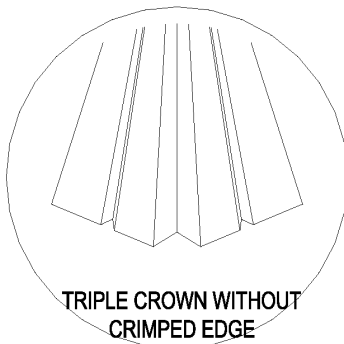
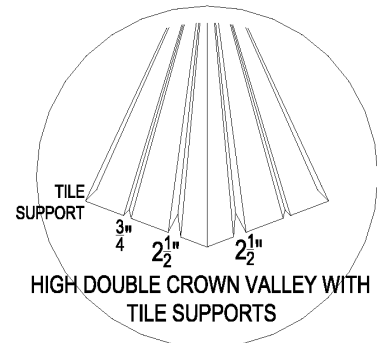
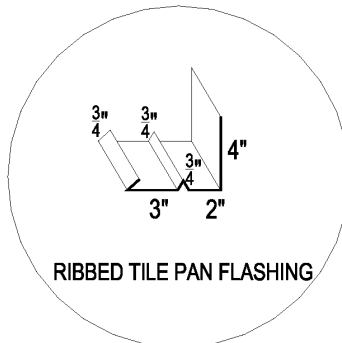
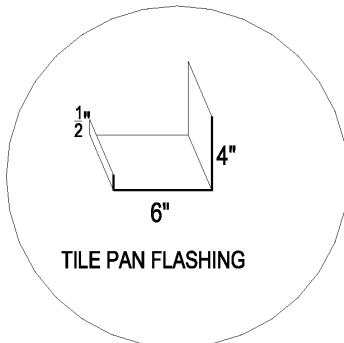
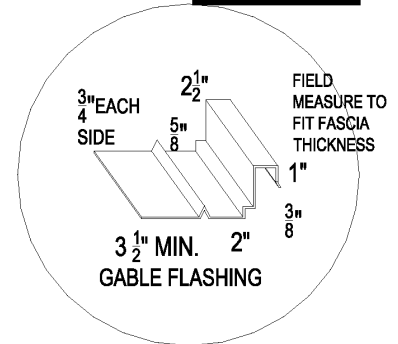
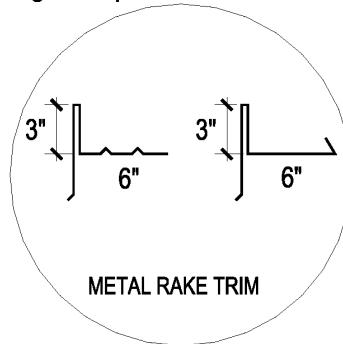
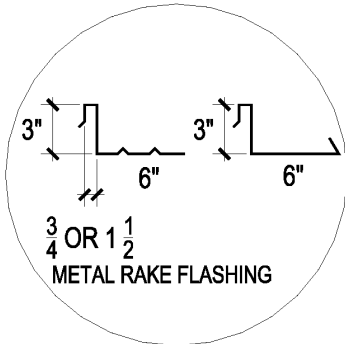
Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

Appendix A

METAL FLASHING EXAMPLES

See MC-19A for additional rake flashing examples

MC-12B



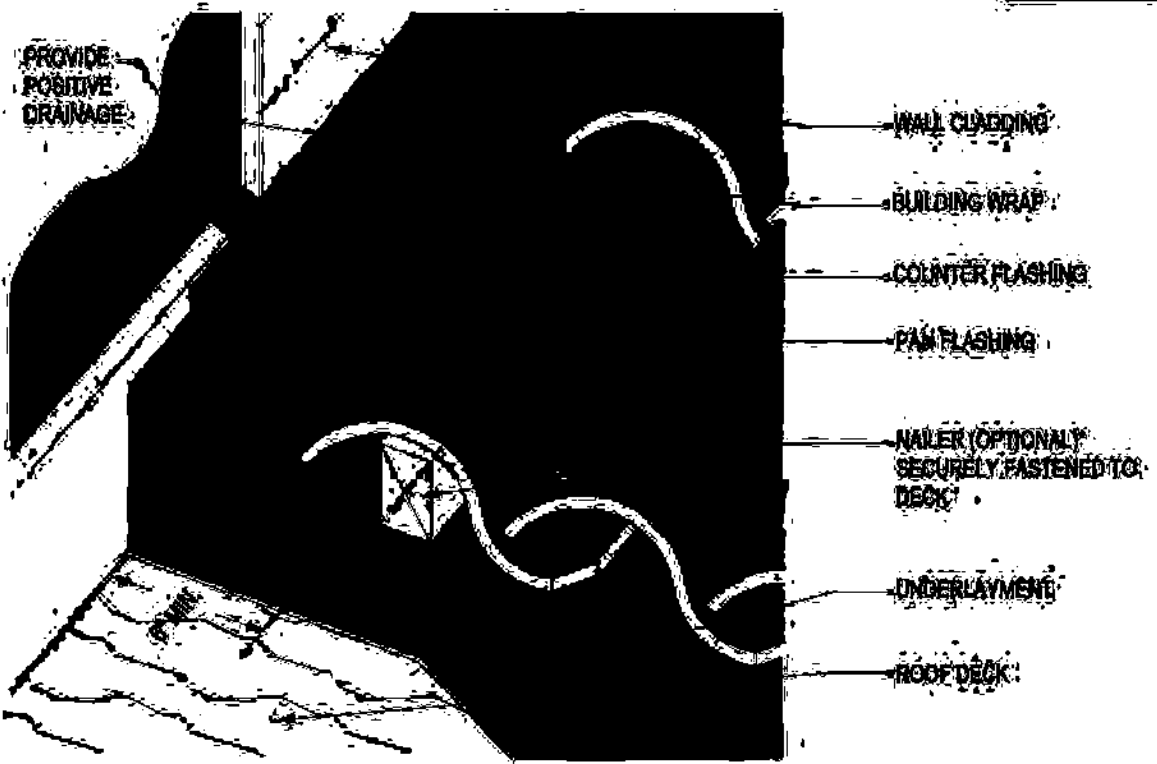
NOTES: DOUBLE CROWN VALLEY

1. These pictures show options that are found in the field at this time; other designs that will handle anticipated water flows may be used upon submissions of supporting data indicating that anticipated water flows are equivalent to the code requirements.
2. Valley metals shall extend 11" each way in compliance with International Building Code (IBC) section 1507.3.9, International Residential Code (IRC) R905.3.8 and Uniform Building Code (UBC) section 1508.4 unless approved by the local building official.
3. Tile valleys may be cut, closed, or open.
4. When flat profiled tile is installed as "Closed Valley" a ribbed valley metal or a single crown valley metal with a batten extension shall be used. Valley metals shall conform to IBC section 1507.3.9, IRC R905.3.8 and UBC section 1508.4.
5. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions, and area practices.
6. All roof flashing shall be minimum of (No. 26 galvanized sheet gauge) not less than 0.019 inch corrosion-resistant metal (G90). See Table A for additional options.

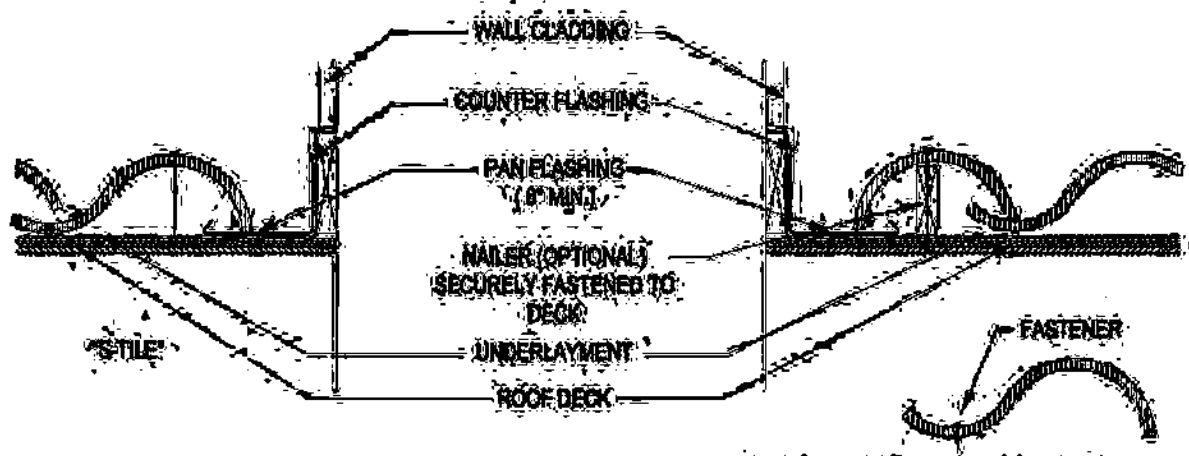
Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

SIDEWALL DETAILS - CLAY'S TILE

MC-13



Note: Tiles to be installed in such a fashion as to prevent water diversion or blockage. For recommended underlayment and fastening requirements, see Table 1A and 1B.

