



**Roofing System**

**Installation Guide**



Through a licensing agreement with Zappone <sup>TM</sup>  
Manufacturing of Spokane Washington

# Table of Contents

Preperation	3	NOTE:  This application guide has been prepared and is offered by Millennium Tiles in a licensing agreement with Zappone™ Manufacturing as a service to professional contractors and the “do-it-yourself” homeowner with the assumption and caveat that common sense and accepted safety practices will be utilized.
Tiles and Common Accessories	4, 5	
Step By Step Application:		These procedures and techniques are not intended to substitute for any local, state or national building codes or safety requirements. It is highly recommended that the appropriate authorities be contacted for any requirements specific to the intended installation.  As always when working with metal products care must be given to avoid injury from cuts and abrasions. Also, working on roofs is inherently dangerous. It is recommended that the proper safety equipment and attire be worn.  Millennium Tiles L.L.C. assumes no responsibility for improper installation, property damage, or personal injury that may result from working with this product and these guidelines.
1. Roof Inspection	6	
2. Starter Strip Installation	6	
3. Underlayment Application	6	
4. Valley Installation	7	
5. Gable-End Installation	7	
6. Tile Application	7, 8, 9	
7. Hip/Ridge Cap Installation	10, 11	

## **PREPERATION**

### **TOOLS:**

Both professional contractors and “do-it-yourself” homeowners can easily apply Millennium Tiles Roofing Systems. This list of required tools is minimal and includes:

Hammer	Tin Snips
Ladder	Tape Measure
Hand Seamer	Utility Knife

### **WALKING ON ROOF:**

The interiors of Millennium Tiles are recessed (shadow cupped) allowing the tile to rest flat against the deck. This eliminates the air space that makes other metal roofs so noisy and allows for walking on the roof when necessary. Be sure to stay within the recessed area of the tile and do not walk on the interlocking edges.

### **SAFETY:**

It is impossible for Millennium Tiles to be completely aware of all local requirements in all regions. Therefore, nothing in this booklet should be construed as to be contrary to any required safety regulation, procedure or device. Good common sense must be utilized whenever one works on a roof or uses a ladder. Please contact your local authorities for safety requirements.

### **DECK PREPARATION:**

Depending on applicable local codes, a Millennium Tiles Roofing Systems may be installed over existing composition roofing. Care should be taken to remove any “curled” or uneven composition tiles and to provide as flat a surface as possible. The system may not be applied over existing wood shake, other metal roofing or over any roof that may prevent smooth and even application. The system requires “solid” decking (no spaced decking), an underlayment of minimum of No. 30 and a minimum slope of 3:12.

## TILES AND ACCESSORIES

### **LARGE TILE:**

The Large tile measures 15" x 9 5/8", with an exposure of 14 1/2" x 8 3/8". The tiles are packed per 1/2 square. 124 tiles = 1 square (100 sq/ft). Each box weighs approximately 50 lbs. The nailing flange contains two pre punched holes for hand nails; roofing nail guns can penetrate the tab it is not necessary to go through the holes. The large tiles are available with our without the indentation (shadow cup). We recommend the shadow cup tile be used for roof applications; either tile can be used for wall applications.



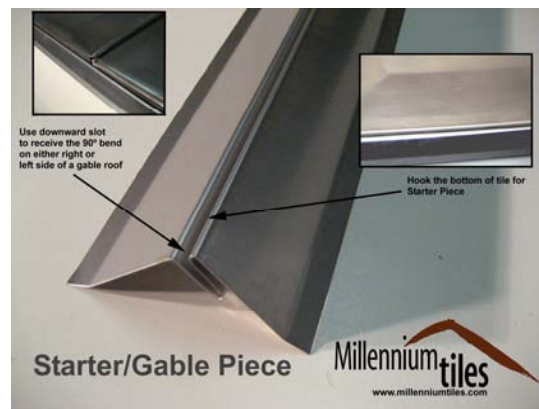
### **ACCENT TILE:**

The accent tile measures 9 1/4" x 7 1/2". The tiles are packed per 1/2 square. 248 tiles = 1 square (100 sq/ft) Ea. box weighs roughly 50 lbs. Accent tiles are can be used on walls, dormers, bay windows, entry ways, etc... They are not intended to be used for entire roofs.



