



# DIVINE ROOFING SYSTEM

- Stone Coated Metal Roofing Products -

## PRODUCT & INSTALLATION MANUAL



Manufactured by KyungDong Ceratech Co.,Ltd.

# **CHAPTER 1.**

## GENERAL

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## 1-1. COMPANY OVERVIEW & HISTORY

Since its establishment in 1982, and with its management philosophy to achieve customer satisfaction through quality services and products, while striving to become a first class organization, encouraging creativity and utilizing high technology, KyungDong Ceratech Co.,Ltd. has been focusing all of its energy on the production of environmentally friendly products to minimize and restore environmental disruption caused by hasty industrialization.

As a sole manufacturer, seller, developer of perlite-related products in Korea, KyungDong Ceratech Co.,Ltd. has cultivated the local perlite industry and now enjoys the world's most renowned technology in this area. With the firm belief that creativity and high technology are paramount to achieving KyungDong's mission, KyungDong Ceratech has established R&D INSTITUTE, putting in an all-out effort to develop new technology. Due to this commitment, KyungDong Ceratech was able to develop various energy saving materials such as industrial insulation. KyungDong Ceratech also helps prevent environmental disruption through purifying a variety of pollutants such as industrial waste by supplying filter aids. As a provider of many products such as artificial soil for green urban areas and innocuous construction materials, KyungDong Ceratech is valued as a company that creates new life environments for nature and mankind.

KyungDong Ceratech is expected to lead the green industry' in the 21st century, by utilizing its many specialists in the fields of environmental concerns.

To meet the increasing customer demand and have a competitive edge in the world market, a fully-automated, state-of-the-art plant was built in Asan, Korea. Also, to secure a sufficient supply line of raw materials and to obtain a foothold in the Chinese market, Tianjin Sanhua Industrials Co., Ltd. was established in Tianjin, China.

In addition, Shanghai Huadong office was established in order to add fresh fuel to the business in China.

Because of its improved technical superiority and accumulated experience, KyungDong Ceratech is positioned for global market expansion.

### **This warranty is subject to the following conditions:**

1. The subsequent owner must send a written notice of change of ownership of the roof within 30 days from change of ownership, by registered mail to KyungDong at its address set forth below.
2. A written notice of defect must be sent by registered mail to KyungDong at its address set forth below. The notice must contain the name and address of the owner of the claimed defective panel or panels and must describe the defect in detail.
3. This warranty shall not apply to any damage caused by not following the manufacturer's instructions for walking on the roof, and damage caused by defects, movement or subsidence in the structure on which the roof is installed, nor any damage caused by failure to follow the manufacturer's installation instructions. Whether a KyungDong stone coated steel roofing is leak-proof or not depends almost entirely on how the panels are installed and, therefore, no warranty is made by KyungDong as to whether roofs containing panels covered by this warranty will prove to be leak-proof. A separate warranty covering installation of the panels may be made available from the installation contractor.
4. This warranty is the only warranty KyungDong makes in respect of its sells. Dealers and installers of the KyungDong stone coated steel roofing are not authorized to extend or modify the terms of this warranty in any manner.
5. KyungDong shall have no liability for any consequential, incidental indirect or special damage or loss of any kind whatsoever (including but not limited to damage caused by leaks). Some states do not allow the exclusion or, limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
6. KyungDong shall have no liability for any damage when due to any of the following causes: earthquake, hurricane, tornado, cyclone, lightning, fire, acts of God, ice or weather of a catastrophic nature as defined by the United States Weather Bureau; harmful chemicals, surface discoloration due to air pollution, contamination caused by animals, birds or plants, fumes, corrosive vapors or normal weathering of surface; vandalism, misuse, physical abuse, riot, insurrection or civil disorder; negligence in or failure to provide reasonable and necessary maintenance of the roof panels to prevent an accumulation of surface dirt, staining or mildew.
7. There shall be no implied warranties of merchantability or fitness for any particular purpose beyond the term of this warranty or beyond the term prescribed by the laws of the state in which the panels are sold if that term is shorter than the term of this warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.
8. No warranty shall apply to any KyungDong stone coated steel roofing modified, altered or changed in design or function after it has left the factory, except when the alteration is required by the manufacturer's installation instructions. No warranty shall apply if any warranty repair work, except temporary emergency repairs, is done by any service or repair representative not approved by KyungDong.
9. The replacement of any KyungDong stone coated steel roofing by KyungDong shall not extend the term of this warranty except as required by law.
10. This warranty gives the original purchaser of KyungDong stone coated steel roofing specific legal rights and you may also have other rights under state or federal law.
11. This warranty shall not be binding on KyungDong unless the purchaser makes payment in full for the panels covered by this warranty.
12. If any provision of this "limited warranty" is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions shall nevertheless continue in full force without being impaired or invalidated in any way.

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## **1-2. LIABILITY AND WARRANTY**

### **1-2-1. LIABILITY**

This manual offers generally recommended installation application techniques only and should not be substituted for any local building code specifications. The recommended installation techniques proposed in this manual have been promoted by Kyungdong Ceratech Divine.

### **1-2-2. WARRANTY POLICY**

This warranty is subject to the following terms and conditions.

- Limited lifetime warranty
- Lifetime transferable material and workmanship limited warranty
- Twenty-year surface coating limited warranty

KyungDong Ceratech Co.,Ltd.(“KyungDong”) hereby warrants to the original property purchaser (“owner”) that each KyungDong stone coated steel roofing (“Product”) will : (1) remain free from manufacturing defects in workmanship and materials that would adversely affect the performance of the Products; (2) be resistant to blow-offs in wind velocities up to 120 miles per hour; and (3) resist hail damage, defined as follows: (a) penetration of hail stones completely through the panel; or (b) cracks or splits of the panel’s steel substrate around the point of impact, for life-time from the date of installation under the terms and conditions set out below.

To the extent of those Products actually containing defects in material or manufacturing workmanship that would adversely affect the performance of the Products, KyungDong shall either repair or replace the defective panel, provided KyungDong’s liability shall be limited to a total expenditure not to exceed the reasonable replacement cost of the particular defective panel during the first twenty (20) years after installation and declining annually on a prorated basis for material only during the remaining years.

KyungDong also warrants, for twenty years from the date of installation, if the surface coating of each Product will not unduly deteriorate as a result of manufacturing defects, exposure to weather and other circumstances of the roof, then KyungDong will, at its option, either repair or replace the panel(s) or apply KyungDong bond surface coating or similar surface coating to the panel(s); provided KyungDong liability with respect to the surface coating shall be limited to a total expenditure not to exceed the original cost of the particular panel or panels during the first two (2) years after installation and declining annually on a prorated basis during the remaining eighteen (18) years.

KyungDong will attempt to replace defective Products with the same color or design. However, color variations may exist between panels manufactured at different times and KyungDong may discontinue or change the design of a particular product profile. In any event, KyungDong reserves the right to replace the defective panel with a panel of similar design and color.

# **CHAPTER 2.**

## **MATERIALS, EQUIPMENT & SPECIFICATIONS**

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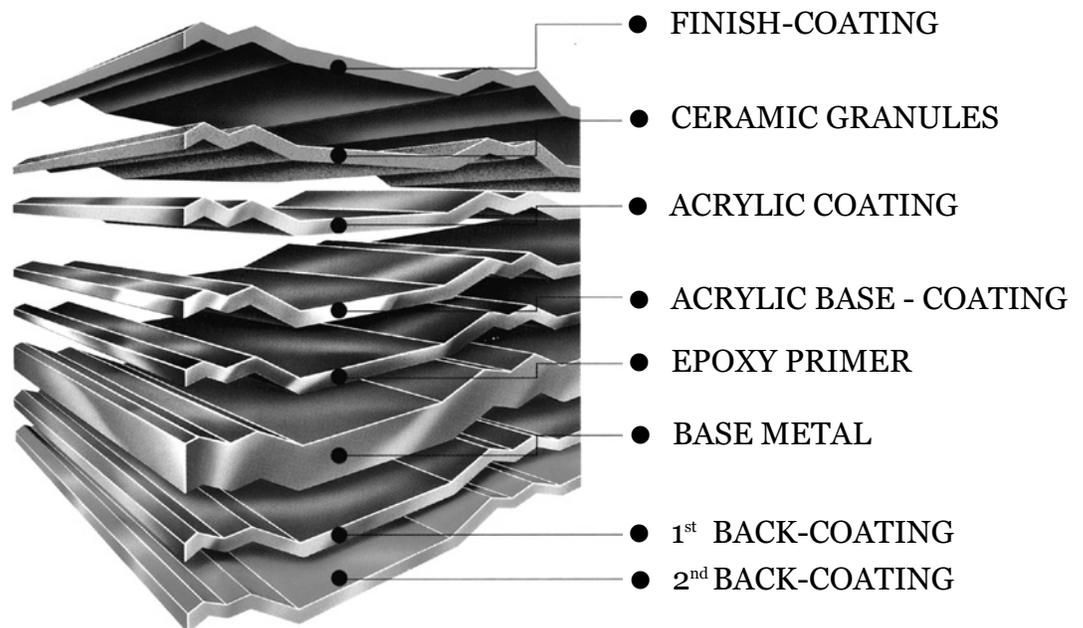
## 2-1. INTRODUCTION

This manual is prepared in order to show the recommended processes for new construction roofing and re-roofing with stone coated steel roofing system to the contractor, roof installer, distributor and architect. The descriptions and drawings in this manual are suitable for applications in the United States and subject to change without notice. International applications are mostly similar though may have some differences. If using this manual for applications not included, contact the KyungDong Divine Technical Division.

## 2-2. MATERIALS GENERAL DESCRIPTION

### 2-2-1. Descriptions

DIVINE is a high quality roofing tile with a continuous type coating pressed on the galvanized steel sheet attached to its front and rear; thus providing high durability and heat resistance. It has sophisticated designs in rich natural colors and fits various settings. All Divine panels and trim are manufactured with the same materials.



### 2-2-2. Features

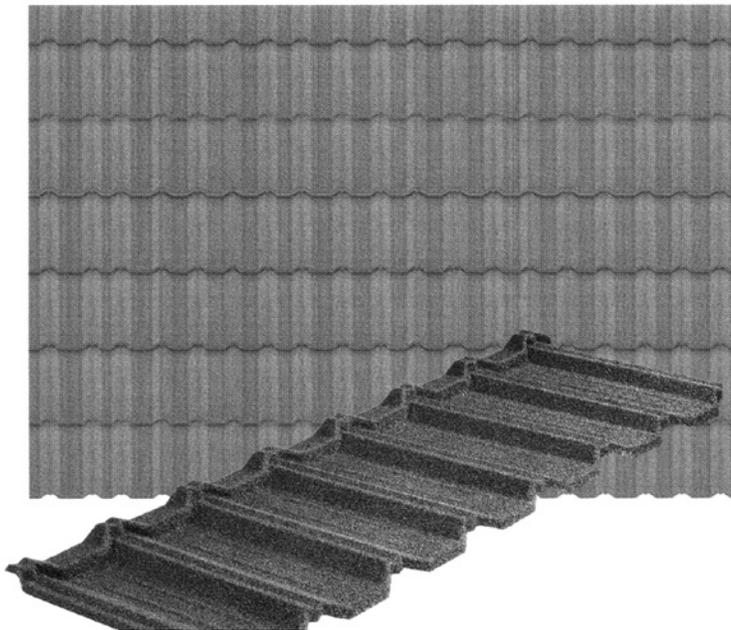
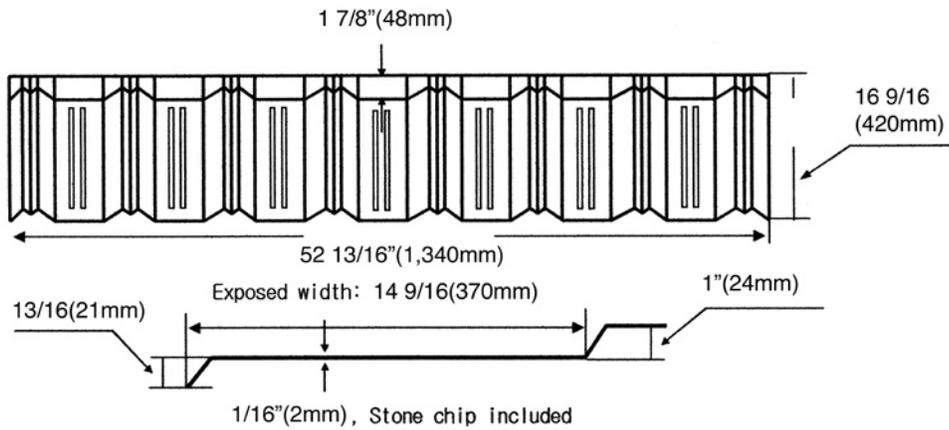
- Lightweight metal roofing materials
- Outstanding weathering, durability, heat resistance, and anti-corrosion properties
- A variety of rich natural colors with three-dimensional effects
- Self-manufacturing system ensures steady supply
- Easy work for cutting and bending

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### 2-2-3. Physical Properties

#### □ DIVINE

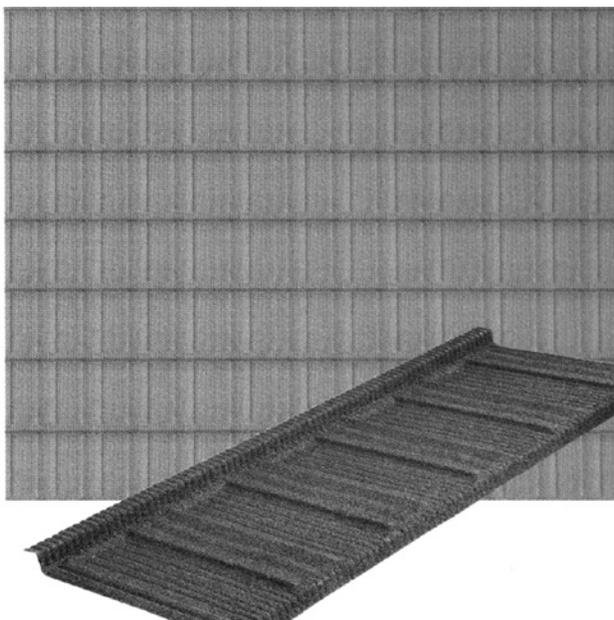
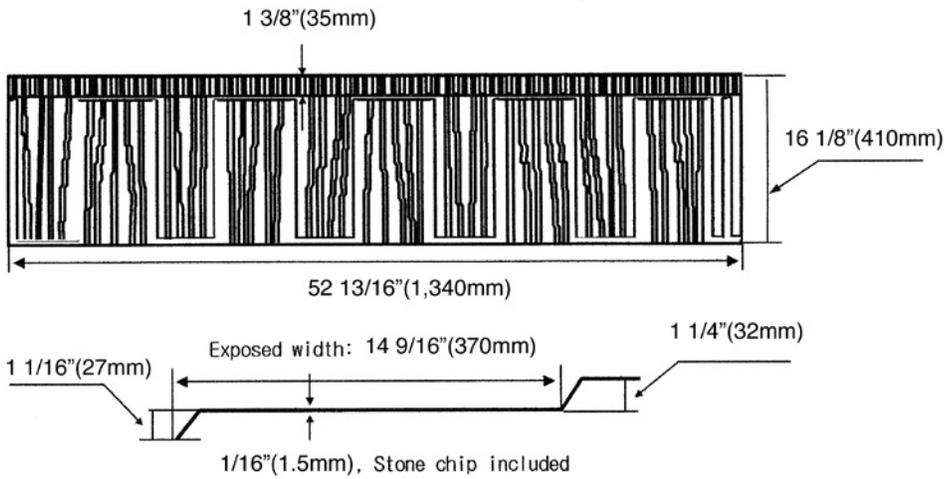
Total length: 52 13/16" (1,340mm)  
Exposed length: 50 7/16" (1,280mm)  
Exposed width: 14 9/16" (370mm)  
Bent height: 1" (25mm)  
Tile weight: 6.62lb (3.0kg)  
Tile coverage ratio: 5.27sq.ft (0.49m<sup>2</sup>)  
Coverage ratio: 22.7 tiles/sq.ft (2.11 tiles/m<sup>2</sup>)



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**□ DIVINE Shake**

Total length: 52 13/16" (1,340mm)  
Exposed length: 50 7/16" (1,280mm)  
Exposed width: 14 9/16" (370mm)  
Bent height: 1" (25mm)  
Tile weight: 6.62lb (3.0kg)  
Tile coverage ratio: 5.27sq.ft (0.49m<sup>2</sup>)  
Coverage ratio: 22.7 tiles/sq.ft (2.11 tiles/m<sup>2</sup>)

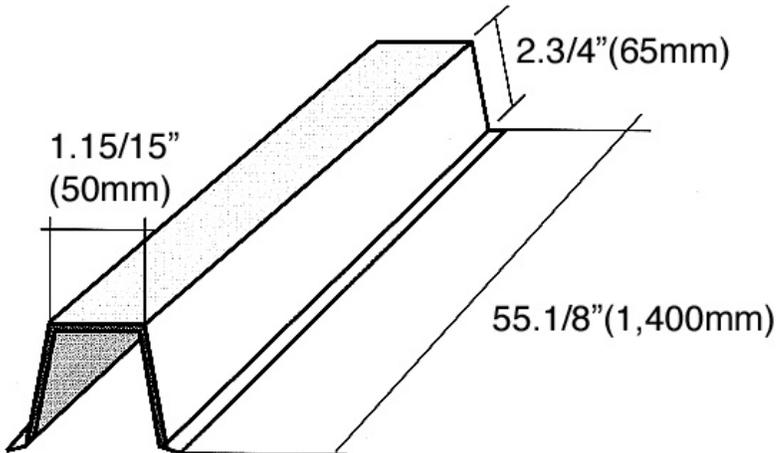
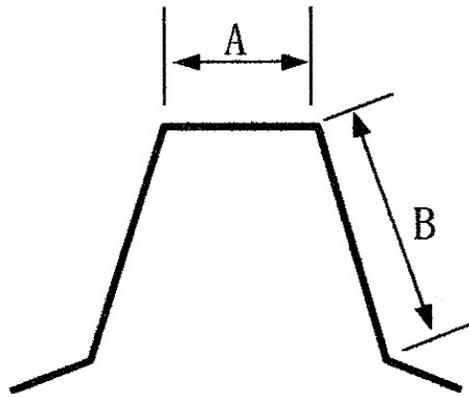


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# Ridge

## □ DIVINE RIDGE

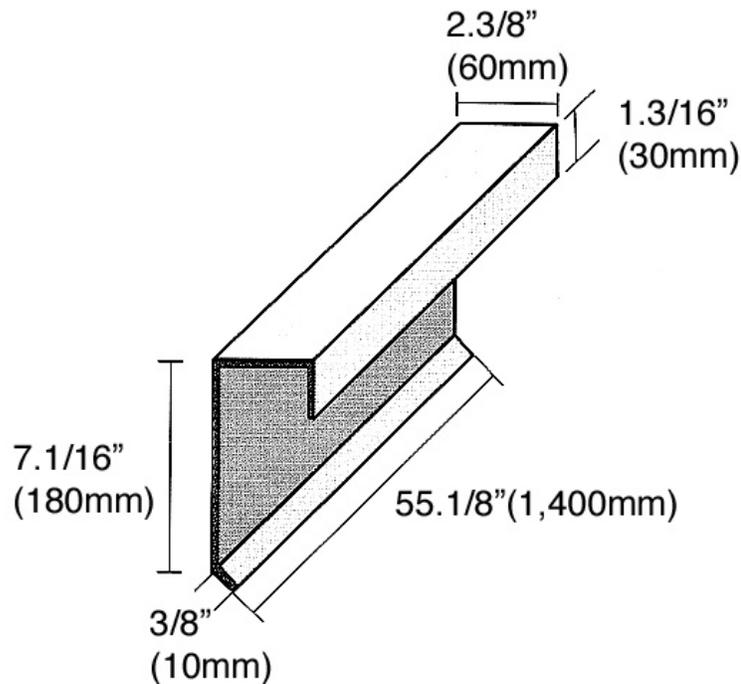
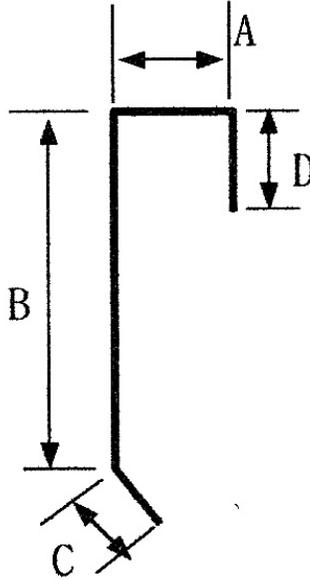
Total length: 55 1/8"(1,400mm)  
Exposed length: 51 3/16"(1,300mm)  
Exposed width: 1 15/16"(50mm)  
Bent height: 2 9/16"(65mm)  
Tile weight: 2.9982lb(1.36kg)  
Tile coverage ratio:  
Coverage ratio:



# Fascia Metal

## □ DIVINE FASCIA METAL

Total length: 55 1/8"(1,400mm)  
 Exposed length: 51 3/16"(1,300mm)  
 Exposed width: 2 9/16"(60mm)  
 Bent height: 7 1/8"(180mm)  
 C: 3/8"(10mm)  
 D: 1 3/16"(30mm)  
 Tile weight: 4.1887lb(1.90kg)  
 Tile coverage ratio:  
 Coverage ratio:



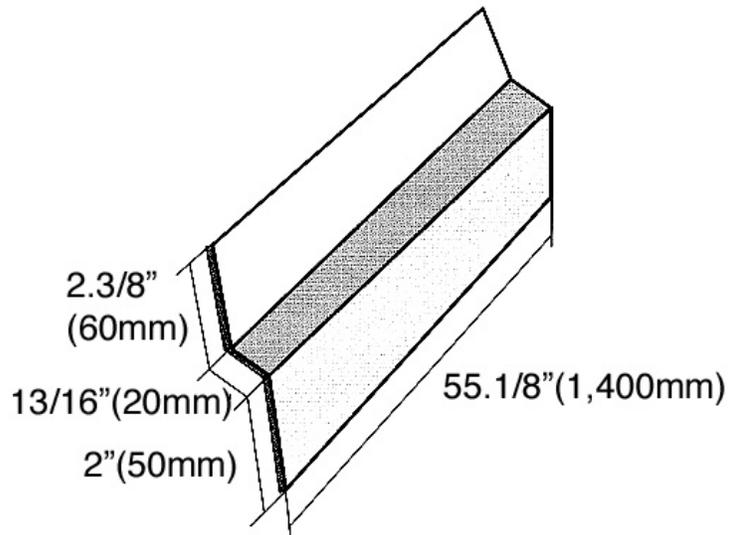
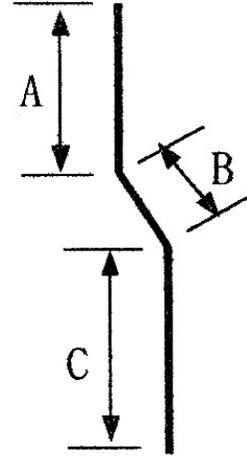
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# Flashing