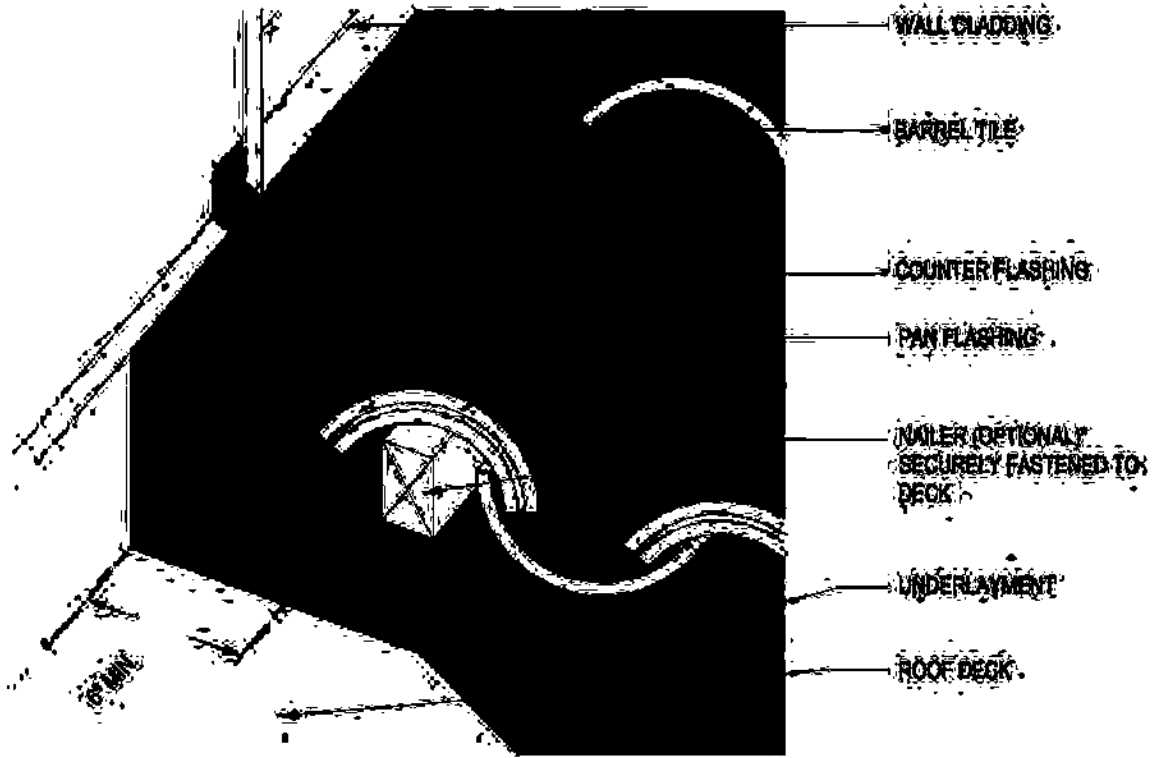


Note:
 1. Underlayment should extend a minimum of 6\"/>

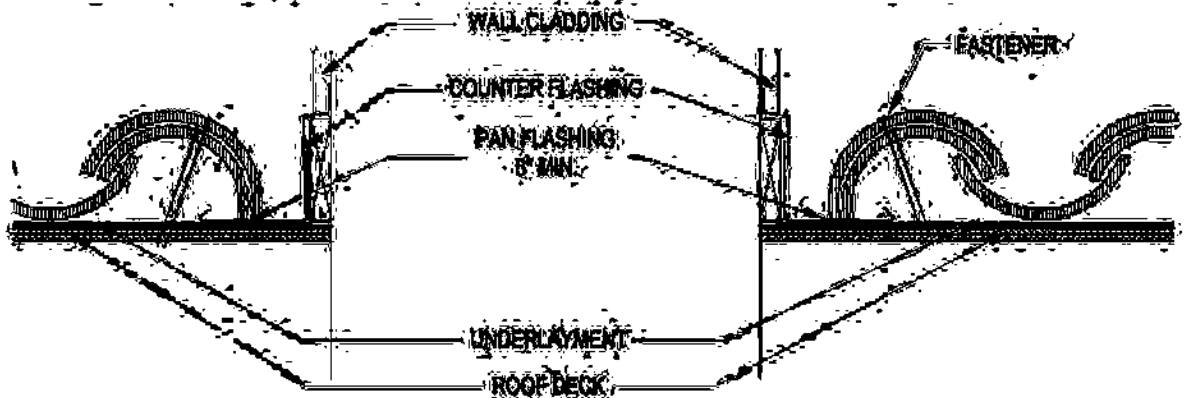
Drawing shown depicts the application of all tile profiles. Unless otherwise noted, it would apply to either concrete or clay tiles.

SIDEWALL DETAILS - TWO PIECE CLAY

MC-13A



Note: Tiles to be installed in such a fashion as to prevent water diversion or blockage. Fasteners shall be of sufficient length to penetrate $\frac{1}{2}$ in. or through the roof sheathing, whichever is less. See Table 1A and 1B for more information.



Notes:

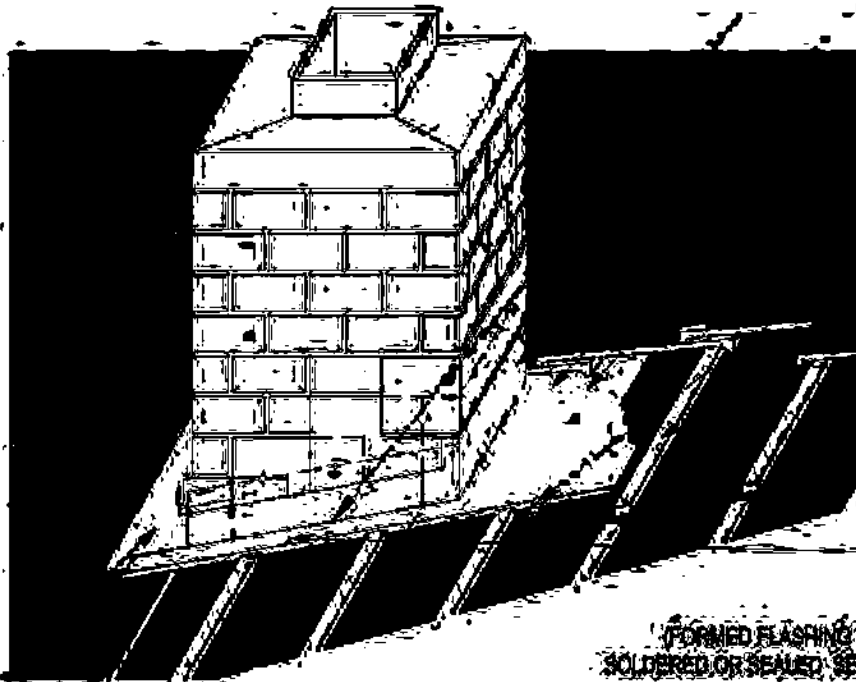
1. Underlayment should extend a minimum of 4" up vertical wood blocking or wall.
2. See MC-12B for additional flashing details.

Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either Concrete or Clay Tile.

CHIMNEY FLASHING - PAN TYPE (Chimney or other penetration 30" or less in width)

MC-14

NOTE:
WHERE DEBRIS CAN ACCUMULATE, SEE STEP FLASHING OPTION MC-14B



APRON FLASHING WITH WEATHER BLOCKING FOR LOW AND HIGH PROFILE TILES

APRON TO BE OF SUFFICIENT LENGTH TO PROVIDE MIN. 2" LAP ON TO TILE



Notes: 1. APRON FLASHING 2. PAN OR CHANNEL FLASHING 3. BACKER OR SADDLE FLASHING

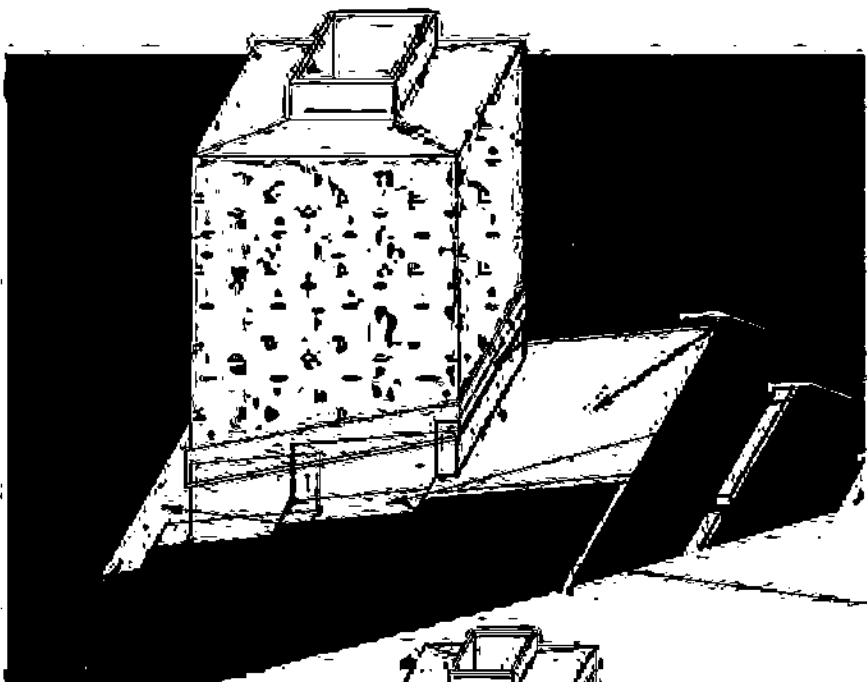
- Chimney flashing dimensions may vary according to local weather conditions, chimney size, chimney location, slope of roof, rafter length, behind chimney and tributary water area.
- A backer or saddle flashing may be used for chimneys and other penetrations 30" or less in width. Extend a minimum of 6" up chimney.
- A diverter or cricket flashing is recommended for chimneys and other penetrations equal to or greater than 30" in width to promote positive runoff.
- Dimensions shown are recommended minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions and area practices.
- Flashing must be securely fastened to chimney or sidewall framing.
- Underlayment tiles fast to chimney wall a minimum of 4 inches.
- All chimney flashing shall be minimum of 16-g. 26 galvanized sheet panned not less than 0.015 inch corrosion resistant metal (CR90). See Table A for additional options.

Drawings shown depict the application of all tile profiles. Unless otherwise noted, it would apply to other concepts of clay tiles.