### **STARTER/GABLE FLASHING:**

Produced in 10' lengths and applied at the eave edge. The starter strip doubles as eve drip edge and as a rake end. The starter/gable interlocks with the first course of tiles.



### **VALLEY FLASHING:**

Produced in 10' lengths. It interlocks with the tile to provide a leak proof condition.



**END WALL:**

Produced in 10' lengths. Utilized to flash the eave side of chimney, skylights, solar panels, and other protrusions requiring enclosure at the roof's surface.



**SIDE WALL:**

Produced in 10' lengths. Utilized to flash the ridge side and gable/hip sides of chimneys, skylights, solar panels, and other protrusions requiring enclosure at the roofs surface.



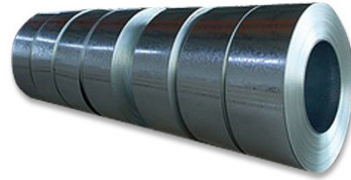
**HIP AND RIDGE CAP:**

Sold per piece, each cap has 9 1/2" exposure. Applied on both hips and ridges.



**COIL STOCK:**

Ask about sizes, gauges, and availability



**FASTENERS:**

With stainless steel applications, stainless steel fasteners must be used. With Zalmag applications use galvanized fasteners. Hand nails, collated nails, or screws are acceptable for installing the tiles. Specify 1", 1 1/4", 1 3/4" or 2 1/2".



**PIPE COLLAR FLASHING:**

Specify 1" to 1 1/2", 2" to 2 1/2", 3" to 3 1/2", 4" to 4 1/2"



**HAND SEAMER**

Hand operated tool for creating bends in metal tiles when needed for installation with valleys, gable ends, and side walls.



# STEP BY STEP APPLICATION

## 1. Roof Inspection

Roof must have a minimum slope of 3:12 (Fig. 1).

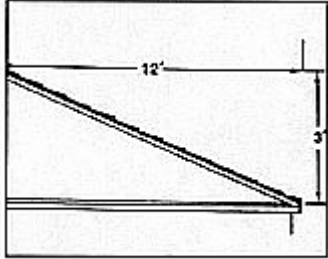


Fig. 1

Deck must be solid with a minimum thickness of 1/2" for plywood or 7/16" for wafer board and applied in accordance with the manufacturer's specifications.

If an existing roof is being covered, eliminate all curled and loose tiles, bumps, buckles, and anything that might interfere with the smooth application of the Millennium Tiles Roofing System and the interlocking mechanisms that provide the watertight characteristic of the Millennium Tiles.

**Caution:** Prevent Electrolysis. Use care to prevent any dissimilar metals or corrosive nonmetallic materials from coming into direct contact with the metal tiles and accessories, particularly in areas that may become wet. Do not allow water to flow from dissimilar metals to the tiles.

## 2. Install Starter Strip

Install the starter strip along the eave edge by nailing 6" on center and keeping the strip straight. At adjoining sections, notch-nailing flange back one inch from end (Fig. 2) and overlap the preceding

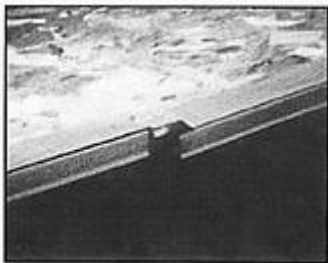


Fig. 2

starter strip. Nail within 1" to 2" of eave in a zigzag pattern. (Fig. 3)

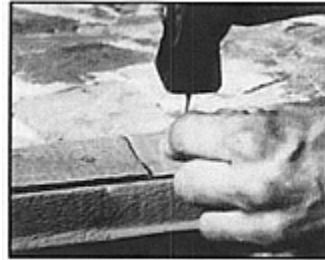


Fig. 3

## 3. Apply Underlayment

Apply an underlayment of No. 30 felt. Underlayment is required when covering an existing roof as well as when installing on bare decks. Start at the eave edge and roll felt or guard parallel to eave edge, making sure the starter strip upper flange is covered. (Fig. 4).

