

MARTINDALE'S
BEVEL ANGLES
BINS-TOWERS-HIP & VALLEY ROOFS

BEVEL ANGLES

FOR THREE DIMENSIONAL CONNECTIONS

TAPERED BIN, HOPPER & TOWER CORNER ANGLES

DIAGRAMS FOR QUICK SOLUTIONS
FORMULAS FOR SPECIAL CONDITIONS

HIP & VALLEY ROOF FRAMING CONNECTIONS

SKETCHES TO LOCATE BEVEL ANGLES REQUIRED
FORMULAS FOR BEVEL ANGLES

ANALYTIC PROOF OF FORMULAS

TABLES OF HIP & VALLEY BEVEL CONNECTION ANGLES

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CONTENTS

Preface	page 4
General Notes	page 5

PART I

CORNER ANGLES-TAPERED BINS, HOPPERS & TOWERS

Use of Diagrams	page 6
Typical Bin Sketch	page 7
Diagrams and Examples	page 8 to 13
Formulas	page 15

PART II

HIP & VALLEY FRAMING ANGLES

Comment	page 16
Use of Sketches, Formulas and Tables	page 17
Formulas, H. & V. Framing Angles	page 18
Roof Sketch and Location Formulas	page 19
Typical Connection Sketches	page 20 to 31
Proof of Formulas	page 32 to 37
Notes on Tables of H. & V. Framing Angles	page 38
Tables of H. & V. Framing Angles	page 40 to 62

PREFACE

There is a scarcity of information relating to the solution of three dimensional angles as required for bevel corner angles for tapered bins, hoppers, chutes, towers, spires, masts and other tapered structures, and for hip and valley roof framing angles, and practically no prepared tables for ready reference

This book is designed to supply such information and to present the subject briefly and concisely and to publish for the first time diagrams and tables of beveled angles that will supply a considerable portion of such angles without computation. Formulas are given for angles not previously included, and new formulas for hip and valley framing angles easier to use.

GENERAL NOTES

Bevel corner angles for tapered bins, hoppers, chutes, towers and other tapered structures are dealt with in Part I and hip and valley roof framing angles in Part II.

PART I provides diagrams and formulas for finding the pitch of the bevel corner angles for tapered bins, hoppers, chutes, towers, spires, masts and other similar structures. The diagrams furnish the bevel corner angle directly from the side slopes for rectangular bins, hoppers, etc. The formulas provide the means of finding the bevel corner angle for any shaped structure.

PART II provides sketches of various roof arrangements, sketches of typical hip and valley roof framing connections, formulas for finding the horizontal position of the hip or valley, formulas for the hip and valley roof framing angles, tables of hip and valley roof framing angles for various roof slopes and hip or valley positions and analytic proof of the formulas given.

The sketch of various hip and valley roof arrangements indicate the value of the horizontal locating angle for hip and valleys for different combinations of roof slopes and intersecting angles.

The sketches of typical hip and valley roof framing connections illustrate typical purlin and rafter connections and locate the several bevel framing angles used for making such connections, including angles for cuts, clearance, locating from top or bottom of purlin and other required triangulation.

The tables of hip and valley framing angles are given for 23 roof slopes, the even inch pitch roof slopes of vertical and horizontal pitch. For each roof slope the pitches of the twelve framing angles are given at even degree positions of the hip or valley, as indicated by 51 positions of the locating angle D from 20° to 70° . The pitches are given to the nearest $1/32''$ of pitch. This arrangement given the pitches close enough together so that the pitch for any intermediate position of the hip or valley can be found by interpolation, for the slopes given.

The formulas are given for the bevel framing angles for the solution of the angles for roof slopes not included in the tables.

Analytic proof of the formulas are given for students and others interested, as the formulas are new. These formulas are based upon the roof slope and the horizontal angles between the ridge and valley, for valley framing angles, and between the hip and eave for hip framing angles.

-- 5 --

[\[contents\]](#) [\[previous page\]](#)

[\[next page\]](#)

PART I

Beveled Corner Angles

Tapered Bins, Hoppers, Chutes, Towers, Spires, Masts, Etc.

USE OF DIAGRAMS

There are three diagrams covering the full range of slope combinations for rectangular tapered bins, hoppers, chutes, towers, etc., that is, for corners square in plan or horizontal section. The Typical Bin Sketch shown on the following page indicates the slope combinations covered by each diagram.

For a particular problem select the diagram that includes sides with slopes corresponding to your problem. It is only necessary to find the correct pitch for one side along the side edge of the diagram, and follow the line to the intersection of the pitch line at the top of the diagram for the other side, and at that point of intersection, the curves show the pitch of the resulting corner angle. The examples given on the page opposite each diagram outlines the procedure more in detail.

All pitch lines are shown at 1/8" intervals. The pitch to the nearest 1/16" of pitch can be read by interpolation.

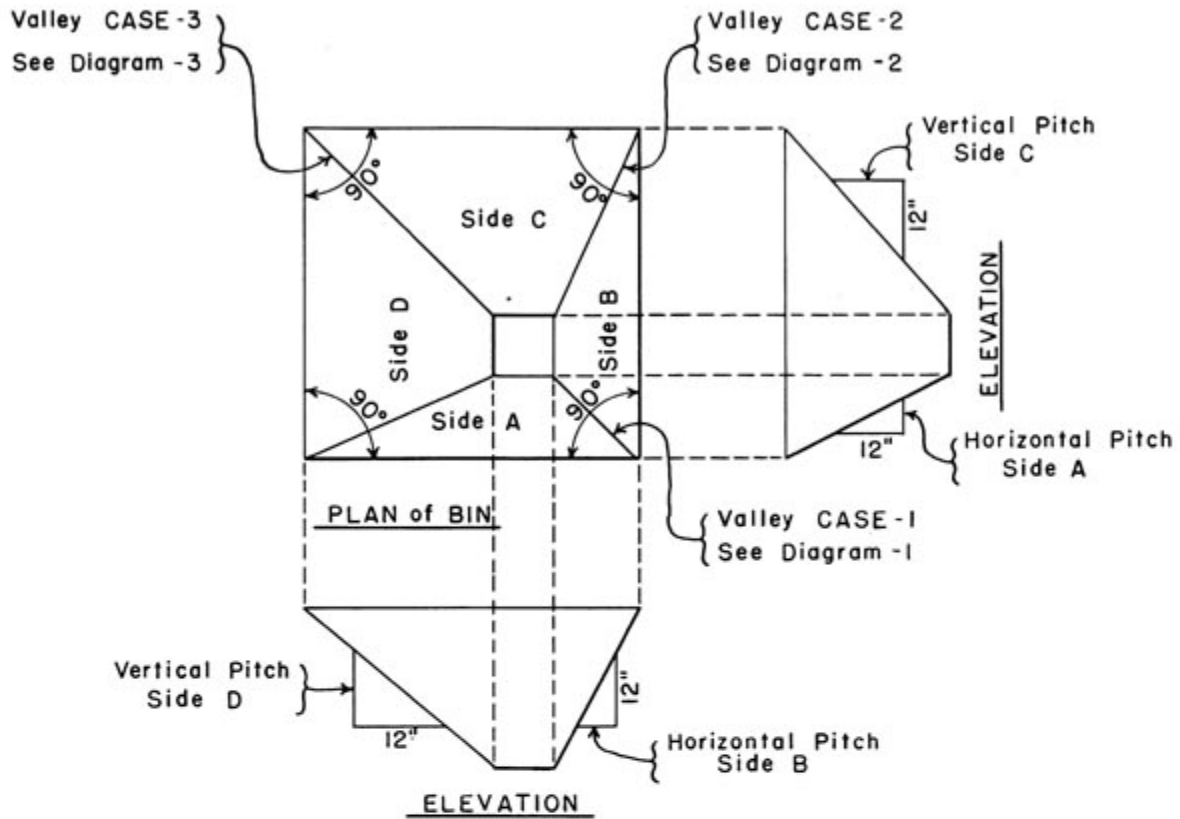
Note that the diagrams are for corners SQUARE IN PLAN only. To find the bevel of corners where the sloping sides meet in an acute or obtuse angle in plan, see formulas [page 15](#).

Note that the bevel of the corner for any two slopes is the same whether they meet right or left hand to the examples given.

Hip corners for tapered towers can be found in the same manner as for bins, as the corners would be the same as an inverted bin with the same slopes. Similarly the beveled corners of any tapered structure such as chutes, masts, spires and the like can be found by reference to the proper diagram.

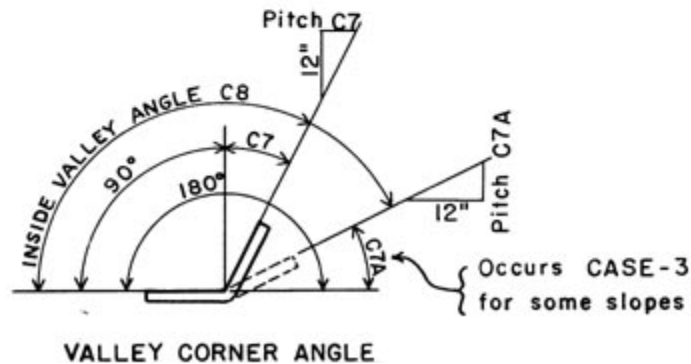
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MARTINDALE'S
VALLEY CORNER ANGLES FOR BINS & HOPPERS
 TYPICAL BIN SKETCH
 (WITH CORNERS SQUARE IN PLAN)



VALLEYS SHOWN FOR THREE CONDITIONS

- CASE - 1 Slopes of both sides over 45° (Pitches horizontal) see Diagram -1
- CASE - 2 { Slope of one side over 45° (Pitch horizontal)
 Slope of other side under 45° (Pitch vertical) } see Diagram -2
- CASE - 3 Slopes of both sides under 45° (Pitch vertical) see Diagram -3
- Slopes of sides 0° to 45° from horizontal given in vertical pitch.
- Slopes of sides 45° to 90° from horizontal given in horizontal pitch.



[\[contents\]](#) [\[previous page\]](#)

[\[next page\]](#)

EXAMPLES for DIAGRAM NO-1

BIN PROBLEM

Given a bin corner, square in plan, one side with 6" horizontal pitch slope, the other side with 4" horizontal pitch slope, to find the resulting bevel angle at the valley.

In diagram No. 1, select 6" pitch line on Side A, follow to the intersection with 4" pitch line from Side B. This intersection point lies between the 1 5/8" and 1 3/4" pitch line for angle C7. By interpolation the pitch to the nearest sixteenth is 1 11/16".

TOWER PROBLEM

Given a tapered tower, square in plan, both sides having a 2" horizontal pitch slope, to find the pitch of the resulting hip corner beveled angle.

In diagram No. 1, on Side A select the 2" pitch line, follow to the intersection with the 2" pitch line from Side B. The point of intersection lies between the 1/4" and 3/8" pitch line for angle C7. By interpolation, the pitch to the nearest sixteenth is 5/16".

[[contents](#)] [[previous page](#)] [[next page](#)]

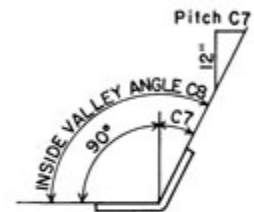
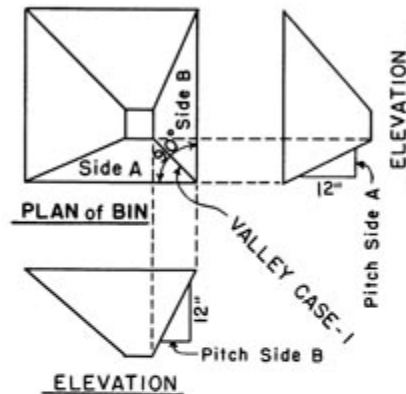
MARTINDALE'S
VALLEY CORNER ANGLES FOR BINS & HOPPERS
 CORNERS SQUARE IN PLAN

**VALLEY CONDITIONS
 CASE - I**

Side A Slope between 45° & 90°
 Pitch horizontal to 12" vert.

Side B Slope between 45° & 90°
 Pitch horizontal to 12" vert.

Corner angle 90° in plan.



VALLEY CORNER ANGLE
 (Section normal to Valley)

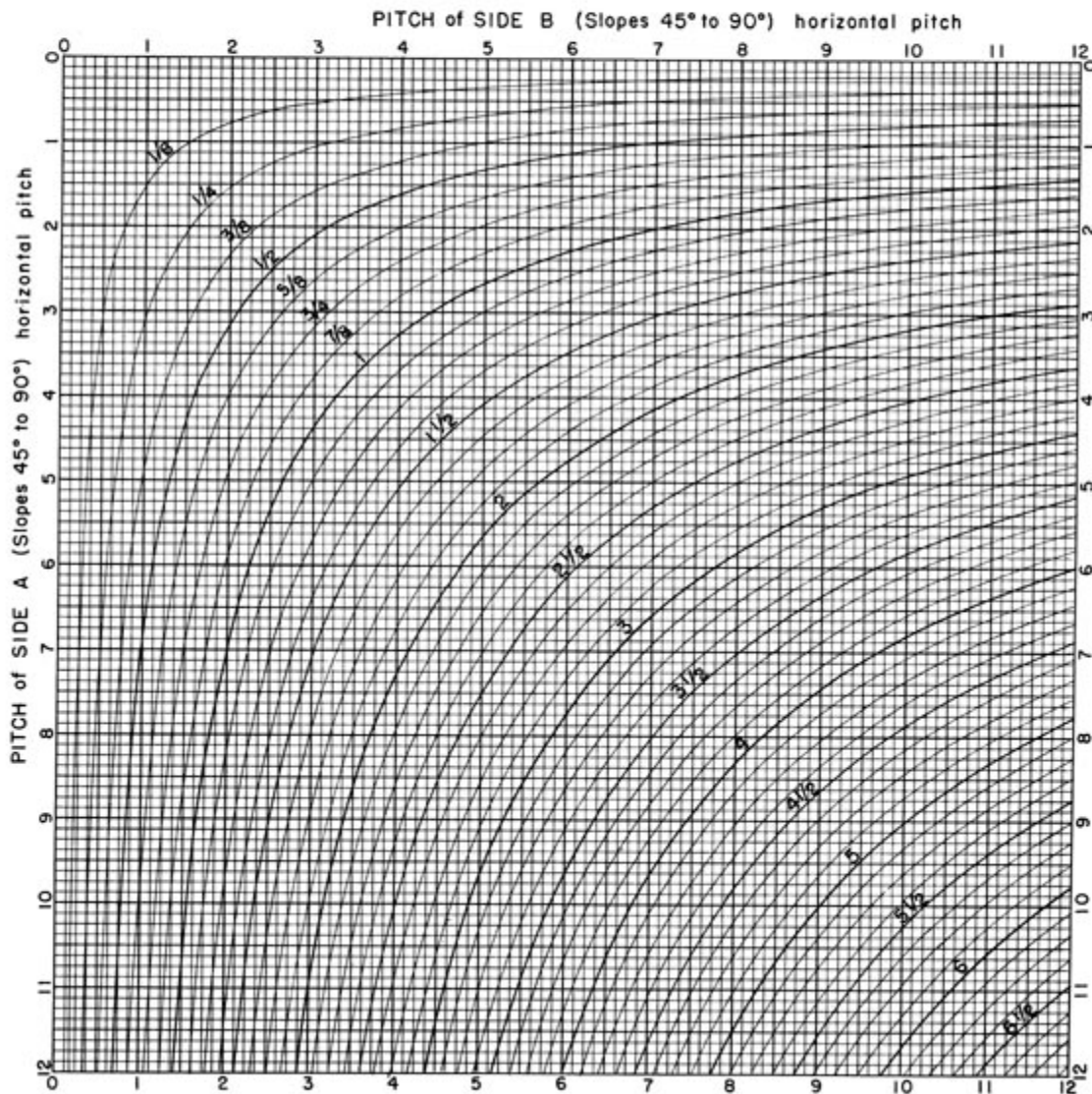


DIAGRAM NO-1

CURVED LINES REPRESENT PITCH OF ANGLE C7 FOR CASE - I

[\[contents\]](#) [\[previous page\]](#)

[\[next page\]](#)

EXAMPLES for DIAGRAM NO-2

BIN PROBLEM

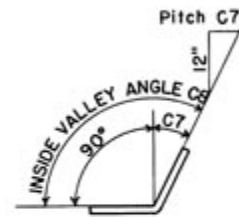
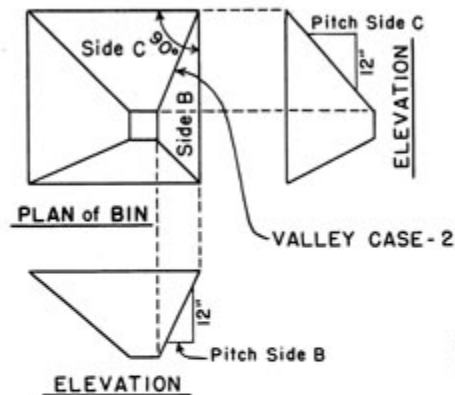
Given a bin corner, square in plan, one side with 6" horizontal pitch slope and the other side with 10" vertical pitch slope, to find the resulting bevel angle at the valley.

In diagram No. 2, note that Side B is for horizontal pitches and Side C is for vertical pitches. Select 6" line side B and follow to intersection with 10" line from side C. This intersection point lies near the $4 \frac{3}{8}$ " pitch line for the desired angle C7.

[[contents](#)] [[previous page](#)] [[next page](#)]

MARTINDALE'S
VALLEY CORNER ANGLES FOR BINS & HOPPERS
 CORNERS SQUARE IN PLAN

VALLEY CONDITIONS
CASE - 2
 Side B Slope between 45° & 90°
 Pitch horizontal to 12" vert.
 Side C Slope between 0° & 45°
 Pitch vertical to 12" horiz.
 Corner angle 90° in plan.