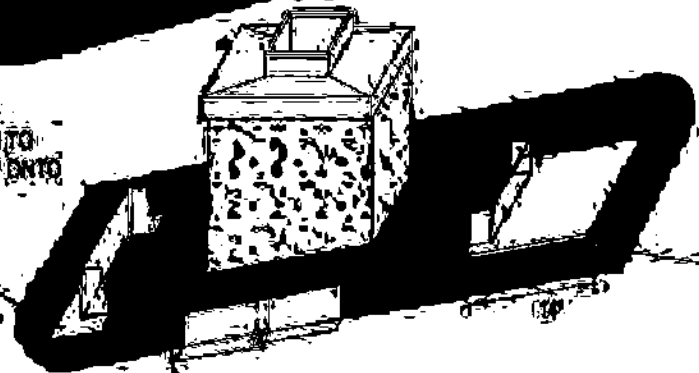
CHIMNEY FLASHING - STEP TYPE (Chimney or other penetration 30" or less in width)

MC-14A

NOTE:
TYPICALLY USED IN AREAS WHERE DEBRIS CAN ACCUMULATE



APRON MUST BE OF SUFFICIENT LENGTH TO PROVIDE MIN. 3" LAP ONTO TILE



Notes: APRON FLASHING STEP FLASHING FLAT SADDLE FLASHING

1. Chimney flashing dimensions may vary according to local weather conditions, chimney size, chimney location, slope of roof, rafter length behind chimney and gutters/water area.
2. A backer or saddle flashing may be used for chimneys and other penetrations less than 30" in width. Extend a minimum of 6" up chimney, and 4" minimum outside of chimney.
3. A diver or cricket flashing is recommended for chimneys and other penetrations greater than 30" in width to provide positive runoff.
4. Dimensions shown are recommended minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions and area practices.
5. Underlayment must turn up chimney wall a minimum of 4 inches.
6. All chimney flashing shall be minimum of No. 26 galvanized sheet gauge, not less than 0.019 inch corrosion-resistant metal (G90). See Table A for additional options.

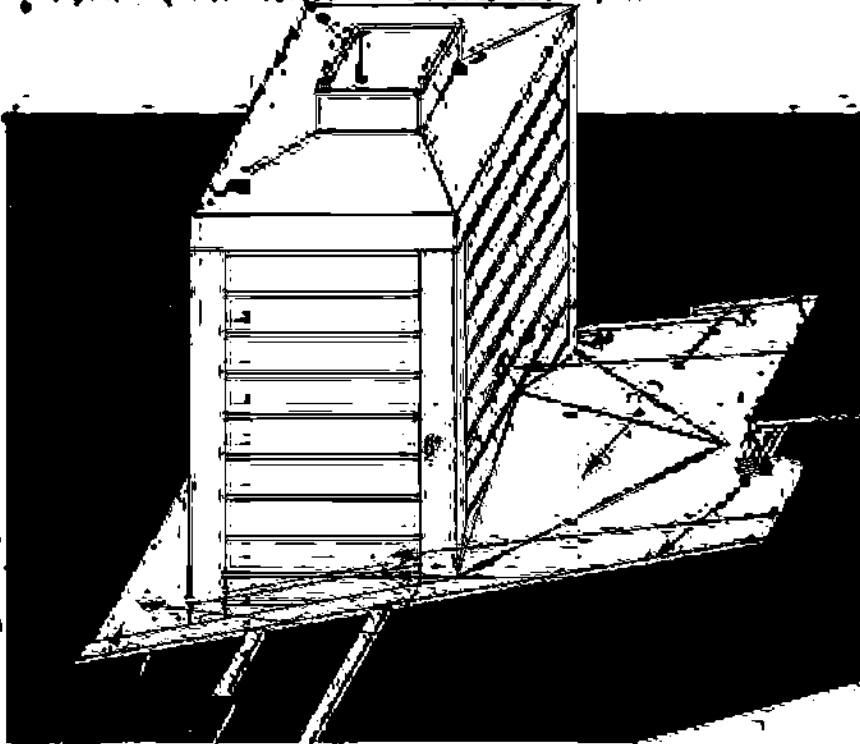
Detailing shown depicts the application of all tile profile. Unless otherwise noted it would apply to stone concrete or clay tile.

Appendix A

CHIMNEY CRICKET FLASHING - PAN TYPE (Chimney or other penetration greater than 30" wide)

MC-15

NOTE: WHERE DEBRIS CAN ACCUMULATE, SEE STEP FLASHING OPTION IN 2.4.4.



CRICKET MAY BE COVERED WITH AN APPROVED SEALED SYSTEM IN ACCORDANCE WITH LOW-SLOPE ROOFING REQUIREMENTS.

CRICKET FLASHING (EXTEND UPPER END OF FLASHING 6 MIN. BEYOND FIRST COURSE OF OVERLAYING TILE)

MIN. 2" ABOVE APEX

CRICKET METAL FLASHING WITH OPTIONAL HEM

COUNTER FLASHING

CHANNEL OR PAN FLASHING

APRON FLASHING WITH WEATHER BLOCKING FOR LOW AND HIGH PROFILES

APRON MUST BE OF SUFFICIENT LENGTH TO PROVIDE 3" LAP ONTO TILE

EDGING FLASHING WITH SOLDERED OR SEALED SEAMS



APRON FLASHING



PAN OR CHANNEL FLASHING



CRICKET FLASHING

Notes:

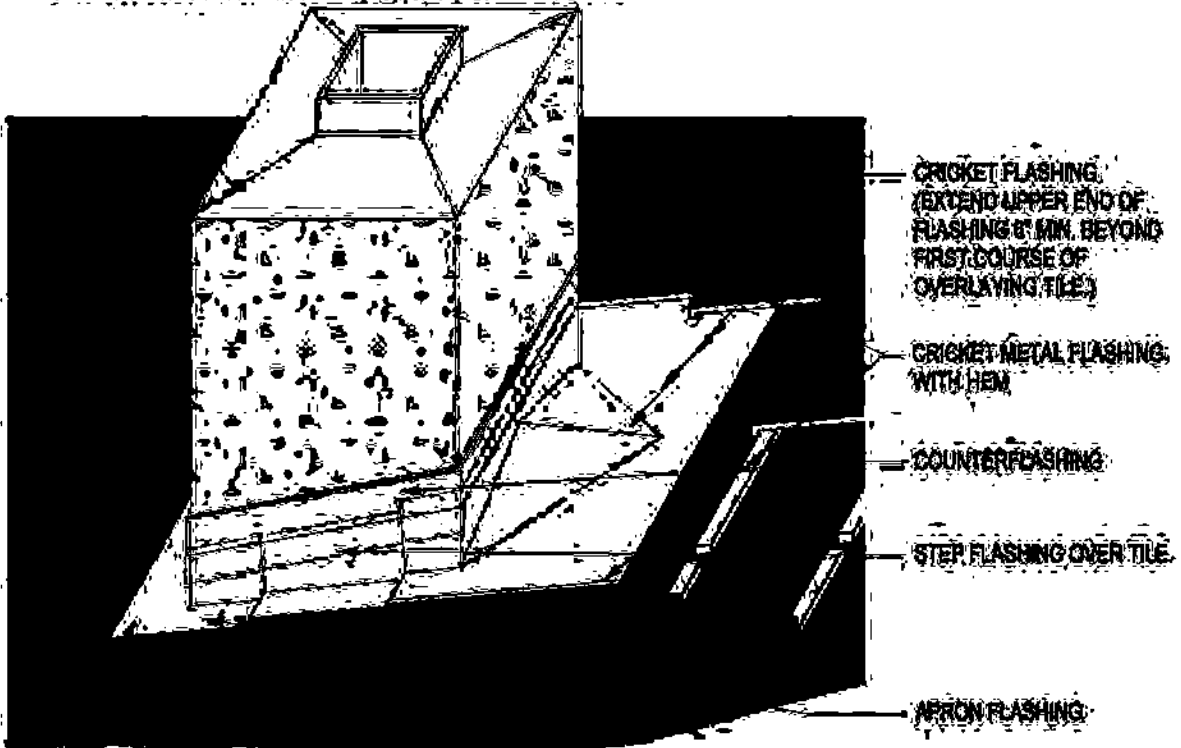
1. Chimney flashing dimensions may vary according to local weather conditions, chimney size, chimney location, slope of roof, water length behind chimney and primary water area.
2. A backer or saddle flashing may be used for chimneys and other penetrations less than 30" in width.
3. Extend a minimum of 6" up chimney and 14" up roof slope.
4. A cricket or cricket flashing is recommended for chimneys and other penetration greater than 30" in width to provide positive up-drift conditions, and area protection.
5. Dimensions shown are recommended minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions, and area practices.
6. Underlayment must turn up chimney wall a minimum of 4 inches.
7. All chimney flashing shall be minimum of (No. 26 galvanized sheet gauge) not less than 0.019 inch corrosion resistant metal (CR01). See Table A for additional options.

Drawings shown depict the installation of all materials. Unless otherwise noted, it would apply to either concrete or clay tile.