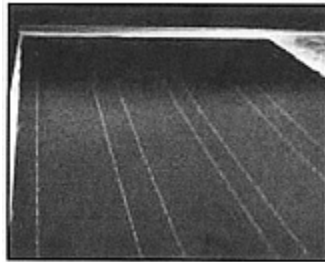


Fig. 4

Continue to apply and overlap felt or guard as recommended by the manufacturer.

Some local codes require a second layer of felt or a thicker underlayment at the eave edge to a point beyond the bearing wall. Contact your local authorities for the requirements in your area.

#### 4. Install Valleys

Install the continuous valley so that it covers and extends slightly beyond the starter strip. (Fig. 5).

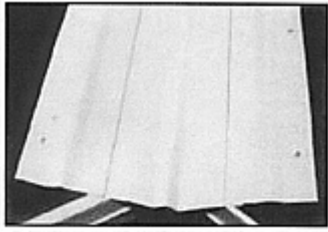


Fig. 5

Nail 10" on center in nailing flange.

When more than one continuous valley piece is required, overlap the upper piece over the lower piece by 3" to 6" and seal with mastic. (Fig. 6).



Fig. 6

If a valley intersects a ridge, cut and bend the continuous valley so that it overlaps the ridge. If two valleys meet at a ridge, cut and bend the end of both valley pieces so that the first overlaps the ridge and the second valley piece then overlaps the first valley piece.

#### 5. Install Gable Ends

Install the gable end overlaying the starter strip. (Fig. 7).

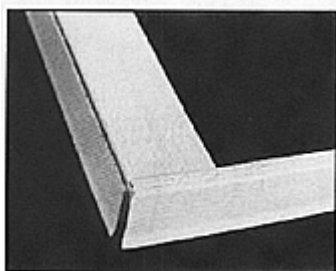


Fig. 7

Place the fascia leg firmly against the gable side fascia and fasten by nailing 10" on center in the nailing flange.

When placing a number of gable-ends in succession you may either butt the pieces

together or notch (Fig. 8),

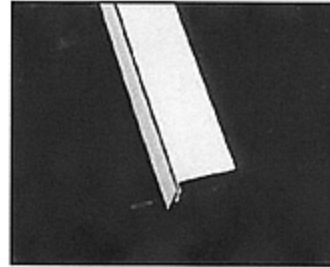


Fig. 8

and overlay the pieces. (Fig. 9).

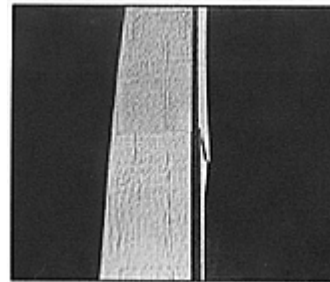


Fig. 9

#### 6A. Tile Application

Install tiles from left to right beginning at the lowest left-hand corner of any area to be covered. When working with a gable style roof, trim the first tile to remove the left side tapered lock and notch the nailing flange and butt  $\frac{3}{4}$ ". Using a hand seamer, make a 90 degree downward bend creating a  $\frac{3}{4}$ " downward face on the left side of the tile. (Fig. 10).

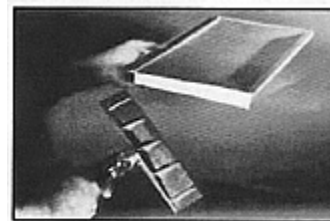


Fig. 10

Place this face into the receiving slot of the gable end and lock the butt of the tile into the starter strip. Press the tile firmly upward and fasten by nailing through the holes provided in the nailing flange. (Fig. 11).