VALLEY CORNER ANGLE
 (Section normal to Valley)

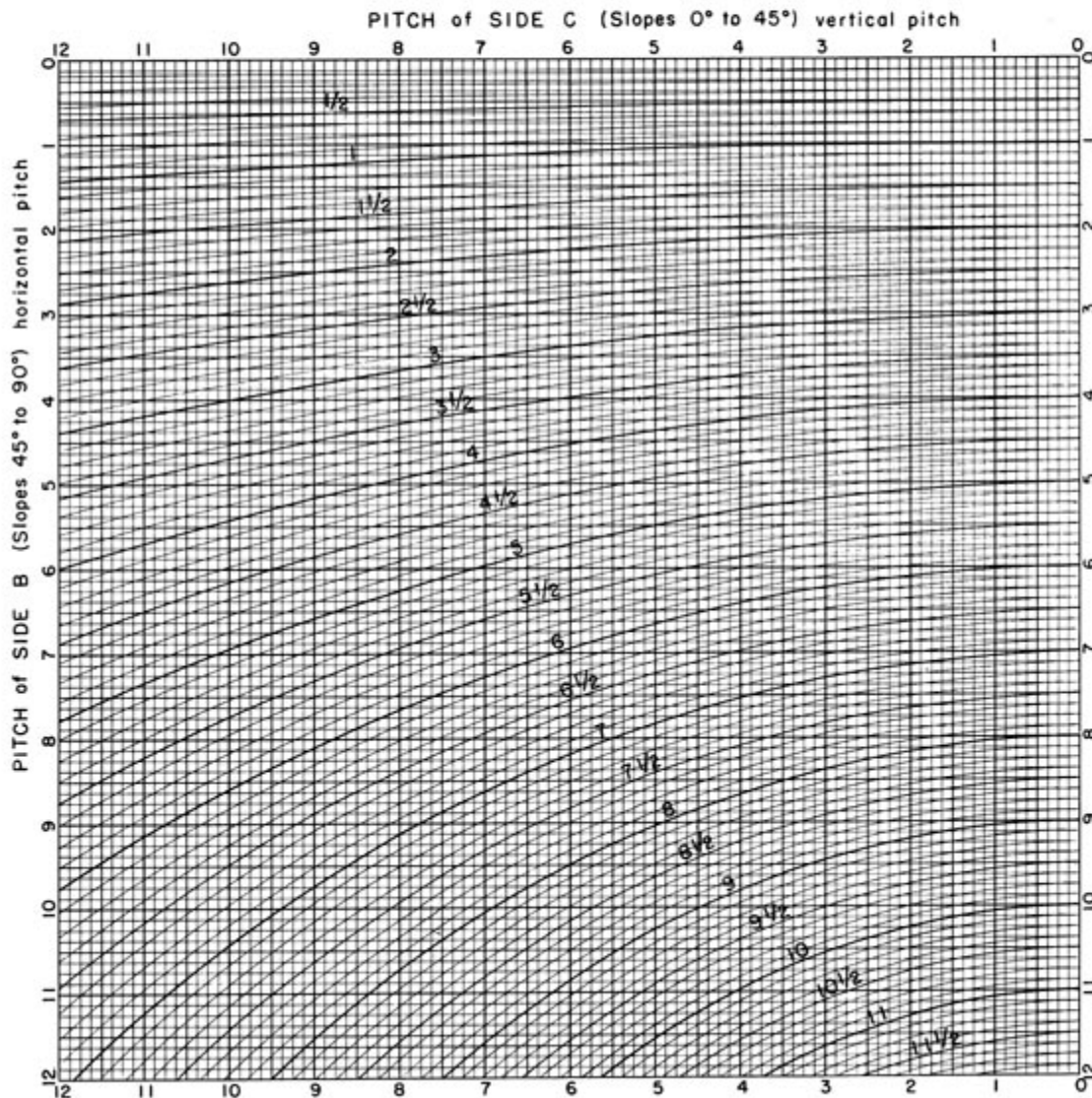


DIAGRAM NO-2
 CURVED LINES REPRESENT PITCH OF ANGLE C7

[\[contents\]](#) [\[previous page\]](#)

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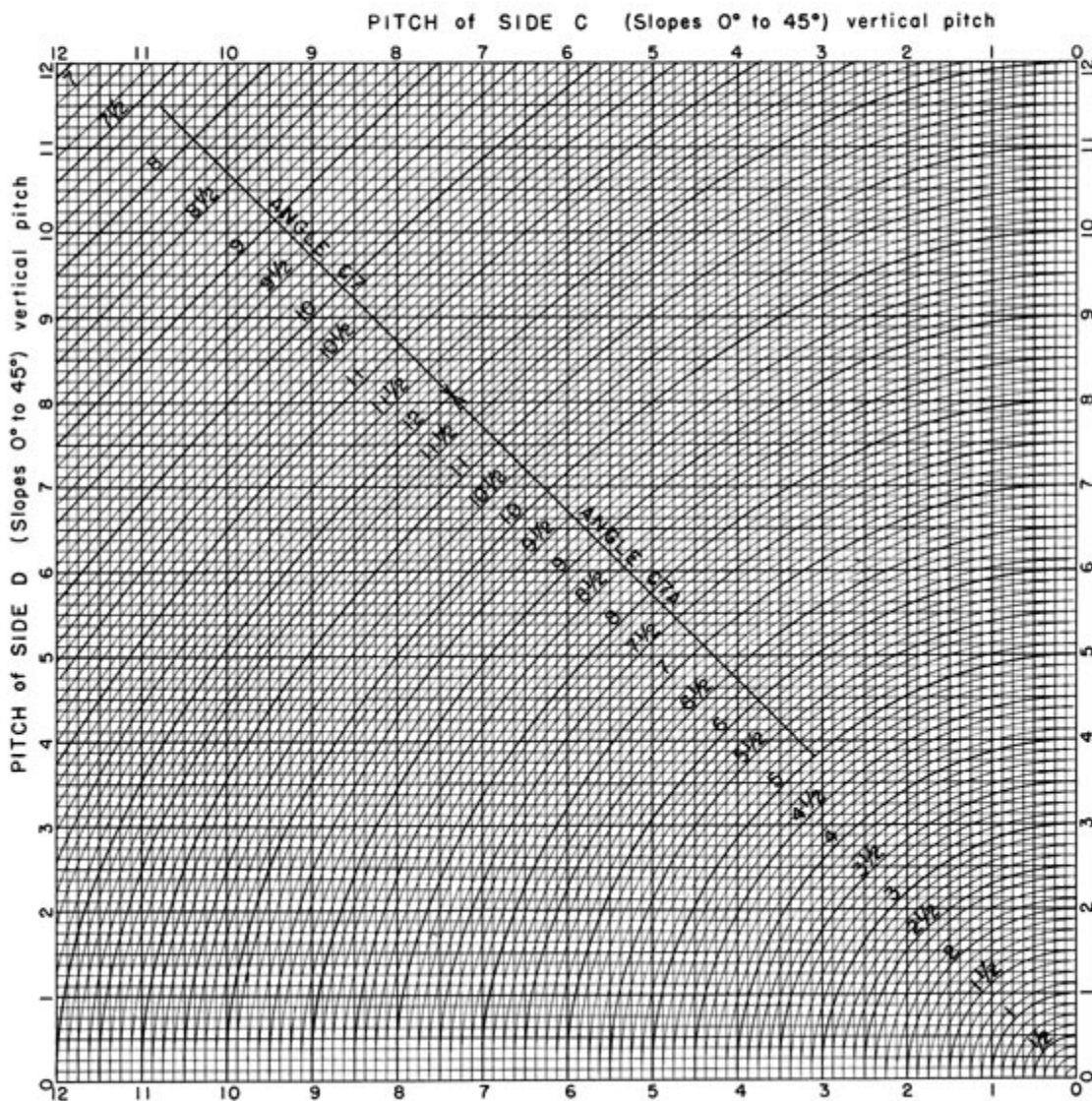
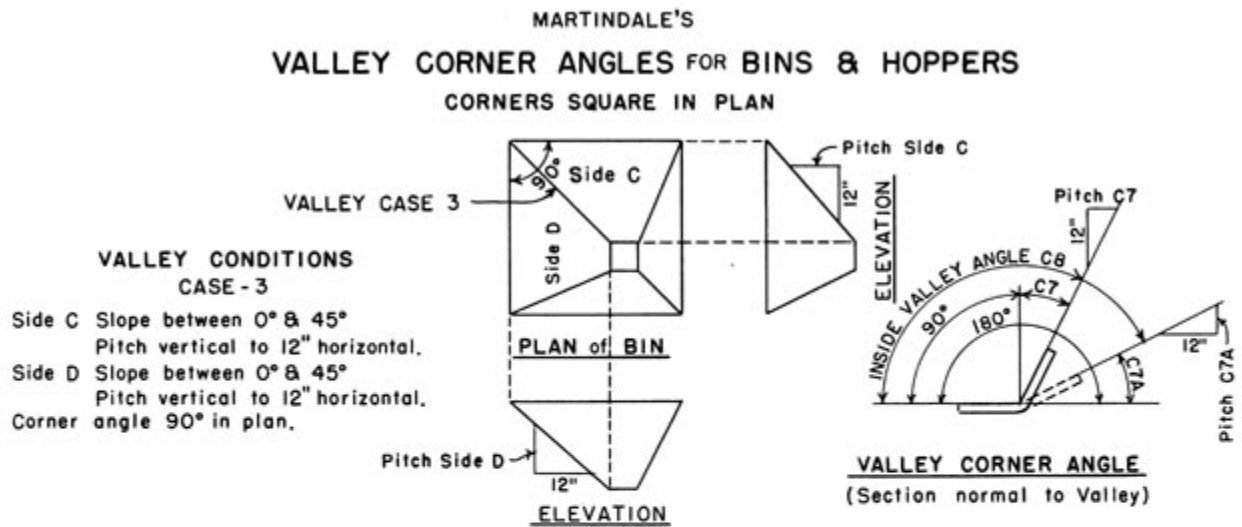
EXAMPLES for DIAGRAM NO-2

BIN PROBLEM

Given a bin corner, square in plan, one side with 10" vertical pitch slope and the other side with 8" vertical pitch slope, to find the resulting bevel angle at the valley.

In diagram No. 3, select the 10" line side C and follow to intersection with 8" line from side D. This intersection point lies near the 10" pitch line for the desired angle C7.

[[contents](#)] [[previous page](#)] [[next page](#)]

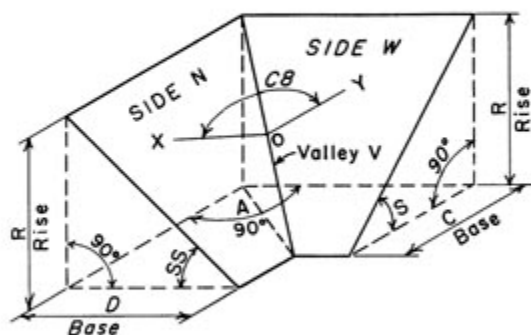


[\[contents\]](#) [\[previous page\]](#)

[\[next page\]](#)

MARTINDALE'S
VALLEY CORNER ANGLES FOR BINS & HOPPERS
FORMULA

CORNERS SQUARE IN PLAN



ISOMETRIC VIEW

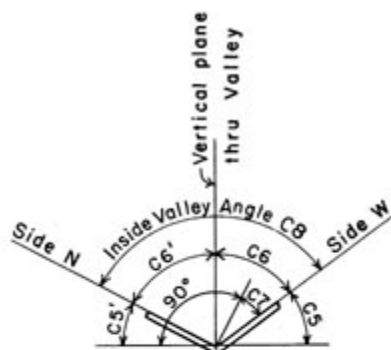
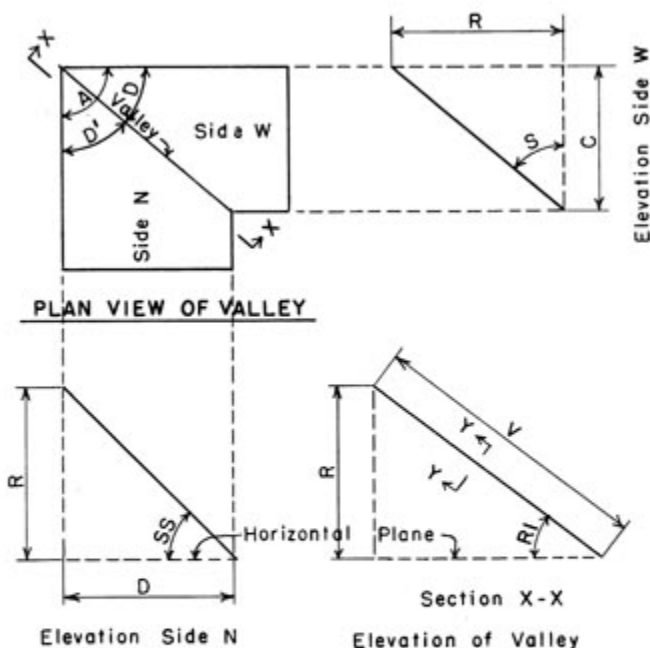


VALLEY CORNER ANGLE
(Section normal to Valley)

Given Angle A = 90° in horizontal plan

$$\sin C7 = \cos S \cdot \cos SS$$

CORNERS NOT SQUARE IN PLAN



VALLEY CORNER ANGLE
Section Y-Y normal to Valley

Given Angle A = Any angle in horizontal plane

Find C8 from $C8 = C6 + C6'$

$$\tan C6 = \tan D \cdot \csc RI$$

$$\tan RI = \tan S \cdot \sin D$$

$$\tan C6' = \tan D' \cdot \csc RI$$

$$\tan RI = \tan SS \cdot \sin D'$$

Note - Tables pages 40 to 62 gives values of C6 for some slopes.

PART II

Hip & Valley Roof Framing Angles

COMMENT

The following Formulas, Hip and Valley Roof Arrangement Sketch, Typical Connection Sketches and Tables of Hip and Valley Framing Angles, have been prepared to assist in solving the bevel angles required for Hip and Valley roof framing as usually framed.

The Hip and Valley Roof Arrangement Sketch page 19 is to aid in finding the horizontal reference angle D used in the formulas and tables.

The Typical Connection Sketches pages 20 to 31 incl. are to aid in locating the bevel angle marks and the position of the bevel angles.

The Formulas page 18 are for solving the bevel angles not covered by the tables.

The Tables of Hip and Valley Framing Angles, pages 40 to 62 incl. are for finding the pitch of the bevel angles directly from the roof slope and horizontal reference angle D of the hip or valley, for the roof slopes included.

The Analytic Proof of the formulas, pages 32 to 37 incl. are for reference of students and others interested.

[\[contents\]](#) [\[previous page\]](#) [\[next page\]](#)

HIP & VALLEY ROOF FRAMING ANGLES

USE OF SKETCHES, FORMULAS & TABLES OF ANGLES

To use the following sketches, formulas and tables of hip & valley framing angles, the user should be familiar with the arrangement of purlins and hip and valley rafters assumed as the basis of the formulas. This arrangement is described basically under "Notes on Formulas" below.

Because the formulas are based upon the roof slope and the horizontal angle between the ridge and the valley framing angles, and between the eave and the hip framing angles, the first procedure is to find this horizontal angle to degrees and minutes. This horizontal angle is marked D and is used in the formulas, sketches and tables

Sketch #1 shows several hip and valley roof arrangements and locates angle D for each arrangement. Formulas for calculating angle D from the two meeting roof slopes and the horizontal angle between the ridges for valleys, and between the eaves for hips, are given for each case.

The twelve connection sketches #2 to #13 show six pairs of hip and valley rafter connections for the same purlin. Note that channel, beam and tee purlins are shown, and that connections with clips above and below the purlin are shown so that types required for ridge and eave purlin can be selected. Connections with flange clips and bent plates are also shown. Connections using both single and multiple punching are also shown. The connections are detailed for punched and riveted work. The working points have been projected from one view to another and to a diagram of the roof, to assist in following the working points from one face to another. The small triangulation incidental to calculating the drop of hip rafters for clearance, for making cuts and for locating from top or bottom of purlin, are shown and elaborated.

The purpose of the connection sketches is to locate and orient the several bevel angles and to indicate their use for cuts, clearance, etc., as well as the bend and the bevel of the connection. Angle marks for other types of connections can be located by comparing with somewhat similar types or from the location given with the formulas.

Having located the desired angle marks the pitches can be found in the Tables of Hip & Valley Framing Angles, provided the roof slope you want is given, and by use of the formulas for other roof slopes.

NOTES ON FORMULAS, PAGE 18

The formulas for the Hip & Valley Roof Framing Angles are based upon the roof slope and angle D. The twelve bevel angles formulated and given in the tables, cover all the bevel angles formed by two members with web and flange faces meeting in a three dimensional position from each other, when framed as follows-

1. All framing members have web and flange faces square with each other.
2. Rafter webs are in a vertical plane.

3. Rafters are parallel to hip or valley.
4. Webs of purlins are at right angles to the roof line.
5. Purlins are parallel with the ridges.
6. The ridge and eave are level.
7. Angles A and D are in a level plane.

[\[contents\]](#) [\[previous page\]](#) [\[next page\]](#)

M A R K S & F O R M U L A S

HIP & VALLEY ROOF FRAMING CONNECTION ANGLES

S & SS = Roof Slopes

A & A' = Horizontal angles between ridges and between eaves.

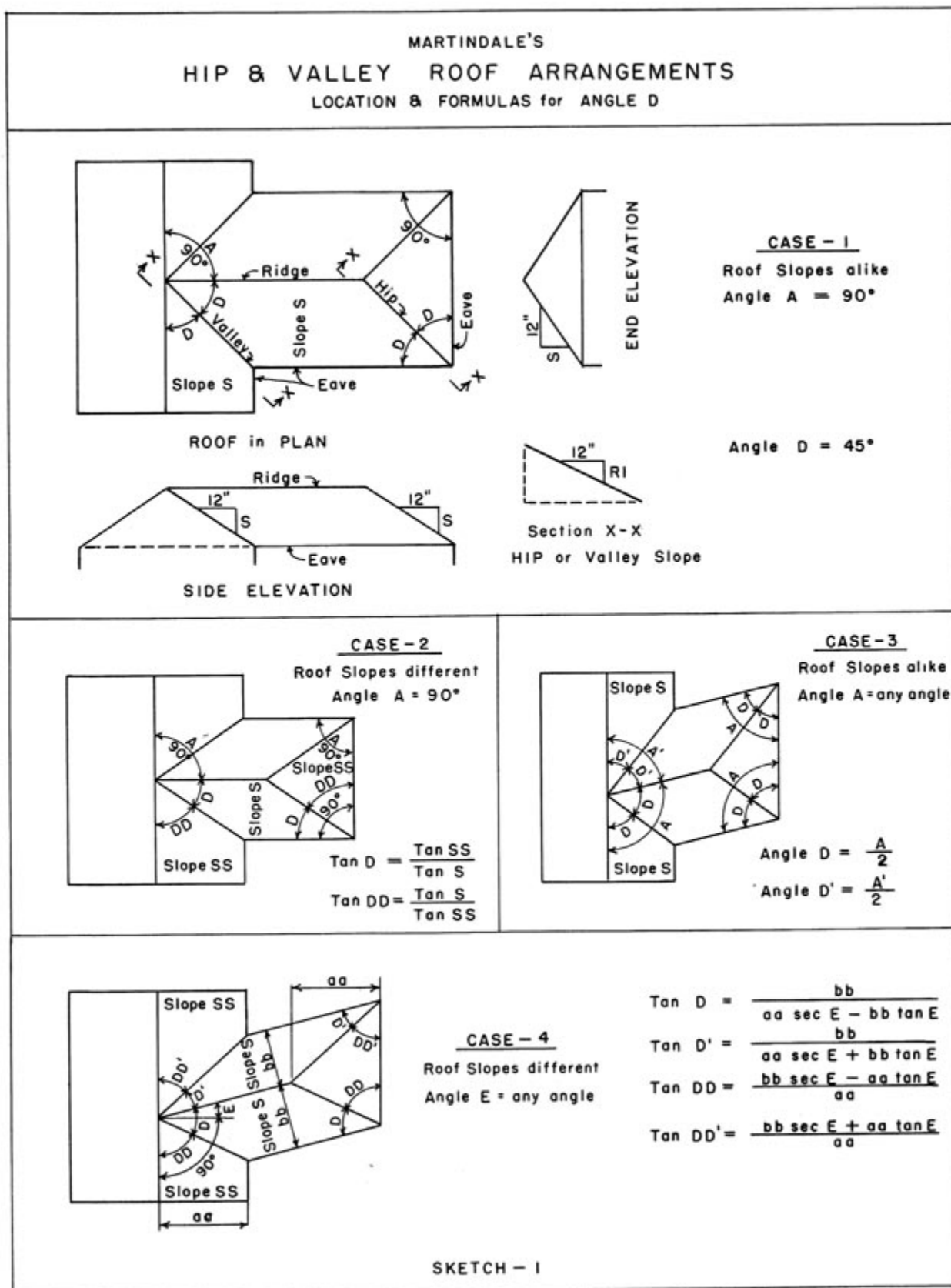
D = Horizontal angles between ridge and valley or eave and hip. Marked D, D', DD & DD' for different roof arrangements shown Sketch #1.