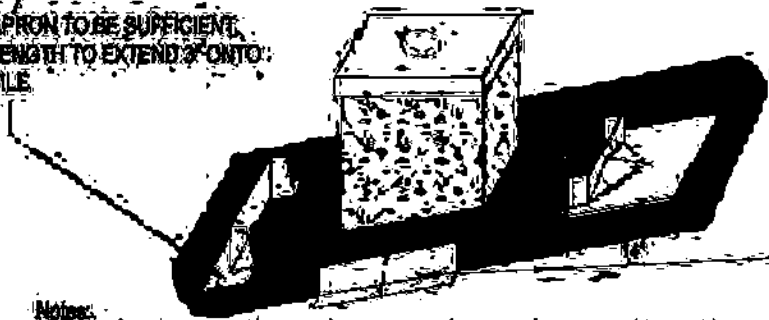
CHIMNEY CRICKET FLASHING - STEP TYPE (Chimney or other penetration greater than 30" wide)

MC-15A

NOTE:
TYPICALLY USED IN AREAS WHERE DEBRIS CAN ACCUMULATE



APRON TO BE SUFFICIENT LENGTH TO EXTEND 3" ONTO TILE



STEP FLASHING OVER TILE (AVAILABLE FOR PROFILE TILES)

Notes:

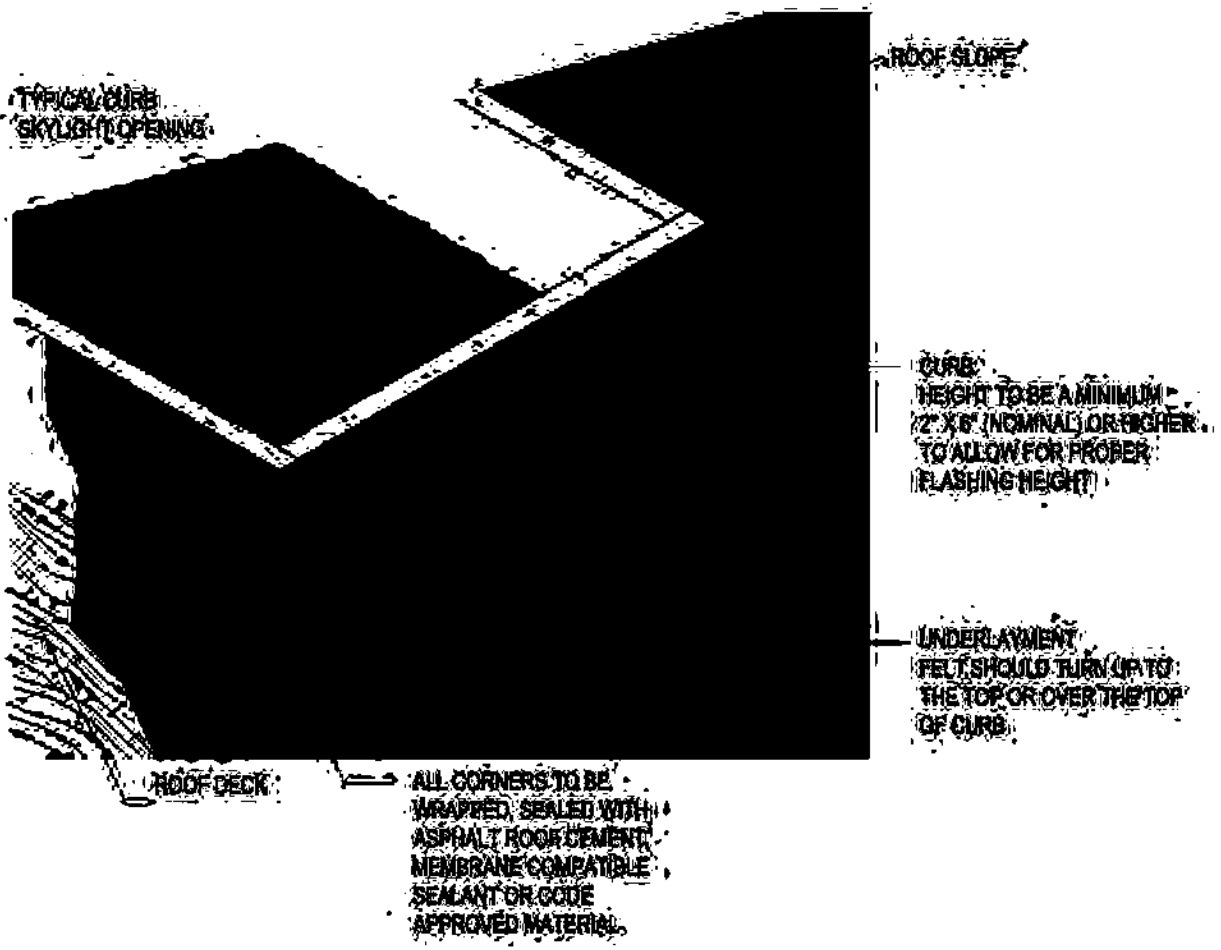
1. Chimney flashing dimensions may vary according to local weather conditions, chimney size, chimney location, slope of roof, water length behind chimney and tributary water area.
2. A backer or flashing may be used for chimneys and other penetrations less than 30" in width.
3. Extend a minimum of 6" up chimney and 14" upslope.
4. A cricket or cricket flashing is recommended for chimneys and other penetrations greater than 30" in width to protect positive runoff.
5. Dimensions shown are recommended minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions.
6. Underlayment must turn up chimney wall a minimum of 4 inches.
7. All chimney flashing shall be minimum of (No. 26 galvanized steel gage) not less than 0.019 inch corrosion-resistant metal (C90). See Table A for additional options.

Drawing shows depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

Appendix A

SKYLIGHT UNDERLAYMENT DETAIL

MC-16

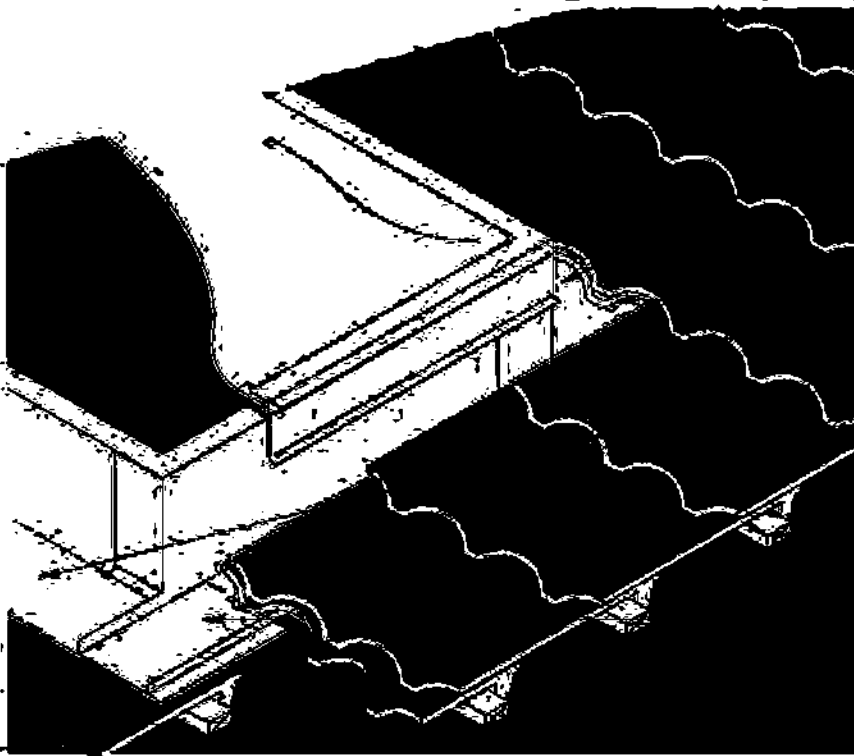


- Notes:**
1. For recommended underlayment and flashing requirements, see Table 1A and 1B.
 2. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions and area practices.
 3. A becker or saddle flashing should be used for curved penetrations, depending upon width or radii. Extend flashing a minimum of 2" up curb.

*Drawing shows depicts the application of all tile profiles. Unless otherwise noted it would apply to other concrete or clay tiles.

SKYLIGHT FLASHING - PAN TYPE

MC-16A



NOTE:
WHERE DEBRIS CAN ACCUMULATE, SEE STEP FLASHING OPTION MC-16B.

SADDLE OR CRICKET FLASHING GIBBED OR SEALED WITH THREE COURSE APPLICATION

TILE TO BE HELD BACK FROM UP-SLOPE CURB OF SKYLIGHT, SO NOT TO IMPAIR RUN OFF.

APRON FLASHING MUST BE OF SUFFICIENT LENGTH TO PROVIDE 3" MIN LAP ONTO TILE.

BATTENS WHERE REQUIRED

PAN OR CHANNEL FLASHING

UNDERLAYMENT

OPTIONAL BEHIND EDGES



APRON FLASHING



PAN OR CHANNEL FLASHING

FORMED FLASHING WITH SOLDERED OR SEALED CORNERS



SADDLEBACKER FLASHING

Notes:

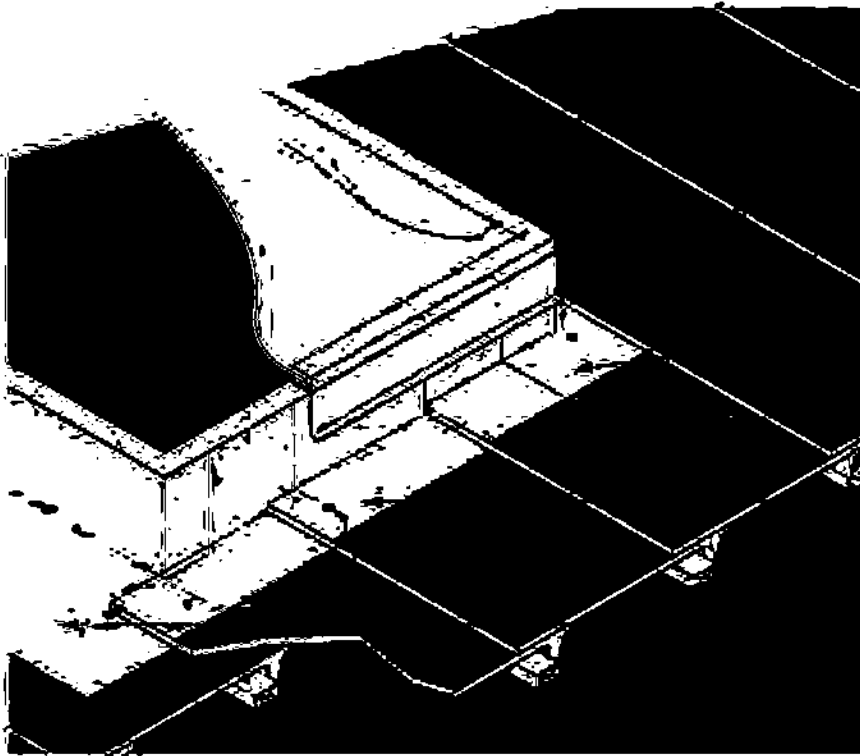
1. Skylight flashing dimensions may vary according to local weather conditions, curb size, location, slope of roof, gutter length behind skylight and contigatory run of eave.
2. A saddle or cricket flashing may be used for skylights and other penetrations less than 30" in width. Extend a minimum of 6" up or to top of curb, and 14" up roof slope.
3. A cricket flashing is recommended for skylights and penetrations equal to or greater than 30" in width to promote positive runoff. Curb supporting side shows otherwise.
4. For recommended underlayment and fastening requirements, see Table 1A and 1B.
5. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions.
6. Malleable metal or weather blocking material, required for weather flange with profiled tile.
7. All skylight flashing shall be minimum of (No. 26) galvanized sheet gauge) not less than 0.019 inch corrosion-resistant metal (9007). See Table A for additional options.