Fig. 11

When working with a hip style roof, trim the first tile diagonally so that it aligns with the center of the hip. Lock the tile butt into the starter strip, press firmly upward and fasten by nailing through the holes provided in the nailing flange.

Whether gable style or hip style, continue applying tiles left to right, placing tile-projecting tab on the upper left of each shingle into the corresponding groove on the upper right of the preceding shingle.

Rather than continuing each course the full length of the roof, after installing five or six tiles work upward within your reach by beginning three or four more courses. Work this pattern from left to right adding more upper courses as you work farther to the right. (Fig. 12).

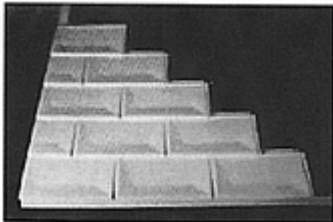


Fig. 12

To set the splits appropriately, start the second course and then each alternating course with half a tile. (Note: When trimming tiles, most remaining pieces can be used later. Try to save them in a box separate from the scrap).

### About Roof Jacks

The Millennium Tiles can easily be jacked, if necessary, on steep roofs. First, secure the jack to the deck in accordance with the manufacturer's specifications, then roof over the jack. Make two cuts in the hook of the tile's butt equal in distance to twice the width of the jack. Bend the bottom portion of the hook between the

cuts upward to allow the jack to protrude from beneath the shingle.

To remove, push upward on the bottom of the jack until it slides out from under the fasteners and pull out from under the tile. Re-bend straightened portion of the hook and lock into place.

### 6B. Tile Application at End of Course

When ending a course at a gable end, lay the last tile in place extending over the gable end and make a mark on the tile at a point  $\frac{3}{4}$ " beyond the gable end. Trim the tile at this mark and create a downward face on the right side of the tile by notching the nailing flange and butt and bending the tile remainder as was done on the first tile starting at a gable end. Place the downward face into the receiving slot of the gable end piece, lock the butt of the tile firmly in the starter strip and fasten in place. (Fig. 13).

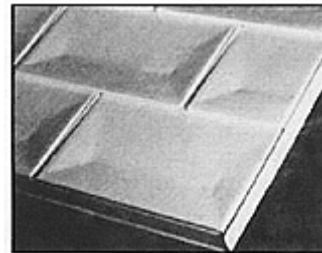


Fig. 13

When ending a course at a hip, lay the last tile in place extending over the hip and make a mark on the shingle at a point 2" beyond the center of the hip. Trim the tile at this point and at a diagonal matching the direction of the hip. Lock the tile firmly in place and bend the portion that extends over the hip firmly down on to the deck and any tile that may have been installed on the other side. (Fig. 14).



Fig. 14

The installation of the hip/ridge cap, described later, will conceal this procedure.

### 6C. Tile Application at the Ridge

When reaching the ridge, lay the last course in place extending the tiles beyond the ridge. Make a mark on the tiles at a point 2" beyond the center of the ridge and trim the tiles at that mark. Lock the tiles firmly in place and bend the portion that extends over the ridge firmly down on to the deck and any tile that may have been installed on the other side. Again, the installation of the hip/ridge cap, described later, will conceal this procedure.

### 6D. Tile Application at Valleys

Coming into a valley:

Lay the tile which will transect the valley into place and make a mark on the tile at a point  $\frac{3}{4}$ " beyond the left valley "S" lock. Trim the tile at this point and at a diagonal matching that of the valley. Notch the right side nailing flange and shingle butt back  $\frac{3}{4}$ ".

Using a hand seamer, bend the trimmed  $\frac{3}{4}$ " 90 degrees downward. Measure  $\frac{3}{8}$ " up the newly bent downward face and make a second 90-degree bend inward, toward the tile. Lock this new under fold into the valley "S" lock and nail tile into place. (Fig. 15).