## DIVINE FLASHING

Total length: 55 1/8"(1,400mm)  
Exposed length: 51 3/16"(1,300mm)

A 2 3/8"(60mm)  
B 13/16"(20mm)  
C 1 15/16"(50mm)  
Tile weight: 1.9400lb(0.88kg)  
Tile coverage ratio:  
Coverage ratio:



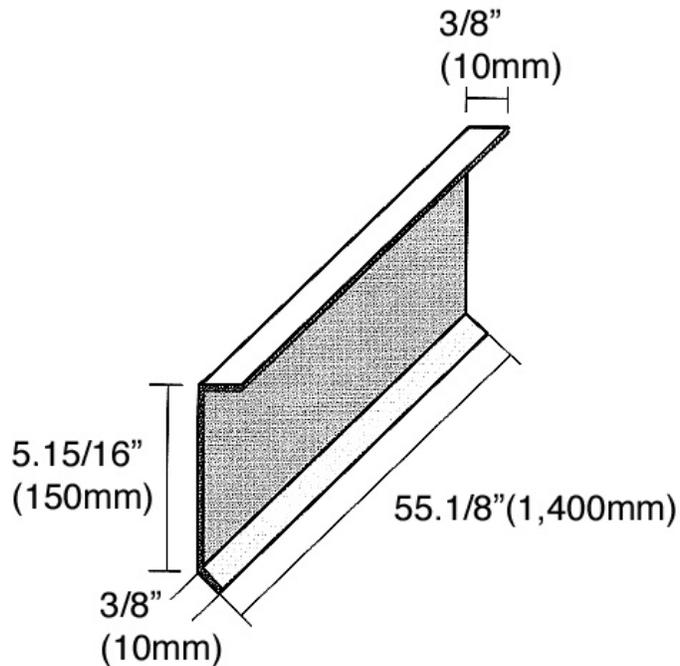
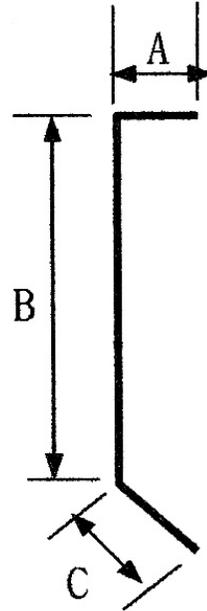
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## Eaves Metal

### □ DIVINE EAVES METAL

Total length: 55 1/8"(1,400mm)  
Exposed length: 51 3/16"(1,300mm)

A 3/8"(10mm)  
B 5 15/16"(150mm)  
C 3/8"(10mm)  
Tile weight: 2.5353lb(1.15kg)  
Tile coverage ratio:  
Coverage ratio:



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# Flat

**DIVINE FLAT**

Total length: 55 1/8"(1,400mm)

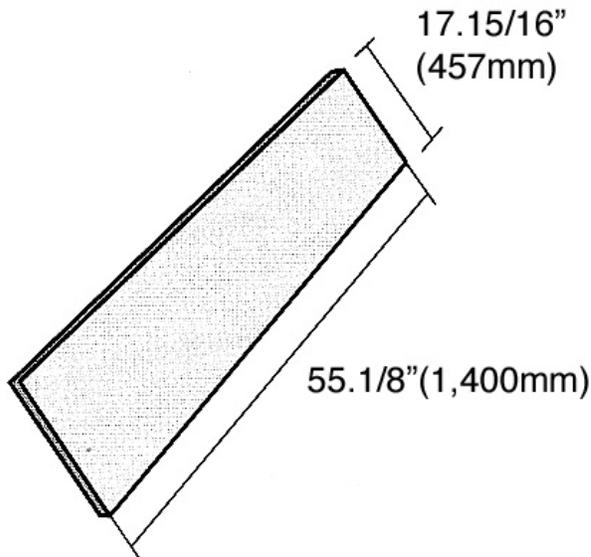
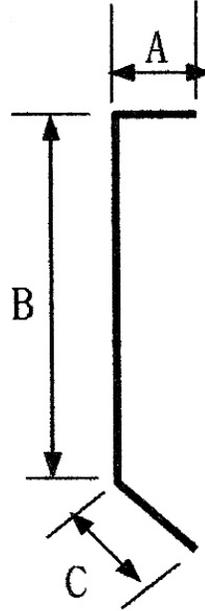
Exposed length: 51 3/18"(1,300mm)

Bent height:

Tile weight: 1.9400lb(0.88kg)

Tile coverage ratio:

Coverage ratio:



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## Divine Trim

### A & C Cap

Total length: 15 3/4"(400mm)

Exposed length:

Exposed width 5 3/4"(147mm)

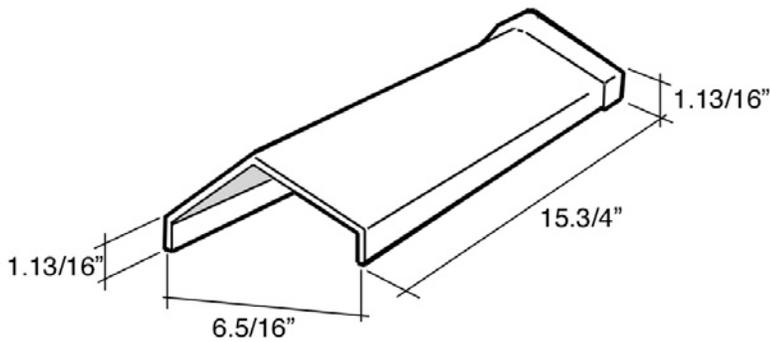
Bent height: 3 11/16"(94mm)

Tile weight:

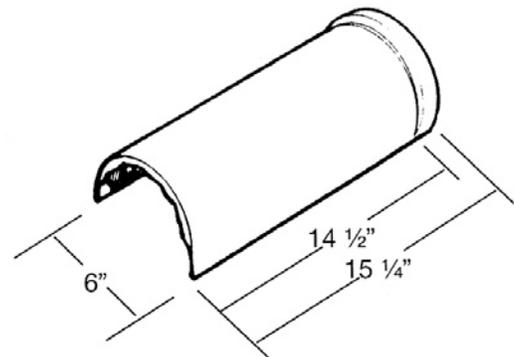
Tile coverage ratio:

Coverage ratio:

A Cap



C Cap



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### **a) Special Flashings**

Special Flashings shall be manufactured from at least 28gauge G-90 Galvanized or  
®GALVALUME primed or resin coated steel.

### **b) Paint & Sealants**

Color matching of paint is recommended. This paint is effective for color coordinating  
the vent pipes, chimney saddle, flashings etc.. A tube style sealant is recommended.  
It must be of a type known as a "Natural Cure". Do not use acidic sealants.

### **c) Battens & Counter Battens**

#### **Steel**

Steel battens may be used. They should be a minimum. 22AWG gauge corrosion  
resistant material and shaped either 'Z' section or a 'C', 'J', 'U'.

Each shape should have as close to right angles as possible. Minimum batten size is 1" high X 1" wide.  
Steel battens must be shaped to resist the design loads of the building.

#### **Wood**

To decrease waste, it is recommended to use lengths longer than 10 ft.

Usually 1" X 4" of counter battens are used.

Please note Table 1 - 1, 1 - 2, 2 - 1 & 2 - 2 from Appendixes for using "Fasteners".
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## 2-3. Equipment

### a) Bender

A bender is used to bend Valley, Hip, and Rake pieces.

Size: 36”H X 18”W (914 X 450 mm)

Weight: 41lb (18.6 kg)

### b) Bender Attachment

A bender attachment is used to bend full panels to make a ridge.

Size: 54”L X 12” D (1,372 X 300 mm)

Weight: 56 lb (25.4 kg)

### c) Cutter

A cutter is used to cut the panels for Ridge, Valley, Hip, and Rake areas.

It is possible to dismantle a cutter in order to transport easily.

Size: 44”L X 24”H (1,118 X 600 mm)

Weight: 37 lb (16.8 kg)

### d) Batten Spacers

Batten spacers are used to lie out one batten row at a time.

Batten spacing is from the front face of one batten to the front face of the next.

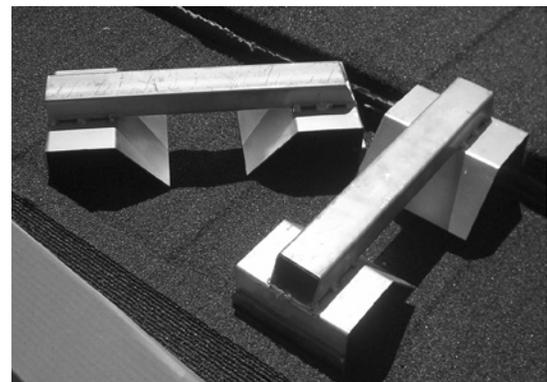
It is recommended to position the batten spacer with the arrow associated with the respective panel towards the ridge to space battens accurately for that profile.

### e) Hand Tools

Hand Stapler, Nail Pouch, Electric Drill, Circular Saw, Chalk or Construction Marker, Caulking Gun, Measuring Tape, Metal Shears/Snips, Smooth-Faced Claw Hammer, String Line, Extension Cord, Pop Rivet Gun, Pinch Bar (2: Cats Paw type)



Bender



Divine Batten Spacer



cutter

# **CHAPTER 3.**

## MATERIAL ESTIMATING & GENERAL INFORMATION

## 3-1. MATERIAL ESTIMATING

### 3-1-1. Divine Estimating

In order to estimate correctly, it is necessary to measure a combination of the fascia rafter, hip, rake and valley. Because Divine and Divine Shake's sizes are different, these products use different formulas to calculate the number of panels. The three illustrations below show how to use the formulas to turn feet into divine roof panels and calculate the total number of panels for each shape of roof. Due to the waste of the product at hips and valleys, additional product may be needed as compensation.

Formulas:

# of panels from fascia to ridge = Rafter length / 1.2

# of panels from gable end to gable end = Roof length / 4.2

#### a) Straight Gable Roof

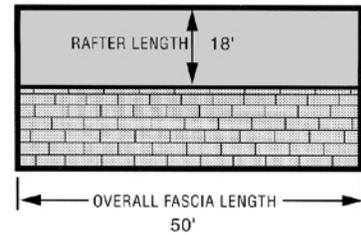
Roof Length 50' / 4.2 = 14 panels across

Rafter Length 18' / 1.2 = 15 panel rows up

(Formula)

14 panels across X 15 panel rows up = 210 panels

210 panels X 2 opposite side = 420 total panels



#### b) Hipped Roof

Roof Length 50' / 4.2 = 14 panels across

Rafter Length 18' / 1.2 = 15 panel rows up

14 panels across X 15 panel rows up = 210 panels

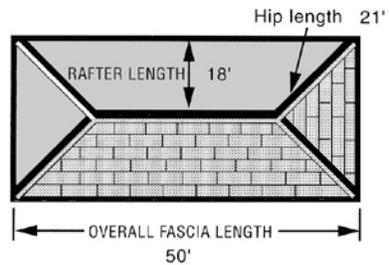
210 panels X 2 opposite side = 420 total panels

Hip Length 21' X 4 Hips = 84'

(Formula)

84' of hip X 0.4 = 33.6 additional panels for cuts (round up)

420 total panels (straight gables (a)) + 34 additional = 455 total panels



#### c) Complex Gable Roof with Hips and Valleys

(Formula)

Roof length / 4.2 = # of panels gable to gable

Rafter length / 1.2 = # of panels fascia to ridge

Section A

Roof length 50' / 4.2 = 14

Rafter length 18' / 1.2 = 15

14 X 15 X 2 = 420 panels (both sides of roof)

Section B

Roof length 33'6" / 4.2 = 10

Rafter length 18' / 1.2 = 15

10 X 15 X 2 = 300 panels (both sides of roof)

Section C

Roof length 8' / 4.2 = 3

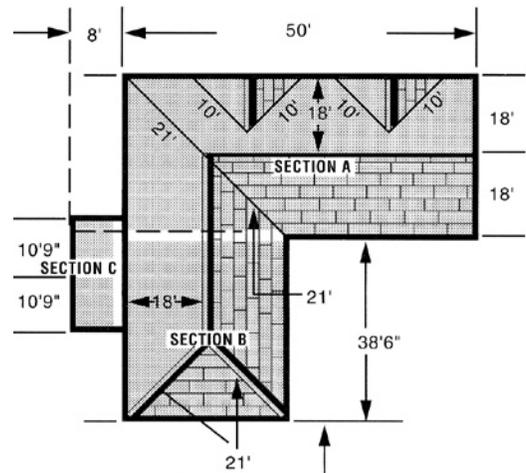
Rafter length 10'9" / 1.2 = 9

3 X 9 X 2 = 54 panels (both sides of roof)

420+300+54

(Total Hip and Valley Length on Entire Roof 124 X 0.4)

= 824 Total Panels Required



### 3-1-2. Divine Shake Estimating

In order to estimate correctly, it is necessary to measure a combination of the fascia rafter, hip, rake and valley. Because Divine and Divine Shake's sizes are different, these products use different formulas to calculate the number of panels. The three illustrations below show how to use the formulas to turn feet into divine roof panels and calculate the total number of panels for each shape of roof. Due to the waste of the product at hips and valleys, additional product may be needed as compensation.

Formulas:

# of panels from fascia to ridge = Rafter length / 1.2

# of panels from gable end to gable end = Roof length / 4.2

#### a) Straight Gable Roof

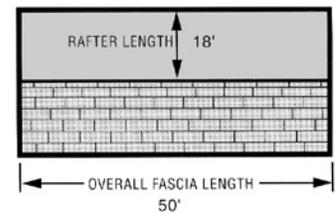
Roof Length 50' / 4.2 = 15 panels across

Rafter Length 18' / 1.2 = 15 panel rows up

(Formula)

15 panels across X 15 panel rows up = 225 panels

225 panels X 2 opposite side = 450 total panels



#### b) Hipped Roof

Roof Length 50' / 4.2 = 15 panels across

Rafter Length 18' / 1.2 = 15 panel rows up

15 panels across X 15 panel rows up = 225 panels

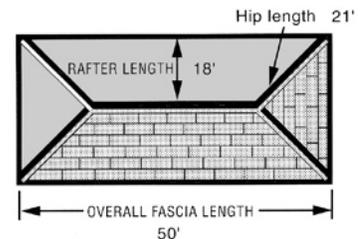
225 panels X 2 opposite side = 450 total panels

Hip Length 21' X 4 Hips = 84'

(Formula)

84' of hip X 0.8 = 68 additional panels for cuts (round off)

450 total panels (straight gables (a)) + 68 additional = 518 total panels



#### c) Complex Gable Roof with Hips and Valleys

(Formula)

Roof length / 4.2 = # of panels gable to gable

Rafter length / 1.2 = # of panels fascia to ridge

Section A

Roof length 50' / 4.2 = 15

Rafter length 18' / 1.2 = 15

15 X 15 X 2 = 450 panels (both sides of roof)

Section B

Roof length 33'6" / 4.2 = 10

Rafter length 18' / 1.2 = 15

10 X 15 X 2 = 300 panels (both sides of roof)

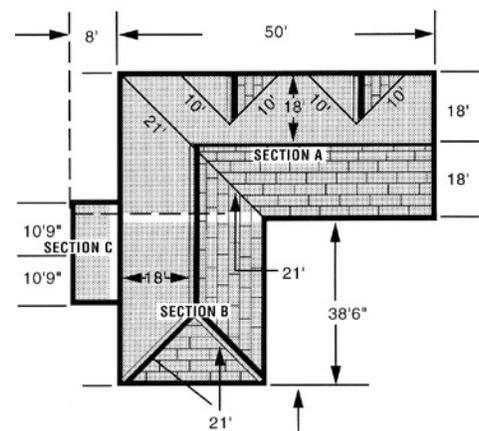
Section C

Roof length 8' / 4.2 = 3

Rafter length 10'9" / 1.2 = 9

3 X 9 X 2 = 54 panels (both sides of roof)

420+300+54+(124' X 0.8 Total Hip and Valley Length on Entire Roof)= 904 Total Panels Required



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### 3-1-3. Accessories Estimating

#### a) Mission & Shake Trim

A small amount of trim should be considered when computing required accessories.

Measure the length in feet of all rakes, hips and ridges, and then divide this total by 1.2.

Example: Total ridge, hip, rake measurement = 150 ft.

$150 \text{ ft.} / 1.2 = 125 \text{ mission trim.}$

#### b) Fascia, Valley & Z-bar Metal

When estimating the roof, compute the needed fascia metal face width.

The following are basic formulas for fascia to fit different roof style.

Rock Roof with no existing eave metal  
3" fascia (89mm)

Rock Roof with existing eave metal  
3" ~ 5" (89 ~ 125mm) fascia

Comp / Fiberglass Shingles  
3" ~ 5" (89 ~ 125mm) fascia

Wood Shingles  
3" ~ 5" (89 ~ 125mm) fascia

Wood Shake  
5" (125mm) fascia

Fascia, Valley, Z-bar etc. is estimated and ordered in 10 foot lengths.

Calculate the exact valley by referring to the Materials and Equipment section of this manual.

#### c) Battens & Counter Battens

Battens  
2" X 2" size is needed for both new construction and re-roofing.  
Estimate 100' of batten per 100 sq.ft of roof area.

Counter Battens  
1" X 4" size is needed for re-roofing. Estimate 60' of counter batten per 100 sq.ft of roof area.  
Notice: Fascia metal is not needed with new construction if the fascia board is raised to the height of the batten above the roof-sheathing surface.  
The same estimating formula is applied to mission & shake trim.

---

## **3-2. GENERAL INFORMATION**

### **3-2-1. Installation Labor**

For cost effective and proper installation, the job needs a minimum. of two roofers from start to finish.

It takes approximately 3~4 days to finish a simple 35 sq.ft roof with two experienced installers.

### **3-2-2. Footwear**

It is recommended that rubber soled athletic shoes or similar soft soled footwear be worn to provide greater traction for safety and to avoid a panel surface damage.

### **3-2-3. Roof Traffic**

When walking on Divine products, installers should walk on the front edge of the product, in the middle of the low parts, with the installers' weight on the balls of the feet.

In order to prevent denting damage of the panels from frequent traffic, it is recommend to install 1" X 4"(25 X 100mm) battens 4 ~ 5 ft. (1.2 ~ 1.5m) long between each regular batten row in a ladder type row up the roof where the excessive traffic pattern is to be.

### **3-2-4. Handling**

It helps to use the touch-up kit to repair small damage on the panel. If surface damage occurs to the panel, or a panel is punctured in areas other than specified nailing points, it should be replaced.

### **3-2-5. Transporting & Storage**

If panels are stored or transported in wet weather, they must be covered to avoid damage.

### **3-2-6. Packaging**

Each pallet of Divine or Divine Shake weighs around 2,060 lbs(935 kg).

### **3-2-7. Underlayments**

All underlayments must be of a type and specification that is allowed by the local building official.

---

**Re-roofing 30 lb felt;**

Traditional type 30 organic fiber felt of two layers of type 15 organic fiber felt or equivalent is only required in area experiencing heavy snow, rainstorm, or dust.

**New construction 30 lb felt;**

One layer of type 30 or two layers of type 15 or equivalent are proposed solid sheathed or over spaced surfaces to prevent damage of the structure during roof installation.

When open rafters or trusses are used, A reinforced underlayment is suggested to avoid “sagging” of the underlayment.

**3-2-8. Roof Pitch**

The Divine interlocking design performs on any pitch from 2:12 (11 degrees) minimum to a vertical face.

For slopes less than 2:12 (11degrees), confer with your local building official.

For only decorative roofing, Divine panels below this minimum pitch are allowed.

Divine panels should be installed over an accepted weathertight underlayment system as per the code.

**3-2-9. Building Codes**

The installing contractor must check with and meet all local and state building code requirements before installation starts.

**3-2-10. Extreme Weather Conditions**

**a) Wind Uplift**

Standard Installation:

Divine panels installed in accordance with this manual using a minimum of five(5) 6d-2” (50mm) long common galvanized or corresponding mechanically manufactured nails per panel exceed the UBC code requirements for: 80/40/B equal to 56 psf. uplift (2.68 kpa).

Extreme Wind Condition

Winds not to exceed 80mph.

Building not to exceed 40ft.

Terrain conditions exposure B.

For high wind areas greater than 80/40/B, special buildings up to 48ft. (14.68m) wide by 100ft. (30.48m) long, special fastener patterns are needed for the roof ‘field’ and roof ‘edge’ areas. The roof ‘edge’ averages 48” (1,220mm) in from the roof perimeter, (along the fascia and up the riser).

**b) Freeze Thaw Conditions;**

Special Valley metal and underlayments may be needed. See the Re-roofing section of this manual for more detail on this subject.

# **CHAPTER 4.**

## **NEW CONSTRUCTION AND SPECIFICATION INFORMATION**

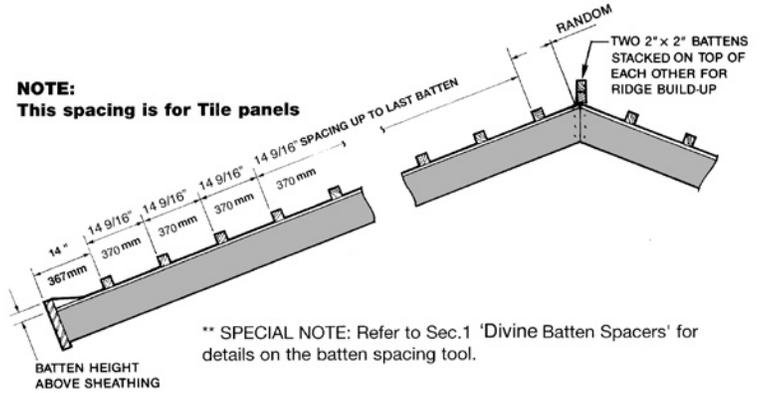
## 4-1. General Framing Information

### 4-1-1. Batten Spacing

Divine panels are installed using wood or steel type batten strips that are 2" x 2" (50 x 50mm), ripped from lumber of a grade standard or better.