B E V E L C O N N E C T I O N A N G L E S

MARK	LOCATION	FORMULA
R1	Pitch of Hip or Valley Rafter.	$\tan R1 = \tan S \sin D$
R2	Angle on Hip or Valley Rafter web locating intersection of Purlin web.	$\tan R2 = \sin S \cos S \cos D \cotan D$
R3	Angle on Hip or Valley Rafter flg. locating intersection of Purlin web.	$\tan R3 = \sin S \cos S \cos D \csc R1$
P1	Angle on Purlin web, locating intersection of Hip or Valley Rafter web.	$\tan P1 = \sin S \cotan D$
P2	Angle on Purlin flg. locating intersection of Hip or Valley Rafter web.	$\tan P2 = \cos S \cotan D$
P3	Angle on Purlin web, locating intersection of Hip or Valley Rafter flg.	$\tan P3 = \cos D \sin R1 \cos R1 \sec S$
C1	Complement of the acute angle between Purlin web and Hip or Valley web.	$\tan C1 = \sin P1 \cotan S$
C2	Complement of the acute angle between Purlin web and Hip or Valley flange.	$\tan C2 = \tan R2 \cos R3$
C3	Angle between Purlin web and a plane perpendicular to both web and flange of Hip or Valley Rafter.	$\tan C3 = \cotan D \cos S$
C4	Angle on a plane perpendicular to web and flange of Hip or Valley Rafter, locating intersection of Purlin web.	$\tan C4 = \sin R1 \cotan D$
C5	Angle between Roof plane and Hip or Valley Rafter flange.	$\tan C5 = \sin R1 \cotan D$
C6	Angle between Roof plane and Hip or Valley Rafter web.	$\tan C6 = \tan D \csc R1$

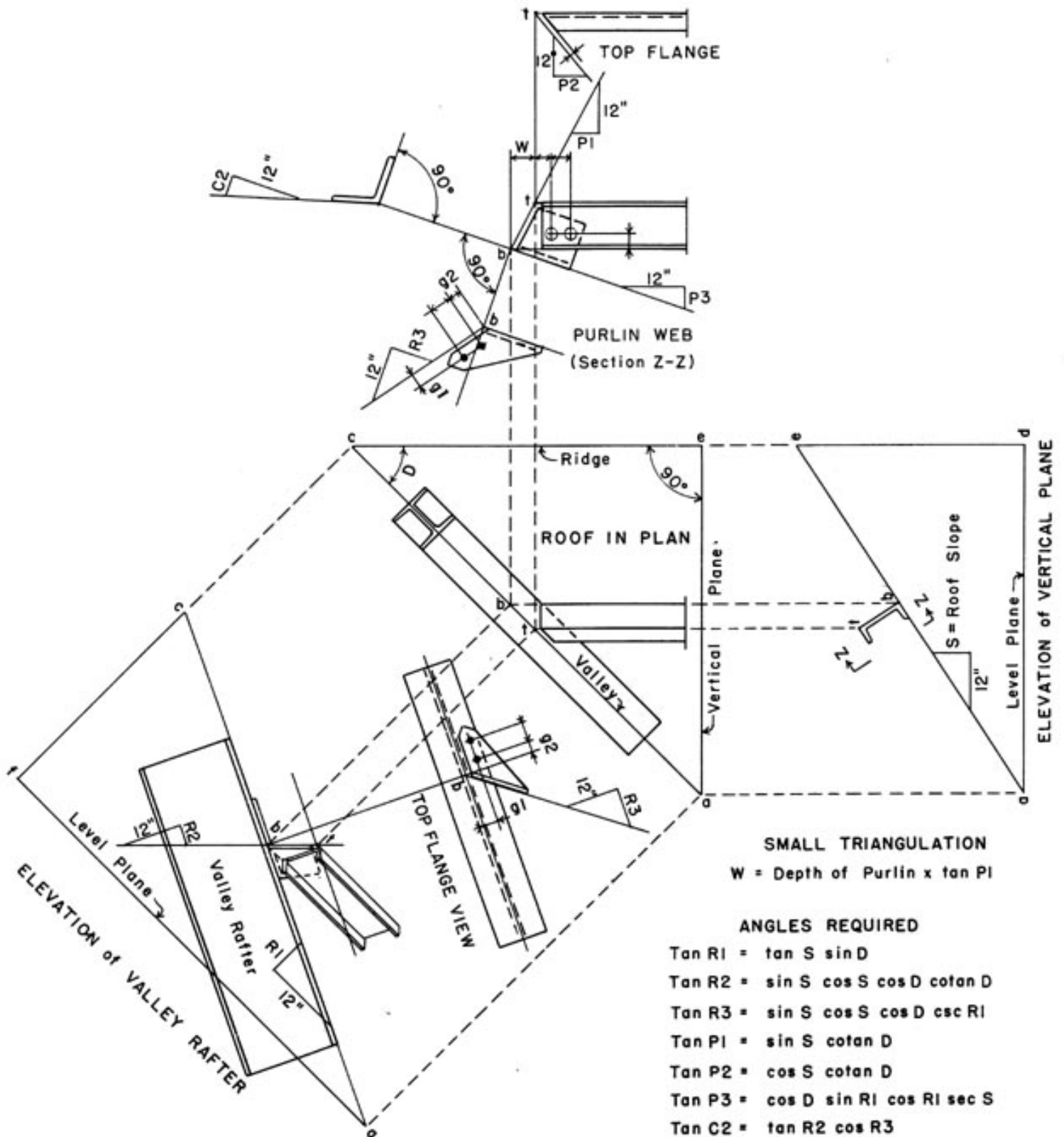
Analytic proof of formulas given on pages 32 to 37.

[\[contents\]](#) [\[previous page\]](#) [\[next page\]](#)



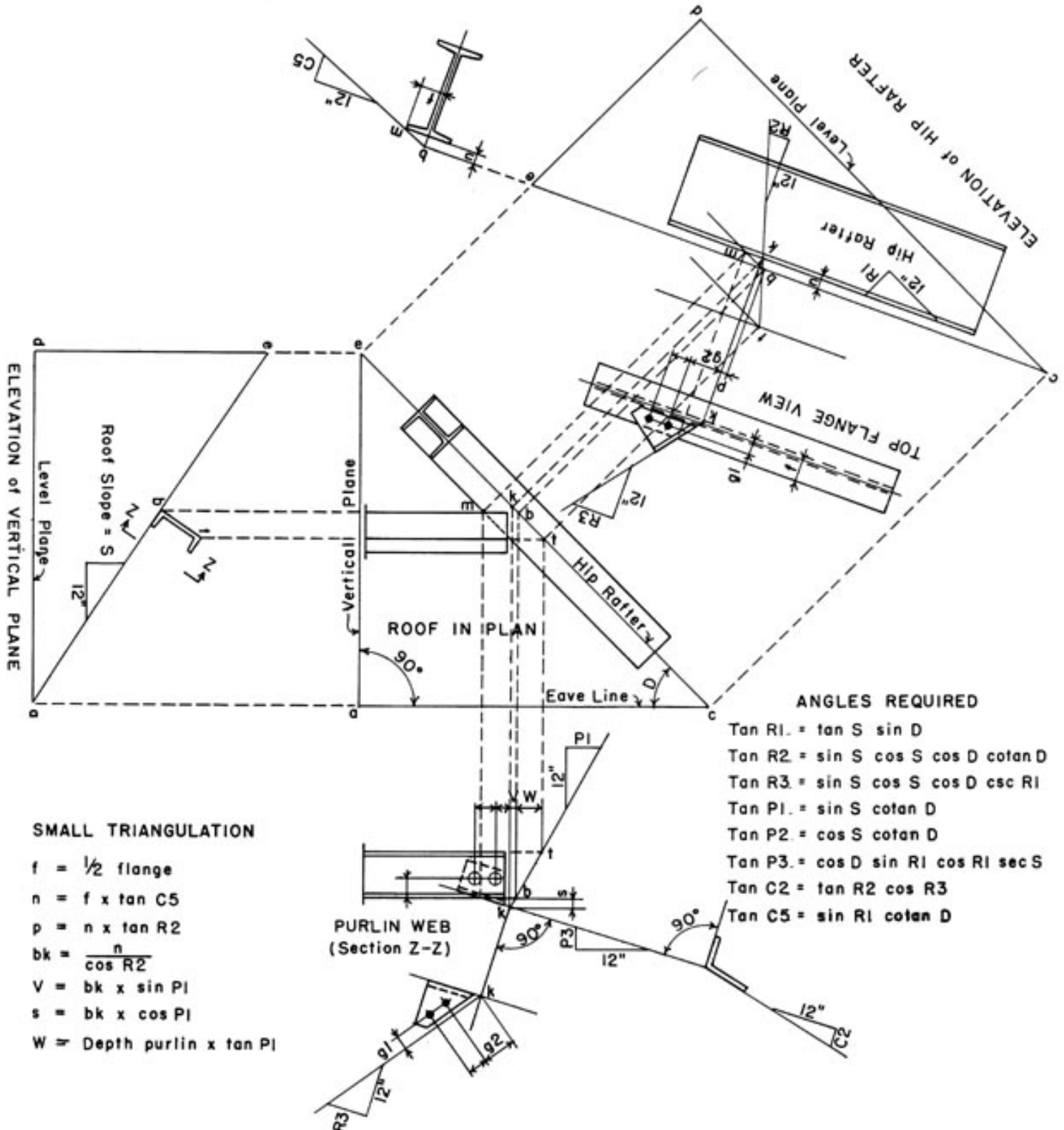
MARTINDALE'S VALLEY CONNECTION SKETCH #2

CHANNEL PURLIN — BEAM RAFTER
CLIP ANGLE ABOVE PURLIN



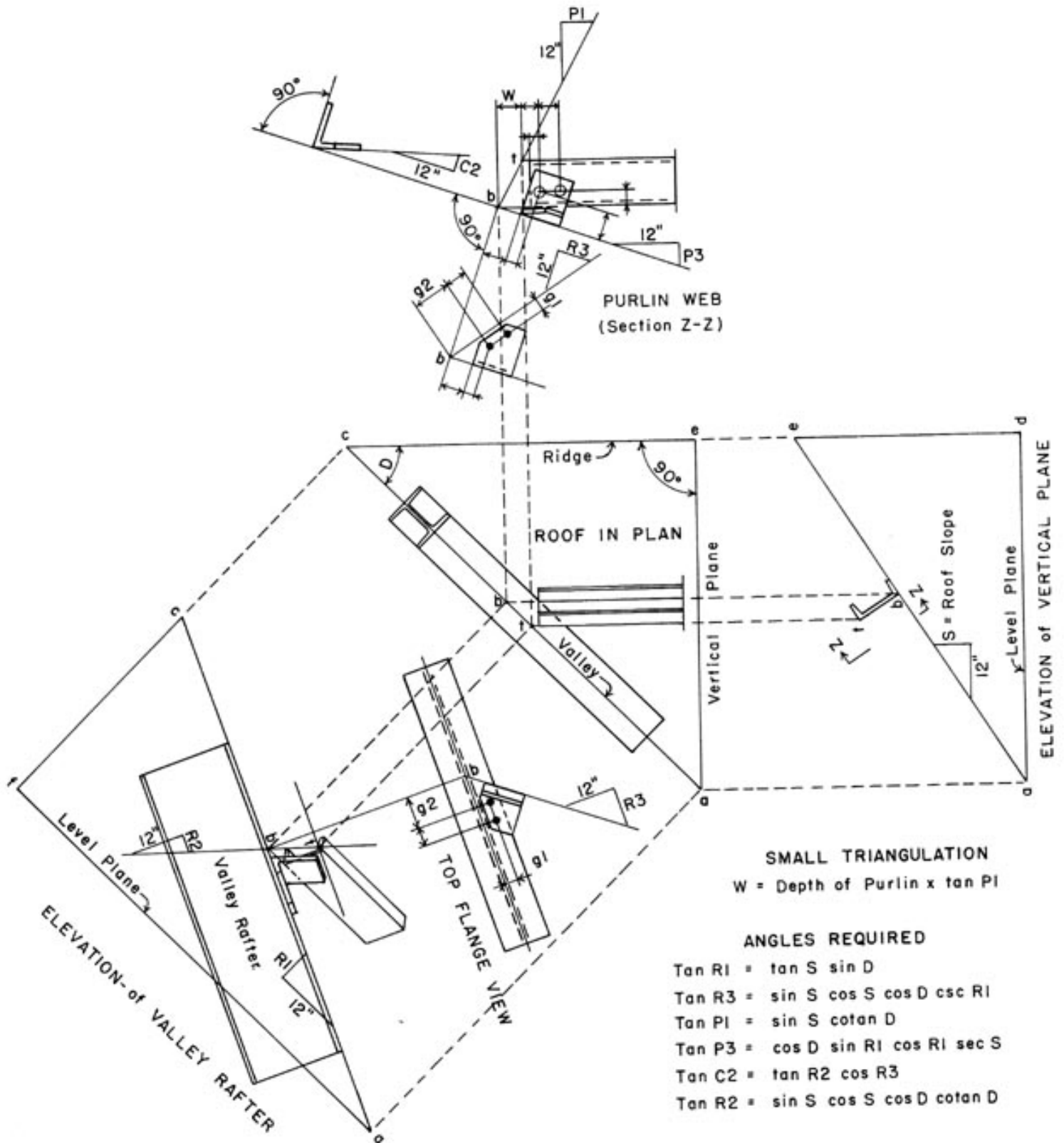
MARTINDALE'S HIP CONNECTION SKETCH #3

CHANNEL PURLIN — BEAM RAFTER
CLIP ANGLE ABOVE PURLIN
RAFTER DROPPED TO CLEAR PURLIN



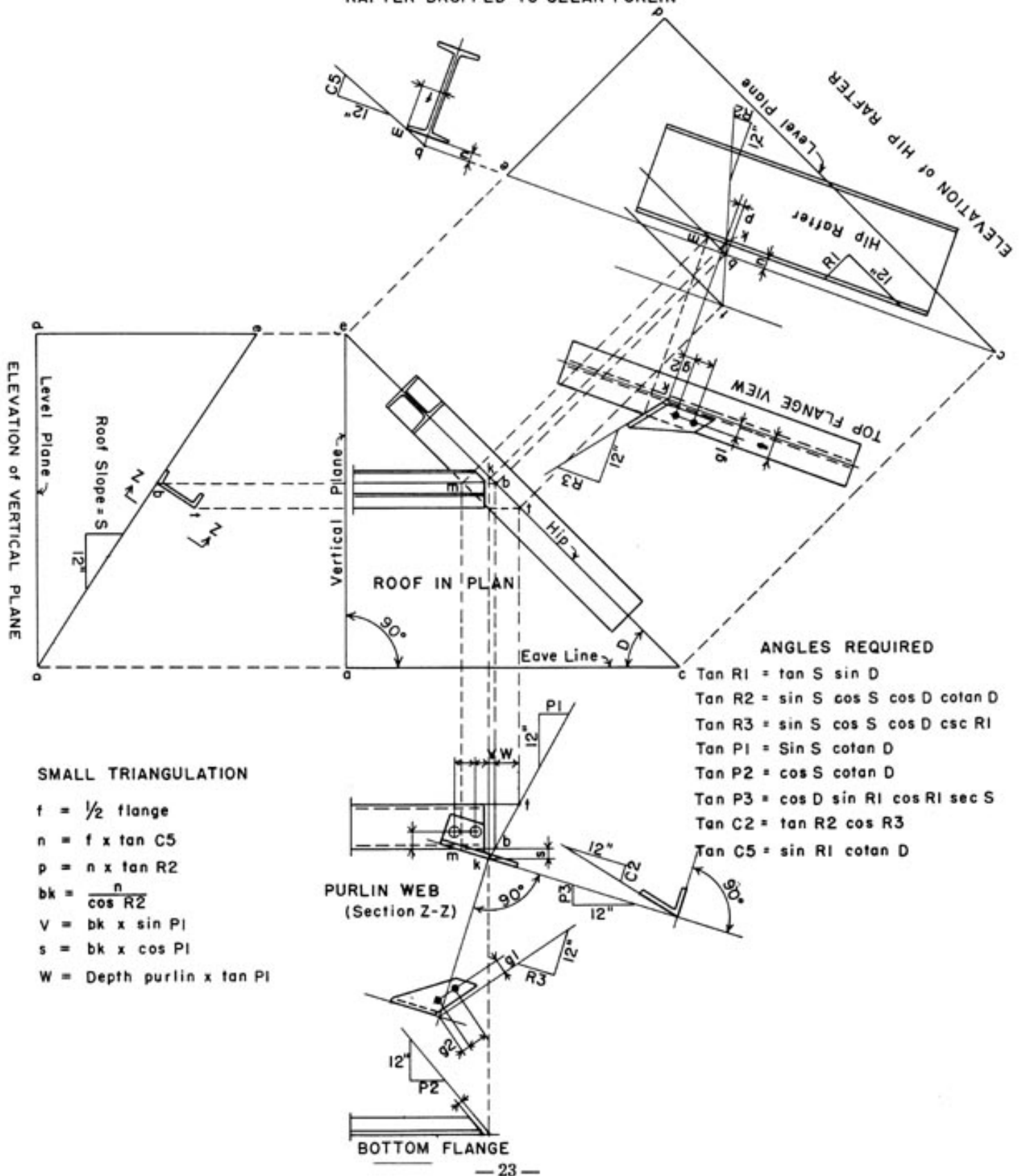
MARTINDALE'S VALLEY CONNECTION SKETCH #4