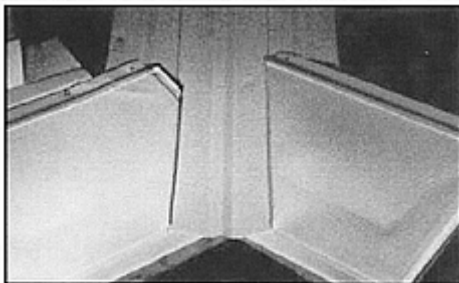


Fig. 15

For tiles running out of the valley, simply use the above process on the left side of the tile.

### 6E. Application at Plumbing Vents

Apply tiles from below up to the plumbing vent in normal fashion. Install vent flashing overlapping the tiles below the vent. (Fig. 16).

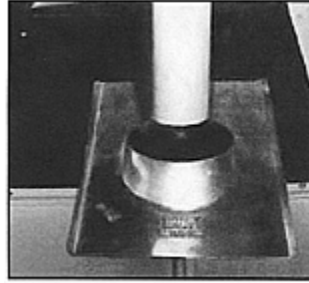


Fig. 16

Install tiles above the vent, cutting as necessary to ensure a tight fit around the collar of the vent. (Fig. 17).

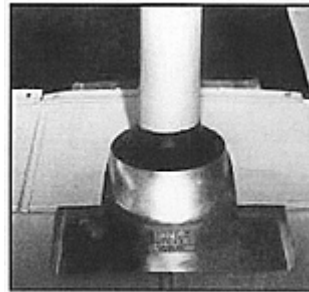


Fig. 17

On low slope roofs, a piece of adhesive backed ice and water shield can be placed on the underside of the tiles that sit on top (ridge side) side of the vent.

### 6F. Application around Chimney/Skylight/Dormer, etc. (Roof to Wall Conditions).

Install end wall and side wall pieces around the protrusion. Apply end wall pieces to those areas below (eave-side) of the protrusion (Fig. 18).

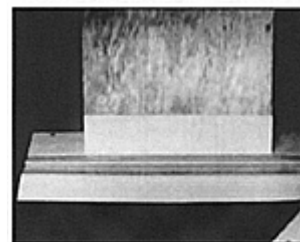


Fig. 18

and sidewall piece to those areas on the sides (Fig. 19),



Fig. 19

and above (right-side) of the protrusion. (Fig. 20).

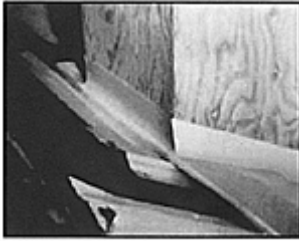


Fig. 20

### Tiles Below Protrusion

Trim tiles at the top to assure a tight fit when inserted into the end wall channel. (Fig. 21).

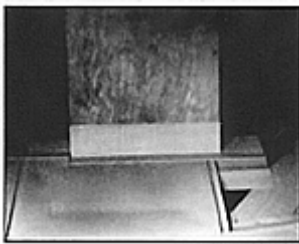


Fig. 21

Fasten tile to deck as closely as possible to the inside of the end wall channel. Cover nail head with mastic.

### Tiles to Side of Protrusion

Trim tile so that it extends beyond sidewall “S” lock  $\frac{3}{4}$ ”. Notchback nailing flange and butt  $\frac{3}{4}$ ”. Using a hand seamer, bend the remaining trimmed portion of the tile 90 degrees downward. At a point  $\frac{3}{8}$ ” up this newly bent face, make a second 90-degree bend inward, towards the tile. This creates the “male” of an “S” lock. Lock the tile into the sidewall and fasten to the deck. (Fig. 22).



Fig. 22

### Tiles Above Protrusion

If the courses do not work out so that a full shingle can be used above the protrusion while keeping the course straight, trim the bottom of the tile so that the nailing flange lines up with the nailing flanges of the other tiles in the course and the bottom extends  $\frac{3}{4}$ ” beyond the side wall “S”

lock. Notch the left and right side lock channels back  $\frac{3}{4}$ ”.