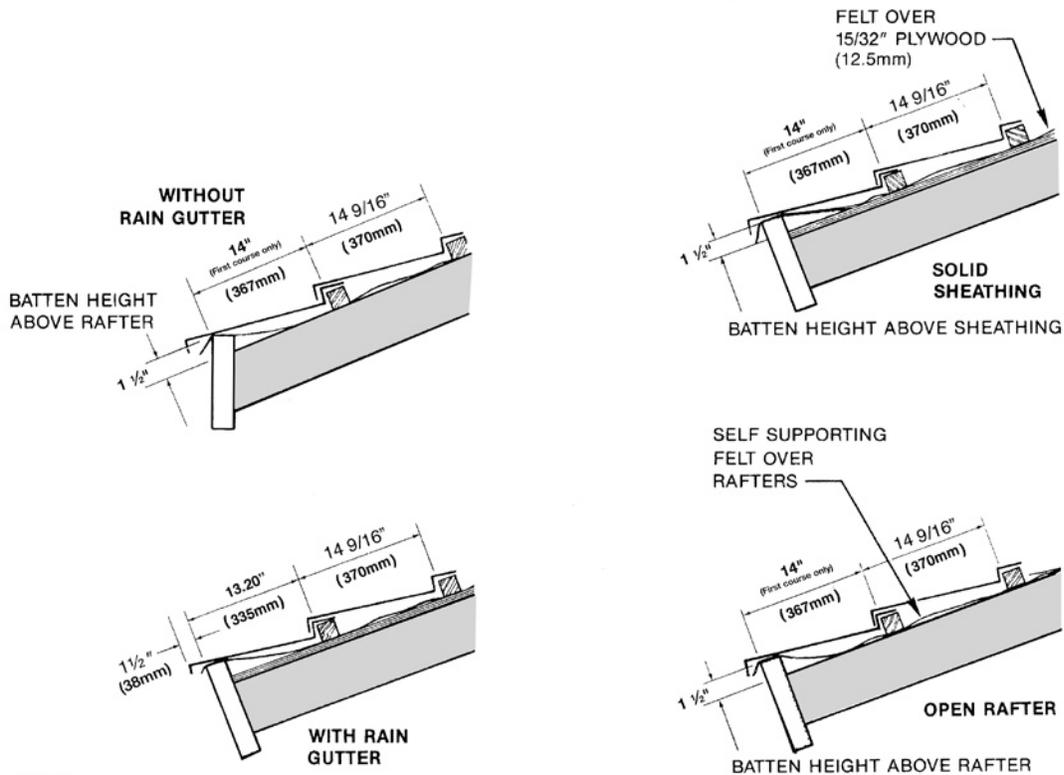
Spacing is important to the panel layout, as each panel fits neatly against the front face of one batten to the next.

The first batten up from the fascia is consistently placed at 14" (367mm) and the last batten at the ridge is random relying on the rafter length.



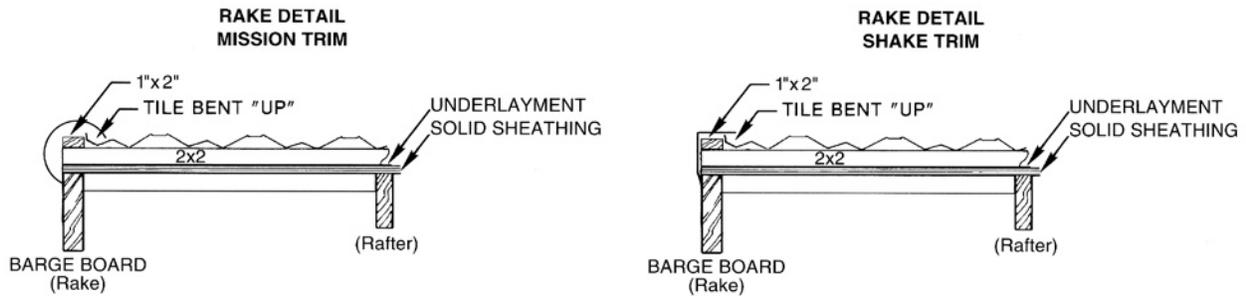
### 4-1-2. Fascias

The fascia should be placed above the sheathing or rafters by the height of the batten, 1" (38mm).



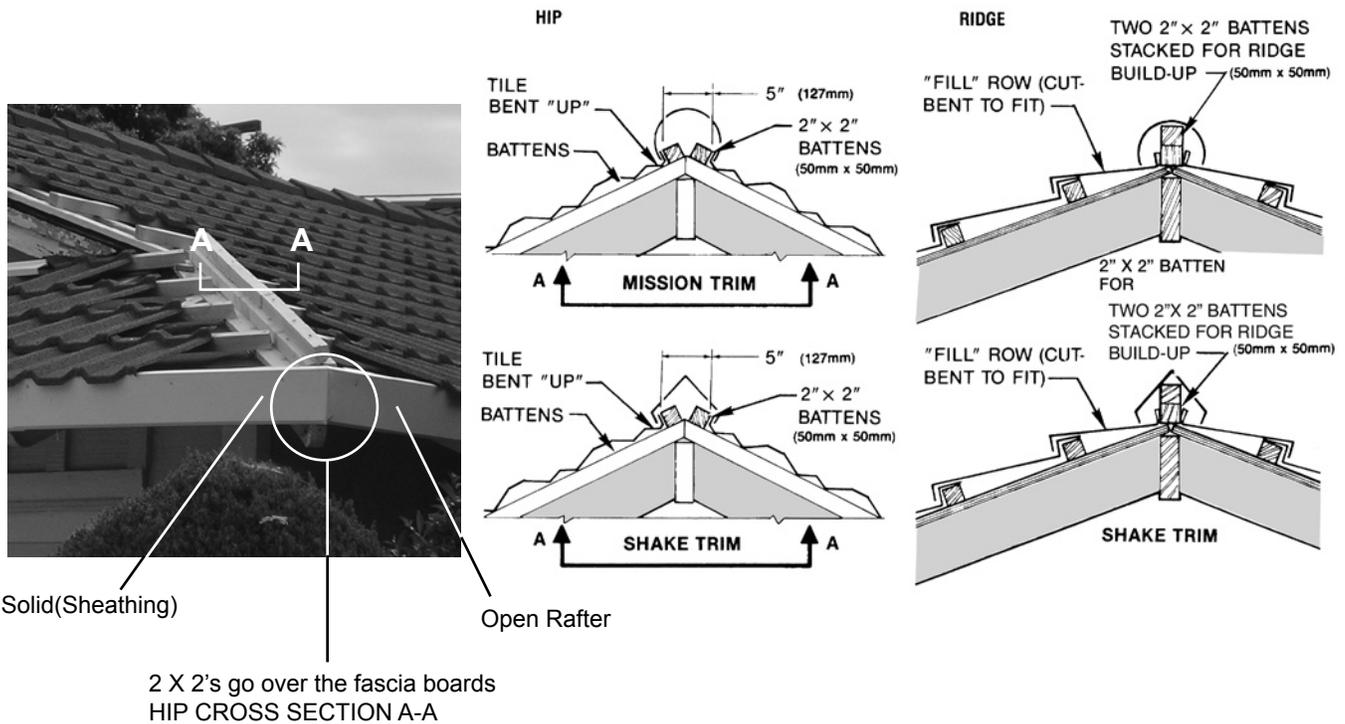
**NOTE:**  
This spacing is for Tile panels only.  
Spacing for Shake after first course is 14 9/16".

### 4-1-3. Rake Detail



### 4-1-4. Ridge & Hip Nailers

The installer performs build-up when applying the battens.

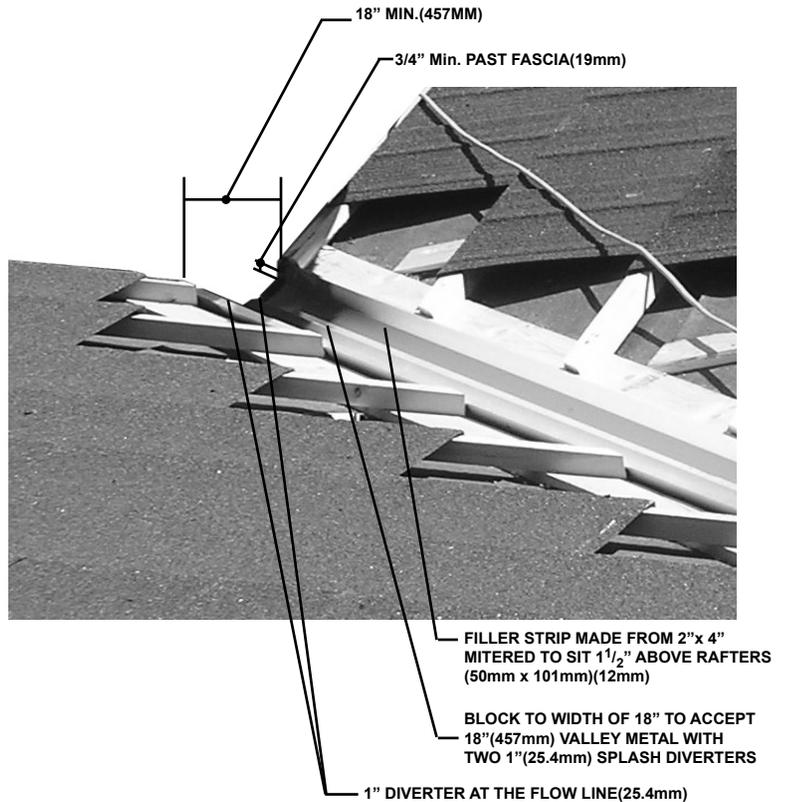


#### 4-1-5. Valley / Open Rafter

First, place a strip of underlayment under the valley trough.

Put valleys on top of the rafter or trusses between two strips of lumber spaced to allow the valley metal. The Divine panel battens will canterlever up onto these strips sliding down either side of the valley. The 18" (450mm) valley is recommended to be applied with open rafter framing.

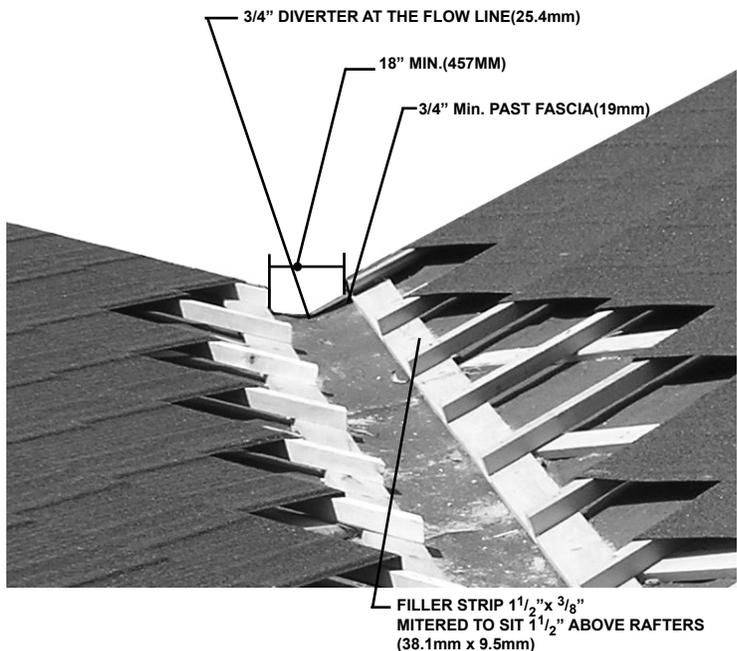
See special installation procedures of this manual for snowfall areas.



#### 4-1-6. Valley / Solid Sheathing

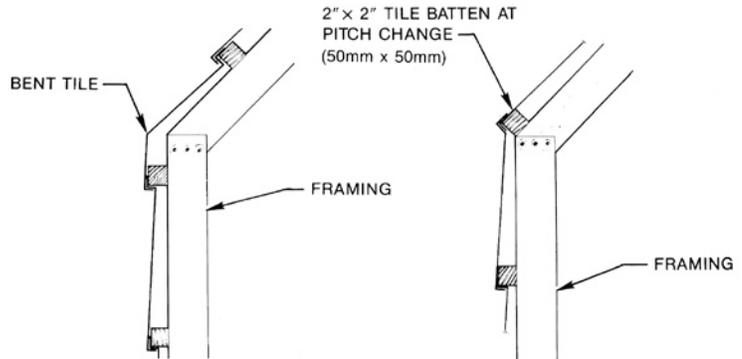
Place lumber strips down either side of the valley metal. This prevents squashing of the valley return flange by the canterlevered battens. "open" or "closed" valley methods are admittable. In heavy snow and severe freeze/thaw conditions, use "open" valley method. (See special

installation procedures section of this manual.)



### 4-1-7. Mansard / Facades

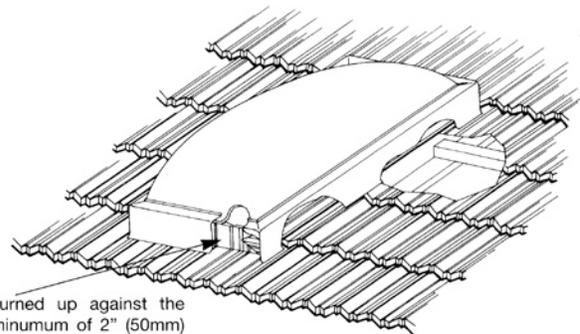
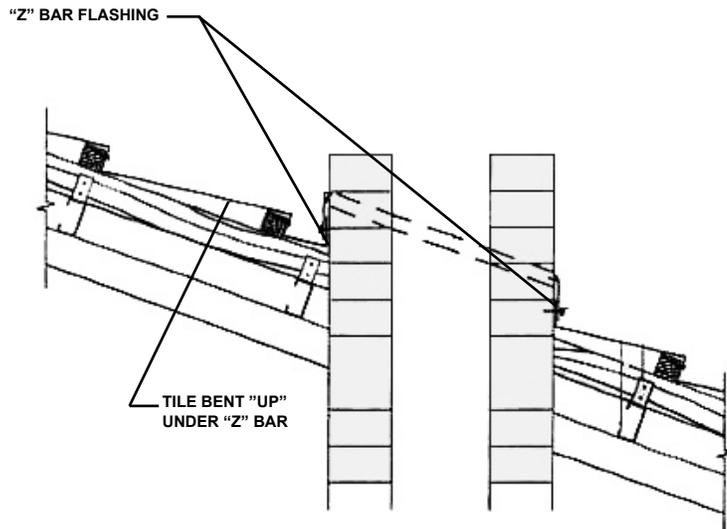
A batten structure is acceptable for Divine roof panel system. Wood battens are 2" X 2" (50 X 50mm) nominal or 1" high steel type. A vertical wall or steep angled mansard is installed in the same way as for lower pitched structures.



### 4-1-8. Flashing Details, Chimneys, Skylights etc.

Chimneys, skylights, and other square cornered roof protrusions are flashed with the Divine panels. It is suggested that square cornered protrusions larger than 48" (1,220mm) wide are flashed at the back with a custom metal saddle.

The Divine panel is bent up against the chimney or skylight, and counterflashed with Z-bar, 3" (87.5mm) fascia metal stepped flashing, or the skylight down bent flange.

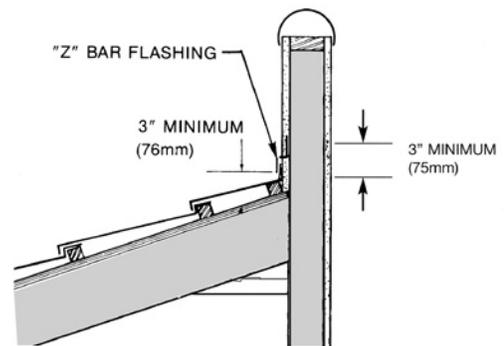
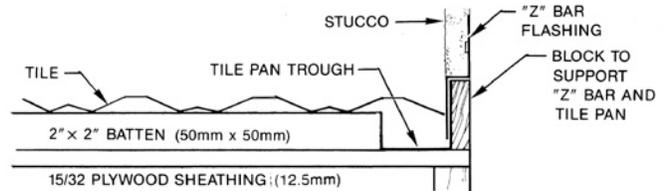


DIVINE PLATE turned up against the skylight curb a minimum of 2" (50mm) and sealed.

#### 4-1-9. Vertical Wall Details

Divine roof panels are able to be turned up under a Z-bar type flashing. When stucco or other types of exterior cladding are installed, a “tile pan” may be used.

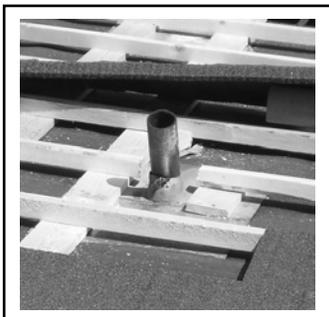
Notice: All exterior cladding including stucco should be completed in advance Divine panel installation.



#### 4-1-10. Pipe Flashing Details

A pliable type of flashing must be applied around all vent pipes and all roof penetrations. Buildings requiring a “dry-in” condition must have all conflicting sub-trades complete their job before installing Divine roof panels. If a “dry-in” state is required use two vent flashings per vent penetration, the first should be a regular galvanized vent flashing, sealed with the roof felt/deck and the other one is for use with the Divine panels.

Do not use copper, aluminum, or lead flashings without a parting barrier between different materials.



Base Flashing Galvanized for “DRY IN” state



Full tile installed around pipe

**FLASHING DRESSED TO TILE CONTOURS**



Tile section fitted over Flashing

---

## 4-2. Steel Framing

### 4-2-1. General Information

These details demonstrate different types of steel framing using trusses to fit a variety of applications. They are recommended details only and there are several more ways a steel framed structure can be connected. The design possibilities for steel framing are unlimited and can be used to defeat unusual design structure troubles on flat roof conversions, mansards and for complete steel structures.

### 4-2-2. Underlayment

When the panels are to be installed over open rafters/trusses, a reinforced underlayment is necessary.

### 4-2-4. Framing Details

The rafter or truss system on a steel framed structure is generally produced from galvanized steel in 22 ~18 gauge designed to meet the roof spans required. When using the Divine system, the “channel” metal, usually used as purlins, is spaced at 14 9/16” (370mm) for Shake or 14 3/8” (365mm) for Tile from the front of one channel to the next and forms the Divine panel batten. To decide the number of rows of channel required for a particular roof area, separate the rafter length by 1.2. (Check sec. 2 Material Estimating).

### 4-2-5. Framing Materials

Steel channels can be produced into numerous shapes to provide the required strength. Generally, the “Hat” channel require two fasteners is used. Other types are: “J” channel. “C”, “U” or “Z” channels are requiring only one fastener per channel and rafter/truss intersection.

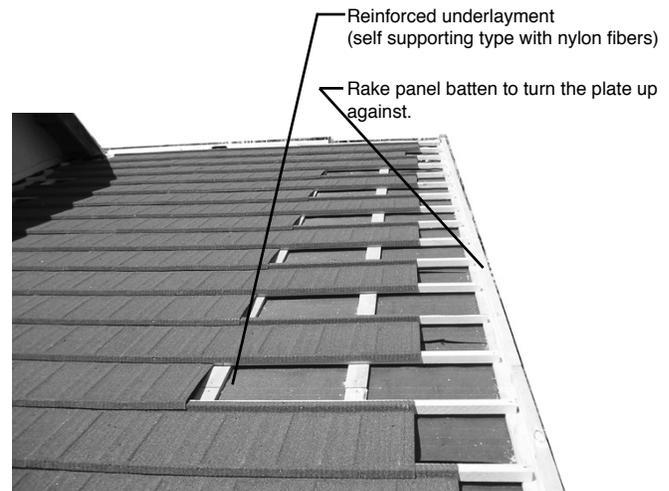
Some types of channels are admittable, from traditional “hat” to “C”. They should be manufactured from minimum 22 (0.64mm) gauge corrosion resistant material and are minimum 1 (38mm) in height and have right angled bends (90 degrees).

Steel battens shall be designed to resist the loads of the building.

At the fascia a “J” or “C” channel is recommended, allowing the use of Divine fascia metal.



### R RAKE & FASCIA



Reinforced underlayment  
(self supporting type with nylon fibers)

Rake panel batten to turn the plate up  
against.

Refer to page 1 for Important Note  
on open-rafter roof decks

#### 4-2-6. Valley Details

Blocking of the valley intersection is necessary where the steel battens meet with the valley metal.

Divine Tile turned down on the inside of each splash diverter. Sealant can be used to provide a watertight seal.

Reinforced underlayment (self supporting type with nylon fibers)

**V VALLEY**



18" wide, double splash diverters.

#### 4-2-7. Ridge & Hip Areas

The installer should use a section of channel to secure trim pieces at all hip and ridge areas. The channel shall be placed a minimum of 2" (50mm) above the channel used for battens. This takes consideration of the required Divine panel bend-up and trim installation.

Special Note: For details on pipe flashings, Divine panel & trim installation, and other details, please refer to the re-roofing chapter of this manual.

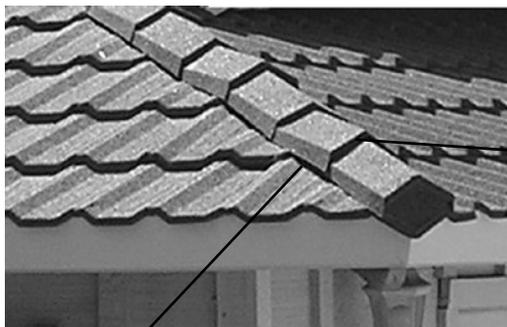
#### RIDGE / RAKE GABLE



Two "C" channels stacked to form a 5" wide ridge beam.

Rake battens to turn the Divine pannel up against.

#### HIP



Trim cap "C" channels stacked on top of the "C" channels below.

Two "C" channels stacked on top of the Divine panel batten channels.

# **CHAPTER 5.**

## **RE-ROOFING & SPECIAL INSTALLATION DETAILS**

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## 5-1. RE-ROOFING GENERAL INSTRUCTION

Divine products are designed with a distinct technique that allows them to be installed over existing roofs without getting rid of the existing roofing material. This is accomplished by installing a new frame on top of the existing roof to which the Divine product can be installed.

This chapter will take you through a step-by-step procedure on how to re-roof with Divine products over an existing roof. Each section will include: what the process is, the procedure on the roof, purpose, and detailed illustrations showing the stages. Pay attention to all warning signs; they explain important information about the procedure. A similar step-by-step procedure applies when re-roofing over other shapes of roofs. Refer to the 'Special Installation Procedures' for specific details when re-roofing over other materials.