CHANNEL PURLIN — BEAM RAFTER
CLIP ANGLE BELOW PURLIN



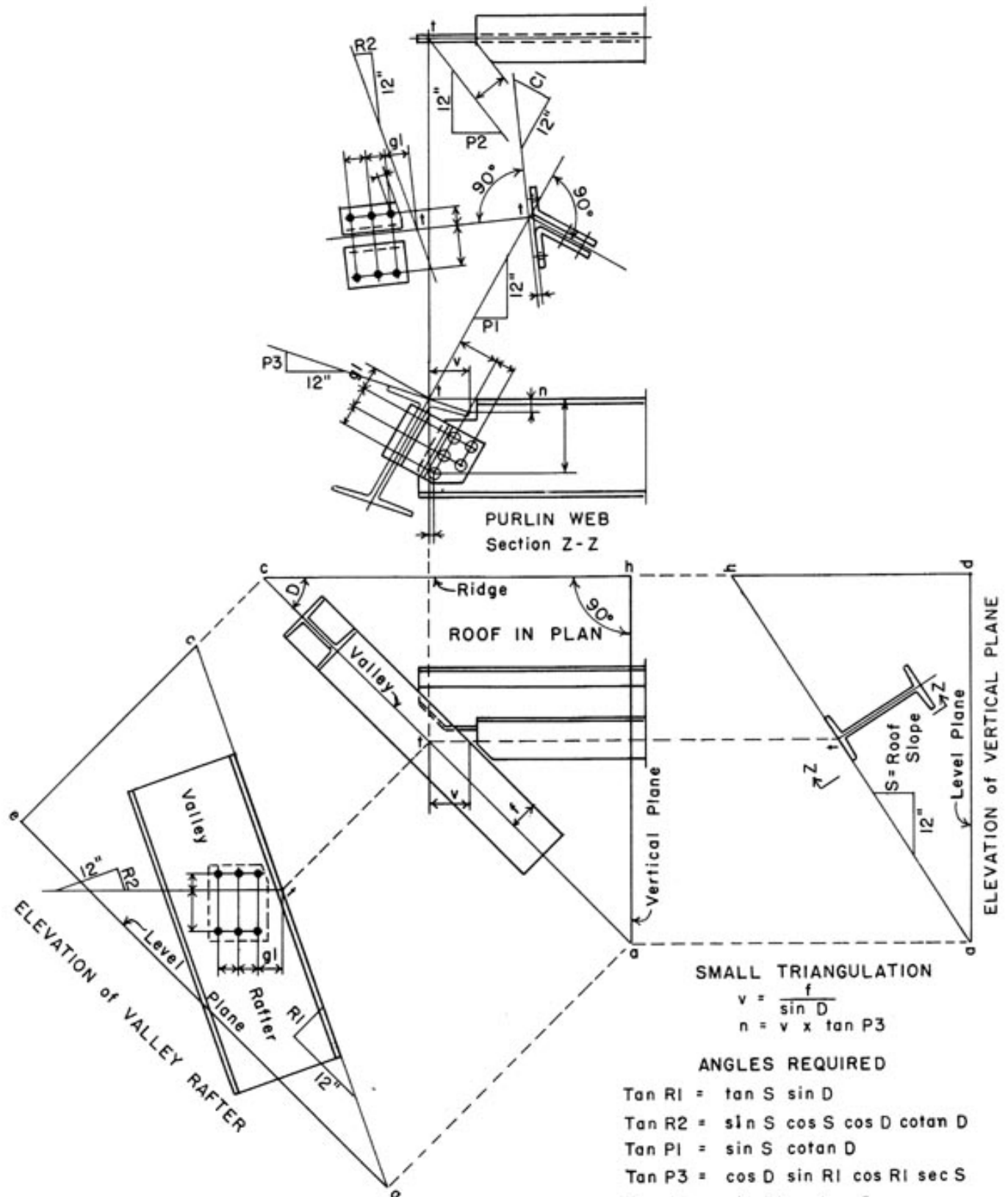
MARTINDALE'S HIP CONNECTION SKETCH #5

CHANNEL PURLIN — BEAM RAFTER
CLIP ANGLE BELOW PURLIN
RAFTER DROPPED TO CLEAR PURLIN



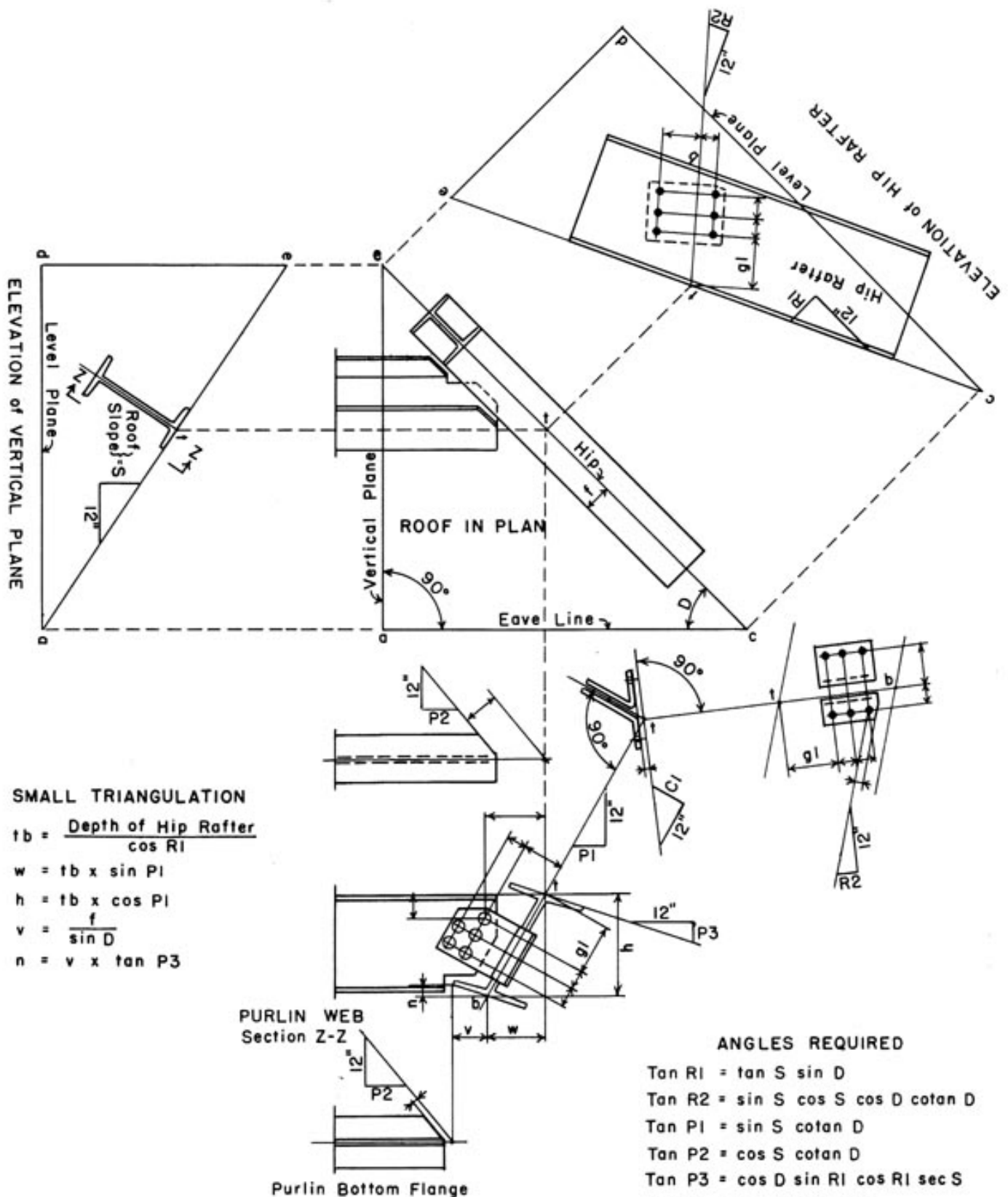
MARTINDALE'S VALLEY CONNECTION SKETCH #6

PURLIN WEB TO VALLEY RAFTER WEB
HOLES SQUARE WITH CONNECTION — SKEW IN BEAMS



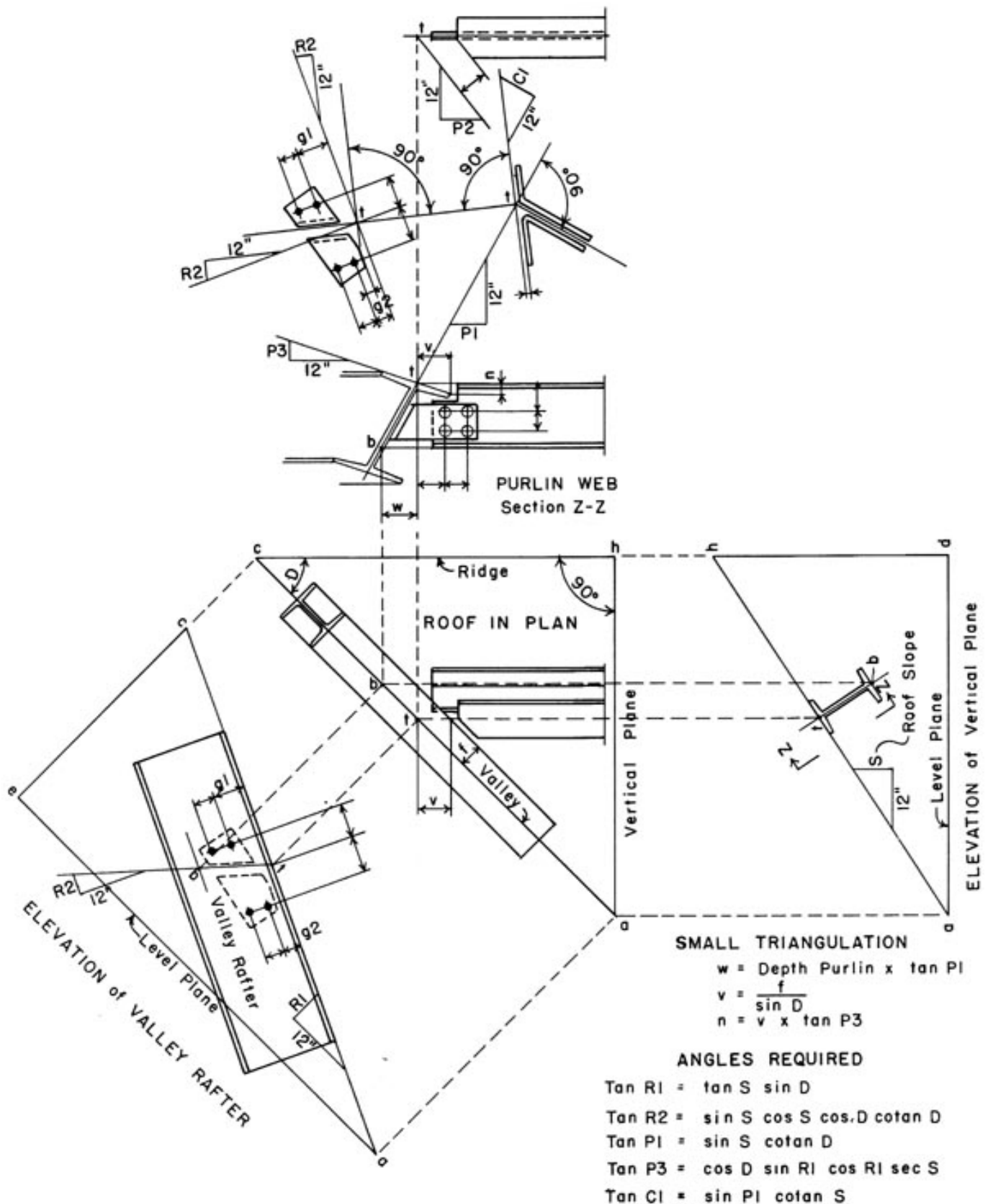
MARTINDALE'S
HIP CONNECTION SKETCH #7

PURLIN WEB TO HIP RAFTER WEB
HOLES SQUARE WITH CONNECTION — SKEW IN BEAMS



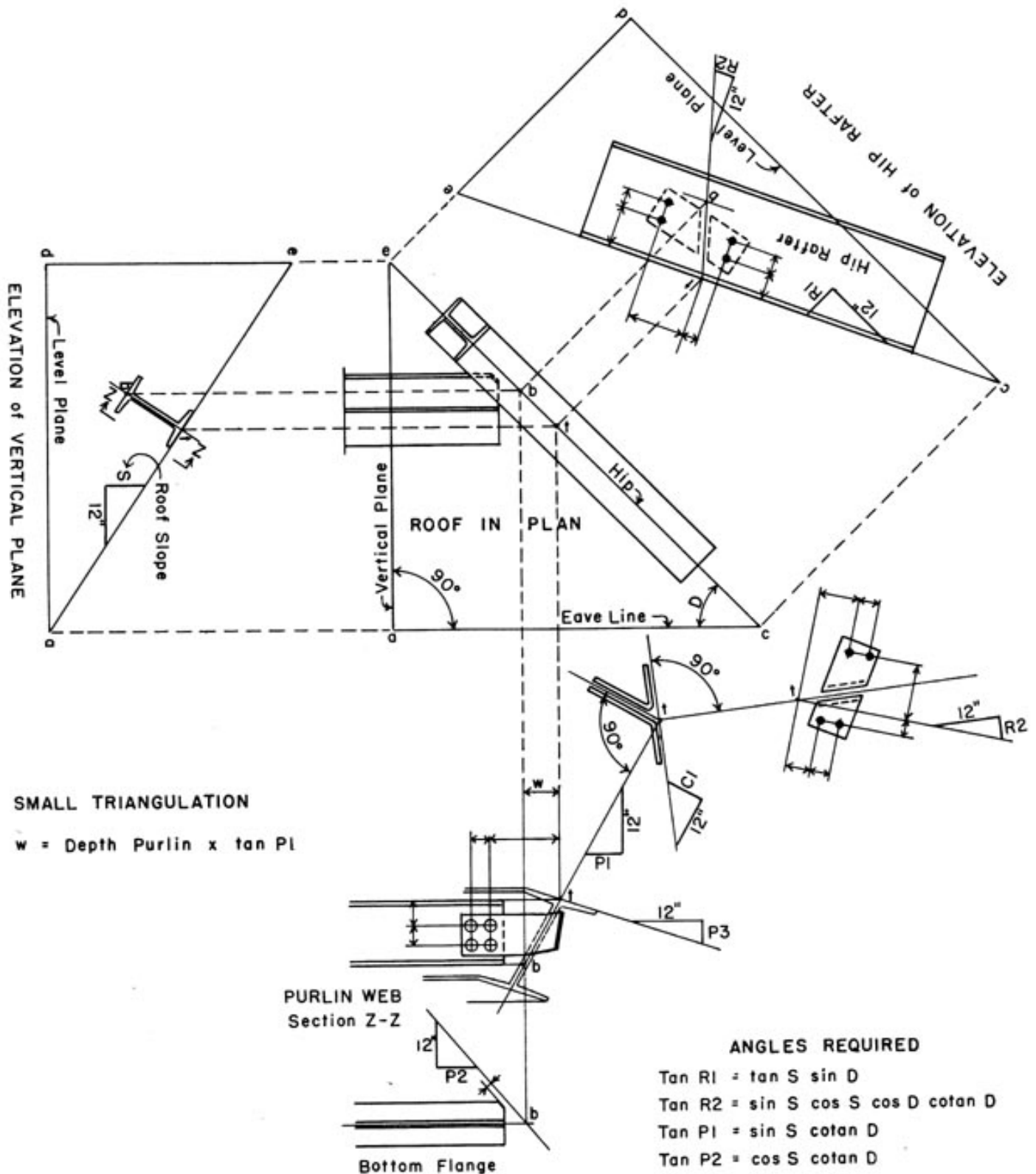
MARTINDALE'S VALLEY CONNECTION SKETCH #8