Drawing shown depicts the application of all the profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

SKYLIGHT STEP FLASHING

MC-16B

NOTE:
TYPICALLY USED IN AREAS WHERE DEBRIS CAN ACCUMULATE.



CURB HEIGHT TO BE A MINIMUM 2 1/8" (NORMAL) OR HIGHER TO ALLOW FOR STEP FLASHING.

TILE TO BE HELD BACK FROM UP-SLOPE CURB OF SKYLIGHT, SO NOT TO IMPAIR RUN-OFF.

SADDLE OR CRICKET FLASHING

BAITENS OPTIONAL

STEP FLASHING (MADEABLE FOR PROFILE TILE)

APRON FLASHING

UNDERLAYMENT



APRON FLASHING



STEP FLASHING



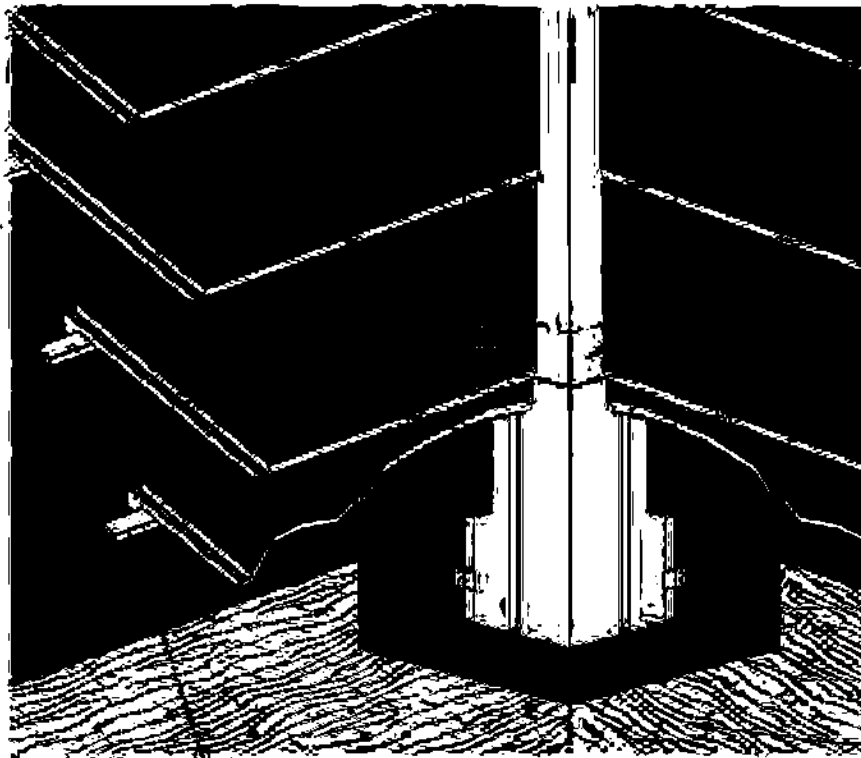
SADDLE BACKER FLASHING

- NOTE:
1. Skylight flashing dimensions will vary according to local weather conditions, size, location, slope of roof, gutter length behind skylight and contributory run-off area.
 2. A backer or saddle flashing may be used for skylights and other penetrations less than 30" in width. Extend a minimum of 6" up to top of curb and 14" up roof slope.
 3. A cricket flashing is recommended for skylights and penetrations equal to or greater than 30" in width to promote positive runoff. For recommended underlayment and fastening requirements see Table 1A and 1B.
 4. Dimensions shown are minimums and are intended to be applied with a liberal, reasonable tolerance due to field conditions and area practices.
 5. Malleable metal or weather blocking material, required for weather closure with profile tile.
 6. All skylight flashing shall be minimum of No. 26 galvanized sheet piling not less than 0.019 inch corrosion resistant metal (300). See Table A for additional options.

Drawing shows details for application of all the profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

OPEN VALLEY - TILE INSTALLED WITH GAP AT CENTER OF VALLEY

MC-17



OPTIONAL BATTENS

Note: Tile at valleys may be cut to form closed or open metal valley detail. When flat profiled tile is installed see closed valley, a ribbed valley metal or a single crown valley metal with a batten extension shall be used.

When using standing seam flashing, used woven underlayment method. See MC-03 & MC-17B.

Notes:

1. For recommended underlayment and fastening requirements, see Table A and B.
2. Cut tile pieces should be secured by one or a combination of the following: (a) code approved adhesive; (b) wire ties; (c) batten extension; (d) cut the slip; or (e) other code approved fastening device.
3. Metal valley flashing is required to be a minimum of 16-gauge galvanized steel (not less than 0.016 inch corrosion-resistant metal (CRM)). See Table A for additional details. Valley flashing shall extend at least 10 inches from center line both way and have a pleat or bead (it is not less than 1 inch high at flow line formed as part of the flashing).
4. Other valley metal profiles are available. See MC-12B for example.
5. Tile must extend a minimum of 4" over the valley metal.
6. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions and area practices.
7. Valley details should be designed to suit climatic area, control water runoff, and discharge expected water flows.

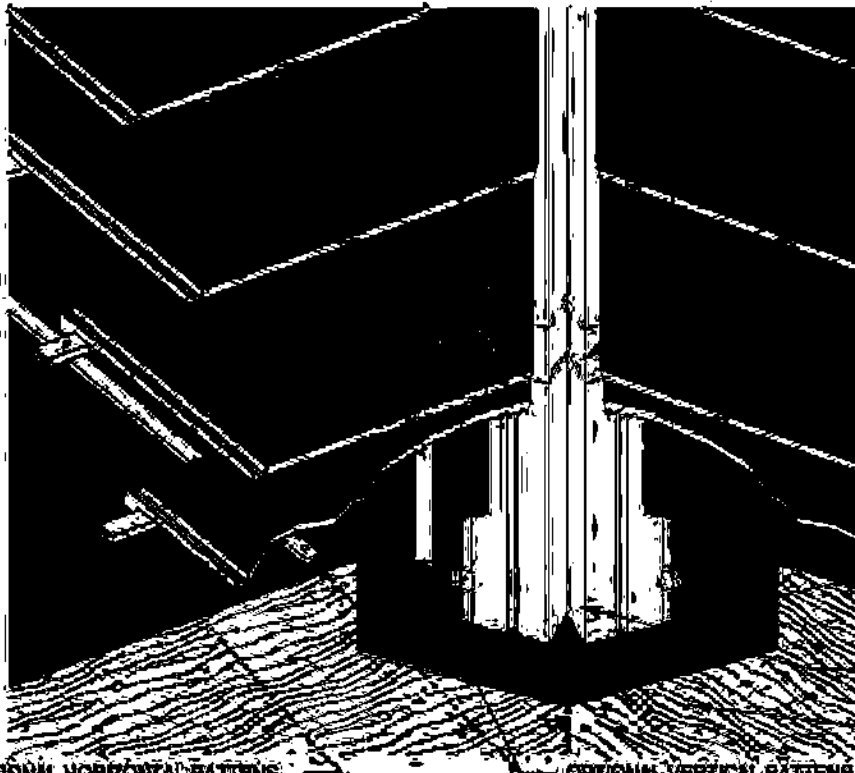
Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

Appendix A

THREE RIB VALLEY METAL PROFILES

(ON COUNTER BATTEN)

MC-17A



FIELD TILE

LAP VALLEY JOINTS 6" MIN.
(NAIL EACH SECTION OF
VALLEY METAL ALONG ITS
UPPER END WHEN USING CLIPS)

OPTIONAL NAILS OR METAL
CLIPS

NAILS USED AT THE METAL EDGE
(SHALL BE SEALED)

UNDERLAYMENT

VALLEY METAL

ROOF DECK

OPTIONAL HORIZONTAL BATTENS
(REQUIRED IF VERTICAL BATTEN
USED)

OPTIONAL VERTICAL BATTENS INSTALLED UNDER
HORIZONTAL BATTENS

Note: When flat profiled tile is installed as "closed valley," a ribbed valley metal or a single crown valley metal with a batten extension shall be used.

When using standing seam flashing, use woven underlayment method see MC-09 & MC-17B.