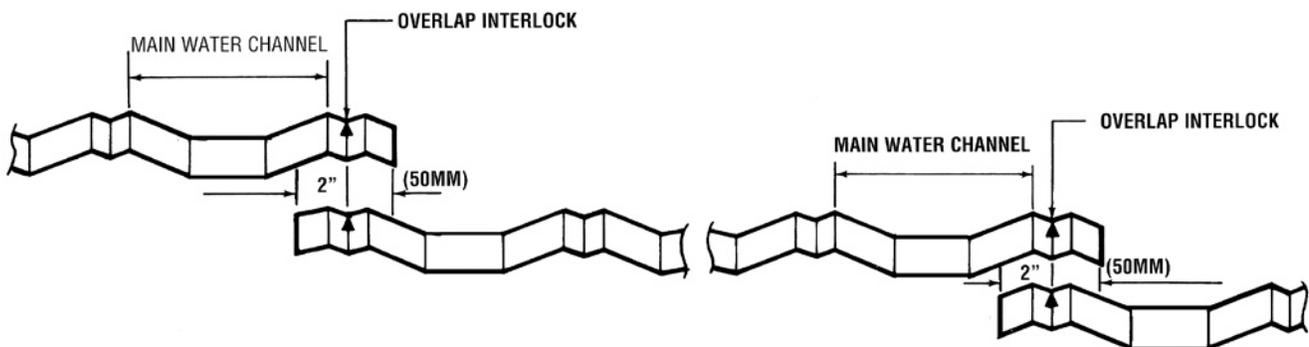
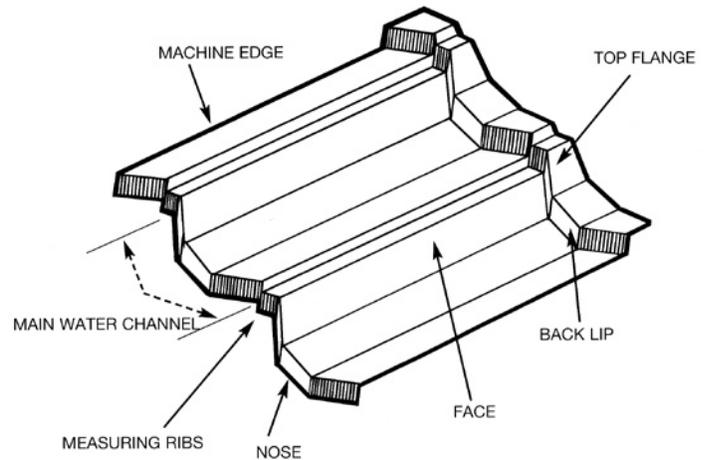
Battens for re-roofing are:

Counter-battens 1" X 4" (25 x 100mm)

Battens 2" X 2" (50 x 50mm)

It is vital to remember when installing Divine panels that they should always be:

- a) Placed from the top down
- b) Extended over the Fascia Build-up
- c) Bent down at Valley
- d) Bent up at Rakes, Ridges, Hips, and Chimney/Roof-to-Wall areas



## 5-2. RE-ROOFING OVER SHAKE PROCEDURE

### 5-2-1. Preparation of The Existing Roof Cutback

#### a) Purpose

To construct a solid foundation to build from.

Perimeter roughly saw set take out surface secure available

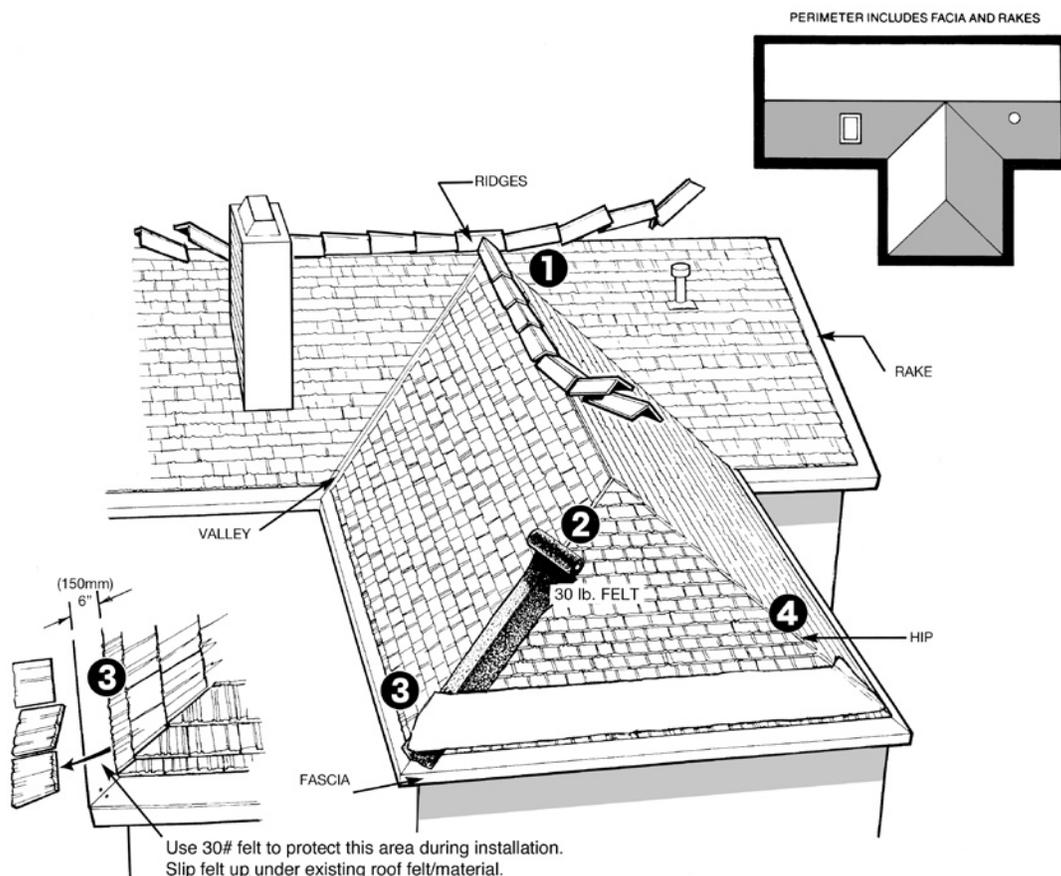
#### b) Procedure

- i) Get rid of all existing ridge and hip caps starting a waste pile on the ground.
- ii) Roll out 30 lb. (1.5 kg/m<sup>2</sup>) felt on hips and ridges. This is optional to protect the structure during installation.
- iii) Cut with a saw the entire roof perimeter, including rakes, roughly 6" (150mm) from the fascia. Set the saw depth to only cut the existing roof material, not sheathing. Where any metal extends past the roof line, take it out by cutting it back with tin snips.

When the building does not have an eave overhang, trim the existing roof back only to the fascia. A 1" X 4" (25 X 100mm) may be required to make a level surface for the 1" X 4" (25 X 100mm) counter-batten.

- iv) If a "B" fire rating is required, install 72 lb. (3.5kg/m<sup>2</sup>) mineral surfaced fiberglass cap sheet over existing roof outside, or 1" (38mm) thick, "Listed" foil faced fiberglass. Lap 2" (50mm) at all seams, at fixing it with staples or flathead composition nails. The foil faced material is obtainable from Divine and installed foil side up.

☐ Refer to your local building department for fire rating specifications. If the specifications require fire rating, underlayment should be installed over existing fire retardant roof materials.



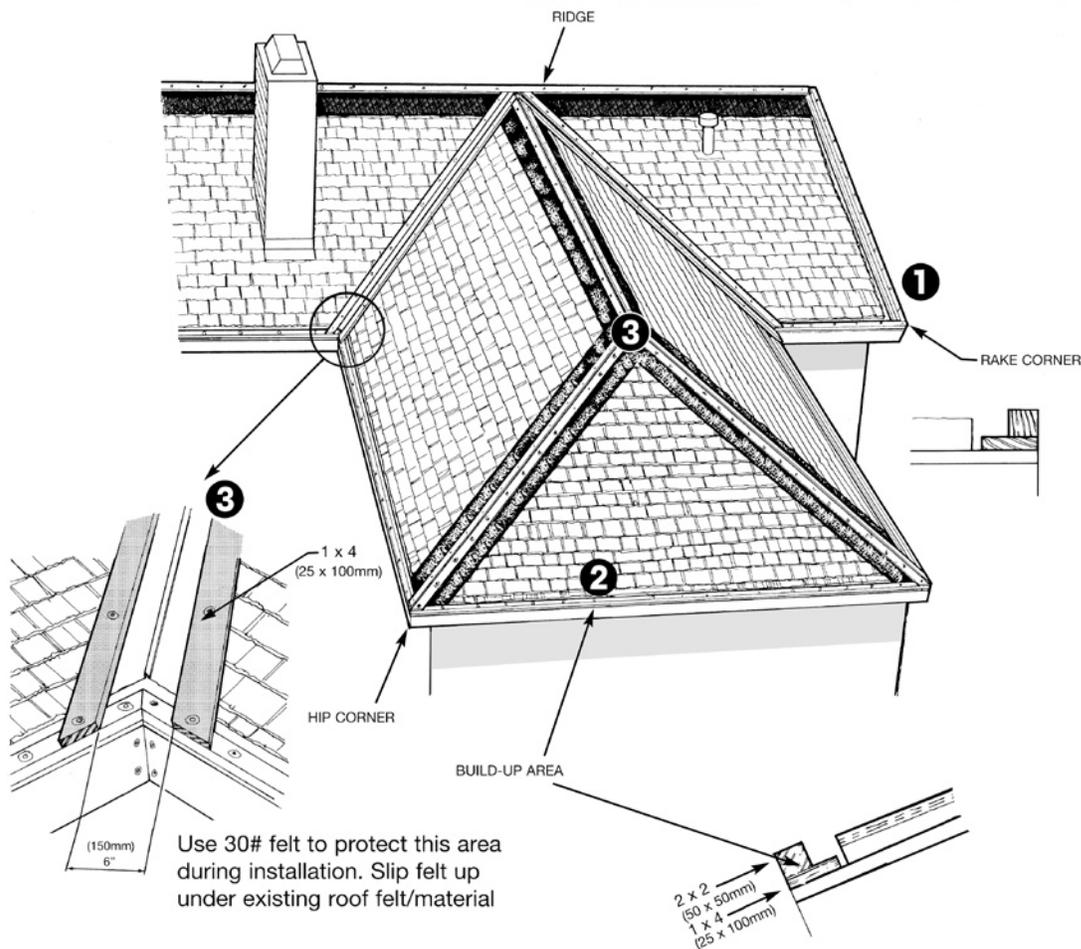
## 5-2-2. Installing New Framing For Divine Panel Build-up

### (a) Purpose

To make available nailing points for counterbattens at the fascia and 1" x 4" (25 x 100mm) on both sides of the ridge, hip, valley and up the rakes.

### (b) Procedure

- i) Determine the counterbatten spacing by marking the correct positions of each existing rafter or truss at the fascia above existing rafter or truss at the fascia above of the new perimeter build-up. This is easily accomplished with a man on the ground pointing at each rafter.
- ii) Substitute entire trimmed perimeter with 2" x 2" (50 x 50mm) or 1" x 4" (25 x 100mm) lumber or a combination of both. Heap them up evenly with the fascia until they are flush with the existing roof surface. Cut the corners and lengths to fit.
- iii) Position a 1" x 4" (25 x 100mm) counterbatten on both sides of the hip ridge and valley center positions. Place 1" x 4" (25 x 100mm) valley battens 6" (150mm) apart to allow the new 6" (150mm) valley metal. Do not remove existing valley.



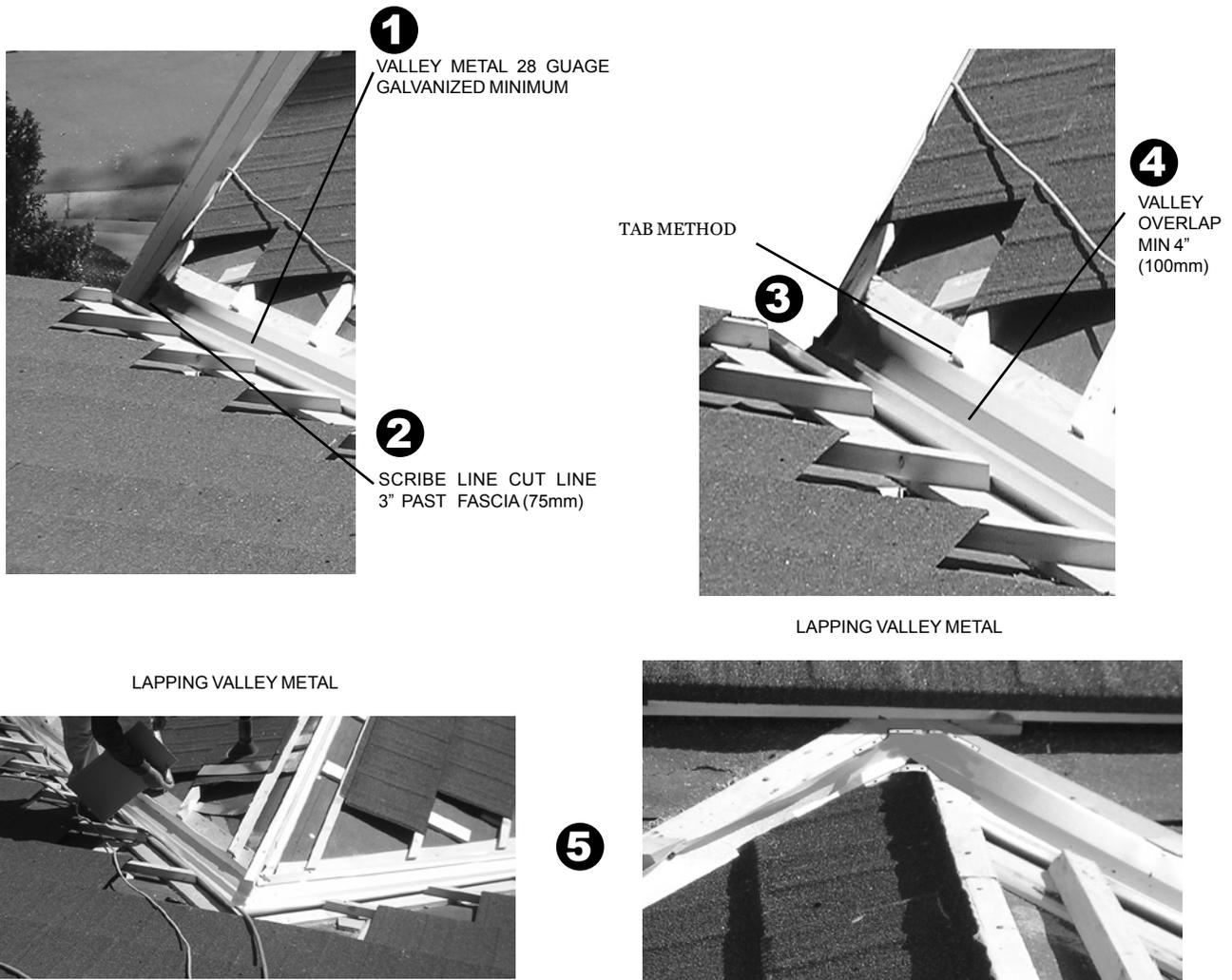
### 5-2-3. Installing Divine Valley Metal

#### (a) Purpose

To provide adequate water drainage for new roof

#### (b) Procedure

- i) Position new valley metal 3”(75mm) past the fascia build-up. Plane any interfering shake to allow valley metal to seat correctly.
- ii) Scribe the valley corner to the underneath of the valley metal with a marker. Cut ”(6mm) below the scribe line with tin snips.
- iii) Cut 1”(25mm) tabs from the valley metal return flange opposite each other to fix firmly the valley metal, then bend them back and nail to the 1” x 4”(25 x 100mm).
- iv) To overlap valley metal, lay out valley metal sides of first valley section, then connect the other valley section with a 4”(100mm) Min. lap. Fasten with tab method as before compressing together the two lapped sections firmly.
- v) Where two valleys interconnect at the ridge, they must be overlapped and fixed.



---

## 5-2-4. Installing 1" x 4" (25 x 100mm) Counterbattens

### (a) Purpose

To make an even surface for securing the 2" x 2" (50 x 50mm) Divine panel battens.

### (b) Procedure

- i) Place counterbattens at 24" (600mm) on center. Rafter spacing greater than 24" (600mm) on center require accept additional counterbattens between each rafter for support.
- ii) Install counterbattens flush with the fascia build-up and continuing along the full rafter length to the ridge. Nail each counterbattens according to the following method:

#### Preferred Method (Counterbattens positioned directly above rafter/truss members)

Where roofing is covered by existing sheathing, nominal 1" x 4" wood counterbattens, spaced a Max. of 24" on center, shall be placed just above and parallel to the framing members and attached at 12" on center with one 16d common nail. Fasteners shall have a minimum combined penetration into the sheathing and framing members of 1".

If the rafter/truss members are absolutely secured by the existing roof cover and a "boxed-in eave detail", then the counterbattens may be placed at the 24" maximum spacing, but independent of the rafter/truss member. In this case, the following "alternative" fastening method shall be applied.

#### Alternative Method (Counterbattens placed independent of rafter/truss members)

If roofing is placed over an existing roof covering, nominal 1" x 4" wood counterbattens, spaced a Max. of 24" on center, shall be placed across the existing roof surface parallel to the framing members and connected at 6" on center with one 16d common nail. If encountering protrusions through the roof, such as chimneys, air conditioners and vents, etc., install a counterbatten on both sides of the protrusion extending around 6" (150mm) out both end.



---

## 5-2-5. Installing 2" x 2" (50 x 50mm) Counterbattens

### (a) Purpose

To provide secure nailing points and to space battens correctly – for Divine: 14 3/8" (365mm), Divine shake: 14 9/16" (370mm) from the front surface of one batten to the next.

### (b) Procedure

Batten spacing should be calculated carefully. To make sure that each panel interlocks firmly in place resting against the battens, pay careful attention to the batten spacing.

### (c) Batten Spacer

The size of the batten spacer exactly spaces the 2" x 2" (50 x 50mm) battens for either tile or shake panels. Place the batten spacer with the arrow associated with the respective panel towards the ridge to space battens exactly for that profile. With this quick and accurate batten installation will be assured.

- i) Install a 2" x 2" (50 x 50mm) batten around the fascia perimeter flush completely with the build-up and on top of the counterbattens.
- ii) Place a marking nail 14" (362mm) from the fascia at both edges of the roof. The following rows measure: for Divine shake: 14 9/16" (370mm), for Divine panel: 14 3/8" (365mm). String between the two marking nails and check that the middle of the string line measures no greater than the batten spacing needed from the fascia. When the fascia is bent out, make lowering adjustments, to both end marking nails. Verify the middle of the bottom row to confirm that is no greater than 14" (368mm) from the outside of the fascia to the front of this first batten.
- iii) Place the first row of marking nails at each counterbatten and string line joint. Clear away string line, and position a batten behind the marking nails, and nail it in place. Then remove all marking nails.
- iv) Working on the roof, place the Divine batten spacer over the nailed first row batten. Place the next batten tightly against the top face of the batten spacer and nail it in place. Be careful of positioning the batten spacer correctly.

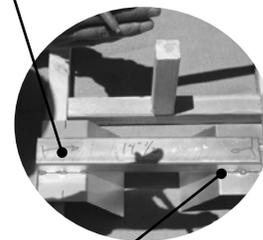
The

widest flange should face down the roof.

\* Check 2" x 2" (50 x 50mm) batten spacing all the time before nailing. For houses with gutters, see the "Special Installation Procedures" chapter of this manual.

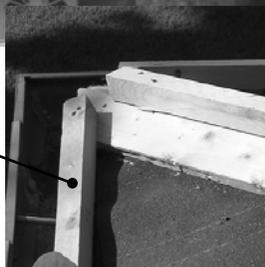


5" WIDE FLANGE  
(This can be used to position the  
hip and ridge battens 5" apart.  
Point toward ridge for TILE.)



6" WIDE FLANGE  
(This can be used to position the  
Valley 1x4 6" apart inside)

FASCIA BATTEN  
HIP CORNER



2 x 2 BATTENS  
(50 x 50 mm)



RAKE

---

## 5-2-6. Installing 1" x 4" (25 x 100mm) Counterbattens (continued from 5-2-4)

### (a) Hip

Cut and connect the battens at the center of the hip.

### (b) Valley

For closed valleys, cut the battens so that they are flush with, or hang over somewhat into the valley by 1" (25 mm). For open valleys, cut the battens flush with valley walls. Open valleys are recommended for areas with trees overhanging the roof.

### (c) Rake

Cut the battens 1" (25mm) back from the outside of the rake end. See Special Installation Procedures chapter for Divine Tile Pan metal details.

### (d) Chimneys, A/C, Skylights etc.

For rectangular shape protrusions, install a 2" x 2" (50 x 50mm) batten at the bottom and top of the protrusion. This batten should be extended by 2" (50mm) either side of the protrusion. Substitute split or damaged battens with new ones.

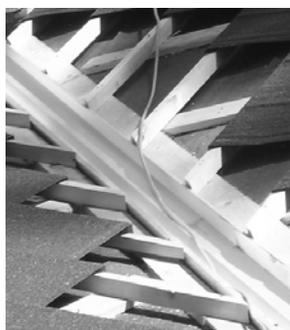
### (e) Vents

When a panel batten meets a vent, cut the 2" x 2" (50 x 50mm) about 1" (25mm) back from the vent pipe.

\* Always apply a string line for the first row when setting out battens. Do not snap chalk lines.



HIP



VALLEY

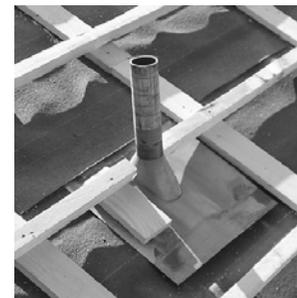
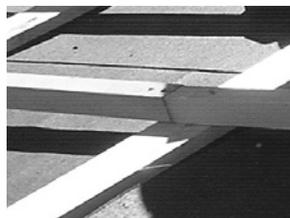


CHIMNEYS

**BATTEN INTERSECTIONS**  
Cut the battens so they join at the center of a 1 x 4 (25 x 100mm) counterbatten.



RAKE



VENTS

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## 5-2-7. Installing New Framing For Divine Trim

### (a) Purpose

To provide assured nailing points for Divine trim at the ridge, hip, and rake areas.

### (b) Procedure

Two types of Divine trim are provided.

\* C Cap (Mission Type): Installed on rakes, ridges and hips.

\* A Cap (: Installed on rakes, ridges, and hips.

Mission and shake caps need a build-up at ridges and hips of 2" (50mm) above battens.

### (c) C Cap Framing

#### i) Ridges

Place two 2" x 2" (50 x 50mm) battens over the middle of the ridge. Put them 5" (125mm) apart from their outer edge. Holding them straight, affix them with nail to the counterbattens every 24" (600mm) on center. Trim at each ridge edge.

Place two 2" x 2" (50 x 50mm) battens just on top of the other battens. Put them 5" (125mm) apart from their outer edge. Holding them straight, fix them with nail every 24" (600mm) on center. Trim at ridge edge.

#### ii) Hips (For Mission Trim)

Place two 2" x 2" (50 x 50mm) battens over the center of the hip. Put them 5" (125mm) apart from their outer edge. Holding them straight, fix them with nail at each batten row. Cut the 2" x 2" (50 x 50mm) battens to hip length.

Remember to join over a batten. Miter to ridge and fascia joints.