Using a hand seamer, bend the remaining  $\frac{3}{4}$ ” trimmed section downward 90 degrees. At a point  $\frac{3}{8}$ ” up from the bottom of this newly bent face, make a second 90-degree bend inward towards the tile. Lock this newly created butt into the “S” lock of the sidewall and fasten to the deck. (Fig. 23).

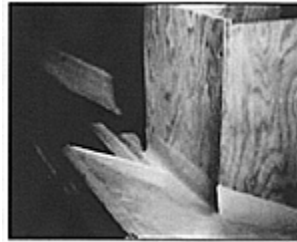


Fig. 23

## 7. Install Hip and Ridge

When installing a hip style roof, install caps on all hips prior to the ridge.

### Hips

To assist in a straight hip installation, snap a line from the bottom of the hip to the top. Using a hand seamer, straighten, and flatten the “S” hook on the butt of the first hip/ridge cap. Place the cap at the bottom of the hip where two eaves come together. Extend the cap  $\frac{3}{4}$ ” beyond the corner created by the eaves. (Fig. 24).

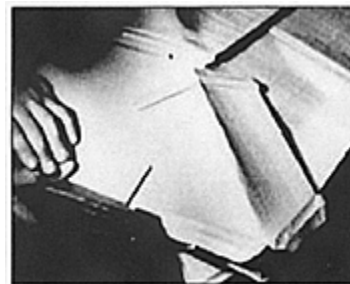
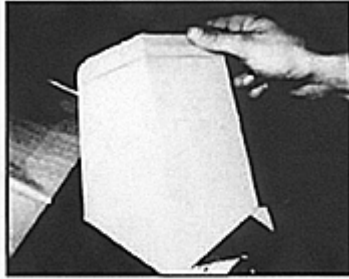


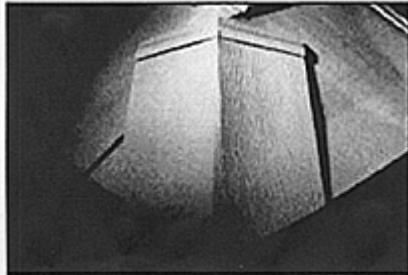
Fig. 24

Scribe or draw diagonal lines on the cap from the center point to the sides, even with and parallel to the eave. Trim and fold the bottom of the ridge cap so that the new hooks created will fit in the “S” lock of the two adjoining starter strips. (Fig. 25).



**Fig. 25**

Lock the first cap into place and fasten with two nails in the nailing flange. (Fig. 26).

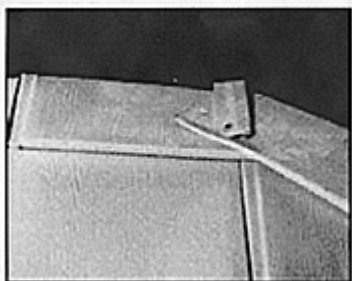


**Fig. 26**

The second and each subsequent cap will lock into the nailing flange of the cap below.

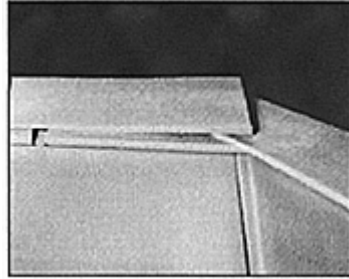
### Ridges

Whether working on a gable style roof or a hip style roof, begin installing hip/ridge caps on ridges by creating a “ridge cap starter strip”. Trim the nailing flange from a hip/ridge cap and fasten it to the roof at either end of the ridge. (Fig. 28).



**Fig. 28**

Install the first ridge cap by locking it into the ridge cap starter and fastening it to the roof with two nails through the nailing flange. (Fig. 29).



**Fig. 29**

Continue installing the caps across the ridge in a like manner.



550 E. Centralia St.  
Elkhorn, WI 53121  
262-723-7778  
Toll Free 866-842-8585  
Fax 262-723-7629  
info@millenniumtiles.com

Licensed by Zappone™ Manufacturing.  
Copyright 2000 All Rights Reserved.

This document is protected against any unauthorized copying, duplication or reproduction in any manner.