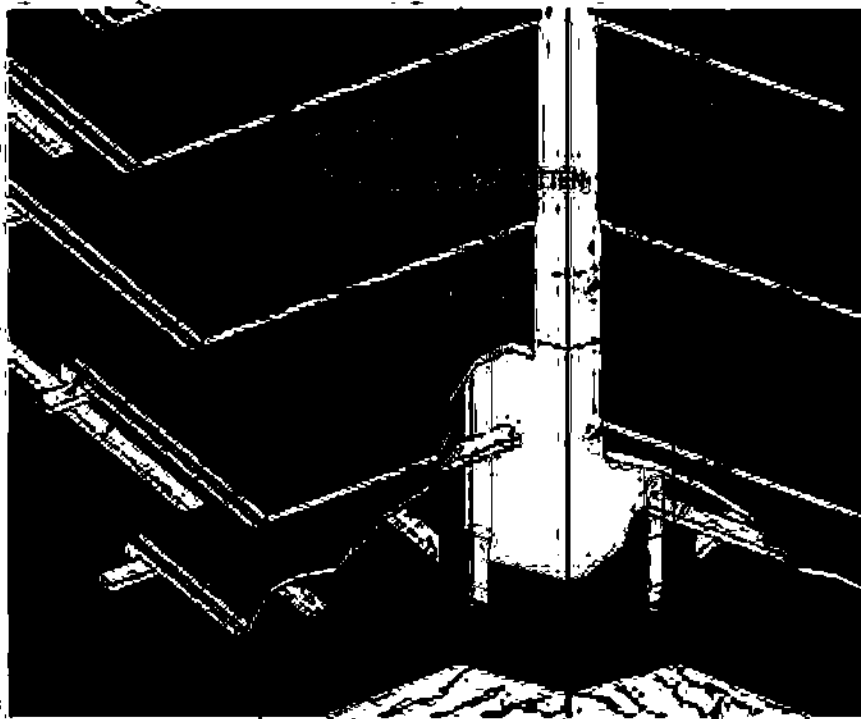
Note:

- For recommended underlayment and fastening requirements, see Tables 1A and 1B.
- Cut tile pieces should be secured by one or a combination of the following: (a) code approved adhesive; (b) wire ties; (c) batten extension; (d) cut tile clip; or (e) other code approved fastening device.
- When valley flashing is required to be a minimum of No. 26 galvanized sheet (gauge) not less than 0.016 inch corrosion-resistant metal (CRD). See Table A for additional options. Valley flashing shall extend at least 11 inches from centerline in each way and have a splash diverter (it not less than 1 inch high at flow line formed as part of the flashing).
- Other valley metal profiles are available. See MC-12B for examples.
- The metal must extend a minimum of 4" over the valley metal.
- Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions and area practices.
- Valley details should be designed to suit climatic area, control water and discharge expected water flows.

Drawing shows details for application of all tile profiles. Unless otherwise noted it would apply to other profiles or clay tiles.

VALLEY METAL - FOR DEEP TROUGH VALLEY

MC-17B



FIELD TILE
 LAP VALLEY JOINTS 2" MIN.
 (BLIND NAIL EACH SECTION
 OF VALLEY METAL ALONG ITS
 UPPER END WHEN USING
 CLIPS)
 VALLEY METAL
 OPTIONAL 1" WIDE METAL
 CLIP
 (ATTACH TO EACH
 HORIZONTAL BATTEN)
 OPTION 2
 HORIZONTAL BATTEN
 UNDER METAL
 UNDERLAYMENT

OPTION 1
 HORIZONTAL BATTEN
 OVER METAL
 ROOF DECK

Note: Valley metal shall extend at least 1" from center line each way and shall have a splash diverter not less than 1" high at the flow line formed as part of the flashing. Other designs that will handle anticipated water flows may be used upon submission of supporting data indicating that anticipated water flows are equivalent to the code requirements.

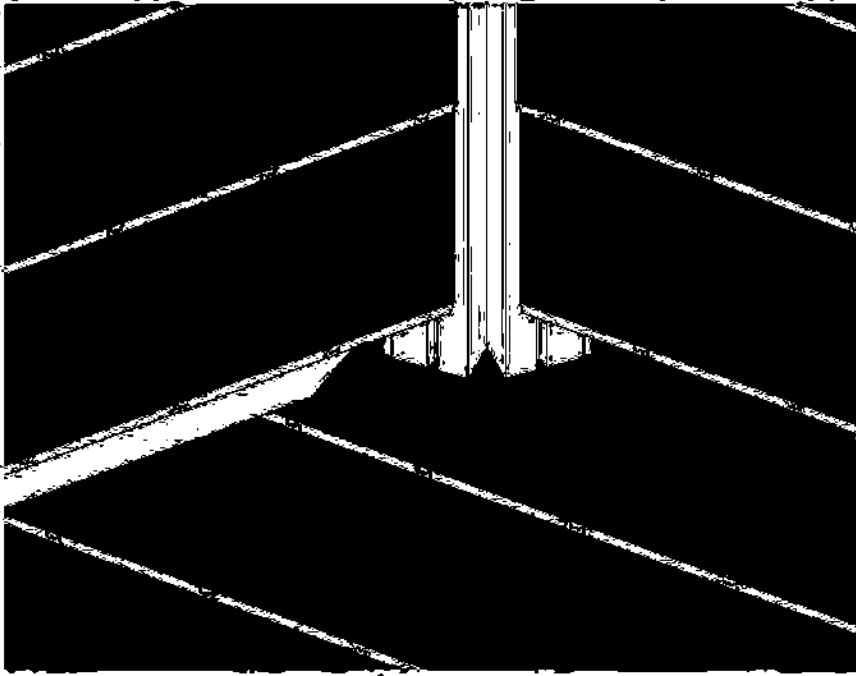
- Notes:
1. For recommended underlayment and fastening requirements, see Tables 1A and 1B.
 2. Clip fasteners shall be secured by one or a combination of the following: (a) code approved adhesive; (b) wire ties; (c) bolts; (d) order; (e) fasteners; or (f) other code approved fastening device.
 3. Metal valley flashing is required to be a minimum (No. 26 galvanized sheet gauge) not less than 0.014 inch corrosion-resistant metal (CR0). See Table A for additional options. Valley flashing shall extend at least 1 1/2 inches from centerline each way and have a splash diverter not less than 1 inch high at flow line formed as part of the flashing. On projects with large exposure roof areas and/or long rather than short water valley metal is required. The shall extend over valley into valley trough a minimum of 4-1/2".
 4. Other valley metal profiles are available. See MC-12B for examples.
 5. The metal shall extend a minimum of 4" over the valley metal.
 6. Dimensions shown are minimums and are intended to be approximate to allow for reasonable tolerances due to field conditions and steel practices.
 7. Valley details should be designed to consider climate area, condy water and discharge expected water flows.

Drawing shows typical application of all the profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

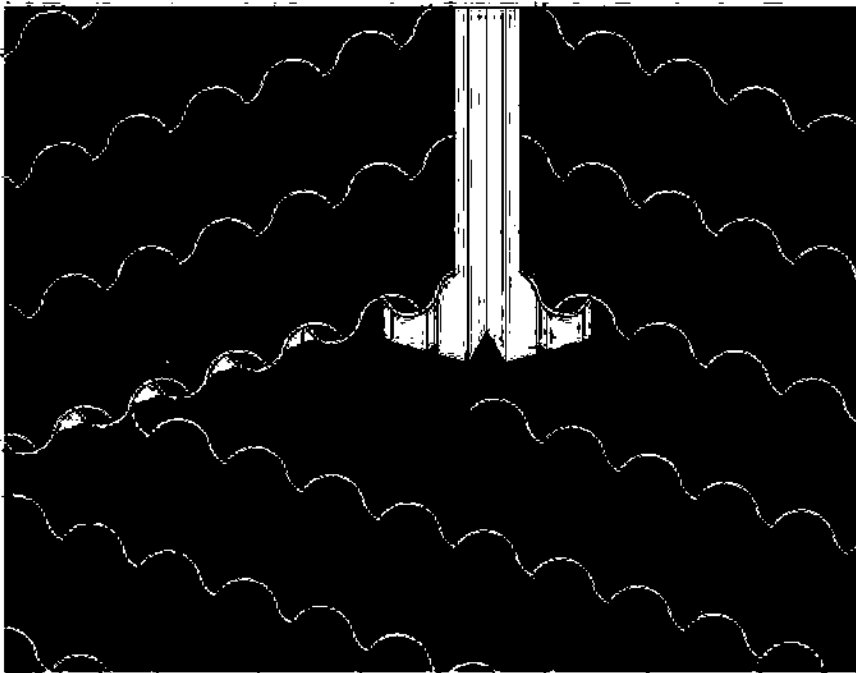
Appendix A

VALLEY TRANSITIONS

MC-17C



EXAMPLE FOR FLAT OR
LOW PROFILE TILE
THE VALLEY METAL MUST
LAP ONTO THE TILE OF THE
COURSE BELOW THE ROOF
TRANSITION FLASHING