#### iii) Rakes

Battens at the rake area must be placed 1" (25mm) from the outer end of the new rake framing.

Place a trim batten on top and flush with the battens running down the rake end. Holding the trim batten straight, fix them with nail at every batten row. Cut the trim batten to fit from the fascia to the ridge. Make sure all trim battens are connected over a batten.

### (d) A Cap Framing

#### i) Ridges

Place a 1" x 4" (25 x 100mm) batten over the center of the end. Holding it straight, fix it with nail in place along ridge length every 24" (600mm). Trim at ridge ends. Place two 2" x 2" (50 x 50mm) battens over the center of the 1" x 4" (25 x 100mm) batten along ridge length. Holding them straight, affix with nail in place every 24" (600mm). Trim at ridge edges.

#### ii) Hips (For A Caps)

Place one 2" x 2" (50 x 50mm) batten over the center of the hip. Holding it straight, affix it with nail at each batten row. Trim battens should be connected over a batten. Cut trim battens to fit and miter at ridge, fascia and hip joints.

#### iii) Rakes

Designed for shake trim batten framing at the rake, the same procedure is applied as for A Cap trim. See Special Installation Procedures chapter, "Roof-to-Wall" flashing for Divine Tile Pan and Rake Z-Bar details.

\* Rake trim battens should be 1" x 2"

C Cap Framing



A Cap Framing



RAKE TRIM BATTEN 1X2 OR 2X2  
CHECK BUILD-UP (25X50 OR 50X50mm)

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## 5-2-8. Installing Divine Fascia Metal

### (a) Purpose

To cover all new framing build-up at the fascia.

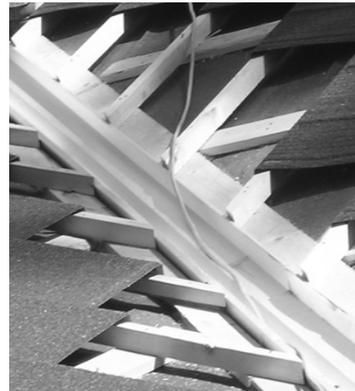
### (b) Procedure

Divine fascia metal is coated by stone chips to match panels. Fascia metal is not available on the rake ends; therefore Divine Trim covers this part.

Make the fascia metal fit onto the front of the fascia (first) 2" x 2" (50 x 50mm) batten. Holding the laps firm, and nailing at the top lip or face. Be careful not to dent and buck the metal.

- i) Through marking, cutting, bending, and then nailing, suit the fascia metal around the hip corner.
- ii) Through marking, cutting, bending, and then nailing, suit the fascia metal into the valley corner.

\* If there are high and low points at the roof, it may be required to install the fascia metal in small sections along the roof line.



### HIP

NAIL POINT

BEND LINE



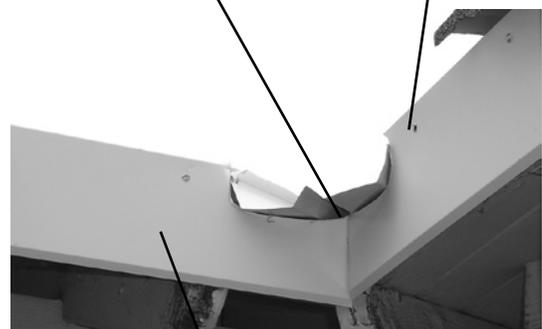
FASCIA METAL

FASCIA CAN ALSO BE SECURED THROUGH THE FACE, CLOSE TO THE TOP BEND.

### VALLEY

BEND LINE

NAIL POINT



FASCIA METAL

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## 5-2-9. Loading Divine Panels On to the Roof

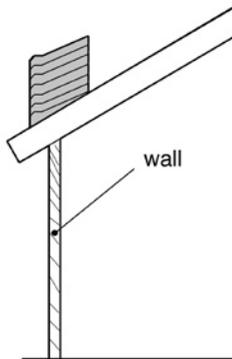
### (a) Purpose

To provide an easily accessible supply of Divine panels when installing.

\* Both types of Divine panels are loaded and divided across the roof in the same way.

### (b) Procedure

- i) The first stack of four panels loaded on the roof must be placed on the fourth full batten row from the ridge with the panel nose facing up the roof.
- ii) Place similar stacks leaving an expected full panel length between stacks.



**\* Tiles Should be stacked on the wall area.**

---

## 5-2-10. Installing And Nailing Divine Tile Panels

### (a) Purpose

To provide a new roof covering firmly fixed to the existing roof.

### (b) Procedure

Divine panels should be installed from the ridge down because of their distinct interlocking design. Be careful when interlocking the panels. Refer to the “Special Installation Procedures” chapter for an easy method line up the panels. Panels may be overlapped partly either left to right or right to left. Lap the panels away from discharging valleys or the standard line of sight. First, install all full panels, and then fill in with cut sections.

- i) Place the panels by lining up the corrugations and lapping properly across the first full row closest the ridge.  
Holding the panels against the batten, tack nail them through the top flange of the panel. In order to accept to measure, cut and bend at the rake areas, either cut and bend a panel or leave a gap.
- ii) When placing panels on hip and valley roofs, the same procedure is applied. But the hip or valley angle forms the stagger pattern automatically. Laying first panel on a hip or valley roof approximately 6”(150mm) in from the nearest part of the panel to the hip or valley. Divine Tile panels can be lapped in multiples of one tile pan, every 6”(150mm) or more. Make sure that panel ribs are arranged.  
\* In order to prevent slipping of the panel from the battens, tack panels are extended 2 pans or more past the row above.
- iii) Place a minimum of 4 rows of tile from the ridge before nailing. The tile nailing point is important as the Divine System utilizes exposed nailing. Panel fasteners should attach firmly into the battens. Nail the tile facing down the roof.
- iv) The last tile row at the fascia is face nailed. This is the ONLY place the tile should be face-nailed. The bottom row nails must be covered and chipped. On all rake edges, the tile should be bent up against the rake batten. For a cut and bent section to be fitted later, reserve space approximately 2 pans.  
Place all full tiles around the protrusion, such as chimneys, skylights, etc., Tack the tile in these areas.  
When roofing around a vent pipe, cut the full tile that will later be flashed around the pipe. To simplify installation of the flashing material later, do not nail around the pipe. See “Vent Flashing” chapter for details.



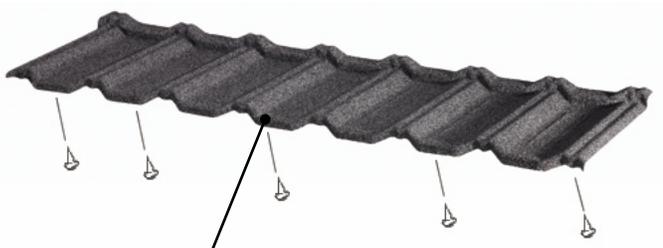


1

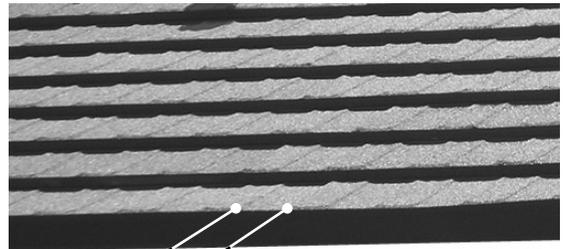
2

3

3



NAIL POINT



MAIN WATER CHANNEL

KEEP NAILS OUT OF  
MAIN WATER CHANNEL

---

**(c) Laying Divine shake**

The end lap modules on either outer end interlock horizontally in the same way as Divine panel. Neighboring higher and lower courses of shake panels interconnect by staggering each course by one-half of one panel. The Divine shake panels cannot be placed straight or irregularly staggered.



**(d) Nailing Divine shake**

The Divine shake is nailed in the same way as Divine panels. Panel fasteners should attach into the battens firmly. There are four-recessed and five-raised shake impressions on the shake. Nailing along the nose is always required on a raised section. Five nails per shake panel should be applied.



---

**(e) Rake/Gable Edge**

Because of the shake panels half-panel stagger, it is necessary to fold up all rake ends 1”(12.5mm). Water should be carry down from each panel onto the next panel, so water drains out to the fascia. If Divine Tile Pan Metal is applied, the 1”(12.5mm) bend-up is not necessary.

\* Shake : Tack every other course as it is laid, In order to prevent sliding of the courses,. Be aware of panel arrangement. Panels must be staggered by half a panel.

**5-2-11. Installing Valley And Hip Cut Sections of Divine Panels**

**(a) Purpose**

To provide weather safety at the valley and hip areas.



HIP INSTALLATION



VALLEY INSTALLATION

**\* IMPORTANT NOTICE \***

Because of the half panel stagger of the Divine shake panel it may be required to cut, bend, and fit small triangular areas to some courses intersecting with the hip or valley.

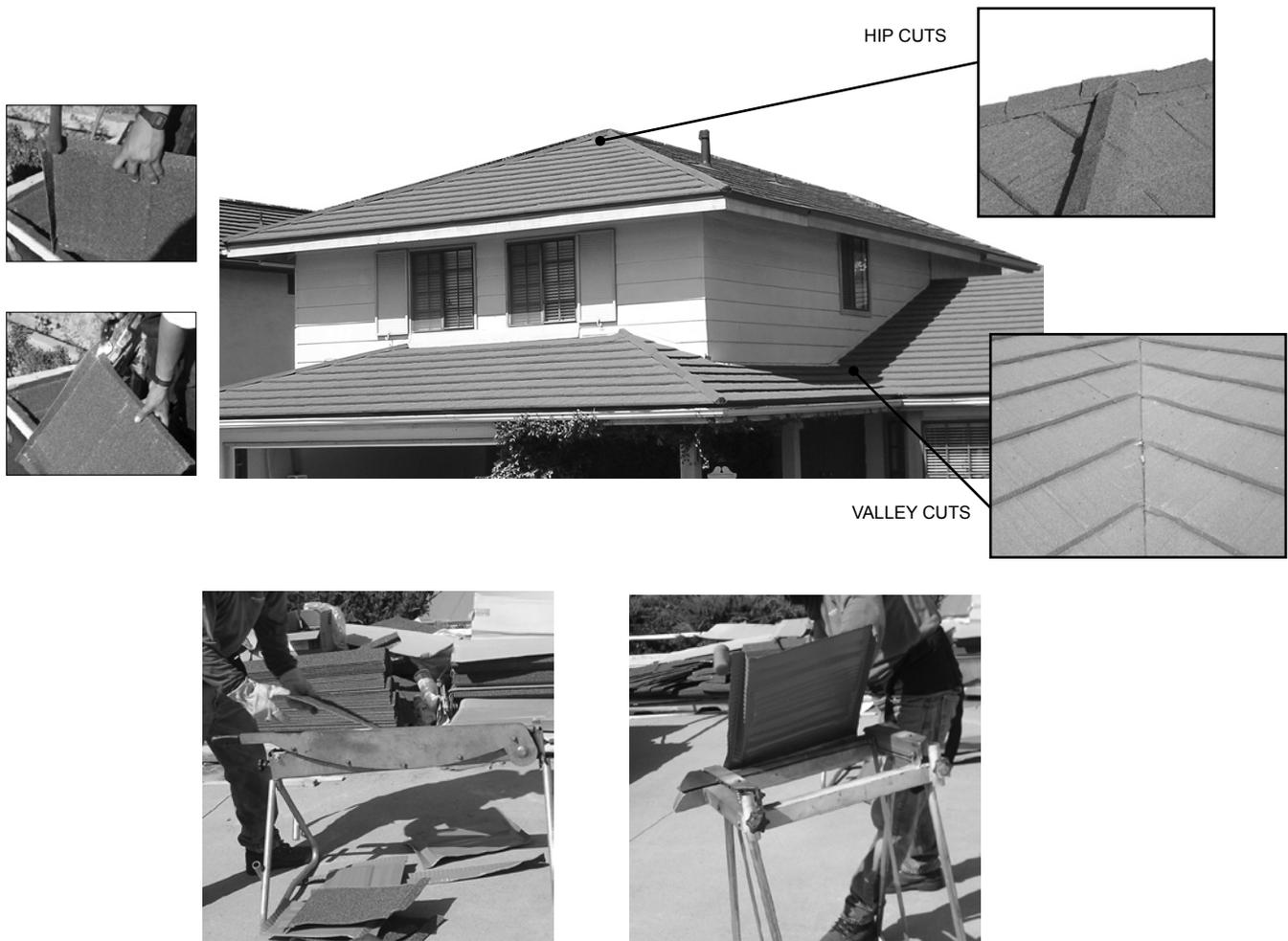
These small areas may be attached to the full shake panel by first running a bead of sealant down the vertical side lap, and then using sheet metal or pop rivet screws to fix them in to position. At all times to provide stability, install the smaller sections on top of the larger ones.

To reduce this situation, place the Divine shake as close as possible to the hip or valley and install the balance from this area.

**(b) Procedure**

Apply two cut pieces per full panel. The triangular formed hip and valley areas where no panels have been laid now should be measured, cut and bent, to fit the roof. To provide a cut with the machine edge on the suitable side of the panel, it is significant to keep in mind to mark which side of the panel you measured from on the roof. The Divine panel has eight measuring ribs, from which all measurements are taken. The Divine shake only has two measuring ribs, from which measurements are taken, which are on either end of the panel.

\* Shake panels are cut and bent in the same way tile is. Sometimes it may be necessary to measure from the middle of the panel. The process will be complete when both sides are folded to fit between a hip and valley.

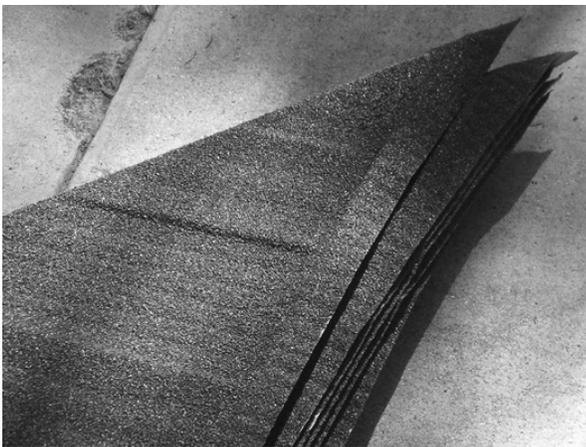


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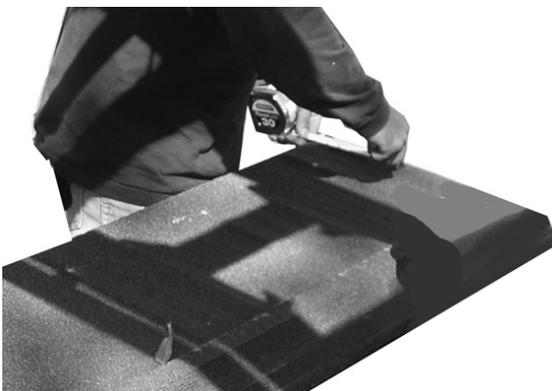
**(c) Valley Procedure**

- i) Working from the top of the valley, two measurements are required for each panel row to acquire the bend line shown at the top and bottom of the panel. Measure from the rib of the tile with the closest valley to the centerline of the valley.  
Mark measurements for each row, working down the roof to the fascia.
- ii) Use measurements taken to full panels by recording the diagonal fold and cut lines onto the panels.
- iii) To acquire the cut line, measure extra 2”(50mm) from the bend line.
- iv) Cut the panels using the Divine cutter, then fold them in the Divine bender by lining up the marks and bending down making a valley cut with a 2”(50mm) downturn.
- Cut, fold, and stack each panel, installing them in order. These are for one side of the valley. Measuring to the valley panel, repeat this process for the other side.
- v) Apply valley panels starting from the bottom to the top. Remind to install them in order. Concentrate on nailing. A batten should be penetrated by panel nails.

\* For open valleys, through the side wall of the valley or the side of the double vee, the bend lines should be measured.



VALLEY CUT



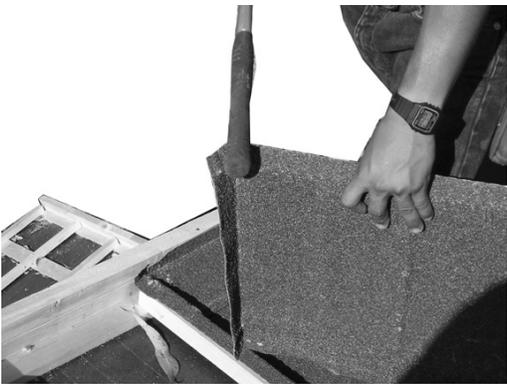
RAKE CUT

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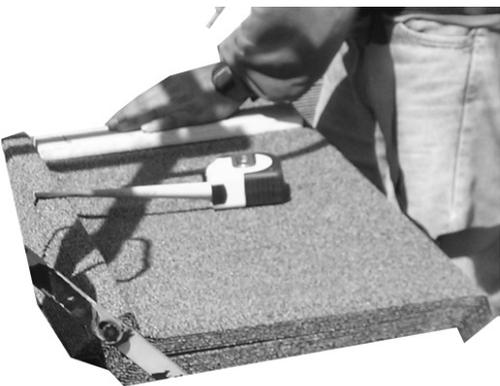
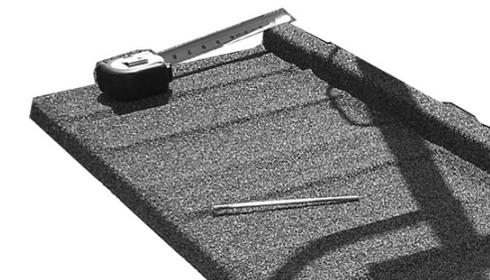
#### **(d) Hip Procedure**

- i) To get the bend line, measuring is performed in the same way as for valley panels. Measuring at the top of the hip, make a measurement list working down the roof.
- ii) After cutting the marked panels, turn them up with the Divine bender making a hip cut panel with a 2" (50mm) upturn. Do this procedure again for the other side of the hip.
- iii) Install hip cuts from the bottom up, nailing in the same manner as for field panels. A batten and the hip board should be penetrated by the nails.

\* For easy installation, at all times subtract 1" (12.5mm) from hip panel measurements. Shake panels are cut and bent in the same way as tile.



HIP CUT



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## 5-2-12. Installing ridge And Rake Cut Panels

### (a) Purpose

To provide a suitable panel for the existing roof for the last course at the ridge and to the rake edge.

### (b) Procedure

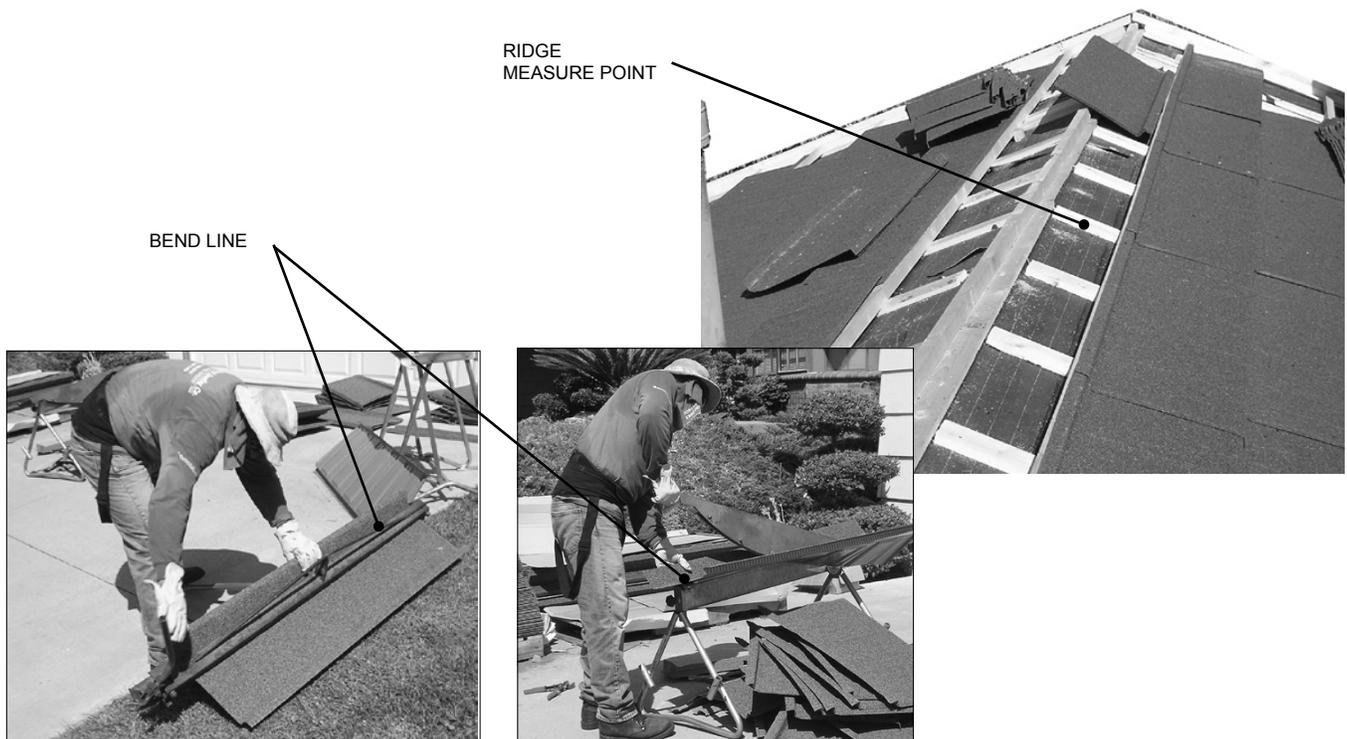
The short panel at the ridge and the sections at the rake should be measured, cut, and bent to fit.

### (c) Ridge Cut Panel

- i) To acquire the bend line, measure the space from the back lip of the panel already installed to the ridge board. This is generally taken at the same position where the nail penetrates the panels. Subtract 1" (12.5mm) from the measurement taken and marked.
- ii) Use measurements to full panels, record the full panel at both ends. To get the cut line, draw a line 2" (50mm) past the bend line.
- iii) First, remember to bend the ridge cut panels, and then cut off the extra along the already recorded cut line. Use the Divine full panel bender.  
When all ridge panels are ready to install, apply them as below:

- A. Place the ridge cut panel. Beginning at one end of the ridge, nail any side first.
- B. Nail the other side by turning the panel up in the midpoint to make it line up with the panel underneath.
- C. The center of the panel can now be nailed, in the same manner as field panels.
- D. Take care not press the back of the ridge cut panel down. The ridge cut panel should be in the same level as the rest of the roof. The ridge cut should be nailed through the 2" (50mm) turn-up.
- E. At hips and rakes, the ridge cut panel should to be bent up the same as the full panels. At valleys, the ridge cut panel should be bent down.

\* In order to allow ridges to fit, at all times, subtract 1" (12.5mm) from ridge panel measurements. Shake panels are cut and bent in the same way as tile.