PURLIN WEB TO VALLEY RAFTER WEB
HOLES SQUARE WITH BEAM - SKEW IN CONNECTION



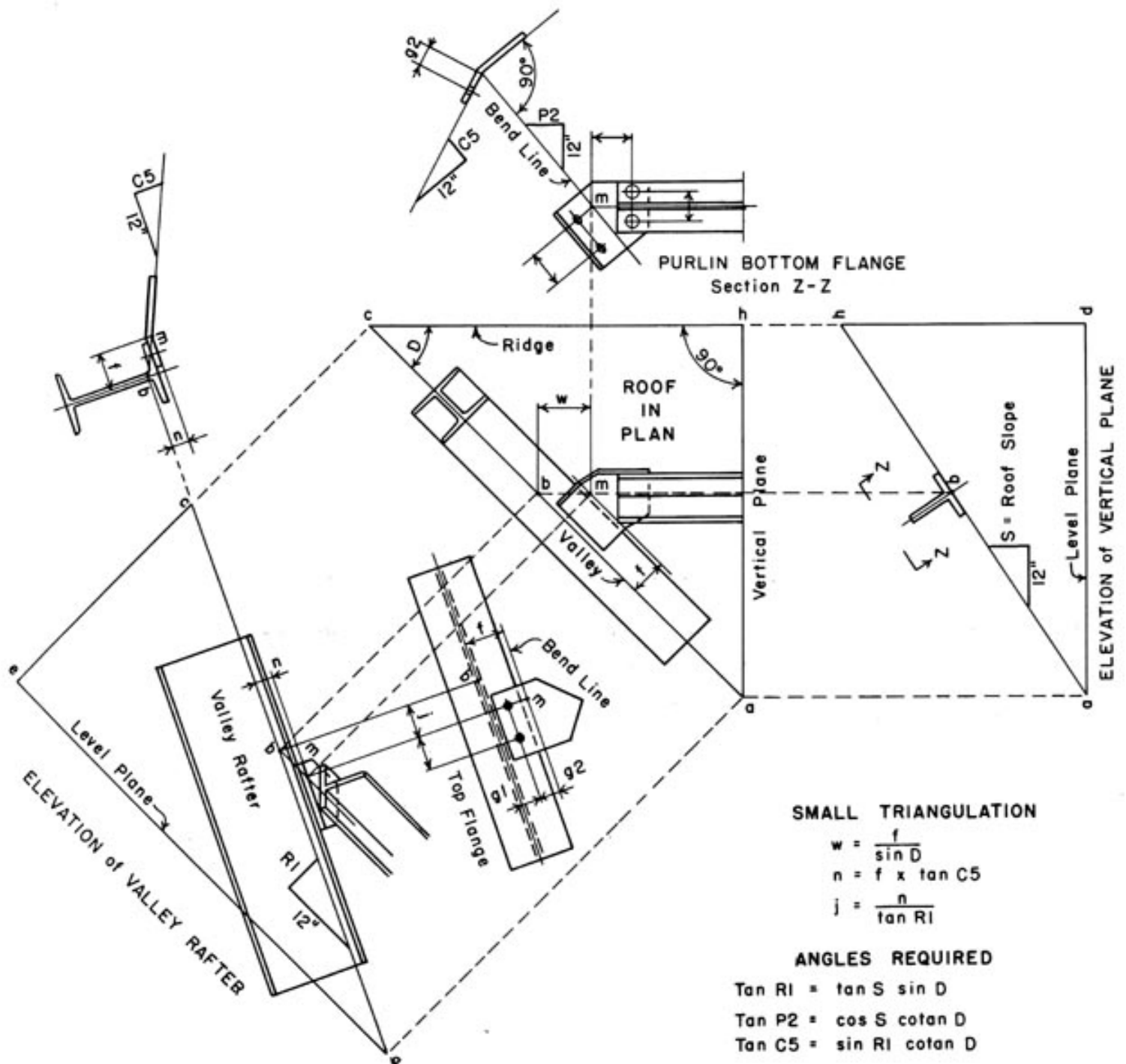
HIP CONNECTION SKETCH #9

PURLIN WEB TO HIP RAFTER WEB
HOLES SQUARE WITH BEAMS - SKEW IN CONNECTION



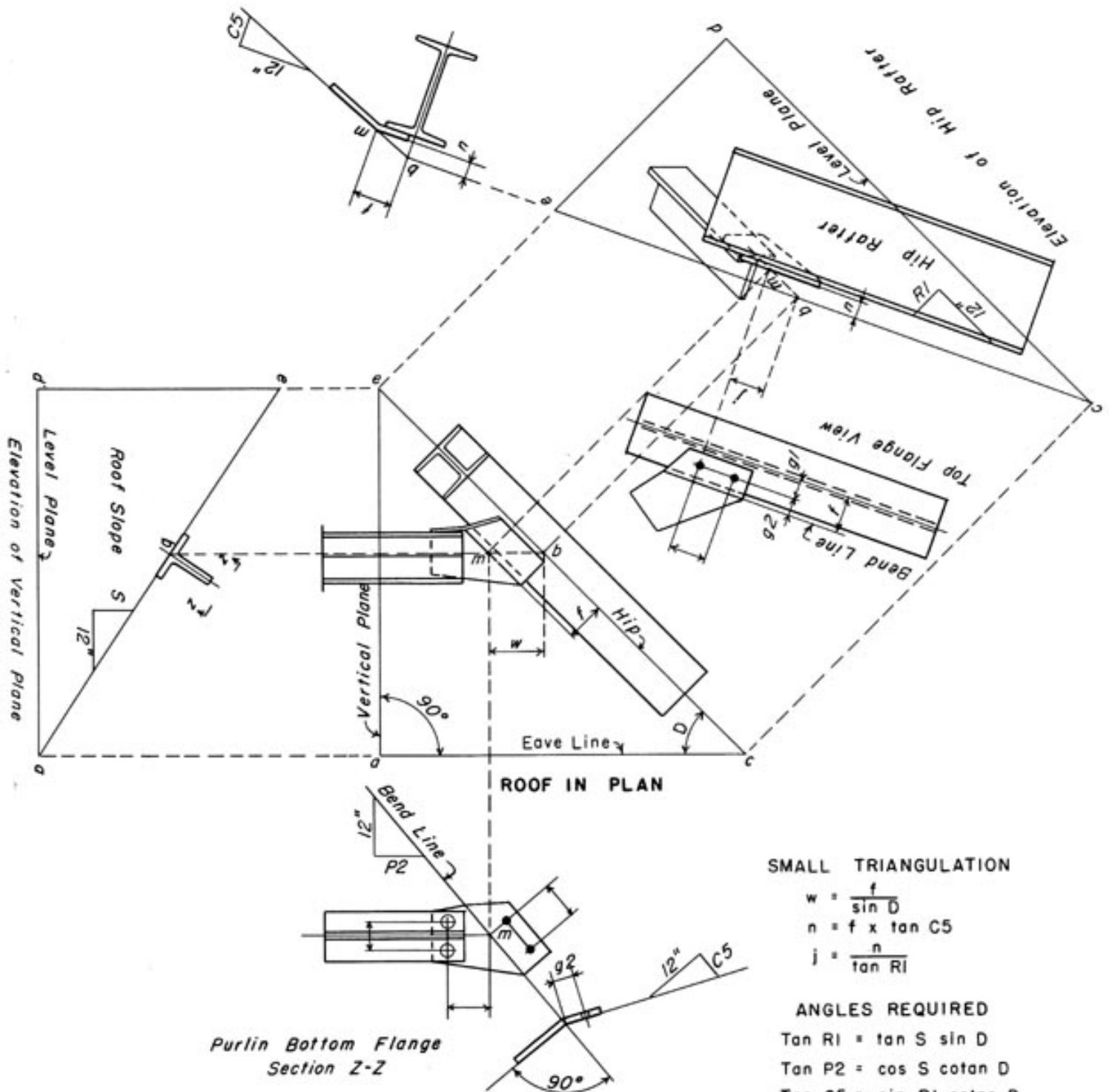
MARTINDALE'S VALLEY CONNECTION SKETCH #10

BENT PLATE CONNECTION
TEE PURLIN FLANGE TO VALLEY RAFTER FLANGE
RAFTER RAISED FOR BENT PLATE



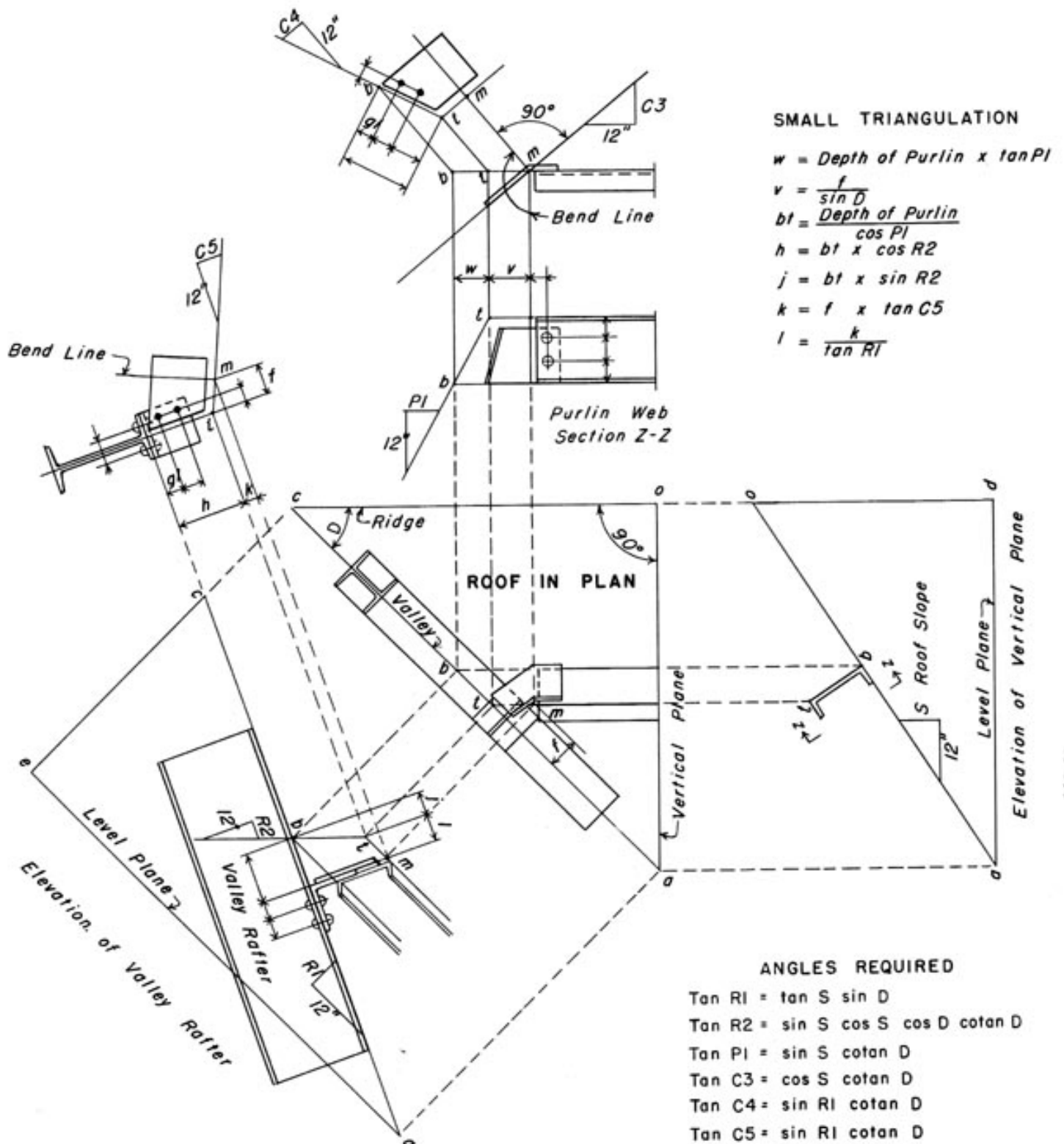
MARTINDALE'S
HIP CONNECTION SKETCH #11

BENT PLATE CONNECTION
TEE PURLIN FLANGE TO HIP RAFTER FLANGE
RAFTER DROPPED FOR BENT PLATE



MARTINDALE'S VALLEY CONNECTION SKETCH #12

PURLIN WEB TO CLIP ON VALLEY RAFTER FLANGE



HIP CONNECTION SKETCH #13

PURLIN WEB TO CLIP ON HIP RAFTER FLANGE
RAFTER DROPPED FOR CLEARANCE

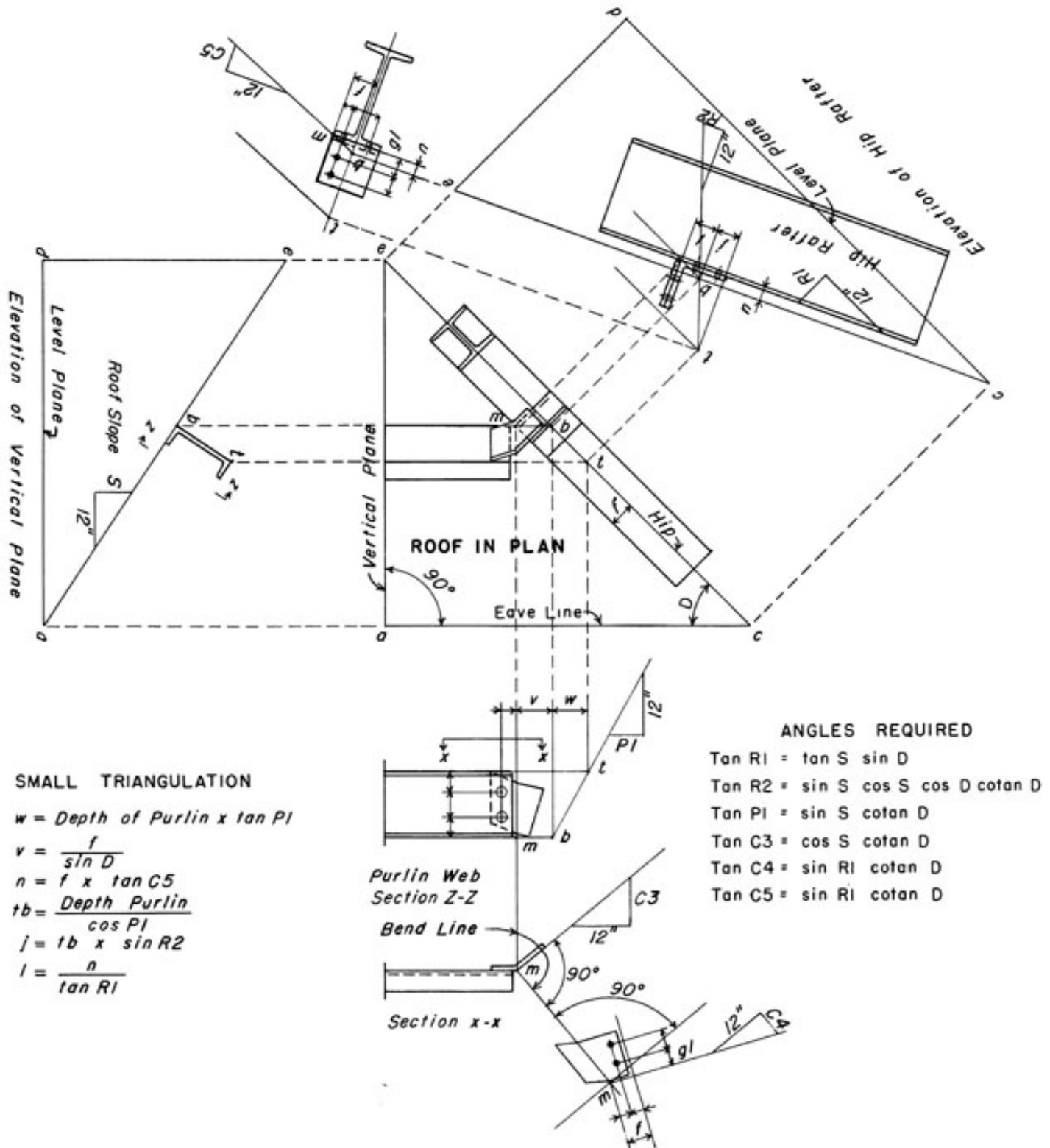
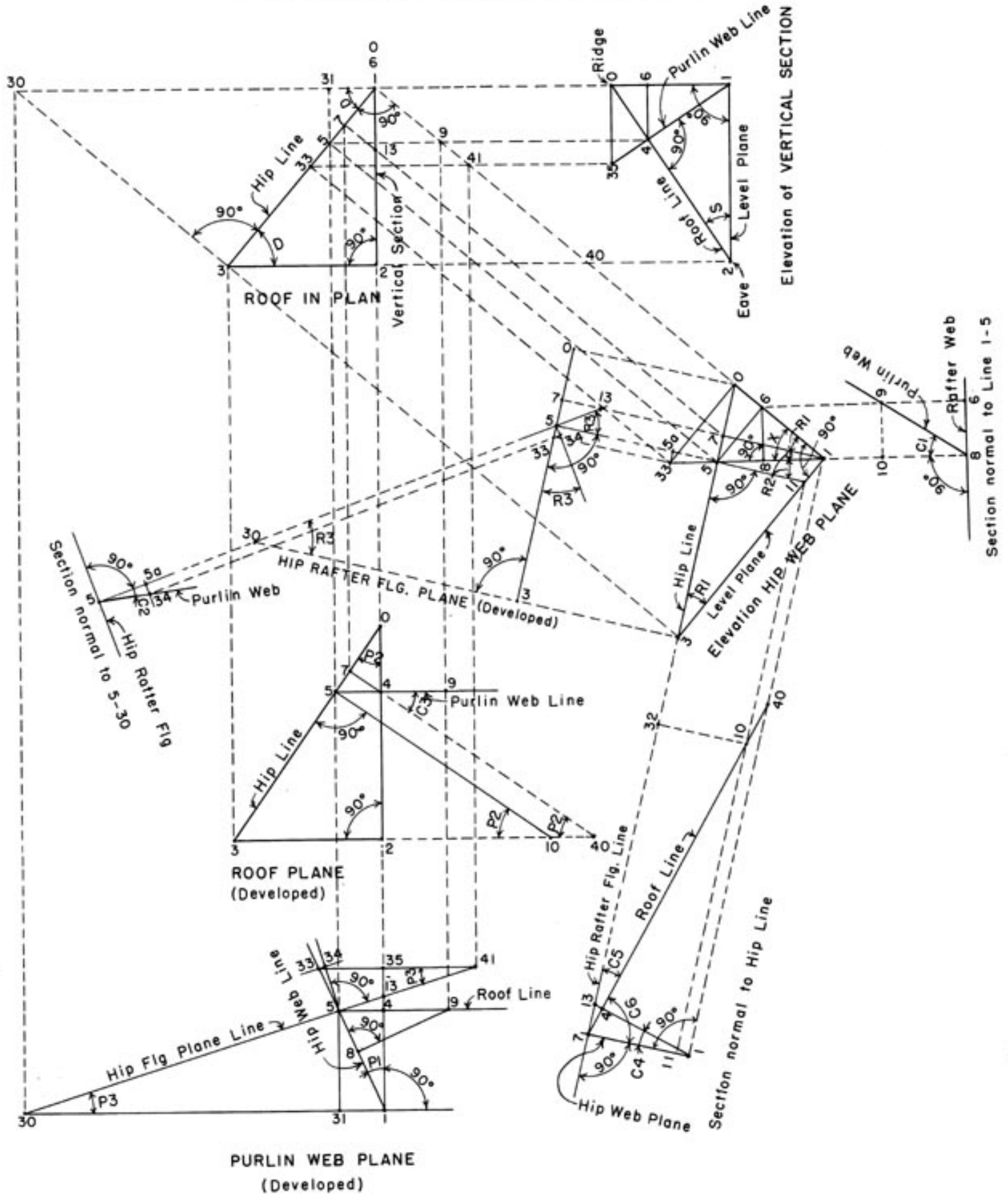


DIAGRAM FOR ANALYTIC PROOF **HIP & VALLEY ROOF FRAMING ANGLE FORMULAS**



ANALYTIC PROOF OF BEVEL ANGLE FORMULAS

Line values used in formulas on following pages

Numbered lines refer to Diagram page 32

LINE	VALUE
1-2	= Unity or one for trigonometric functions of slope S.
1-4	= sin S
1-0	= tan S
2-4	= cos S
2-0	= sec S = $\frac{1}{\cos S}$
1-3	= 1-2 $\frac{1}{\sin D}$ = $\frac{1}{\sin D}$ = csc D
5-6	= 6-4 csc D = $\sin^2 S$ csc D
6-4	= sin S sin S = $\sin^2 S$
1-6	= sin S cos S
5-7	= 1-7 tan R2 = $\frac{\sin R1 \tan R2}{\sin D}$
1-7	= 1-3 sin R1 = $\frac{\sin R1}{\sin D}$
13-7	= 1-7 tan C5 = $\frac{\sin R1 \tan C5}{\sin D}$
3-5	= 1-6 $\frac{1}{\sin R1}$ = $\frac{\sin S \cos S}{\sin R1}$
3-30	= 1-3 cotan D = $\frac{\cotan D}{\sin D}$ = $\frac{\cos D}{\sin D}$ = cos D
2-3	= 1-2 cotan D = cotan D
5-31	= 1-4 = sin S
30-31	= 3-11 $\frac{1}{\cos D}$ = $\frac{\sin S \cos S}{\sin R1 \cos R1 \cos D}$
3-11	= 5-11 $\frac{1}{\sin R1}$ = $\frac{\sin S \cos S}{\sin R1 \cos R1}$
5-11	= 1-6 $\frac{1}{\cos R1}$ = $\frac{\sin S \cos S}{\cos R1}$
6-8	= 1-6 sin (R1 + R2) = sin S cos S sin (R1 + R2)
9-6	= 8-10 = 5-9 sin D = $\frac{\sin S \cos S \sin (R1 + R2) \tan (R1 + R2) \sin D}{\sin P1}$
5-9	= 5-8 $\frac{1}{\sin P1}$ = $\frac{\sin S \cos S \sin (R1 + R2) \tan (R1 + R2)}{\sin P1}$
5-8	= 6-8 tan (R1 + R2) = sin S cos S sin (R1 + R2) tan (R1 + R2)