THE VALLEY METAL MUST
LAP ONTO THE TILE OF THE
COURSE BELOW THE ROOF
TRANSITION FLASHING

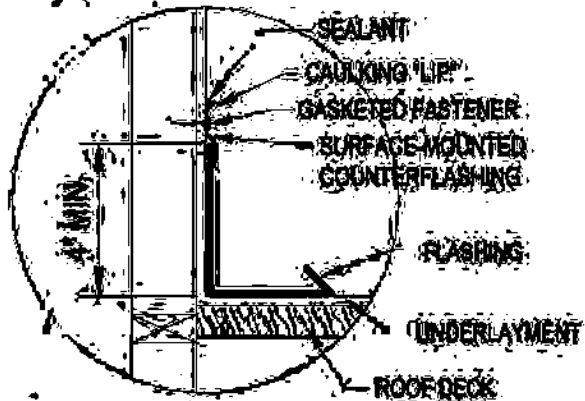
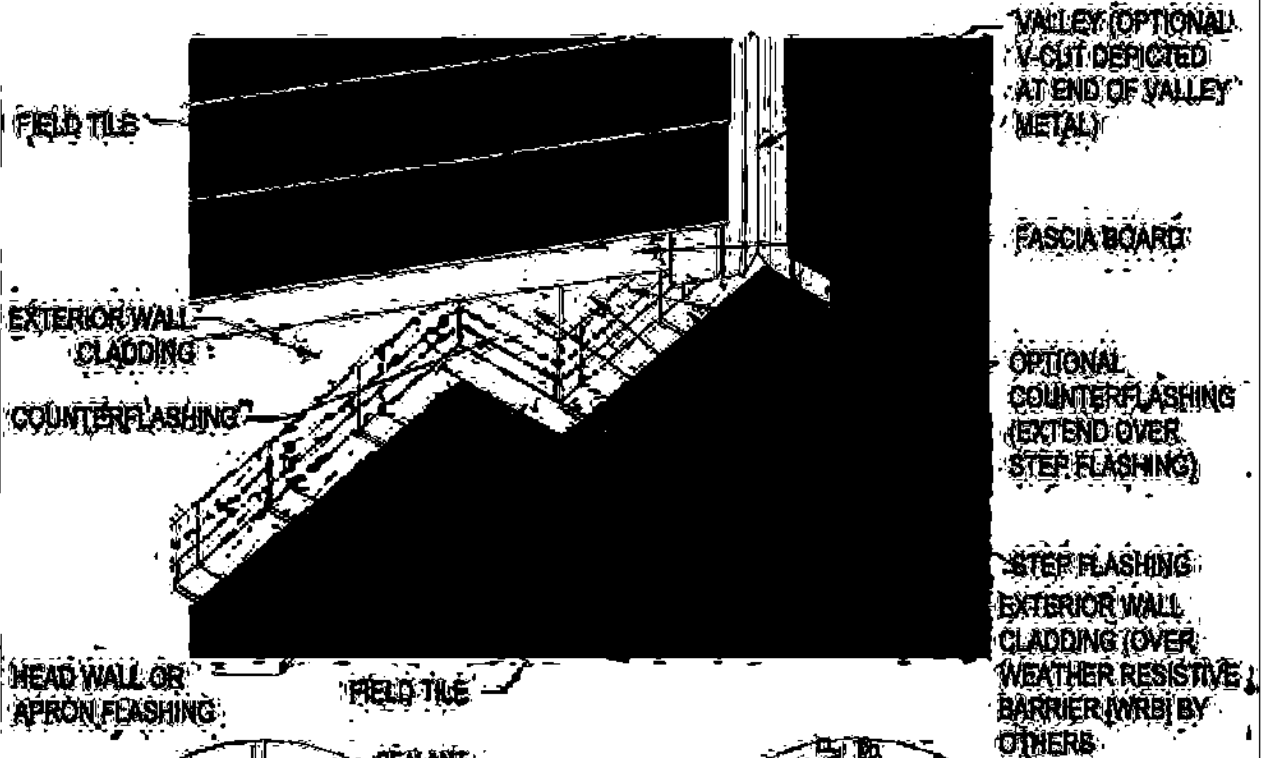
EXAMPLE FOR HIGH PROFILE
TILE
LEAD SOAKER OR OTHER
APPROVED MALLEABLE
MATERIAL SHOULD BE USED
TO FORM A WATER FLOW
TRANSITION FLASHING

Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

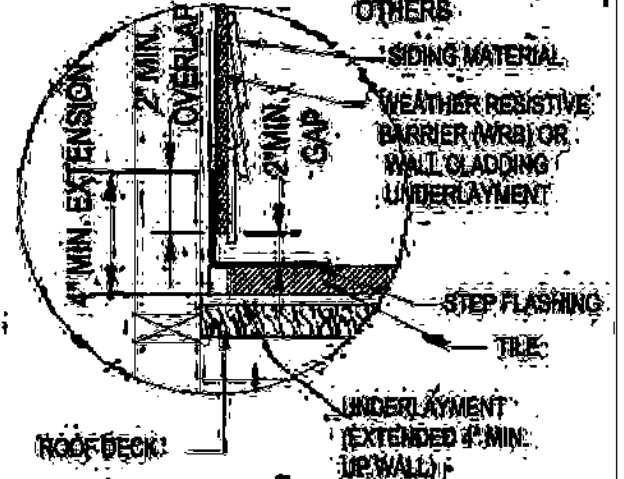
Appendix A

BOXED-IN SOFFIT

MC-17D



SURFACE MOUNT FLASHING



NOTES:

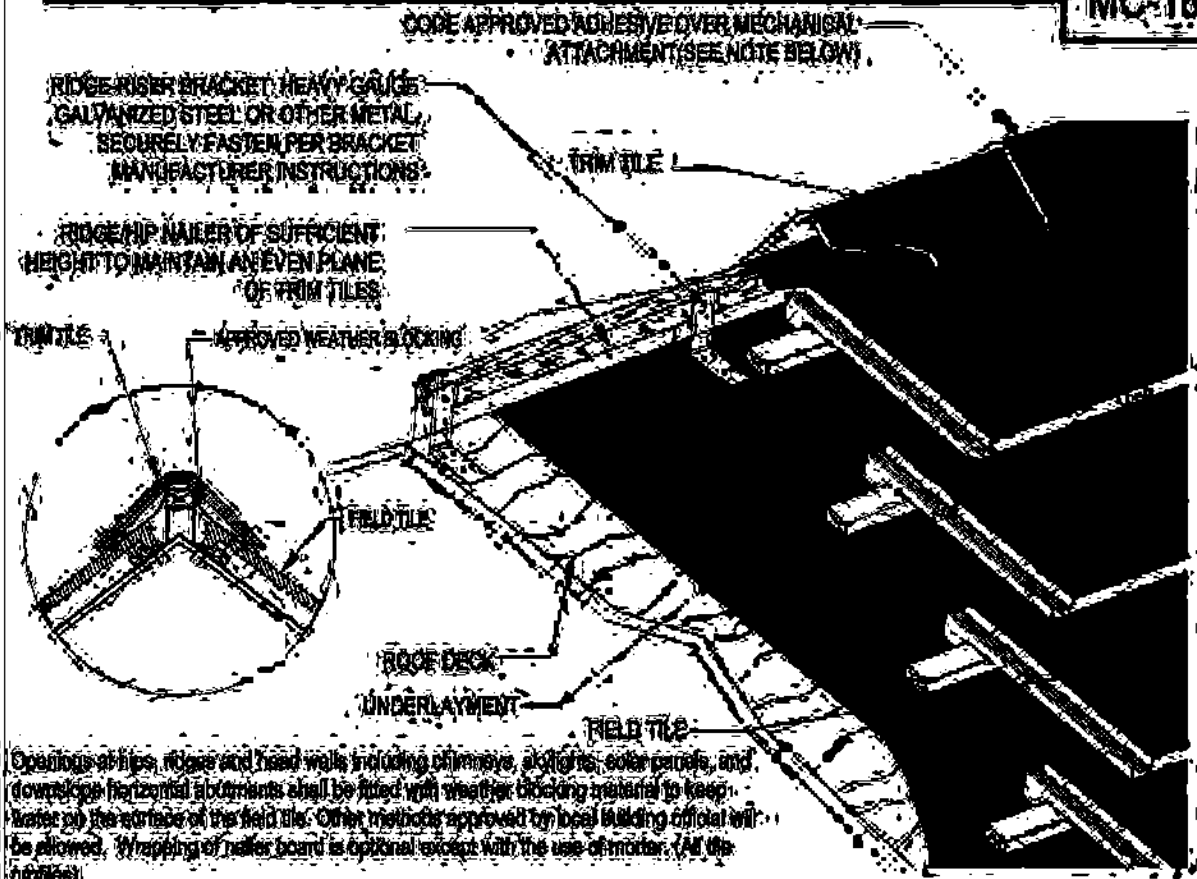
1. Surface mounted flashing may be sufficient in some mild climates. However, concealed or inset flashings such as "Z" metal or Stucco type two piece right and counter flashing or step flashing, are recommended in wet climates, particularly with stucco or other permeable cladding systems.
2. Dimensions shown are minimums and are intended to be appropriate to allow for reasonable tolerances due to field conditions, and site practice.

Drawing shows details for application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

Appendix A

HIP AND RIDGE (Optional Method)

MC-18

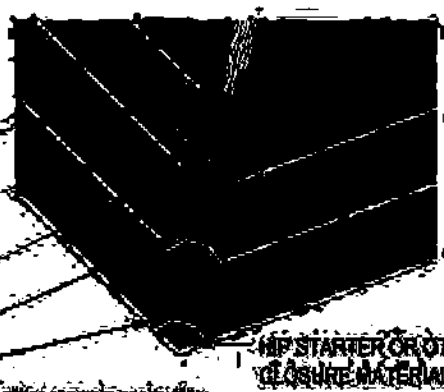


Openings at hips, ridges and head walls including chimneys, skylights, solar panels, and downpipes horizontal abutments shall be fitted with weather blocking material to keep water off the surface of the field tile. Other methods approved by local building official will be allowed. Wrapping of nailer board is optional except with the use of mortar. (All the parties)

Notes:

1. For recommended underlayment and fastening requirements, see Table JA and 1B.
2. All hip and ridge tile are required to have a code approved adhesive between laps or trim tile to cover nail hole and create a bond between trim tiles.
3. Tiles to be cut in a manner to properly conform to the method of weather blocking material used.
4. Battens for tiles with protruding anchor lugs are optional for slopes between 3:12 and 12:12. Direct deck attachment of tiles approved by local building official is allowed.
5. Dimension shown are minimums and are intended to be approximate, allow for reasonable tolerance due to field conditions, and site practices.
6. Orientation and termination of ridge trim tiles may vary.

HIP BOARD OR NAILER:
 HIPS TO BE SEALED WITH UV RESISTANT MATERIAL, MORTAR, ROOF CEMENT, PREFORMED PLASTIC OR SELF-ADHERING FLASHING WHERE TILE MEETS HIP BOARD.
 (ROOFERS CEMENT OR TILE ADHESIVE MUST BE APPLIED AT HEAD UP TO COVER NAIL HOLE.
 PROVIDE MINIMUM 2" HEADLAP.
 HOLD BACK HIP NAILER APPROX. 6" FROM EAVE EDGE.



Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

HIP AND RIDGE

MC-18A

CODE APPROVED ADHESIVE
(OVER MECHANICAL
ATTACHMENT)

RIDGE TILE

WEATHER BLOCKING MORTAR
OR OTHER APPROVED
MATERIALS

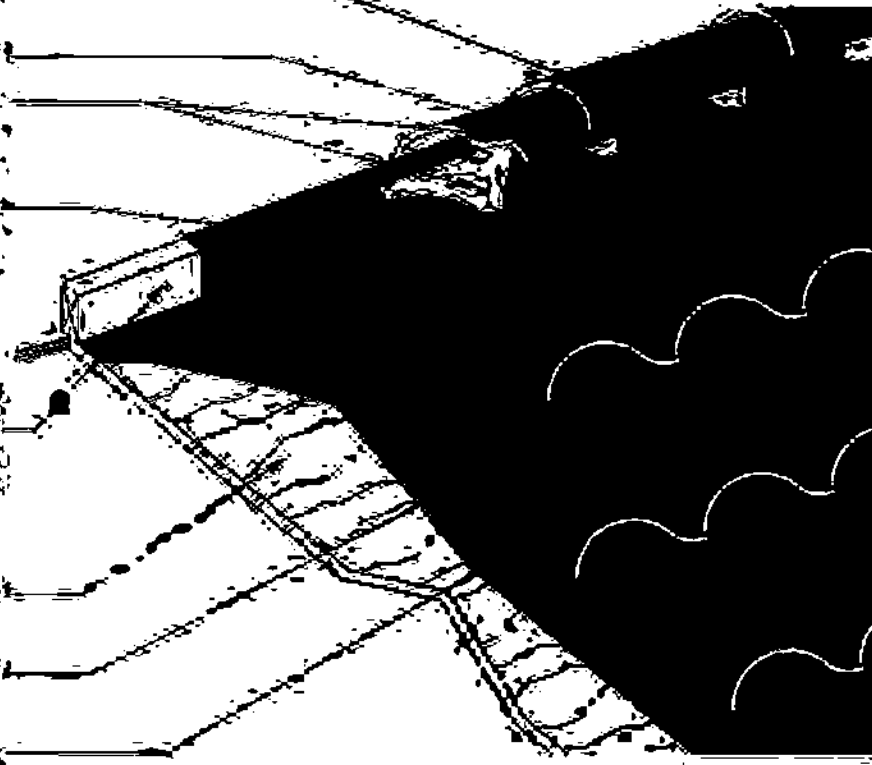
WRAPPING OF WATER
BOARD IS OPTIONAL EXCEPT
WITH THE USE OF MORTAR

SECURELY FASTEN RIDGE RIB
NUMBER OF SUFFICIENT
HEIGHT TO MAINTAIN AN EVEN
PLANE OF TRIM TILES

ROOF DECK

UNDERLAYMENT

FIELD TILE



• Openings at hips, ridges and head walls (including chimneys, skylights, solar panels, and downspout horizontal attachments) shall be filled with weather blocking material to keep water on the surface of the field tile. Other methods approved by local building official will be allowed.

• Wrapping of water board is optional except with the use of mortar. (All profiles of this)

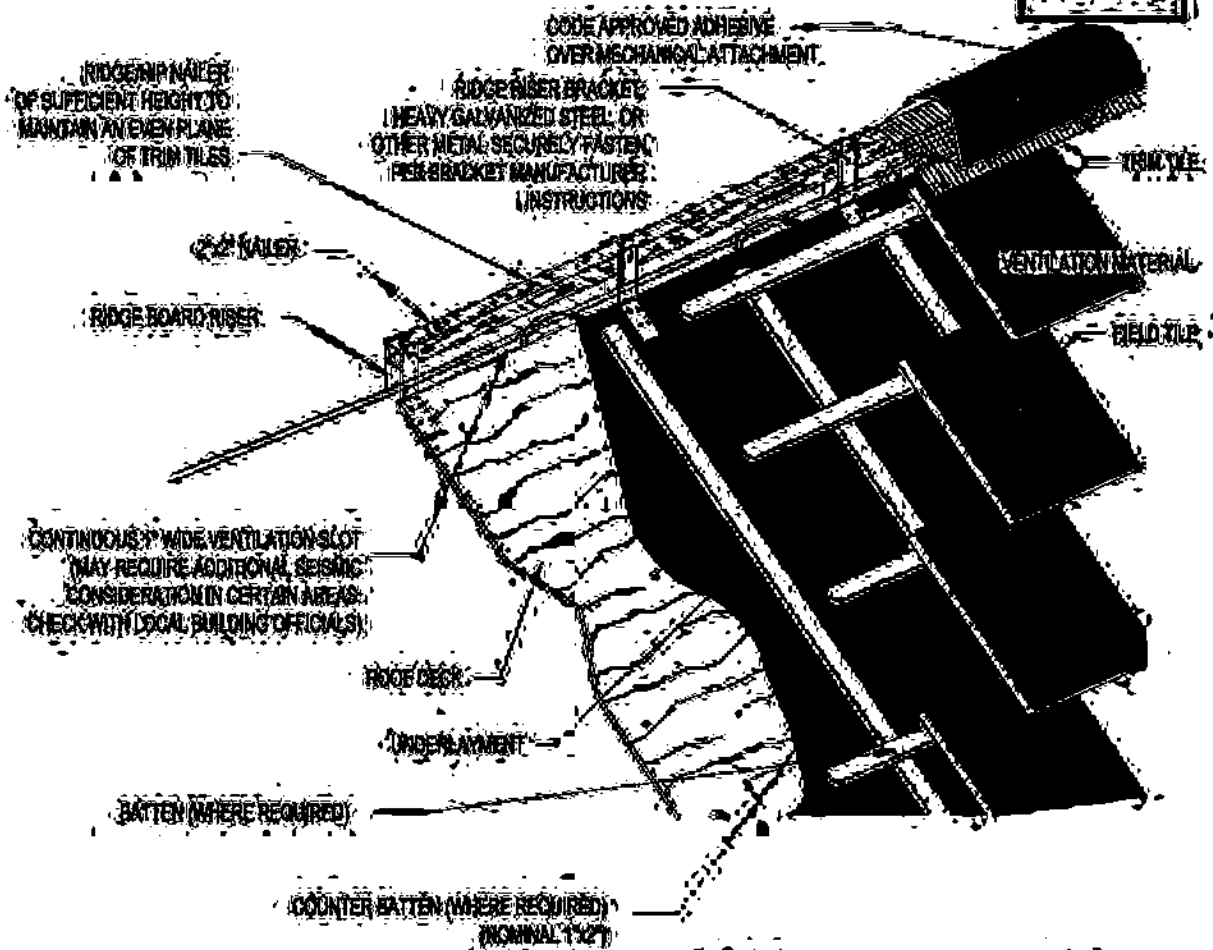
Notes:

1. For recommended underlayment and fastening requirements, see Table 12A and 12B.
2. All hip and ridge tile are required to have a code approved adhesive or special clip between laps of trim tiles to cover nail holes and create a bond between ridge tiles.
3. Batters for tiles with protruding anchor legs are optional for slopes between 3:12 and 7:12. Direct deck attachment of tiles as approved by local building official will be allowed.
4. Dimension shown are minimum and are intended to be approximate to allow for reasonable tolerance due to field conditions, and are practices.

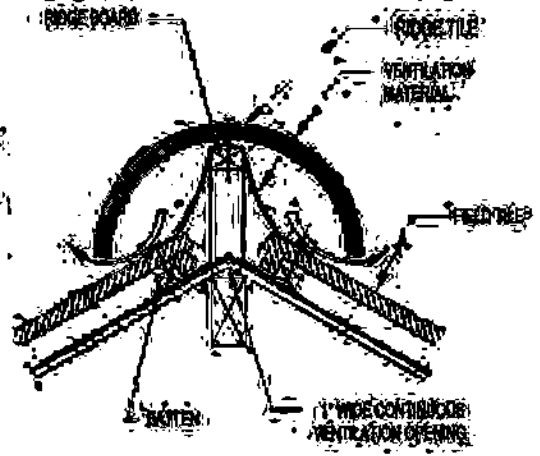
• Detailing and/or depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

VENTED RIDGE (Optional Method)

MC-18B



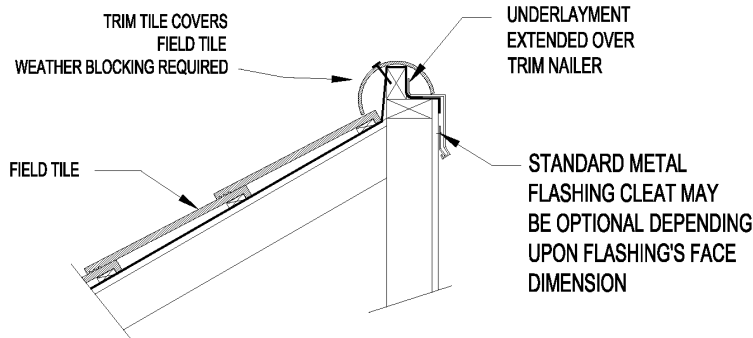
- Notes:-
1. Refer to vent manufacturer instructions for products and limitations.
 2. Ensure the vent material, weather blocking and/or ridge tile will provide sufficient coverage over field tile. If top course is held down from ridge to allow for ventilation cut out or slot in sheathing. For recommended underlayment and fastening requirements see Table 1A and 1B.
 3. Dimension shown are minimums and are intended to be appropriate to allow for reasonable tolerance due to field conditions, and area practices.



Drawing shows typical application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.

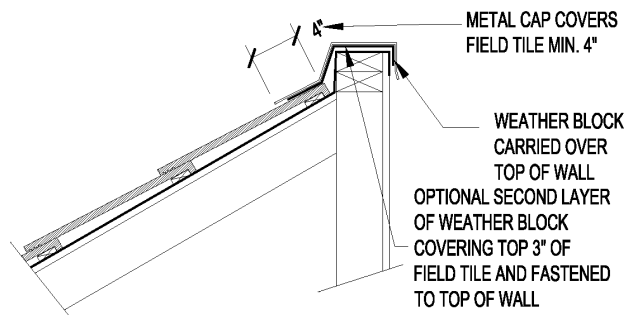
PARAPET OR MANSARD CONDITION

MC-18C



Notes: Detail may vary depending on type of tile being used. Two-piece tile method may replace requirement for metal flashing.

METAL CAP CONDITION



Notes:

1. For recommended underlayment and fastening requirement, see Table 1A and 1B.
2. Dimension shown are minimums and are intended to be approximate to allow for reasonable tolerance due to field conditions, and area practices.

Drawing shown depicts the application of all tile profiles. Unless otherwise noted it would apply to either concrete or clay tiles.