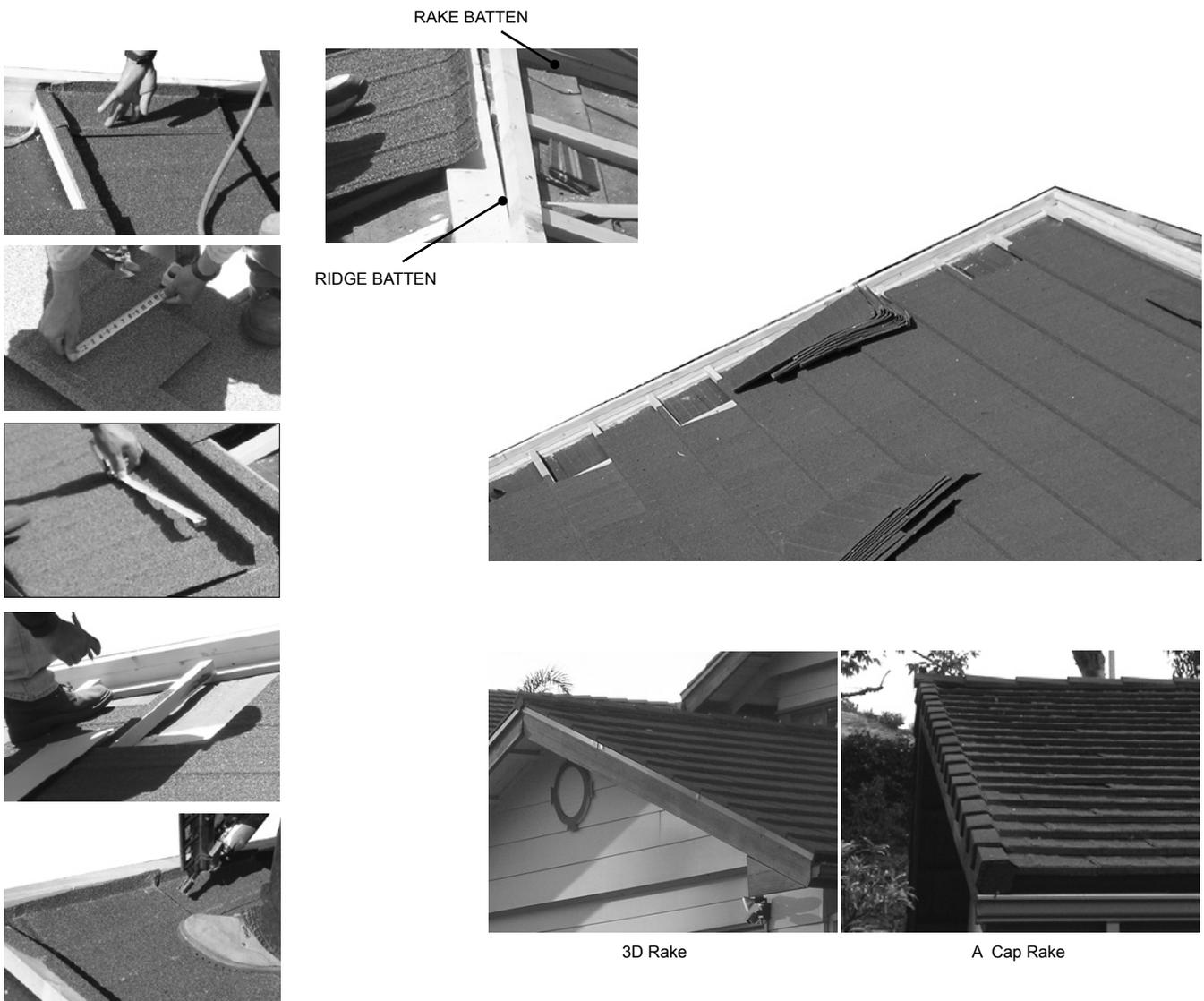
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### (d) Rake Panel Procedure

In order to make a channel for the water to drain from the roof and avoid leaking, when measuring the rake areas, it is critical to make sure that each rake panel will permit water to flow down onto the next rake panel.

- i) To get the bend line, measure the distance from the rake end to the Divine Panel.
- ii) Apply the measurements to the panels. (Add 1" (25mm) to marks for the cut line)
- iii) Cut and bend up on the already recorded lines.
- iv) The installation of the rake panels uses same method as a full panel. Make sure that each rake panel drains into the one below.

\* In order for ridges to fit, at all times, subtract 1" (12.5mm) from ridge panel measurements. Shake panels are cut and bent in the same way as for tile.



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## 5-2-13. Installing Vent, Chimney And Skylight Flashings

### (a) Purpose

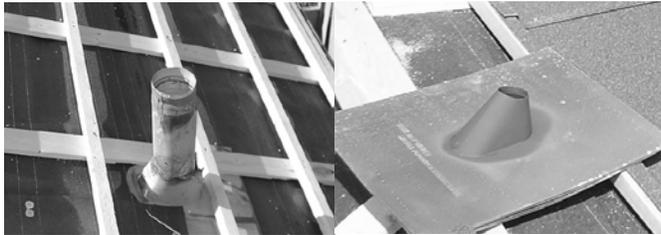
To provide a weather security flashing around roof protrusions.

### (b) Procedure vents

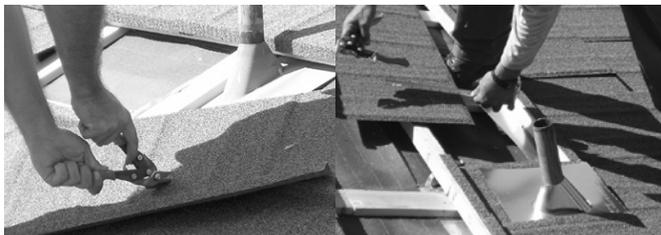
It is critical to maintain a tight fit around any protrusion. Sandwiching of the vent flashing material is allowed by the Divine panel.

- i) Put the full panels around the vent to be flashed by punching a hole larger than the pipe.
- ii) Slip down the new flashing over the pipe and seat it securely onto the panel face forming it to the panel outlines.
- iv) Put securely a 2 to 3 pan (or larger) section of Divine panel over the flashing and pipe to wrap the whole flashing base covering only the flashing's cone.
- v) It is critical that the 2 to 3 pan section be cut firmly to the flashing cone. Seal around the cone at the place the panel reaches it.

\* Shake panels are flashed in the same way as tile. Standard galvanized pipe flashings are suggested. Do not use lead, copper, or aluminum flashings if separation barriers between different metals are not inserted.



1



2



3



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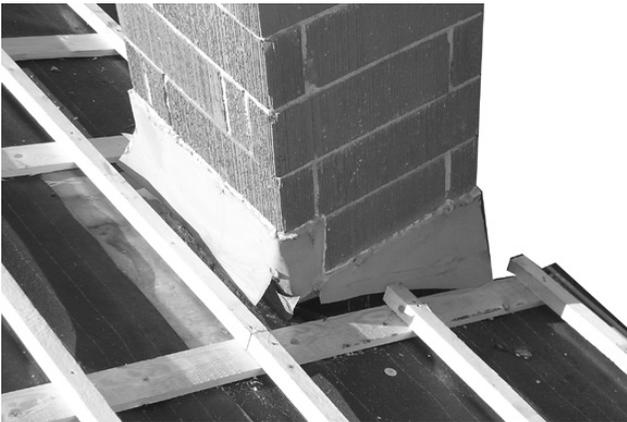
**(c) Skylights**

In order to install re-roofing, install the skylight curb a minimum of 6” (150mm) above the existing roof deck. In order to work on a solid or open roof deck, install the curb a minimum of 6” (150mm) above the roof deck. Shake panels are flashed in the same way as tile.

**(d) Chimney Procedure**

Because of Divine’s interconnecting system, the panel becomes the flashing material around any square or rectangular protrusion. The procedure is a step-by-step course followed with any square cornered flashing. For chimney cut-and-bent sections, install from the front to the back.

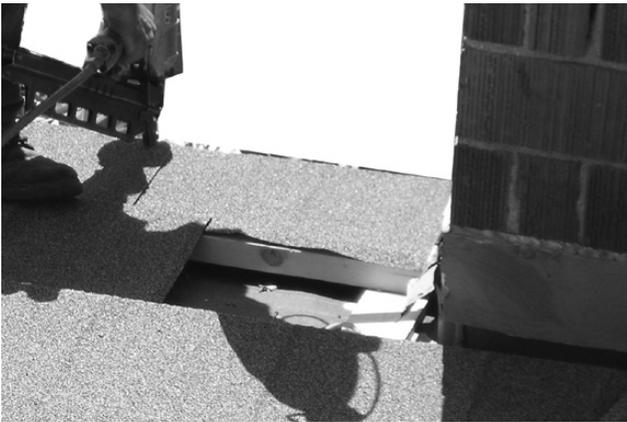
- i) Measure all areas around the chimney that should be secured and record.
- ii) In order to allow a 2” (50mm) upturn around the perimeter of the item being flashed, add 2” (50mm) to the full panel on the ground for the cut line.
- iii) Cut and bend all chimney pieces as illustrated.



**1**



**2**



**3**



**4**

- 
- iv) Install panels around the chimney in order as below:  
First, Install the bottom part across the front of the chimney.  
Second, Install the side parts up both sides.  
Third, Install the back part of the chimney. The Divine chimney saddle should be used as a substitute for this piece.  
Fourth, Install a diverter to support in the weatherproofing.

Other types of protrusions, such as air conditioners, with right angled corners are managed in the same way. The upturned panel is now attached to the chimney with concrete nails or metal screws and is sealed. Apply and seal a Z-Bar around the panel for additional weather security.



**5**



**6**



**7**



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## 5-2-14. Installing Divine Cap or 3D Trim

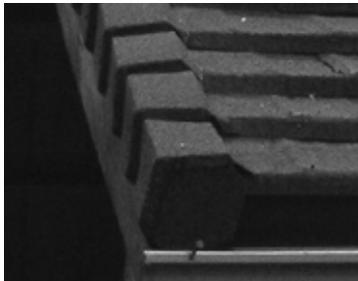
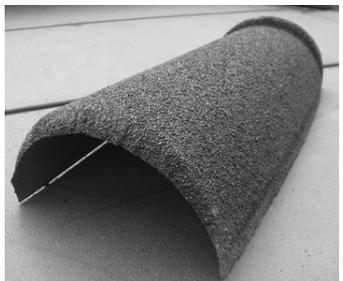
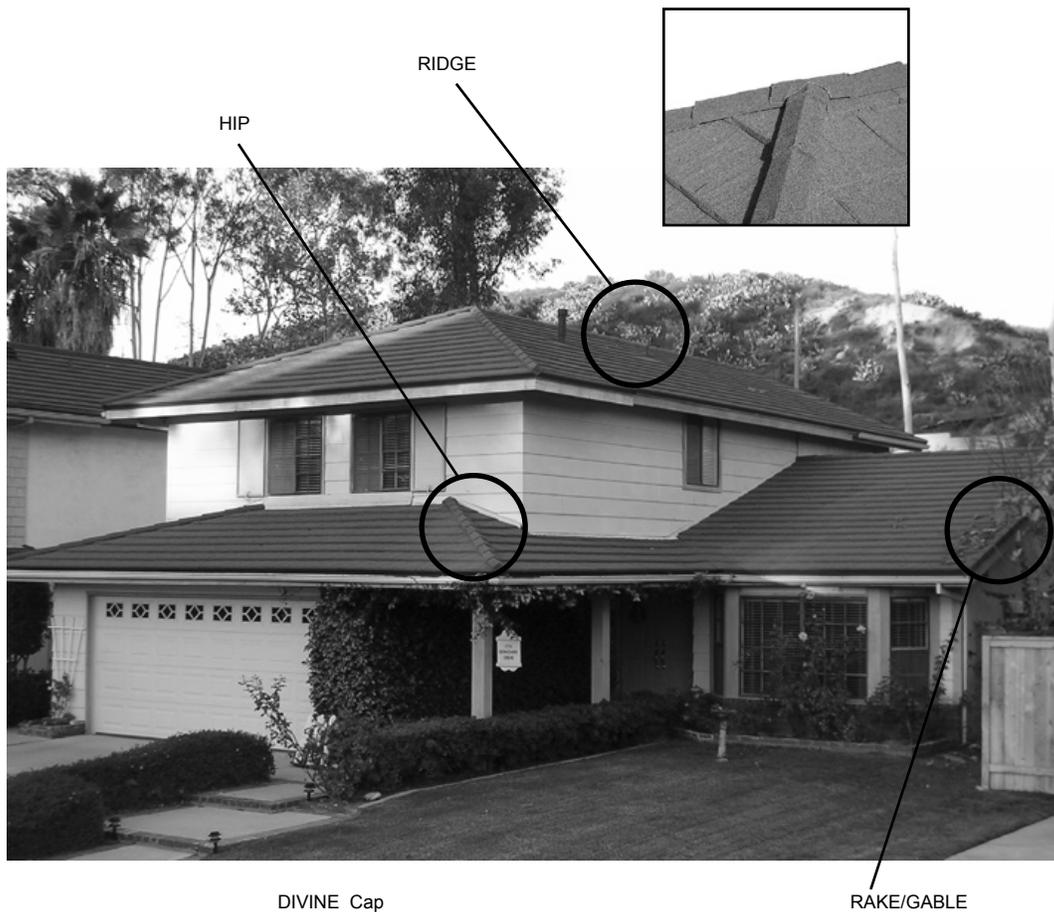
### (a) Purpose

To provide a perfectly trimmed exterior to the edges of the roof.

### (b) Procedure

Install Divine trim on the ridges, rakes and hips. When installing Divine trim, maintain them straightly. Be careful when mitering all trim at roof joints. There are three circular end discs in every bow of Divine trim; they are inserted into the ends of each trim at the fascia for the complete exterior. A Cap trim is installed the same way as C Cap trim.

\* For extreme weather conditions, an elastic type flashing material is required.



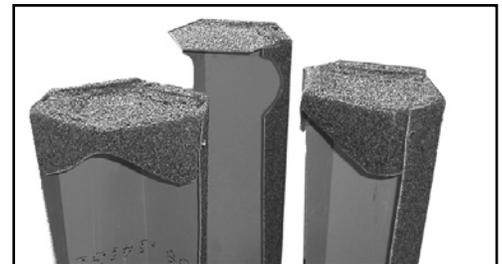
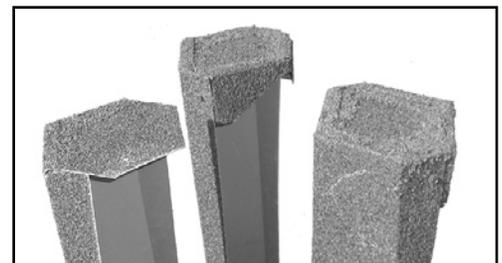
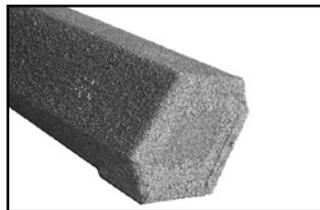
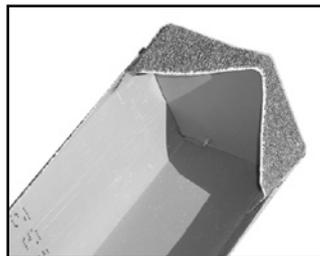
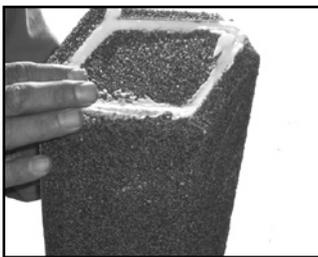
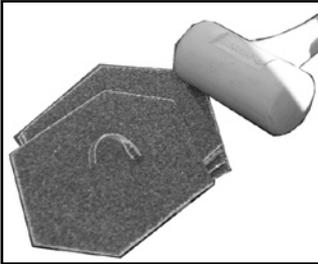
3D RAKE

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**(c) Hip: (A Cap Trim)**

Hip corners at the fascia are completed with the double C Cap end, a flat circular disc, or a semicircular-formed end piece.

The hip and ridge joints are managed the same as the rake and ridge joints. They may be mitered for weather security.



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**(d) Rake:(C Cap Trim)**

Beginning at the fascia, set up the first mission trim. This mission trim demands only a notch at the back lip. Set the rest of the mission trim up the rake interconnecting and nailing. Each piece must sit flush onto the Divine panel.



**(e) Ridge: (A & C Cap Trim)**

At the ridge where two rakes reach, the Divine trim cap should be cut and mitered together to seal the top of the rake. When installing across the ridge from a rake edge, put firmly the first Divine trim with an end disc installed. Tightly cut over the two rake trims. Make sure that each trim piece put firmly down onto Divine panel.



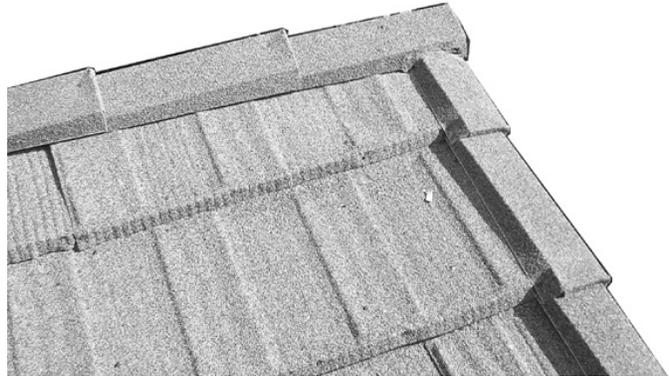
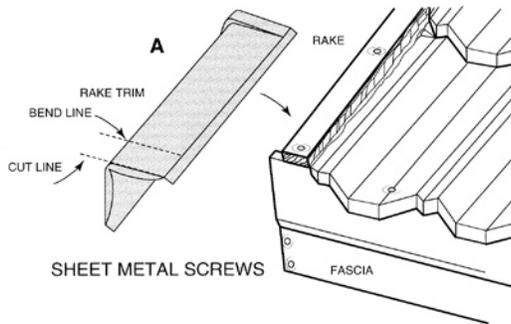
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**(f) Rake: (A Cap)**

Beginning at the fascia, apply the first shake cap. Set the rest of the trim up the rake interconnecting and nailing. Each piece should sit flush onto the Divine panel.

At the ridge where two rakes reach, the Divine trim should be cut and mitered together to seal the top of rake.

When installing across the ridge from a rake edge, put firmly the first Divine trim with an end disc installed. Tightly cut over the two rake trims. Make sure that each trim pieces put firmly down onto the Divine panel.



**(g) Trim Procedure**

Hip: (A Cap)

Hip corners at the fascia are completed with the double trim end cap, a flat circular disc, or a semicircle-shaped end piece.

The hip and ridge joints are managed the same as the rake and ridge joints. They may be mitered for weather security.



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## 5-2-15. Check Overall Installation

### (a) Purpose

To make sure that everything is secured, sealed, and finished.

### (b) Procedure

Check the following by walking over the whole roof.

- Panels and trim are firmly fastened.
- No tools / materials remain on the roof.
- Vents are sealed and are flashed suitably.
- Valley and hip intersections are fit suitably.
- Protrusions, such as chimneys, skylights, and air conditioners, are flashed properly.
- If installed, diverters are secure and will be effective.
- Fascia metal at hip and valley joints is tightly finished.



# **CHAPTER 6.**

## **SPECIAL INSTALLATION PROCEDURES**

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## **6-1. HELPFUL HINTS / TREATED LUMBER / GALVALUME STEEL**

### **6-1-1. Measuring**

When measuring for hip and ridge panel cuts, subtract 1/2" (12.5mm) from the actual measurement taken.

When measuring for chimneys, rakes, skylights etc. subtract 1/4" (6mm) from the actual measurement taken.

Before marking and cutting panels on the ground, Divine suggests recording all measurements for cut panels on the roof. Divine suggests that each cut section is recorded by following the layout.

### **6-1-2. Long Valley Panels (Intersecting Roof Pitches)**

Intersecting roof pitches happen when a valley is the separating line between two different roof pitches. One side of the valley has longer angled valley cuts than the other. They tend to bow when being bent. To prevent the bowing of the valley panel and to make the valley straight, add 1" (25mm) to the apex of the long valley cuts. Following this method, a straighter line is available for the other side. Apply actual measurements for the other side. At this time, install the long valley panels, and then measure the shorter length valley panels to this.

### **6-1-3. General**

#### **(a) Steep Pitch**

For steep pitched roofs, be sure to finish everything on the way down. Protrusions, such as vents, chimneys, and other flashings, should be secured, sealed, and painted.

#### **(b) Stone Chimney**

Flashing a stone chimney is much easier after installing a 2" x 6" (950 x 150mm) lumber frame on boundary around the chimney perimeter and filling with mortar. Apply the 1 x 4 (25 x 100mm) counterbattens as usual, and then butt the 2 x 2 (50 x 50mm) panel battens into the 2" x 6" (50 x 150mm). The Divine panel is bent up against the 2" x 6" (50 x 150mm) and counterflashing is applied to the stone outlines and sealed with mortar or non-acidic 1-part urethane sealant.

### **6-1-4. Removal / Roof Layers / New Framing**

#### **(a) General Information**

Before beginning, to re-roof over more than one layer of existing material, consult the local building official for approval. Counterbatten fasteners should penetrate 1" (25mm) into the roof sheathing or framing members.

#### **(b) Removing Existing Roof Material**

In special cases, demolition of the existing roof may be needed. When sheathing may be needed, consult the local building official for approval. All existing roofing material have to be demolished and removed including flashings, valleys, and battens. Systematically check up the roof structure and substitute any decayed or damaged lumber. Divine panels may be installed over open-spaced or solid sheathing. For specified solid sheathing, use a minimum 1/2" (12mm) CDX type of plywood. In case solid sheathing is not used, install 1 x 4 (25 x 100mm) counterbattens for reroofing because of the existing spaced sheathing. See the "Re-roofing" chapter.

#### **(c) Roof Layers**

A Divine roof can be allowed over a maximum. of two roof layers. For more than two layers of existing roofing, remove the layer(s) until two layers exist.

Example:

Top layer = Divine

Middle layer = Wood Shake

Bottom layer = Wood Shingle

\*Check local building codes

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## (d) Installing New Framing For Different Roof Materials

### i) Purpose:

To assist in the installation of Divine tiles when using different materials, conditions, and roof designs.