ANALYTIC PROOF OF BEVEL ANGLE FORMULAS

Refer to pages 32 & 33

$$1. \quad \tan R1 = \frac{1-0}{1-3} = \frac{\tan S}{\sin D} = \tan S \sin D //$$

$$2. \quad \tan (R1 + R2) = \frac{5-6}{1-6} = \frac{\sin^2 S \csc D}{\sin S \cos S} = \frac{\sin S \csc D}{\cos S} = \tan S \csc D = \frac{\tan S}{\sin D}$$

$$\text{from equation } \tan (R1 + R2) = \frac{\tan R1 + \tan R2}{1 - \tan R1 \tan R2}$$

$$\frac{\tan S}{\sin D} = \frac{\tan S \sin D + \tan R2}{1 - \tan S \sin D \tan R2}$$

$$\tan S - \tan^2 S \sin D \tan R2 = \tan S \sin^2 D + \tan R2 \sin D$$

$$\tan S - \tan S \sin^2 D = \tan R2 \sin D + \tan^2 S \sin D \tan R2$$

$$\tan S (1 - \sin^2 D) = \tan R2 \sin D (1 + \tan^2 S)$$

$$\begin{aligned} \tan R2 &= \frac{\tan S (1 - \sin^2 D)}{\sin D (1 + \tan^2 S)} = \frac{\tan S \cos^2 D}{\sin D \sec^2 S} \\ &= \frac{\cos S}{\sin D} = \frac{\sin S \cos^2 D \cos^2 S}{\cos S \sin D} \\ &= \frac{\sin S \cos^2 D \cos S}{\sin D} \end{aligned}$$

$$\tan R2 = \sin S \cos S \cotan D \cos D //$$

$$\begin{aligned} 3. \quad \tan R3 &= \frac{5-7}{13-7} = \frac{\frac{\sin R1 \tan R2}{\sin D}}{\frac{\sin R1 \tan C5}{\sin D}} = \frac{\sin R1 \tan R2 \sin D}{\sin D \sin R1 \tan C5} = \frac{\tan R2}{\tan C5} = \\ &= \tan R2 \cotan C5 // \end{aligned}$$

$$\tan R3 = \frac{3-5}{3-30} = \frac{\sin S \cos S}{\cos D} = \frac{\sin S \cos S \cos D}{\sin R1}$$

$$\tan R3 = \sin S \cos S \cos D \csc R1 //$$

$$4. \quad \tan P1 = \frac{5-4}{1-4} = \frac{6-4 \cotan D}{\sin S} = \frac{\sin^2 S \cotan D}{\sin S} = \sin S \cotan D //$$

$$5. \quad \tan P2 = \frac{2-3}{0-2} = \frac{\cotan D}{\cos S} = \cotan D \cos S //$$

ANALYTIC PROOF OF BEVEL ANGLE FORMULAS

Refer to pages 32 & 33

$$6. \quad \tan P3 = \frac{5-31}{30-31} = \frac{\frac{\sin S}{\sin S \cos S}}{\frac{\sin R1 \cos R1 \cos D}{\sin S \cos S}} = \frac{\sin S \sin R1 \cos R1 \cos D}{\sin S \cos S} = \frac{\sin R1 \cos R1 \cos D}{\cos S} = \sin R1 \cos R1 \cos D \sec S //$$

$$7. \quad \tan C1 = \frac{6-8}{9-6} = \frac{\sin S \cos S \sin (R1 + R2)}{\sin S \cos S \sin (R1 + R2) \tan (R1 + R2) \sin D} = \frac{\sin P1}{\tan (R1 + R2) \sin D} = \frac{\sin P1}{\tan S \sin D} = \frac{\sin P1}{\tan S} =$$

$$\tan C1 = \sin P1 \cotan S //$$

$$8. \quad \tan C2 = \frac{5a-34}{5-5a} = \frac{5a-33 \cos R3}{5-33 \cos R2} = \frac{5-33 \sin R2 \cos R3}{5-33 \cos R2} =$$

$$\tan C2 = \cos R3 \tan R2 //$$

9. $\tan C3$ In roof plane angle $C3$ is indicated by lines 7-4-5

7-4 is 90° from 0-3

4-5 is 90° from 0-2

Lines 0-3 & 0-2 are sides of angle $P2$

\therefore Angle $C3$ = angle $P2$

$$\therefore \tan C3 = \cos S \cotan D //$$

$$10. \quad \tan C4 = \frac{7-13}{1-7}$$

$$7-13 = 7-40 \cotan D = \frac{\cotan D \sin^2 R1}{\sin D}$$

$$7-40 = 1-7 \sin R1$$

$$1-7 = 1-3 \sin R1$$

$$1-3 = \frac{1}{\sin D}$$

$$\tan C4 = \frac{\frac{\cotan D \sin^2 R1}{\sin D}}{\frac{\sin R1}{\sin D}} = \cotan D \sin R1 //$$

ANALYTIC PROOF OF BEVEL ANGLE FORMULAS

Refer to pages 32 & 33

$$11. \quad \tan C5 = \frac{1-7}{1-40} = \frac{\frac{\sin R1}{\sin D}}{\frac{\tan D}{\sin D}} = \frac{\sin R1}{\tan D} = \sin R1 \cotan D //$$

$$1-40 = 1-3 \tan D$$

$$1-3 = \frac{1}{\sin D}$$

$$\therefore 1-40 = \frac{\tan D}{\sin D}$$

$$12. \quad \tan C6 = 90^\circ - C5 = \cotan C6 = \cotan D \sin R1$$

$$\tan C6 = \tan D \csc R1 //$$

$$13. \quad \tan D \text{ when angle } A = 90^\circ$$

$$\tan R1 = \tan S \sin D$$

$$\tan R1 = \tan S' \sin D'$$

$$\therefore \tan S \sin D = \tan S' \sin D'$$

$$\text{when } A = 90^\circ \sin D' = \cos D$$

$$\therefore \tan S \sin D = \tan S' \cos D$$

$$\tan S \frac{\sin D}{\cos D} = \tan S'$$

$$\tan D = \frac{\tan S'}{\tan S} //$$

$$14. \quad \text{Refer to page 15. } C7 = 90^\circ - (C5 + C5') \\ \therefore \sin C7 = \cos (C5 + C5') \\ \cos (C5 + C5') = \cos C5 \cos C5' - \sin C5 \sin C5'$$

Refer to diagram page 32.

$$\cos C5 = \frac{1-40}{7-40}$$

$$1-40 = 1-3 \tan D$$

$$1-3 = \frac{1}{\sin D}$$

$$1-40 = \frac{\tan D}{\sin D} //$$

$$7-40 = 7-3 \frac{1}{\tan P2}$$

$$7-3 = 1-3 \cos R1$$

$$1-3 = \frac{1}{\sin D}$$

$$7-40 = \frac{\cos R1}{\tan P2 \sin D} //$$

$$\sin C5 = \frac{1-7}{7-40}$$

$$1-7 = \frac{\sin R1}{\sin D}$$

$$\sin C5 = \frac{\frac{\sin R1}{\sin D}}{\frac{\cos R1}{\tan P2 \sin D}}$$

$$\sin C5 = \frac{\sin R1 \tan P2}{\cos R1} //$$

ANALYTIC PROOF OF BEVEL ANGLE FORMULAS

14. continued

$$\cos C5 = \frac{\frac{\tan D}{\sin D}}{\frac{\cos Rl}{\tan P2 \sin D}} = \frac{\tan D \tan P2}{\cos Rl} //$$

$$\begin{aligned} \therefore \sin C7 &= \frac{\tan D \tan P2}{\cos Rl} \frac{\tan D' \tan P2'}{\cos Rl} - \frac{\sin Rl \tan P2}{\cos Rl} \frac{\sin Rl \tan P2'}{\cos Rl} \\ &= \frac{\tan D \tan P2 \cotan D \tan P2' - \sin^2 Rl \tan P2 \tan P2'}{\cos^2 Rl} \end{aligned}$$

$$\tan D \cotan D = 1$$

$$\begin{aligned} \therefore \sin C7 &= \frac{\tan P2 \tan P2' - \sin^2 Rl \tan P2 \tan P2'}{\cos^2 Rl} \\ &= \frac{\cos S \cotan D \cos S' \cotan D' - \sin^2 Rl \cos S \cotan D \cos S' \cotan D'}{\cos^2 Rl} \end{aligned}$$

$$\begin{aligned} D' &= 90^\circ - D \quad \therefore \cotan D' = \tan D \\ &= \frac{\cos S \cotan D \cos S' \tan D - \sin^2 Rl \cos S \cotan D \sin S' \tan D}{\cos^2 Rl} \\ &= \frac{\cos S \cos S' - \sin^2 Rl \cos S \cos S'}{\cos^2 Rl} \\ &= \frac{\cos S \cos S' (1 - \sin^2 Rl)}{\cos^2 Rl} \end{aligned}$$

$$\begin{aligned} (1 - \sin Rl) &= \cos^2 Rl \\ &= \frac{\cos S \cos S' \cos^2 Rl}{\cos^2 Rl} \end{aligned}$$

$$\sin C7 = \cos S \cos S' //$$

NOTES ON**HIP & VALLEY FRAMING ANGLE TABLES**

Where the difference in pitch for any angle for one degree of angle D exceeds $1/16"$, the pitch to the nearest $1/16"$ can be found by interpolating the minutes of angle D. The greatest difference to be found in the tables is $11/16"$ and in most cases much less.

For example, given an 8" vertical pitch roof slope and angle $D=56^{\circ} 20'$, to find pitch of angle P1. On [page 47](#) the pitch for P1 @ 56° is $4-1/2"$ and for 57° is $4-5/16"$. Subtract $1/16"$ from the pitch for 56° and we get the correct pitch for $56^{\circ} 20'$ to be $4-7/16"$.

Note that in some positions the pitch of an angle becomes less as angle D increases, and in other positions they increase. The pitch will reduce or increase accordingly.

Angle C6 is given in degrees and minutes to facilitate adding together the values of C6 for each of two sides of a valley corner angle for bins, hoppers, etc. The full inside valley angle C8 for such corners can be found by adding together the angular value of C6 for each of the two sloping sides.

[\[contents\]](#) [\[previous page\]](#) [\[next page\]](#)

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 1"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	1 5/16	1/8	4 1 1/3 2	3/8	4 1 1/3 2	5/16	4 1 1/3 2	1/8	1 1/3 2	88°22'
69°	1 5/16	1/8	4 9/16	3/8	4 1 9/32	1 1/3 2	4 1 9/32	1/8	1 1/3 2	88°17'
68°	1 5/16	5/32	4 13/16	13/32	4 2 7/32	1 1/3 2	4 2 7/32	1/8	3/8	88°13'
67°	2 9/32	5/32	5 1/16	13/32	5 1/16	3/8	5 1/16	5/32	3/8	88°08'
66°	2 9/32	3/16	5 5/16	7/16	5 5/16	3/8	5 5/16	5/32	1 3/32	88°04'
65°	2 9/32	3/16	5 9/16	15/32	5 9/16	3/8	5 9/16	3/16	1 3/32	87°59'
64°	2 9/32	7/32	5 13/16	15/32	5 13/16	1 3/32	5 13/16	3/16	7/16	87°55'
63°	2 9/32	7/32	6 1/16	1/2	6 3/32	1 3/32	6 3/32	3/16	7/16	87°50'
62°	7/8	1/4	6 1 1/3 2	17/32	6 1 1/3 2	1 3/32	6 1 1/3 2	7/32	1 5/32	87°46'
61°	7/8	1/4	6 5/8	1 1/3 2	6 5/8	7/16	6 5/8	7/32	1 5/32	87°41'
60°	7/8	9/32	6 2 9/32	9/16	6 2 9/32	7/16	6 2 9/32	1/4	1/2	87°37'
59°	2 7/32	5/16	7 3/16	1 9/32	7 3/16	7/16	7 5/32	1/4	1/2	87°33'
58°	2 7/32	5/16	7 1 5/32	5/8	7 1 5/32	7/16	7 1 5/32	1/4	1 7/32	87°29'
57°	2 7/32	1 1/3 2	7 3/4	5/8	7 3/4	1 5/32	7 3/4	9/32	1 7/32	87°24'
56°	1 3/16	3/8	8 1/16	2 1/3 2	8 1/16	1 5/32	8 1/16	5/16	9/16	87°20'
55°	1 3/16	1 3/32	8 3/8	1 1/16	8 3/8	1 5/32	8 3/8	5/16	9/16	87°16'
54°	1 3/16	7/16	8 1 1/16	2 3/32	8 1 1/16	1 5/32	8 1 1/16	1 1/32	1 9/32	87°12'
53°	1 3/16	7/16	9	3/4	9	1/2	9	3/8	1 9/32	87°08'
52°	2 5/32	1 5/32	9 5/16	2 5/32	9 3/8	1/2	9 1 1/3 2	3/8	5/8	87°04'
51°	2 5/32	1/2	9 2 1/3 2	1 3/16	9 1 1/16	1/2	9 2 1/3 2	3/8	5/8	87°00'
50°	2 5/32	1 7/32	10 1/3 2	2 7/32	10 1/3 2	1/2	10	1 3/32	2 1/3 2	86°56'
49°	3/4	9/16	10 3/8	7/8	10 3/8	1/2	10 1 1/3 2	7/16	2 1/3 2	86°52'
48°	3/4	1 9/32	10 3/4	2 9/32	10 3/4	1/2	10 2 3/32	7/16	2 1/3 2	86°48'
47°	3/4	5/8	11 1/8	1 5/16	11 1/8	1/2	11 3/32	7/16	1 1/16	86°44'
46°	2 3/32	2 1/3 2	11 1 7/32	3 1/3 2	11 1 7/32	1/2	11 1/2	1 5/32	1 1/16	86°42'
45°	2 3/32	1 1/16	11 1 5/16	1	11 3 1/3 2	1/2	11 2 9/32	1/2	2 3/32	86°38'
44°	2 3/32	3/4	*11 2 1/3 2	1 1/3 2	*11 5/8	1/2	*11 2 1/3 2	1/2	2 3/32	86°35'
43°	1 1/16	2 5/32	*11 1/4	1 1/16	*11 7/32	1/2	*11 9/32	1 7/32	2 3/32	86°32'
42°	1 1/16	1 3/16	*10 7/8	1 3/32	*10 2 7/32	1/2	*10 7/8	1 7/32	3/4	86°28'
41°	2 1/3 2	7/8	*10 1/2	1 5/32	*10 1 5/32	1/2	*10 1/2	9/16	3/4	86°25'
40°	2 1/3 2	2 9/32	*10 1/8	1 3/16	*10 3/32	1/2	*10 5/32	1 9/32	3/4	86°22'
39°	5/8	3 1/3 2	*9 3/4	1 1/4	*9 3/4	1/2	*9 1 3/16	1 9/32	2 5/32	86°19'
38°	5/8	1	*9 1 3/32	1 9/32	*9 1 3/32	1/2	*9 1 5/32	5/8	2 5/32	86°16'
37°	1 9/32	1 1/16	*9 1/16	1 5/16	*9 1/16	1/2	*9 1/8	5/8	2 5/32	86°13'
36°	1 9/32	1 1/8	*8 3/4	1 3/8	*8 3/4	1 5/32	*8 1 3/16	2 1/3 2	1 3/16	86°10'
35°	9/16	1 5/32	*8 7/16	1 7/16	*8 7/16	1 5/32	*8 1/2	2 1/3 2	1 3/16	86°07'
34°	9/16	1 7/32	*8 1/8	1 1/2	*8 1/8	1 5/32	*8 3/16	1 1/16	1 3/16	86°04'
33°	1 7/32	1 9/32	*7 2 7/32	1 1 7/32	*7 2 7/32	1 5/32	*7 7/8	1 1/16	2 7/32	86°01'
32°	1 7/32	1 1 1/3 2	*7 1 7/32	1 9/32	*7 1 7/32	1 5/32	*7 1 9/32	2 3/32	2 7/32	85°59'
31°	1 7/32	1 1 3/32	*7 1/4	1 2 1/3 2	*7 1/4	7/16	*7 5/16	2 3/32	2 7/32	85°56'
30°	1/2	1 1/2	*6 3 1/3 2	1 2 3/32	*6 1 5/16	7/16	*7 1/3 2	3/4	7/8	85°53'
29°	1/2	1 9/16	*6 1 1/16	1 2 5/32	*6 1 1/16	7/16	*6 3/4	3/4	7/8	85°50'
28°	1 5/32	1 2 1/3 2	*6 1 3/32	1 7/8	*6 1 3/32	1 3/32	*6 1/2	2 5/8 2	7/8	85°48'
27°	1 5/32	1 3/4	*6 5/32	1 1 5/16	*6 1/8	1 3/32	*6 7/32	2 5/32	7/8	85°45'
26°	7/16	1 1 3/16	*5 7/8	2 1/3 2	*5 7/8	1 3/32	*5 3 1/3 2	1 3/16	2 9/32	85°43'
25°	7/16	1 1 5/16	*5 5/8	2 1/8	*5 5/8	3/8	*5 2 3/32	1 3/16	2 9/32	85°40'
24°	1 3/32	2 1/3 2	*5 3/8	2 1/4	*5 3/8	3/8	*5 7/16	2 7/32	2 9/32	85°38'
23°	1 3/32	2 1/8	*5 1/8	2 1 1/3 2	*5 1/8	3/8	*5 7/32	2 7/32	2 9/32	85°36'
22°	3/8	2 1/4	*4 7/8	2 1 5/32	*4 7/8	1 1/3 2	*4 3 1/3 2	2 7/32	2 9/32	85°35'
21°	3/8	2 1 3/32	*4 5/8	2 1 9/32	*4 5/8	1 1/3 2	*4 2 3/32	7/8	1 5/16	85°33'
20°	1 1/3 2	2 9/16	*4 1 3/32	2 3/4	*4 3/8	5/16	*4 1/2	7/8	1 5/16	85°31'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 2"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	1 7/8	1/4	4 5/16	2 3/32	4 5/16	5/8	4 5/16	7/32	1 1/16	86°47'
69°	1 7/8	9/32	4 1 7/32	3/4	4 1 7/32	2 1/32	4 1 7/32	1/4	2 3/32	86°37'
68°	1 7/8	9/32	4 3/4	2 5/32	4 2 5/32	1 1/16	4 2 5/32	1/4	3/4	86°28'
67°	1 2 7/32	5/16	5	1 3/16	5 1/32	2 3/32	5 1/32	9/32	2 5/32	86°19'
66°	1 1 3/16	1 1/32	5 1/4	7/8	5 9/32	3/4	5 9/32	5/16	1 3/16	86°10'
65°	1 1 3/16	3/8	5 1/2	2 9/32	5 1 7/32	3/4	5 1/2	1 1/32	2 7/32	86°01'
64°	1 2 5/32	1 3/32	5 3/4	3 1/32	5 2 5/32	2 5/32	5 3/4	3/8	7/8	85°52'
63°	1 2 5/32	7/16	6	1	6 1/32	1 3/16	6	1 3/32	2 9/32	85°43'
62°	1 2 5/32	1/2	6 9/32	1 1/32	6 9/32	1 3/16	6 9/32	7/16	1 5/16	85°34'
61°	1 3/4	1 7/32	6 1 7/32	1 3/32	6 9/16	2 7/32	6 1 7/32	1 5/32	3 1/32	85°25'
60°	1 3/4	9/16	6 1 3/16	1 1/8	6 2 7/32	7/8	6 1 3/16	1/2	1	85°17'
59°	1 2 3/32	1 9/32	7 3/32	1 3/16	7 3/32	7/8	7 1/16	1 7/32	1 1/32	85°09'
58°	1 1 1/16	2 1/32	7 3/8	1 7/32	7 3/8	7/8	7 1 1/32	9/16	1 1/16	85°00'
57°	1 1 1/16	1 1/16	7 2 1/32	1 9/32	7 1 1/16	2 9/32	7 5/8	1 9/32	1 1/16	84°52'
56°	1 2 1/32	3/4	7 1 5/16	1 1 1/32	7 3 1/32	2 9/32	7 1 5/16	5/8	1 3/32	84°43'
55°	1 2 1/32	2 5/32	8 1/4	1 3/8	8 9/32	1 5/16	8 1/4	2 1/32	1 1/8	84°35'
54°	1 5/8	2 7/32	8 9/16	1 7/16	8 1 9/32	1 5/16	8 9/16	1 1/16	1 5/32	84°26'
53°	1 1 9/32	2 9/32	8 7/8	1 1/2	8 1 5/16	1 5/16	8 7/8	2 3/32	1 3/16	84°18'
52°	1 9/16	1 5/16	9 3/16	1 1 7/32	9 1/4	3 1/32	9 3/16	3/4	1 7/32	84°10'
51°	1 9/16	1	9 1/2	1 9/32	9 1 9/32	3 1/32	9 1/2	2 5/32	1 1/4	84°02'
50°	1 1 7/32	1 1/16	9 7/8	1 2 1/32	9 1 5/16	3 1/32	9 2 7/32	1 3/16	1 9/32	83°54'
49°	1 1/2	1 7/8	10 1/4	1 2 3/32	10 9/32	1	10 3/16	2 7/32	1 5/16	83°47'
48°	1 1/2	1 3/16	10 5/8	1 2 5/32	10 9/8	1	10 1 7/32	7/8	1 5/16	83°40'
47°	1 1 5/32	1 1/4	11	1 2 7/32	11 1/32	1	10 2 9/32	2 9/32	1 1 1/32	83°33'
46°	1 7/16	1 5/16	11 3/8	1 2 9/32	11 7/16	1	11 9/32	1 5/16	1 3/8	83°26'
45°	1 1 3/32	1 3/8	11 3/4	1 3 1/32	11 2 7/32	1	11 1 1/16	3 1/32	1 1 3/32	83°19'
44°	1 3/8	1 1 3/32	*11 2 7/32	2 1/32	*11 3/4	1	*11 2 9/32	1	1 7/16	83°12'
43°	1 3/8	1 1 7/32	*11 7/16	2 1/8	*11 1 1/32	1	*11 1 7/32	1 1/16	1 7/16	83°06'
42°	1 1 1/32	1 5/8	*11 1/16	2 3/16	*10 1 5/16	1	*11 1/8	1 3/32	1 1 5/32	82°59'
41°	1 5/16	1 1 1/16	*10 2 1/32	2 9/32	*10 1 9/32	1	*10 3/4	1 1/8	1 1/2	82°53'
40°	1 9/32	1 2 5/32	*10 9/32	2 1 1/32	*10 7/32	1	*10 1 3/32	1 5/32	1 1 7/32	82°46'
39°	1 1/4	1 7/8	*9 1 5/16	2 7/16	*9 7/8	3 1/32	*10 1/16	1 3/16	1 9/16	82°40'
38°	1 7/32	1 3 1/32	*9 5/8	2 1 7/32	*9 9/2	3 1/32	*9 2 3/32	1 7/32	1 9/16	82°34'
37°	1 3/16	2 1/16	*9 1/4	2 5/8	*9 5/32	3 1/32	*9 3/8	1 1/4	1 1 9/32	82°28'
36°	1 5/32	2 5/32	*8 2 9/32	2 2 3/32	*8 2 7/32	3 1/32	*9 1/16	1 9/32	1 5/8	82°22'
35°	1 5/32	2 9/32	*8 1 9/32	2 1 3/16	*8 1 7/32	1 5/16	*8 3/4	1 5/16	1 5/8	82°16'
34°	1 1/8	2 3/8	*8 1/4	2 1 5/16	*8 7/32	1 5/16	*8 7/16	1 1 1/32	1 2 1/32	82°11'
33°	1 3/32	2 1/2	*7 3 1/32	3 1/32	*7 2 9/32	2 9/32	*8 5/32	1 3/8	1 2 1/32	82°05'
32°	1 1/16	2 5/8	*7 1 1/16	3 5/32	*7 5/8	2 9/32	*7 7/8	1 1 3/32	1 1 1/16	82°00'
31°	1 1/32	2 2 5/32	*7 3/8	3 9/32	*7 5/16	7/8	*7 1 9/32	1 7/16	1 2 3/32	81°54'
30°	1	2 2 9/32	*7 3/32	3 1 3/32	*7 1/32	7/8	*7 5/16	1 1/2	1 2 3/32	81°49'
29°	3 1/32	3 1/16	*6 1 3/16	3 9/16	*6 3/4	2 7/32	*7 1/32	1 1/2	1 3/4	81°44'
28°	1 5/16	3 7/32	*6 9/16	3 2 3/32	*6 1/2	2 7/32	*6 2 3/32	1 1 7/32	1 3/4	81°39'
27°	2 9/32	3 1 3/32	*6 9/32	3 7/8	*6 7/32	1 3/16	*6 1/2	1 9/16	1 2 5/32	81°34'
26°	7/8	3 1 9/32	*6	4 1/32	*5 1 5/16	2 5/32	*6 1/4	1 1 9/32	1 2 5/32	81°29'
25°	2 7/32	3 2 5/32	*5 3/4	4 7/32	*5 1 1/16	2 5/32	*6	1 5/8	1 1 3/16	81°25'
24°	1 3/16	4	*5 1/2	4 1 3/32	*5 7/16	3/4	*5 2 5/32	1 2 1/32	1 1 3/16	81°21'
23°	2 5/32	4 7/32	*5 1/4	4 5/8	*5 3/16	2 3/32	*5 1 7/32	1 1 1/16	1 2 7/32	81°18'
22°	3/4	4 7/16	*5	4 7/8	*4 1 5/16	1 1/16	*5 9/32	1 1 1/16	1 2 7/32	81°14'
21°	2 3/32	4 2 3/32	*4 2 3/32	5 1/8	*4 1 1/16	1 1/16	*5 1/16	1 3/4	1 7/8	81°11'
20°	1 1/16	5 1/32	*4 1 5/32	5 1 3/32	*4 7/16	2 1/32	*4 7/8	1 3/4	1 7/8	81°07'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 3"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	2 1/32	1 1/32	4 7/32	1 1/16	4 1/4	1 5/16	4 7/32	1 1/32	1	85°15'
69°	2 1/32	1 1/32	4 7/16	1 1/8	4 1 5/32	3 1/32	4 1 5/32	3/8	1 1/32	85°01'
68°	2 2 5/32	7/16	4 1 1/16	1 5/32	4 2 3/32	1 1/32	4 1 1/16	1 1/32	1 1/32	84°47'
67°	2 3/4	1 5/32	4 1 5/16	1 7/32	4 1 5/16	1 1/16	4 2 3/32	7/16	1 5/32	84°33'
66°	2 3/4	1 7/32	5 5/32	1 9/32	5 3/16	1 3/32	5 5/32	1 5/32	1 3/16	84°20'
65°	2 2 3/32	9/16	5 1 3/32	1 1 1/32	5 7/16	1 1/8	5 1 3/32	1/2	1 1/4	84°07'
64°	2 1 1/16	5/8	5 2 1/32	1 1 3/32	5 1 1/16	1 5/32	5 5/8	1 7/32	1 9/32	83°54'
63°	2 1 1/16	2 1/32	5 7/8	1 1 5/32	5 1 5/16	1 3/16	5 7/8	1 9/32	1 1 1/32	83°41'
62°	2 2 1/32	2 3/32	6 5/32	1 1 7/32	6 3/16	1 7/32	6 1/8	5/8	1 3/8	83°28'
61°	2 5/8	3/4	6 1 3/32	1 5/8	6 1 5/32	1 1/4	6 3/8	2 1/32	1 7/16	83°15'
60°	2 1 9/32	1 3/16	6 2 1/32	1 1 1/16	6 2 3/32	1 9/32	6 2 1/32	2 3/32	1 1 5/32	83°02'
59°	2 9/16	7/8	6 1 5/16	1 3/4	7	1 9/32	6 2 3/32	3/4	1 1/2	82°49'
58°	2 9/16	1 5/16	7 3/16	1 1 3/16	7 3/32	1 5/16	7 3/16	1 3/16	1 9/16	82°36'
57°	2 1 7/32	1	7 1/2	1 7/8	7 9/16	1 1 1/32	7 1 5/32	2 7/32	1 1 9/32	82°24'
56°	2 1/2	1 1/16	7 2 5/32	1 3 1/32	7 2 7/32	1 3/8	7 3/4	2 9/32	1 2 1/32	82°12'
55°	2 1 5/32	1 1/8	8 1/16	2 1/32	8 5/32	1 1 3/32	8 1/32	1 5/16	1 1 1/16	82°00'
54°	2 7/16	1 3/16	8 3/8	2 3/32	8 1 5/32	1 1 3/32	8 1 1/32	1	1 2 3/32	81°48'
53°	2 1 3/32	1 9/32	8 1 1/16	2 3/16	8 3/4	1 7/16	8 5/8	1 1/32	1 2 5/32	81°36'
52°	2 3/8	1 1 1/32	9	2 9/32	9 3/32	1 7/16	8 1 5/16	1 3/32	1 1 3/16	81°24'
51°	2 1 1/32	1 7/16	9 5/16	2 1 1/32	9 7/16	1 5/32	9 1/4	1 1/8	1 2 7/32	81°13'
50°	2 5/16	1 1 7/32	9 2 1/32	2 7/16	9 2 5/32	1 5/32	9 9/16	1 3/16	1 2 9/32	81°02'
49°	2 9/32	1 5/8	10	2 1 7/32	10 1/8	1 5/32	9 2 9/32	1 1/4	1 5 1/16	80°51'
48°	2 1/4	1 2 3/32	10 3/8	2 5/8	10 1 5/32	1 5/32	10 1/4	1 9/32	1 3 1/32	80°40'
47°	2 3/16	1 1 3/16	10 2 3/32	2 2 3/32	10 7/8	1 1/2	10 1 9/32	1 1 1/32	2	80°29'
46°	2 5/32	1 2 9/32	11 3/32	2 1 3/16	11 1/4	1 1/2	10 1 5/16	1 3/8	2 1/16	80°18'
45°	2 1/8	2	11 1 5/32	2 2 9/32	11 2 1/32	1 1/2	11 5/16	1 7/16	2 3/32	80°07'
44°	2 3/32	2 3/32	11 7/8	3	*11 5/16	1 1/2	11 2 3/32	1 1/2	2 1/8	79°57'
43°	2 1/32	2 3/16	*11 3/4	3 1/8	*11 1/2	1 1/2	*11 2 9/32	1 9/16	2 5/32	79°47'
42°	2	2 5/16	*11 1 1/32	3 1/4	*11 1/8	1 1/2	*11 1 7/32	1 1 9/32	2 7/32	79°37'
41°	1 3 1/32	2 7/16	*10 1 5/16	3 3/8	*10 3/4	1 1/2	*11 5/32	1 2 1/32	2 1/4	79°27'
40°	1 1 5/16	2 9/16	*10 9/16	3 1 5/32	*10 3/8	1 5/32	*10 1 3/16	1 1 1/16	2 9/32	79°18'
39°	1 7/8	2 2 3/32	*10 3/16	3 1 9/32	*10 1/32	1 5/32	*10 1 5/32	1 3/4	2 5/16	79°08'
38°	1 2 7/32	2 2 7/32	*9 7/8	3 3/4	*9 1 1/16	1 5/32	*10 1/8	1 1 3/16	2 1 1/32	78°59'
37°	1 1 3/16	3	*9 1/2	3 7/8	*9 5/16	1 5/32	*9 3/16	1 7/8	2 3/8	78°50'
36°	1 2 5/32	3 1/8	*9 5/32	4	*9	1 7/16	*9 1 5/32	1 2 9/32	2 1 3/32	78°41'
35°	1 2 3/32	3 5/16	*8 2 7/32	4 5/32	*8 2 1/32	1 7/16	*9 5/32	1 3 1/32	2 7/16	78°32'
34°	1 1 1/16	3 1 5/32	*8 1/2	4 7/16	*8 1 3/32	1 1 3/32	*8 7/8	2	2 1 5/32	78°24'
33°	1 5/8	3 2 1/32	*8 3/16	4 1 5/32	*8 1/32	1 3/8	*8 9/16	2 1/16	2 1/2	78°16'
32°	1 1 9/32	3 2 7/32	*7 7/8	4 2 1/32	*7 3/4	1 3/8	*8 3/32	2 1/8	2 1 7/32	78°08'
31°	1 9/16	4 1/32	*7 1 9/32	4 2 7/32	*7 7/16	1 1 1/32	*8 1/32	2 5/32	2 9/16	78°00'
30°	1 1/2	4 1/4	*7 5/16	5 1/32	*7 5/32	1 5/16	*7 3/4	2 3/16	2 9/16	77°52'
29°	1 1 5/32	4 1 5/32	*7	5 1/4	*6 7/8	1 9/32	*7 1/2	2 1/4	2 1 9/32	77°45'
28°	1 7/16	4 1 1/16	*6 3/4	5 1/2	*6 1 9/32	1 1/4	*7 7/32	2 5/16	2 5/8	77°38'
27°	1 3/8	4 1 5/16	*6 1 5/32	5 2 3/32	*6 5/16	1 1/4	*7	2 1 1/32	2 2 1/32	77°31'
26°	1 5/16	5 7/32	*6 3/16	5 3 1/32	*6 1/32	1 7/32	*6 3/4	2 3/8	2 1 1/16	77°24'
25°	1 9/32	5 1/2	*5 2 9/32	6 1/4	*5 2 5/32	1 5/32	*6 1/2	2 7/16	2 2 3/32	77°18'
24°	1 7/32	5 2 5/32	*5 2 1/32	6 1 7/32	*5 1/2	1 1/8	*6 9/32	2 1 5/32	2 2 3/32	77°12'
23°	1 3/16	6 3/32	*5 1 3/32	6 2 7/32	*5 1/4	1 3/32	*6 1/32	2 1/2	2 3/4	77°07'
22°	1 1/8	6 7/16	*5 1/8	7 3/16	*5	1 1/16	*5 1 3/16	2 1 7/32	2 3/4	77°01'
21°	1 1/16	6 2 7/32	*4 7/8	7 9/16	*4 3/4	1 1/32	*5 5/8	2 1 9/32	2 2 5/32	76°56'
20°	1 1/32	7 9/32	*4 5/8	8	*4 1/2	1	*5 1 3/32	2 5/8	2 1 3/16	76°50'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 4"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	3 ³ / ₄	7 ¹ / ₁₆	4 ¹ / ₈	1 ³ / ₈	4 ⁵ / ₃₂	1 ⁷ / ₃₂	4 ¹ / ₈	7 ¹ / ₁₆	1 ⁵ / ₁₆	83°47'
69°	3 ²³ / ₃₂	1 ¹ / ₂	4 ¹ / ₃₂	1 ¹⁵ / ₃₂	4 ³ / ₈	1 ⁹ / ₃₂	4 ¹ / ₃₂	1 ⁵ / ₃₂	1 ³ / ₈	83°29'
68°	3 ¹¹ / ₁₆	1 ⁷ / ₃₂	4 ⁹ / ₁₆	1 ¹⁷ / ₃₂	4 ¹⁹ / ₃₂	1 ⁵ / ₁₆	4 ⁹ / ₁₆	1 ¹ / ₂	1 ⁷ / ₁₆	83°11'
67°	3 ¹ / ₁₆	1 ⁹ / ₃₂	4 ¹³ / ₁₆	1 ⁵ / ₈	4 ²⁷ / ₃₂	1 ³ / ₈	4 ²⁵ / ₃₂	9 ¹ / ₁₆	1 ¹ / ₂	82°53'
66°	3 ² / ₃₂	2 ¹ / ₃₂	5 ¹ / ₃₂	1 ¹ / ₁₆	5 ¹ / ₁₆	1 ¹³ / ₃₂	5 ¹ / ₃₂	1 ⁵ / ₃₂	1 ⁹ / ₁₆	82°36'
65°	3 ⁵ / ₈	2 ³ / ₃₂	5 ¹ / ₄	1 ²⁵ / ₃₂	5 ⁵ / ₁₆	1 ¹⁵ / ₃₂	5 ¹ / ₄	2 ¹ / ₃₂	1 ⁵ / ₈	82°19'
64°	3 ¹⁹ / ₃₂	3 ¹ / ₄	5 ¹ / ₂	1 ²⁷ / ₃₂	5 ¹⁷ / ₃₂	1 ¹ / ₂	5 ¹ / ₂	1 ¹ / ₁₆	1 ¹ / ₁₆	82°02'
63°	3 ⁹ / ₁₆	2 ⁷ / ₃₂	5 ³ / ₄	1 ¹⁵ / ₁₆	5 ²⁵ / ₃₂	1 ⁹ / ₁₆	5 ²³ / ₃₂	3 ¹ / ₄	1 ³ / ₄	81°45'
62°	3 ¹⁷ / ₃₂	7 ¹ / ₈	6	2 ¹ / ₃₂	6 ¹ / ₃₂	1 ¹⁹ / ₃₂	5 ³ / ₃₂	1 ³ / ₁₆	1 ¹ / ₁₆	81°28'
61°	3 ¹ / ₂	1 ⁵ / ₁₆	6 ¹ / ₄	2 ³ / ₃₂	6 ⁵ / ₁₆	1 ⁵ / ₈	6 ⁷ / ₃₂	7 ¹ / ₈	1 ⁷ / ₈	81°11'
60°	3 ¹⁵ / ₃₂	1 ¹ / ₃₂	6 ¹ / ₂	2 ³ / ₁₆	6 ⁹ / ₁₆	1 ¹ / ₁₆	6 ¹⁵ / ₃₂	2 ⁹ / ₃₂	1 ²⁹ / ₃₂	80°54'
59°	3 ⁷ / ₁₆	1 ³ / ₃₂	6 ³ / ₄	2 ⁹ / ₃₂	6 ²⁷ / ₃₂	1 ²³ / ₃₂	6 ²³ / ₃₂	3 ¹ / ₃₂	1 ³ / ₃₂	80°37'
58°	3 ¹³ / ₃₂	1 ¹ / ₁₆	7	2 ³ / ₈	7 ¹ / ₈	1 ³ / ₄	6 ³ / ₃₂	1 ¹ / ₃₂	2 ¹ / ₃₂	80°21'
57°	3 ¹ / ₃₂	1 ¹ / ₄	7 ⁹ / ₃₂	2 ¹⁵ / ₃₂	7 ³ / ₈	1 ²⁵ / ₃₂	7 ⁷ / ₃₂	1 ³ / ₃₂	2 ³ / ₃₂	80°05'
56°	3 ⁵ / ₁₆	1 ¹ / ₃₂	7 ⁹ / ₁₆	2 ⁹ / ₁₆	7 ¹ / ₁₆	1 ¹³ / ₁₆	7 ¹ / ₂	1 ⁵ / ₃₂	2 ⁵ / ₃₂	79°49'
55°	3 ⁹ / ₃₂	1 ⁷ / ₁₆	7 ²⁷ / ₃₂	2 ² / ₃₂	7 ³ / ₃₂	1 ²⁷ / ₃₂	7 ²⁵ / ₃₂	1 ⁷ / ₃₂	2 ⁷ / ₃₂	79°33'
54°	3 ⁷ / ₃₂	1 ¹⁷ / ₃₂	8 ¹ / ₈	2 ³ / ₄	8 ⁹ / ₃₂	1 ⁷ / ₈	8 ¹ / ₁₆	1 ³ / ₃₂	2 ⁹ / ₃₂	79°17'
53°	3 ³ / ₁₆	1 ⁵ / ₈	8 ¹³ / ₃₂	2 ⁷ / ₈	8 ¹⁹ / ₃₂	1 ⁷ / ₈	8 ¹ / ₃₂	1 ¹ / ₃₂	2 ⁵ / ₁₆	79°01'
52°	3 ⁵ / ₃₂	1 ³ / ₄	8 ²³ / ₃₂	2 ³ / ₃₂	8 ²⁹ / ₃₂	1 ²⁹ / ₃₂	8 ⁵ / ₈	1 ¹³ / ₃₂	2 ³ / ₈	78°45'
51°	3 ¹ / ₈	1 ² / ₃₂	9	3 ¹ / ₁₆	9 ¹ / ₄	1 ¹⁵ / ₁₆	8 ¹⁵ / ₁₆	1 ⁵ / ₃₂	2 ⁷ / ₁₆	78°30'
50°	3 ¹ / ₁₆	1 ¹⁵ / ₁₆	9 ¹ / ₃₂	3 ³ / ₁₆	9 ⁹ / ₁₆	1 ¹⁵ / ₁₆	9 ⁷ / ₃₂	1 ¹⁷ / ₃₂	2 ¹ / ₂	78°16'
49°	3 ³ / ₃₂	2 ¹ / ₁₆	9 ¹ / ₁₆	3 ⁹ / ₃₂	9 ²⁹ / ₃₂	1 ³ / ₃₂	9 ¹ / ₃₂	1 ¹⁹ / ₃₂	2 ⁹ / ₁₆	78°01'
48°	2 ³ / ₃₂	2 ⁵ / ₃₂	10 ¹ / ₃₂	3 ¹³ / ₃₂	10 ¹ / ₄	1 ³ / ₃₂	9 ²⁷ / ₃₂	1 ² / ₃₂	2 ¹⁹ / ₃₂	77°47'
47°	2 ¹⁵ / ₁₆	2 ⁹ / ₃₂	10 ³ / ₈	3 ¹⁷ / ₃₂	10 ⁵ / ₈	1 ³ / ₃₂	10 ³ / ₁₆	1 ²³ / ₃₂	2 ² / ₃₂	77°33'
46°	2 ⁷ / ₈	2 ¹³ / ₃₂	10 ⁹ / ₄	3 ² / ₃₂	11	2	10 ¹ / ₂	1 ¹³ / ₁₆	2 ²³ / ₃₂	77°19'
45°	2 ²⁷ / ₃₂	2 ¹⁷ / ₃₂	11 ³ / ₃₂	3 ²⁵ / ₃₂	11 ³ / ₈	2	10 ²⁷ / ₃₂	1 ⁷ / ₈	2 ³ / ₄	77°05'
44°	2 ²³ / ₃₂	2 ² / ₃₂	11 ¹ / ₂	3 ¹ / ₁₆	11 ¹³ / ₁₆	2	11 ³ / ₁₆	1 ⁵ / ₁₆	2 ¹³ / ₁₆	76°51'
43°	2 ²³ / ₃₂	2 ¹³ / ₁₆	11 ²⁹ / ₃₂	4 ¹ / ₁₆	*11 ²⁵ / ₃₂	2	11 ⁹ / ₁₆	2	2 ²⁷ / ₃₂	76°38'
42°	2 ¹ / ₁₆	2 ¹⁵ / ₁₆	*11 ¹ / ₁₆	4 ⁷ / ₃₂	*11 ³ / ₈	2	11 ⁵ / ₁₆	2 ¹ / ₁₆	2 ²⁹ / ₃₂	76°25'
41°	2 ⁵ / ₈	3 ³ / ₃₂	*11 ⁵ / ₁₆	4 ³ / ₈	*11	2	*11 ¹ / ₁₆	2 ⁵ / ₃₂	2 ¹⁵ / ₁₆	76°12'
40°	2 ⁹ / ₁₆	3 ⁹ / ₃₂	*10 ¹⁵ / ₁₆	4 ¹⁷ / ₃₂	*10 ⁵ / ₈	1 ³ / ₃₂	*11 ¹ / ₃₂	2 ⁷ / ₃₂	3	75°59'
39°	2 ¹ / ₂	3 ¹⁵ / ₃₂	*10 ⁹ / ₁₆	4 ¹ / ₁₆	*10 ⁷ / ₃₂	1 ³ / ₃₂	*11	2 ⁹ / ₃₂	3 ¹ / ₃₂	75°47'
38°	2 ¹⁵ / ₃₂	3 ⁵ / ₈	*10 ³ / ₁₆	4 ²⁷ / ₃₂	*9 ⁷ / ₈	1 ³ / ₃₂	*10 ² / ₃₂	2 ¹ / ₃₂	3 ³ / ₃₂	75°35'
37°	2 ¹³ / ₃₂	3 ¹³ / ₁₆	*9 ⁷ / ₈	5 ¹ / ₃₂	*9 ¹⁷ / ₃₂	1 ³ / ₃₂	*10 ¹ / ₃₂	2 ¹³ / ₃₂	3 ¹ / ₈	75°23'
36°	2 ¹ / ₃₂	4	*9 ¹ / ₂	5 ³ / ₃₂	*9 ⁹ / ₁₆	1 ¹⁵ / ₁₆	*10 ³ / ₃₂	2 ¹ / ₂	3 ⁹ / ₁₆	75°11'
35°	2 ⁹ / ₃₂	4 ⁷ / ₃₂	*9 ⁵ / ₃₂	5 ¹³ / ₃₂	*8 ²⁷ / ₃₂	1 ²⁹ / ₃₂	*9 ²³ / ₃₂	2 ⁹ / ₁₆	3 ⁷ / ₃₂	74°59'
34°	2 ¹ / ₄	4 ¹ / ₁₆	*8 ¹³ / ₁₆	5 ⁵ / ₈	*8 ¹⁷ / ₃₂	1 ²⁹ / ₃₂	*9 ⁷ / ₁₆	2 ⁵ / ₈	3 ¹ / ₄	74°48'
33°	2 ³ / ₁₆	4 ²¹ / ₃₂	*8 ¹ / ₂	5 ²⁷ / ₃₂	*8 ³ / ₁₆	1 ⁷ / ₈	*9 ⁹ / ₈	2 ¹ / ₁₆	3 ⁵ / ₁₆	74°37'
32°	2 ¹ / ₈	4 ²⁹ / ₃₂	*8 ⁵ / ₁₆	6 ¹ / ₁₆	*7 ²⁹ / ₃₂	1 ²⁷ / ₃₂	*8 ²⁷ / ₃₂	2 ³ / ₄	3 ¹ / ₃₂	74°26'
31°	2 ¹ / ₁₆	5 ¹ / ₈	*7 ⁷ / ₈	6 ⁵ / ₁₆	*7 ¹⁹ / ₃₂	1 ¹³ / ₁₆	*8 ¹⁹ / ₃₂	2 ¹³ / ₁₆	3 ⁵ / ₈	74°16'
30°	2	5 ¹³ / ₃₂	*7 ¹⁹ / ₃₂	6 ⁹ / ₁₆	*7 ⁵ / ₁₆	1 ²⁵ / ₃₂	*8 ⁵ / ₁₆	2 ⁷ / ₈	3 ¹³ / ₃₂	74°06'
29°	1 ³ / ₃₂	5 ¹ / ₁₆	*7 ⁵ / ₁₆	6 ²⁷ / ₃₂	*7 ¹ / ₃₂	1 ³ / ₄	*8 ¹ / ₁₆	2 ¹ / ₁₆	3 ⁷ / ₁₆	73°57'
28°	1 ⁷ / ₈	5 ³ / ₃₂	*7	7 ¹ / ₈	*6 ³ / ₄	1 ²³ / ₃₂	*7 ¹ / ₃₂	3	3 ¹ / ₂	73°48'
27°	1 ¹³ / ₁₆	6 ⁹ / ₃₂	*6 ²³ / ₃₂	7 ¹ / ₁₆	*6 ⁷ / ₁₆	1 ¹ / ₁₆	*7 ¹⁹ / ₃₂	3 ¹ / ₁₆	3 ¹⁷ / ₃₂	73°39'
26°	1 ³ / ₄	6 ⁵ / ₈	*6 ⁷ / ₁₆	7 ³ / ₄	*6 ³ / ₁₆	1 ⁵ / ₈	*7 ¹ / ₃₂	3 ¹ / ₈	3 ⁹ / ₁₆	73°30'
25°	1 ¹ / ₁₆	7	*6 ⁵ / ₃₂	8 ¹ / ₈	*5 ²⁹ / ₃₂	1 ⁹ / ₃₂	*7 ¹ / ₈	3 ³ / ₁₆	3 ¹⁹ / ₃₂	73°21'
24°	1 ⁵ / ₈	7 ¹ / ₃₂	*5 ⁷ / ₈	8 ¹⁷ / ₃₂	*5 ⁵ / ₈	1 ⁷ / ₃₂	*6 ²⁹ / ₃₂	3 ¹ / ₄	3 ⁵ / ₈	73°13'
23°	1 ⁹ / ₁₆	7 ³ / ₄	*5 ⁵ / ₈	8 ¹⁵ / ₁₆	*5 ³ / ₈	1 ¹ / ₂	*6 ¹ / ₁₆	3 ⁵ / ₁₆	3 ² / ₃₂	73°05'
22°	1 ¹ / ₂	8 ⁷ / ₃₂	*5 ¹ / ₃₂	9 ¹³ / ₃₂	*5 ¹ / ₈	1 ⁷ / ₁₆	*6 ¹⁵ / ₃₂	3 ³ / ₈	3 ¹ / ₁₆	72°57'
21°	1 ⁷ / ₁₆	8 ²³ / ₃₂	*5 ¹ / ₁₆	9 ⁷ / ₈	*4 ²⁷ / ₃₂	1 ¹³ / ₃₂	*6 ⁹ / ₃₂	3 ¹³ / ₃₂	3 ²³ / ₃₂	72°50'
20°	1 ³ / ₈	9 ⁹ / ₃₂	*4 ¹³ / ₁₆	10 ⁷ / ₁₆	*4 ¹⁹ / ₃₂	1 ¹ / ₃₂	*6 ³ / ₃₂	3 ¹⁵ / ₃₂	3 ³ / ₄	72°43'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 5"