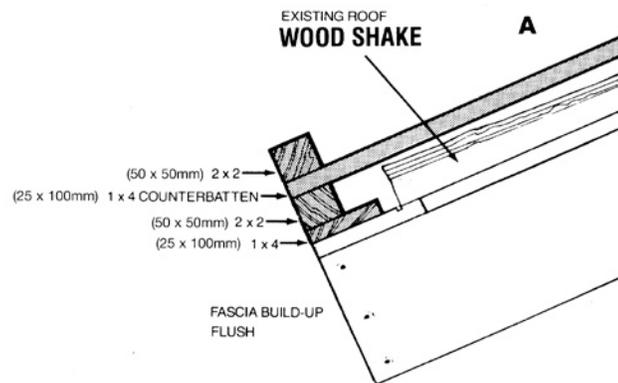
### ii) Procedures

Different roof materials encounter a different fascia build-up. For re-roofing with Divine, typical examples are shown as below.

#### Wood Shake

In general, a 4" to 5" (100 to 125mm) build-up is needed. Combinations are shown as below:

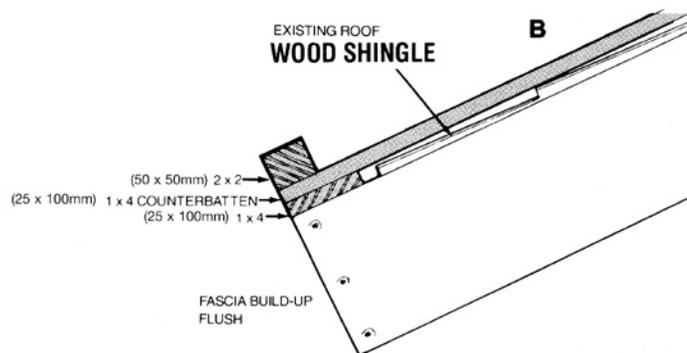
1" x 4", and/or 2" x 2", 2" x 4", & 2" x 2"  
(25 x 100mm, 50 x 50mm).



#### Wood Shingle

In general, a 2" to 3" (50 to 75mm) build-up is needed. Combinations are shown as below:

1" x 4", 1" x 4", and 2" x 2"  
(25 x 100mm, 25 x 100mm, 50 x 50mm)

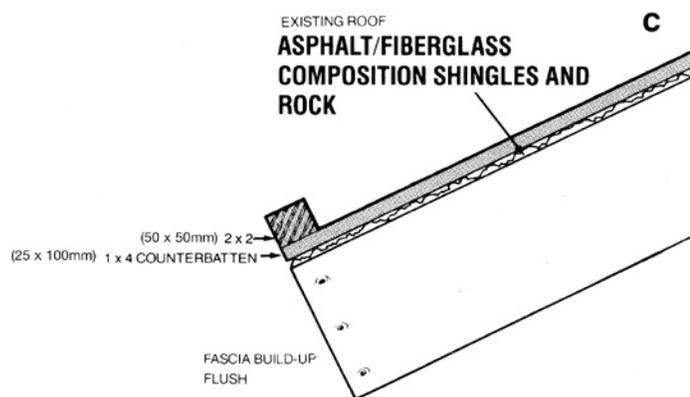


#### Asphalt/Fiberglass Comp.

Shingles and Rock

In general, a 2" to 3" (50 to 75mm) build-up is needed. Combination are shown as below:

1" x 4", & 2" x 2"  
(25 x 100mm, 50 x 50mm)



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## 6-1-5. Divine Tile Laying / Roofs With Gutters

### (a) Divine Tile Laying (Not Divine Shake), Lining up First Row

In order to assure suitable alignment when laying the first full tile row, lay two rows at the same time. The first tile is laid as usual, and then indent the second row 1 to 3 pans and lay the tile above. Keep working across the roof.



### (b) Roofs With Gutters

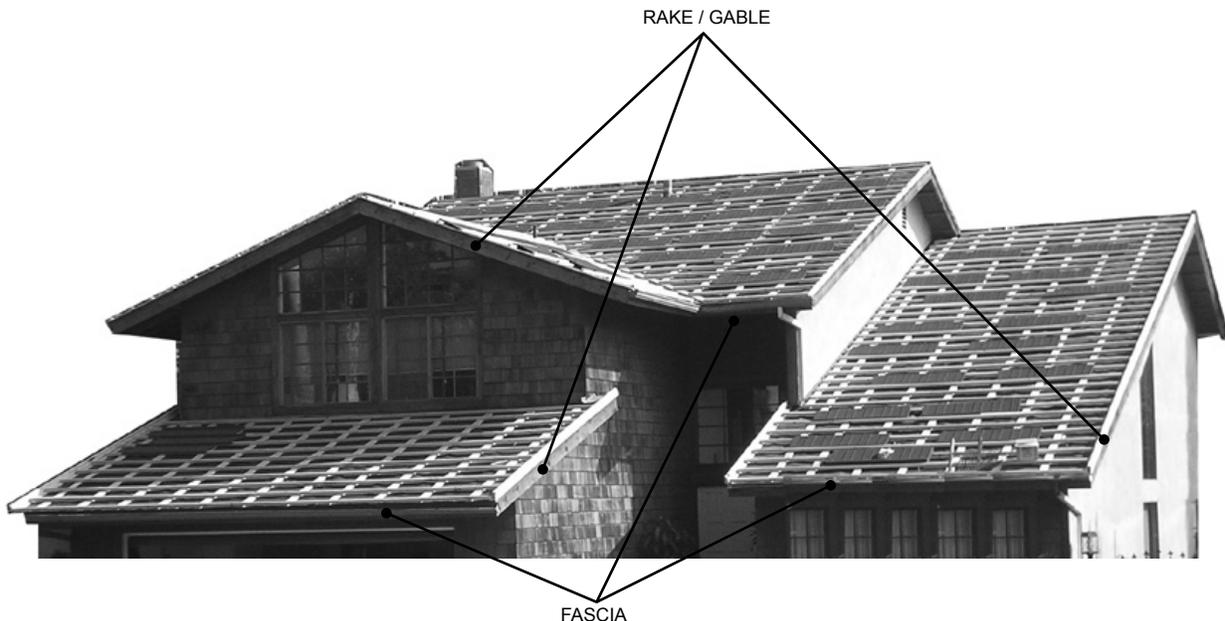
To let water flow into the gutter, the first batten can be reduced to a 1" x 4" (25 x 100mm). To avoid overflowing, a splash diverter may be needed where valleys meet the gutter.

### (c) Batten Set Out With Stepped Fascia

Starting the first full 14" (367mm) from the longest fascia length. Install from the ridge to the fascia with batten spacers where the fascia steps down. Measure, bend, and cut the short course at the fascia the same as the ridge cut panels. Apply 1" x 4" (25 x 100mm) to substitute 2" x 2" (50 x 50mm) battens.

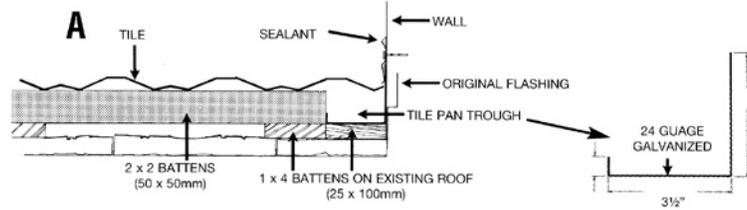


3D RAKE / GABLE(Shake Only)



**(d) Air Conditioner Or Swamp Cooler Resting on Roof**

If the unit should remain, install both sides of the unit. Confirm the tile pan exits out onto the Divine panels at the underside of the unit. The boundary must be boxed in. For weatherproofing, the back of the unit will need a cricket/saddle, which must drain into the tile pan on either side of the unit.



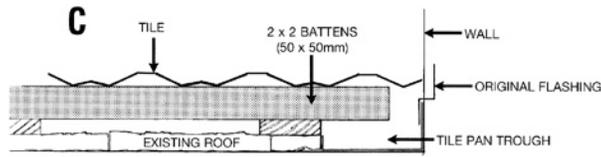
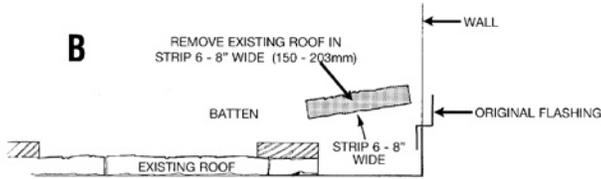
**6-1-6. Rake And Roof-To-Wall Details**

**(a) Roof-To-Wall Flashing A, B, C**

A substitute to the general technique of upturning the Divine panel against a wall and counter flashing is to put in a tile pan on top of a 1" x 4" (25 x 100mm) and counter flash over the tile pan.

When windows or other obstacles hinder the straight line of upturned Divine panels against the wall, follow the instructions as below:

Remove the existing shake in a line from fascia to ridge 4" (100mm) out from the wall. Put in new tile pan into the hole formed by the deletion of the existing roofing material. The new tile pan should be slid up under the existing Z-Bar roof-to-wall flashing. Then Divine panels can be canterlevered over and butted into the wall.



**(b) Rake Z- Bar**

To maintain trim cap alignment and rake-rafter boards well, install the Rake Z-Bar to make a ledge to lay the trim caps to.



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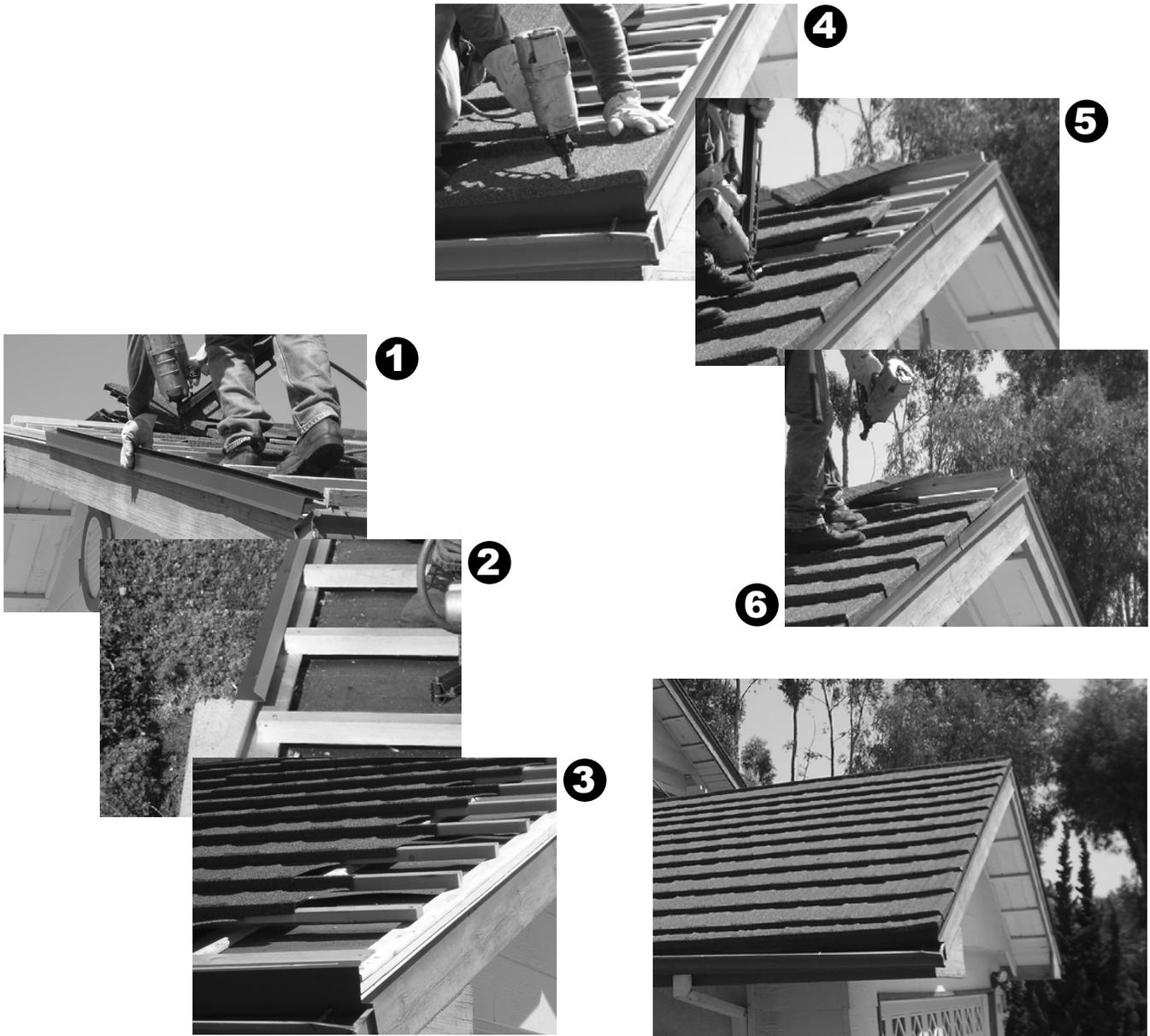
## 6-1-7. Trimless Rake Detail

\* Special Note

The Divine Trimless 3D Rake Metal may be applied over existing spaced sheathing after deletion of the existing wood shake or shingle roof.

For shingle roofs installed directly over the existing wood shake, the following materials are allowed:

- (a) Drip-Edge Metal
- (b) Stone Coated Fascia Metal or Regular Painted Fascia Metal

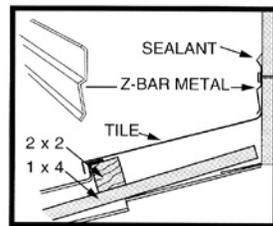
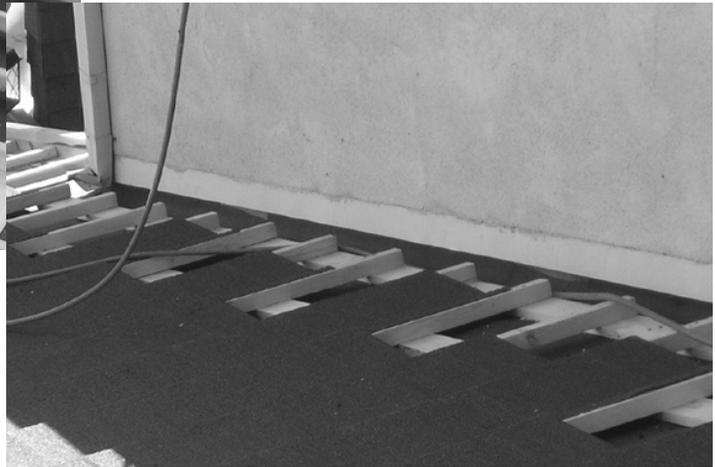


3D Rake Installation

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### 6-1-8. Dutch Gables

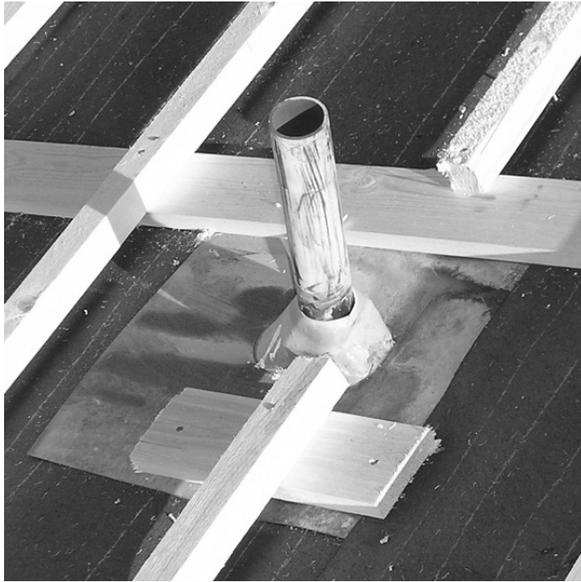
Before battening the roof, cut horizontally through the rake rafter/barge board to generate a space for the battens and Divine panels between the outside of the existing roof and the bottom of the rake rafter. Then the Divine panels can be installed under the rafter to make a weather secured finish.



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### 6-1-9. Vent Pipes

When a panel batten meets with a vent pipe, the panels above it and below it are measured, cut, and flashed. Sandwich the vent flashing over the pipe with a 2~3 pan section. Nail as a regular field panel to make the flashing material to be dressed down over the panel below. The double panning method is acceptable for a substitute.



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## 6-1-10. Short Valleys / Water Diverters

### (a) Short Valleys

When a valley exits onto the roof exterior well above the fascia, install an extra valley cut panel on top of an existing panel, so that the valley metal is hidden and held tightly in place.

Attach the valley cut panels tightly against the valley side walls, so that the extra valley cut panels prevent the water flow.

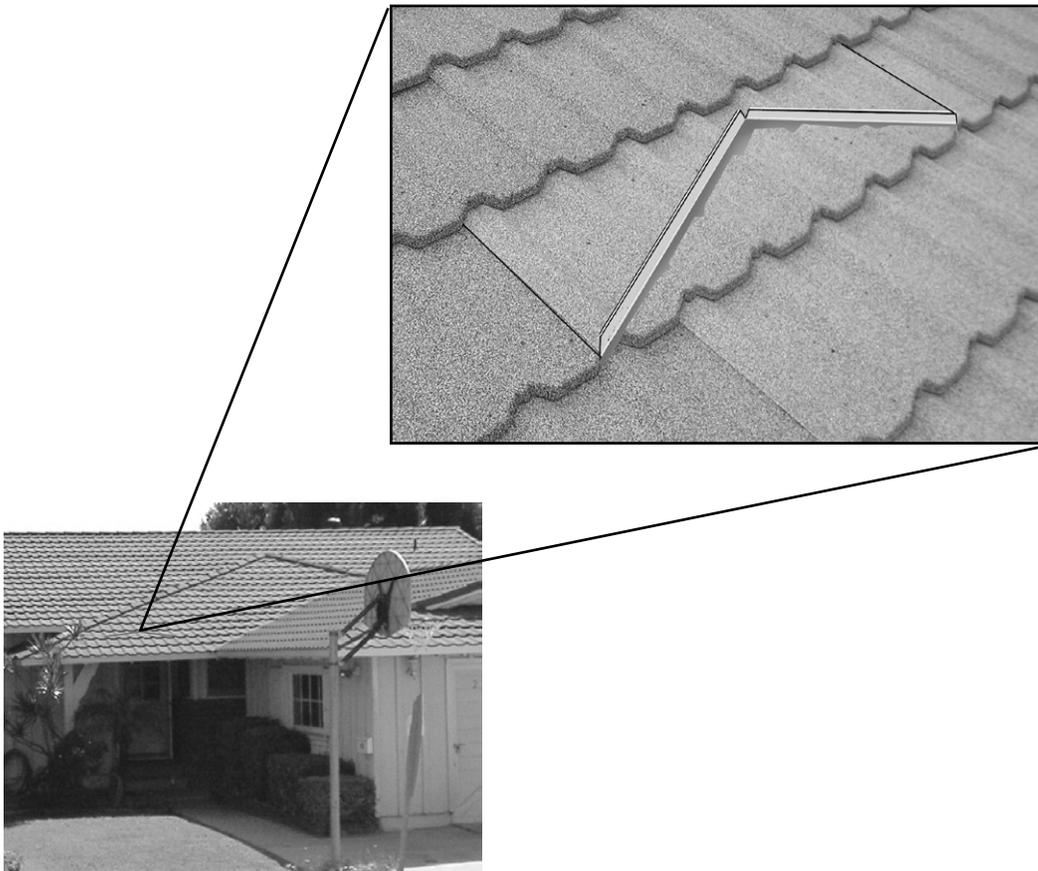
### (b) Water Diverters ‘V’ Type

For large roof protrusions, Divine suggests the use of custom manufactured crickets/saddles. A substitute is illustrated as below.

1 Field Made Diverter:

Divine panels are designed to prevent pooling of water behind large roof protrusions not exceeding 48” (1200mm) in width. If roof protrusions exceed 48” (1200mm) in width, a cricket/saddle made from galvanized metal must be applied. Alternatively, install the diverters, so that the water flows around the protrusion.

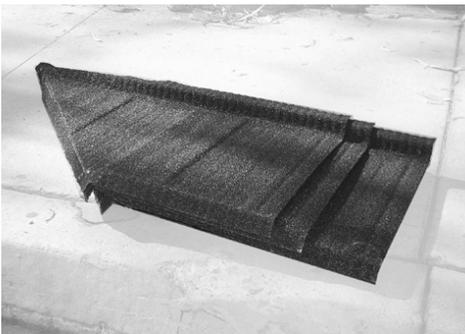
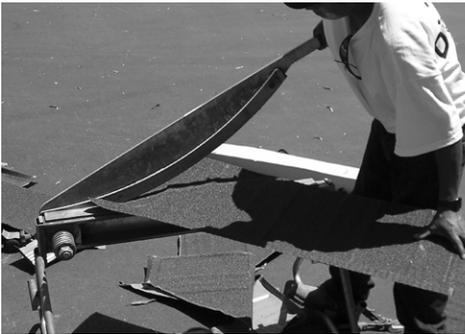
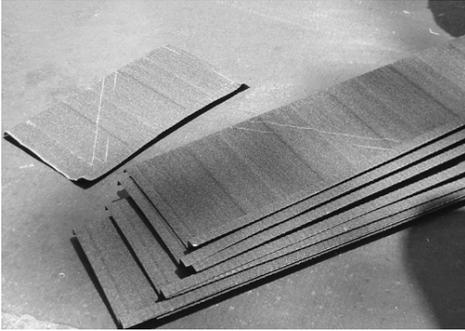
When making a diverter, assure the bend lines by marking a large triangle onto the panel by measuring 2” (50mm) in from each side and 3” (75mm) down from the back lip in the midpoint of the panel. To assure the cut lines, add 1” (25mm) to the bend lines. Single direction diverters are formed by measuring down from the back lip 6” (150mm) on one side and 12” (300mm) on the other.



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## 6-2. OTHER TIPS

### 6-2-1. Valley Cut



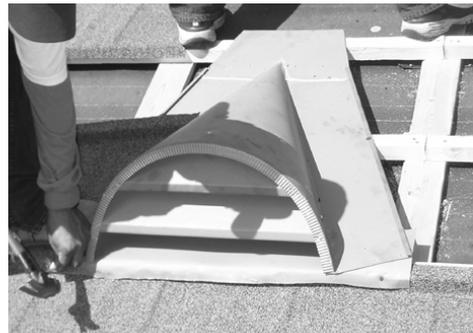
### 6-2-2. Rake / Gable Cut



**6-2-3. 3D Cut**



**6-2-4. Vent Cut**



# **APPENDIXES.**

## The History of Metal Roofing

The concept of stone coated steel roofing can be traced back to the 50's, when a New Zealand Industrialist visiting England was impressed with the way tar and sand was used to camouflage the steel World War 2 bunkers and other military buildings. These buildings held up well to the rigors of the harsh British climate so he took the idea back to New Zealand and developed a roof tile pressed from galvanized steel with a layer of bitumen and crushed rock granules.

The product quickly gained acceptance as other manufacturers began making galvanized roofing systems with various coatings. In the early 70's the products went through revolutionary changes as the bitumen base was replaced by space age, UV resistant and environmentally friendly acrylic resins to handle the extreme variations in weather conditions seen throughout many parts of the world. This helped the products begin migrating to other continents, gaining acceptance and finally reaching the North American market in the late 70's.

Continued development over the next few decades has led stone coated metal roofing systems to become the largest trend in the residential roofing industry today.

Divine, with its direct access to competitive raw materials and technology, is poised to become one of the foremost metal roofing manufacturers, offering two profiles of roof systems, **both Tile and Shake**. The profiles are stamped from 26 gauge galvanized sheet metal and 8 layers of primer, base coats, acrylic resins, crushed granules and over glaze go to make up the finished product. **Available in ten different colors**, the Divine roof system offers **superior protection against any weather conditions**. From the harsh freeze/thaw conditions of below freezing snow country in winter to the intense heat of the desert areas in the summer while able to withstand (and warranted for) 120 MPH wind uplift, it's no wonder stone coated metal roofing systems are used in over 80 countries around the world.

Divine roof panels, being made from steel, gives them a **non combustible, Class A rating**. With the interlocking and fastening method of installation, Divine Roof Systems are the **perfect solution against the threat of fire** or blowing embers.

When you compare the specifications of other roof materials, stone coated roofing panels are also **the most lightweight**. Divine is almost half the weight of even a 40 year composition roof and four times lighter than the so called "light weight" concrete tiles.

**Superior Earthquake Protection!** When you combine both the wood framing system for the Divine roof system with the roof panels themselves, (fastened to manufacturer's specifications), the structural integrity and shear strength that is added to the building is unmatched by other roof systems.

**Environmental Issues!** Most often, Divine roofs can be installed directly over an old wood shake or composition roof, relieving the expense of tearing off the old roof as well as the burden of over taxing our landfills.

**Lower Insurance Premium's!** Many insurance companies offer lower Homeowner's Insurance premiums if you have a Class A, fireproof roof system such as Divine.

**Resale Value!** This is another area where a Divine roof can benefit the homeowner. Real estate professionals consider stone coated metal roofs a real plus when selling a home, adding beauty to the appearance with the greater fire protection and fully transferable lifetime warranties.

## **WRITTEN INSTRUCTION**

The following is a video production outlining the installation details for the Divine metal roofing products. These suggested installation techniques have been developed by Divine as acceptable, tested methods of installation for their products. These methods are not the only way to install Divine products but have been chosen as a reference for experienced installers and a guide for new installers. This is only intended as a supplemental guide to the more comprehensive written Installation Instruction Manual.

Due to the fact that Divine has no control over the actual installation used, no warranty is made in regards to the installation of the product

For the purpose of this video we will be showing you installation technique's assuming that the old roof has been removed. In many instances, Divine can be installed directly over the old shingle or wood shake roof. For exact specifics on the preparation of the existing roof in this application, please refer to the written Installation Manual.

**Know what your Building Codes are!** It is the responsibility of the Installer or Contractor to check and know what the specific building codes are before the start of the installation process.

It is recommended that rubber or soft soled footwear be used to avoid any potential damage to the new roof surface and to provide a more sure grip for safety. You will also need a few tools to complete the installation. A metal tile cutter, a metal tile bender and a full length bender attachment. Pre made "Batten Spacer Bars" are a handy tool to use to ensure the accuracy of the batten spacing and help to speed up the process. You will need a set of at least two spacer bars.

Some other tools that you will need are:

Hammer or Nail Gun

Nail Pouch

Tape Measure

Electric Saw

Extension Cord

Caulk Line

Tin Snips

Caulking Gun

Drill and

Pen and Notepad

**STEP ONE: Roof Preparation**

For the purpose of this video we are assuming the old roof has been torn off, you will have either a plywood or space sheathing deck surface to begin the re-roof installation.

**STEP TWO: Underlayment**

Cover the entire roof surface with one layer of thirty pound felt (30lb), ensuring a 2" to 4" lap on the joints and lap seams. This will give you a Class A fire rated installation.

**STEP THREE: Installing Counter Battens**

Start by placing 1 x 4's up either side of any hips so they butt up against each other at the center of the hip. Also up either side of any valleys, leaving a 6.5 inch space (inside to inside) to accommodate the valley metal. Now begin placing 1 x 4's over every rafter going up the roof keeping them flush with the fascia at the bottom. Spacing should be a maximum of 24" apart. Nail every twelve inches. Refer to the written installation manual for the correct nail length. If you have any chimneys, skylights, dormers, air conditioners, etc., be sure to place a 1 x 4 down either side of these too. Once all the 1 x 4's are in place, nail a 2 x 2 roof batten around the entire perimeter, keeping it flush with the fascia build up and nail in place into the 1 x 4. Cut the 2 x 2's at 45 degrees at the intersections of the hips and cut the 2 x 2's flush with the inside of the 1 x 4's at the valleys. You are now ready to begin installing the roof battens

**STEP FOUR: Installing the Roof Battens**

**PLEASE NOTE:** This is a very important part of the installation and it is essential that the battens are installed at the correct spacing or the roofing panels will not sit correctly on the framing. Always refer to the written manual for the correct spacing. The roof battens are made from nominal 2" x 2" lumber.

First you must set the first row of battens around the roof. At one end of the roof, measure up from the bottom 2 x 2 at the fascia, 14 1/4" and tack a nail into the first 1 x 4 counter batten. Now repeat this step at the other end of the roof side. **Please Note**, the first row is the **ONLY** row that is set at this measurement and is intended to allow a slight overhang of the bottom roof panel over the fascia build up.

Now run a caulk line from one nail to the other to establish a straight line for the 2 x 2 layout. Place a nail on each of the 1 x 4 counter battens at the caulk line. Lay a 2 x 2 on the top side of the nails. Check measure from the first row batten along the roof length, down to the fascia to ensure you still have 14 1/4". If it exceeds this measurement because the house frame bows out, move the original 2 nails down the same amount to ensure the bottom course of metal roofing will overhang the bottom edge, re caulk line and position the first row of roof battens and nail the battens in place.

You can now use the spacer bars to position the rest of the battens. **The correct spacing from the front of one batten to the front of the next is 14 1/2"**. Be sure to position (or cut) all the ends of the 2 x 2's over the 1 x 4's and take care not to split them when nailing.

You will most likely have a short course once you reach the ridges.

**STEP FIVE:                    Installing the Hip, Ridge and Gable Boards**

For the **Hips**, run a 2 x 2 up either side of the hips on top of the roof battens. These should be spaced five inches apart.

For the **Ridges**, place a 1 x 4 along the top of the ridge and then stack two 2 x 2's on top. This will give you the correct build up for the top row of roof panels (which is often less than a full course), and will also provide a nailer for the Divine trim pieces.

For the **rakes (or gables)** it is going to depend on whether or not metal trim pieces are to be used or if the "trimless 3 D" option is desired. NOTE: 3 D is only for Divine Shake panel roofs.

If trim is to be used, a 2 x 2 should be run vertically up each rake, from either a hip intersection or the fascia, to the ridge on top of the roof battens. This way the metal roofing can be turned up against the 2 x 2 to make for a water tight trim finish.

If the 3 D finish is desired, the 2 x 2 roof battens need to be trimmed back at least two inches from the edge of the rakes. A special 3 D metal rake edge is placed on top of the 1 x 4, again going from either a hip intersection or the fascia extending to the ridge board.

**STEP SIX                        Installing the Valley Metal and Metal Edge**

Place the new valley metal between the 1 x 4's at each valley. Be sure that the valley metal extends past the fascia, snip and bend down the excess metal overhanging, parallel to the fascia. Small tabs can be cut into the top lip of the valley metal and secured by nailing into the 1 x 4's on each side. Each valley section should be overlapped at least 4" and when two valleys intersect, they should overlap each other.

The Metal Edge is placed over the bottom 2 x 2 to cover the wood frame build up, extending down into the gutter or over the existing fascia board. Place the metal edge around the entire perimeter nailing into the face of the 2 x 2's. Care should be taken to avoid any twisting or buckling of the metal. The top section of the metal edge is snipped and bent at 90 degree's to form the outside corners at the hips and some cutting will also be necessary to form the metal edge where the valleys protrude.

**STEP SEVEN:                Installing Divine Roof Panels in the Open Roof Areas**

Start by spreading out the roof panels across the roof staying down a few rows from the top. The first row to install is the first full row down from the ridge. Be sure to line up the corrugations and secure the first row by nailing the back edge of the panels down into the panel batten it rests on. Pay attention to keep your panel laps away from the main line of view. Continue to lay the panels across the roof and work your way down the roof. Be careful to ensure that the panels do not slip off the batten by going back over and nailing the panels in place, every few courses. Stand on the panel to be nailed facing down the roof to ensure it is locked over the 2 x 2 correctly. The panels are nailed in the front edge under the highest point of the panels and NOT near the water channels. You should never have more than two pans of a panel without a nail. When nailing the bottom row these can be nailed in the same fashion or may be nailed down vertically in the top of the panel to hit the bottom 2 x 2. Each nail will need to be sealed and chipped later to keep them watertight. When laying panels on a hip end or down a valley, the panels need to be staggered to the angle of the hip or valley.

#### STEP EIGHT

#### **Installing the Hip and Valley Cuts**

The triangular gaps at the hips and valleys that need to be filled are measured individually on the roof in order, from top to bottom. Measurements should always be taken from the center groove of the end lap on the last full panel and be sure to keep the measuring tape parallel to the roof battens when taking the measurements. The measurements are then transferred to full panels on the ground by marking the panels from the same lap groove on the matching end of a panel. Each panel cut should have a top measurement mark and a bottom measurement mark. A 2 x 2 can be used as a straight edge, by placing the 2 x 2 outside the top and bottom marks on the panel. Marking the outside of the 2 x 2 will give you the cut line and the two measurement marks become the bend line. For additional information about the marking and stacking each set of hip/valley cuts, please refer to the Written Installation Instructions. It is important not to mix up the cuts and keep them in the exact order in which they were first measured. Keep each hip and valley separate on the ground to avoid confusion. The bends typically taper from top to bottom with the **hip bend up's** being wider at the top and **valley bend down's** being wider at the bottom.

Hip and Valley cuts are installed from the bottom up and each should be lapped the same direction as the field panels. Nail in the same fashion and put one or two nails into the hip board bend up to secure. Care must be taken when making the valley cuts as there is no trim piece to conceal the appearance. Valleys must be neat and straight when finished.

#### STEP NINE

#### **Installing Ridge Cuts**

Again from the roof, measure the distance from the back of the first top row panels to the ridge board. Check along the ridge as this measurement can vary from one end to the other. Transfer the measurements to the full panels on the ground, marking them from the same place where the measurements were taken on the roof. This is your bend line and the cut line will be 2" further up the panel. Before cutting the ridge course, the panel **MUST** always be **bent first** in the Full Length Bender, **then cut** long ways in the panel cutter. The ridge cuts are now ready to be installed. If laying from left to right, the left hand end of each cut is nailed first in the front of the panel, then nail the other end. Now work your way back nailing the middle of each ridge course panel in the front and then nail the bent up part of the panels into the ridge board, Be sure to keep the back of the ridge cuts flush with the top of the ridge board to ensure the angle is on the same plane as the field panels and not kicked up or down.

#### STEP TEN

#### **Installing Gable or Rake Cuts**

Measure the distance from the last panel to the 2 x 2 running up the rake. NOTE: As with the hip and valley cuts, measure from the center of the panel's overlap grooves.

Start at the top taking down each measurement working your way down the rake to the bottom. Now on the ground, transfer the measurements to the full tiles, using a straight edge to mark a line down each panel. This will be the bend line. Mark another line an extra inch outside the bend line for the cut line to provide the "turn up" against the rake board. Cut and bend up each cut taking care to keep them in the correct order. Once completed on the ground, the cuts can now be installed starting with the bottom cut, nailing in position as you go. Continue on up the rake in the same fashion until all the cuts are installed.

### ALTERNATIVE 3 D RAKES.

As mentioned during the framing stage, rakes can be finished by extending the panels an inch or two past the rake edge, bent down an inch at 90 degrees and bent again to return back into the 3D Rake Metal, creating a 3D effect from the ground. This is only an option for Divine Shake panel installation and you will need a small adaptor for the panel bender to make the double bend correctly. Most panel benders come with the adaptor attached.

### STEP ELEVEN **Pipe and Vent Flashings**

Where ever a panel meets a pipe or vent that penetrates through the roof, cut a hole in the panel so the panel will fit over the top of the existing pipe. NOTE: Always leave the old pipe flashing in place. The cut does not have to be tight to the pipe. Now install the new pipe flashing over the pipe, cutting and molding it to conform to the panel corrugations. Trim off any excess flashing material and nail in place. Now take another roof panel and carefully mark on the panel, the top, bottom and sides where the pipe base will meet the uprise part of the flashing. Cut the hole out of the panel and install the panel over the pipe flashing. NOTE: The hole should be tight to the base of the flashing. Nail in the normal manner and finish by caulking around the intersection of the pipe flashing and panel to seal it. Granules or paint should be used to complete the process and match up the caulking to the same finish as the roof panels.

### STEP TWELVE **Flashing a Chimney**

These instructions are the correct procedure for installations governed by California building jurisdictions so for others, please refer to the written installation manual. Measure the space between the panel and the chimney at all sides. When marking on the ground, allow 2” for the bend up against all sides of the chimney. Start by installing the cut panel that goes in front of the chimney, forming the panel at the sides by cutting at a 45 degree angle In the corners. Next install and secure the cuts on both sides of the chimney and then the piece for the rear of the chimney in the same fashion as the front. A chimney saddle is now formed to fit behind the chimney over the cut panel to act as a water diverter. The saddle should extend from over the first 2 x 2 above the back of the chimney, down to the chimney and up the back of the chimney at least 4”. It should also extend past each side of the chimney to help get the water away. You must now seal up all corners and the top edge of the bend ups where they meet the chimney. Now cut and install a z-bar counter flashing over the bend ups, fasten to the chimney and seal at the top edge.

### STEP THIRTEEN **Installing the Divine Trim**

Start by placing the stone coated “end caps” provided into the trim pieces and securing with either sheet metal screws or rivets. This is designed to create a finished appearance at the bottom of hips, ridges (Also the gable ends where the 3 D option is not being used). Place the trim with the end cap over the hip at the bottom of the roof and nail down through the trim into the 2 x 2 hip boards. Keep the end cap as snug to the fascia corner as possible for a neat cosmetic finish. Work your way up the hip with the trim pieces and nail in the same manner, right near the front edge of each trim piece taking care to ensure that the hips are straight. Where hips intersect and/or meet gables or ridges, the last trim pieces must be cut (or mitered) to form a neat intersection.

The same applies for where the trim going up a gable meets a ridge, etc. Use caulking and loose granules to seal and chip these intersections for a watertight finish. NOTE: No trim pieces are needed on the rakes or gables when the gables are finished with the 3 D option for Divine Shake

#### **STEP FOURTEEN Final Overall Check**

Take time to walk the roof and ensure that all the panels have been nailed correctly. Check the same for the trim and make sure that any top nails have been sealed and chipped. Finally, clean up the job site thoroughly and your installation is now complete.

#### **IMPORTANT : PLEASE TAKE NOTICE**

Divine assumes no liability for incorrect installation of their products or personal injury that may occur as a result of installing these products. This video gives you suggested installation techniques only and is not intended to be a substitute for local building code specifications.

**TABLE 1-2: NEW ROOF-CLASS B**

FASTNER USAGES FOR DIVINE ROOFING PANELS AND BATTERNS

Roof Area				Field				Edge						
3-Sec Gust Basic Wind Speed (mph)				110	125 max	140	150 max	160	170 max	130	140 max	170	170	
Roof HGT above Grade (ft)				60 max	30	60 max	30	60 max	50	60 max	30	60	60	
Design Wind Up Lift Pressure (lbf/ft <sup>2</sup> )				35.5		52.8		73.8		84.5		125.9	175.9	
Fasteners	Batten to Rafters (qty-size)	Rafter Spacing	16 in. o.c.	1-16d	1-16d	2-16d		2-16d		2-16d		1-#8x3" Screw		
			24 in. o.c.	1-16d	2-16d	1-16d & 1-#8x3" Screw		2-16d		2-16d		4-#8x3" Screw		
	Panel to Batten			6-6d in Each Panel		6-6d in Each Panel		6-8d in Each Panel		6-8d in Each Panel		7-8d in Each Panel		9-8d in Each Panel

**TABLE 1-2: NEW ROOF-CLASS C**

FASTNER USAGES FOR DIVINE ROOFING PANELS AND BATTERNS

Roof Area				Field				Edge							
3-Sec Gust Basic Wind Speed (mph)				90	110 max	120	140 max	140	160 max	110	130 max	130	160 max	160	170 max
Roof HGT above Grade (ft)				60 max	20	60 max	15	60 max	20	60 max	15	60 max	15	60 max	40
Design Wind Up Lift Pressure (lbf/ft <sup>2</sup> )				35.5		52.8		73.8		84.5		125.9		175.9	
Fasteners	Batten to Rafters (qty-size)	Rafter Spacing	16 in. o.c.	1-16d	1-16d	2-16d		2-16d		2-16d		1-#8x3" Screw			
			24 in. o.c.	1-16d	2-16d	1-16d & 1-#8x3" Screw		2-16d		2-16d		4-#8x3" Screw			
	Panel to Batten			6-6d in Each Panel		6-6d in Each Panel		6-8d in Each Panel		6-8d in Each Panel		7-8d in Each Panel		9-8d in Each Panel	

1 in. = 25.4 mm, 1 mph = 1.61 km/h, 1 psf = 0.047 kPa

**Battens have to spaced at 14 9/16(370mm) inches o.c.**

Fasteners of batten to conter-batten shall penetrate a minimum of 1 inch into the counter-batten.

Fasteners of batten to rafters have to penetrate a minimum of 2 inches through the roof sheathing and into the rafter framing

Nails must to be corrosion-resistanted common wire nails & screws must to be corrosion-resistanted material.

Roof slopes greater than 2 1/2: 12 & less than or euual to 7:12

Hip/Gable or Gable Roofs, Category II & Partially enclosed Building.

**TABLE 2-1: REROOFING OVER EXISTING ROOF-CLASS B**  
FASTNER USAGES FOR DIVINE ROOFING PANELS AND BATTERNS

Roof Area				Field						Edge					
3-Sec Gust Basic Wind Speed (mph)				110	125 max	140	150 max	160	170 max	130	140 max	170	170		
Roof HGT above Grade (ft)				60 max	30	60 max	30	60 max	50	60 max	30	60	60		
Design Wind Up Lift Pressure (lbf/ft <sup>2</sup> )				35.5		52.8		73.8		84.5		125.9		175.9	
F a s t n e r s	Counter-batten to Rafter & Spaced Sheathing (qty-size)	Rafter & Counter-batten Spacing	7 in. o.c. Spaced Sheathing	16 in. o.c.	1-16d at 14 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	2-16d at 7 in. o.c.			
				24 in. o.c.	1-16d at 7 in. o.c.	2-16d at 10 in. o.c.	2-16d at 7 in. o.c.	2-16d at 7 in. o.c.	1-#8x3" Screw at 7 in. o.c.	1-16d & 1-#8x3" Screw at 7 in. o.c.					
			10 in. o.c. Spaced Sheathing	16 in. o.c.	1-16d at 10 in. o.c.	1-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	1-#8x3" Screw at 10 in. o.c.		
				24 in. o.c.	1-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	1-16d & 1-#8x3" Screw at 10 in. o.c.	1-16d & 1-#8x3" Screw at 10 in. o.c.	1-#8x3" Screw at 10 in. o.c.				
	Batten to Counter-batten (qty-size)	Rafter Spacing	16 in. o.c.	2-16d	1-#8x3" Screw	1-#8x3" Screw	1-16d & 1-8x3" Screw	2-#8x3" Screw	2-#8x3" Screw	1-16d & 2-#8x3" Screw	2-#8x3" Screw				
			24 in. o.c.	1-#8x3" Screw	1-16d & 1-#8x3" Screw	2-#8x3" Screw	2-#8x3" Screw	1-16d & 2-#8x3" Screw	3-#8x3" Screw						
	Panel to Batten				6-6d in Each Panel	6-6d in Each Panel	5-8d in Each Panel	6-8d in Each Panel	7-8d in Each Panel	9-8d in Each Panel					

**TABLE 2-2: REROOFING OVER EXISTING ROOF-CLASS C**  
FASTNER USAGES FOR DIVINE ROOFING PANELS AND BATTERNS

Roof Area				Field						Edge					
3-Sec Gust Basic Wind Speed (mph)				90	110 max	120	140 max	140	160 max	110	130 max	130	160 max	160	170 max
Roof HGT above Grade (ft)				60 max	20	60 max	15	60 max	20	60 max	15	60 max	15	60 max	40
Design Wind Up Lift Pressure (lbf/ft <sup>2</sup> )				35.5		52.8		73.8		84.5		125.9		175.9	
F a s t n e r s	Counter-batten to Rafter & Spaced Sheathing (qty-size)	Rafter & Counter-batten Spacing	7 in. o.c. Spaced Sheathing	16 in. o.c.	1-16d at 14 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	1-16d at 7 in. o.c.	2-16d at 7 in. o.c.			
				24 in. o.c.	1-16d at 7 in. o.c.	2-16d at 10 in. o.c.	2-16d at 7 in. o.c.	2-16d at 7 in. o.c.	1-#8x3" Screw at 7 in. o.c.	1-16d & 1-#8x3" Screw at 7 in. o.c.					
			10 in. o.c. Spaced Sheathing	16 in. o.c.	1-16d at 10 in. o.c.	1-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	1-#8x3" Screw at 10 in. o.c.			
				24 in. o.c.	1-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	2-16d at 10 in. o.c.	1-16d & 1-#8x3" Screw at 10 in. o.c.	1-16d & 1-#8x3" Screw at 10 in. o.c.	1-#8x3" Screw at 10 in. o.c.				
	Batten to Counter-batten (qty-size)	Rafter Spacing	16 in. o.c.	2-16d	1-#8x3" Screw	1-#8x3" Screw	1-16d & 1-8x3" Screw	2-#8x3" Screw	2-#8x3" Screw	1-16d & 2-#8x3" Screw	2-#8x3" Screw				
			24 in. o.c.	1-#8x3" Screw	1-16d & 1-#8x3" Screw	2-#8x3" Screw	2-#8x3" Screw	1-16d & 2-#8x3" Screw	3-#8x3" Screw						
	Panel to Batten				6-6d in Each Panel	6-6d in Each Panel	5-8d in Each Panel	6-8d in Each Panel	7-8d in Each Panel	9-8d in Each Panel					

1 in. = 25.4 mm, 1 mph = 1.61 km/h, 1 psf = 0.047 kPa

**Battens have to spaced at 14 9/16(370mm) inches o.c.**

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Roof slopes greater than 2 1/2: 12 & less than or eual to 7:12

Hip/Gable or Gable Roofs, Category II & Partially enclosed Building.



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