ANGLE D IN PLAN	R1 *	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	4 1/16	1 7/32	4	1 1/16	4 1/32	1 1/2	4	1/2	1 1/32	82°26'
69°	4 2/32	1 3/32	4 7/32	1 5/32	4 1/4	1 9/16	4 7/32	9/16	1 2/32	82°04'
68°	4 5/8	2 1/32	4 7/16	1 7/8	4 15/32	1 5/8	4 7/16	5/8	1 3/4	81°42'
67°	4 19/32	2 3/32	4 21/32	1 31/32	4 11/16	1 11/16	4 21/32	2 1/32	1 13/16	81°21'
66°	4 9/16	2 5/32	4 7/8	2 1/16	4 15/16	1 3/4	4 7/8	2 3/32	1 29/32	81°00'
65°	4 17/32	2 7/32	5 3/32	2 5/32	5 5/32	1 13/16	5 3/32	2 5/32	1 31/32	80°39'
64°	4 1/2	2 9/32	5 1/16	2 1/4	5 13/32	1 7/8	5 1/16	2 7/32	2 1/16	80°18'
63°	4 15/32	1	5 1/16	2 11/32	5 21/32	1 5/16	5 17/32	2 9/32	2 1/8	79°57'
62°	4 7/16	1 1/16	5 13/16	2 7/16	5 7/8	1 3/32	5 25/32	3 1/32	2 3/16	79°36'
61°	4 3/8	1 1/8	6 1/32	2 9/16	6 1/8	2 1/32	6	1 1/32	2 9/32	79°15'
60°	4 1 1/32	1 7/32	6 9/32	2 21/32	6 13/32	2 1/16	6 1/4	1 3/32	2 1 1/32	78°55'
59°	4 9/32	1 5/16	6 17/32	2 25/32	6 21/32	2 1/8	6 1/2	1 5/32	2 13/32	78°35'
58°	4 1/4	1 13/32	6 25/32	2 7/8	6 15/16	2 5/32	6 23/32	1 7/32	2 1/2	78°15'
57°	4 3/16	1 1/2	7 1/32	3	7 3/16	2 7/32	6 31/32	1 9/32	2 9/16	77°55'
56°	4 5/32	1 5/8	7 5/16	3 3/32	7 15/32	2 1/4	7 1/4	1 3/8	2 5/8	77°35'
55°	4 3/32	1 23/32	7 9/16	3 7/32	7 3/4	2 9/32	7 1/2	1 7/16	2 23/32	77°15'
54°	4 1/32	1 27/32	7 27/32	3 11/32	8 1/16	2 5/16	7 3/4	1 17/32	2 25/32	76°56'
53°	4	1 5/16	8 1/8	3 15/32	8 11/32	2 1 1/32	8	1 9/32	2 27/32	76°37'
52°	3 15/16	2 1/16	8 13/32	3 19/32	8 21/32	2 3/8	8 9/32	1 11/16	2 15/16	76°18'
51°	3 29/32	2 3/16	8 23/32	3 23/32	8 31/32	2 3/8	8 9/16	1 3/4	3	75°59'
50°	3 27/32	2 5/16	9	3 7/8	9 9/32	2 1 3/32	8 27/32	1 27/32	3 1/16	75°41'
49°	3 25/32	2 7/16	9 5/16	4	9 5/8	2 7/16	9 1/8	1 29/32	3 1/8	75°23'
48°	3 23/32	2 9/16	9 5/8	4 5/32	9 31/32	2 7/16	9 7/16	2	3 3/16	75°05'
47°	3 21/32	2 11/32	9 31/32	4 5/16	10 5/16	2 15/32	9 23/32	2 3/32	3 1/4	74°47'
46°	3 19/32	2 7/8	10 5/16	4 15/32	10 11/16	2 15/32	10 1/32	2 3/16	3 1 1/32	74°30'
45°	3 17/32	3	10 21/32	4 5/8	11 1/16	2 1/2	10 1 1/32	2 1/4	3 1 3/32	74°13'
44°	3 15/32	3 5/32	11 1/32	4 25/32	11 7/16	2 1/2	10 21/32	2 1 1/32	3 1 5/32	73°56'
43°	3 13/32	3 9/16	11 7/16	4 31/32	11 7/8	2 1/2	10 31/32	2 7/16	3 1 7/32	73°40'
42°	3 11/32	3 1/2	11 13/16	5 1/8	*11 23/32	2 1/2	11 5/16	2 1/2	3 9/16	73°24'
41°	3 9/32	3 1 1/16	*11 13/16	5 5/16	*11 5/16	2 1/2	11 21/32	2 19/32	3 5/8	73°08'
40°	3 7/32	3 7/8	*11 13/32	5 1/2	*10 29/32	2 1/2	12	2 1 1/16	3 1 1/16	72°52'
39°	3 5/32	4 1/16	*11 1/32	5 1 1/16	*10 17/32	2 1/2	*11 21/32	2 25/32	3 3/4	72°37'
38°	3 3/32	4 3/32	*10 21/32	5 29/32	*10 5/32	2 1 5/32	*11 5/16	2 27/32	3 13/16	72°22'
37°	3 1/32	4 1/2	*10 9/32	6 1/8	*9 13/16	2 1 5/32	*11	2 15/16	3 7/8	72°07'
36°	2 15/16	4 3/4	*9 15/16	6 1 1/32	*9 15/32	2 7/16	*10 1 1/16	3 1/32	3 15/16	71°52'
35°	2 7/8	4 31/32	*9 19/32	6 19/32	*9 3/32	2 1 3/32	*10 3/8	3 1/8	3 31/32	71°38'
34°	2 13/16	5 1/4	*9 1/4	6 27/32	*8 25/32	2 9/8	*10 3/32	3 7/32	4 1/32	71°25'
33°	2 23/32	5 1/2	*8 29/32	7 3/32	*8 7/16	2 1 1/32	*9 13/16	3 9/32	4 3/32	71°12'
32°	2 21/32	5 25/32	*8 19/32	7 3/8	*8 1/8	2 5/16	*9 9/16	3 3/8	4 1/8	70°59'
31°	2 19/32	6 1/16	*8 9/32	7 1 1/16	*7 13/16	2 9/32	*9 9/32	3 1 7/32	4 3/16	70°46'
30°	2 1/2	6 3/8	*7 31/32	8	*7 1/2	2 1/4	*9 1/32	3 17/32	4 1/4	70°33'
29°	2 7/16	6 11/16	*7 21/32	8 5/16	*7 7/32	2 7/32	*8 25/32	3 5/8	4 5/32	70°21'
28°	2 1 1/32	7 1/32	*7 3/8	8 1 1/16	*6 29/32	2 9/32	*8 1 7/32	3 1 1/16	4 1 1/32	70°09'
27°	2 9/32	7 13/32	*7 1/16	9 1/16	*6 5/8	2 1/8	*8 9/32	3 25/32	4 3/8	69°58'
26°	2 3/16	7 13/16	*6 3/4	9 15/32	*6 3/8	2 1/16	*8 1/16	3 27/32	4 13/32	69°47'
25°	2 1/8	8 9/32	*6 15/32	9 29/32	*6 1/16	2	*7 27/32	3 15/16	4 15/32	69°36'
24°	2 1/32	8 3/4	*6 31/16	10 3/8	*5 13/16	1 3 1/32	*7 9/8	4	4 1/2	69°26'
23°	1 5 1/16	9 1/4	*5 29/32	10 7/8	*5 1 7/32	1 29/32	*7 7/16	4 1/16	4 1 7/32	69°16'
22°	1 7/8	9 3/4	*5 5/8	11 7/16	*5 1/4	1 27/32	*7 1/4	4 5/32	4 19/32	69°07'
21°	1 13/16	10 3/8	*5 11/32	*11 1 5/16	*5	1 25/32	*7 1/16	4 7/32	4 5/8	68°58'
20°	1 23/32	11	*5 1/16	*11 1 1/32	*4 23/32	1 23/32	*6 7/8	4 9/32	4 21/32	68°49'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 6"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	5 ⁵ / ₈	1 ⁹ / ₃₂	3 ⁷ / ₈	1 ³ / ₃₂	3 ²⁹ / ₃₂	1 ²⁵ / ₃₂	3 ²⁷ / ₃₂	9 ¹ / ₁₆	1 ²⁷ / ₃₂	81°12'
69°	5 ¹⁹ / ₃₂	2 ¹ / ₃₂	4 ¹ / ₁₆	2 ¹ / ₁₆	4 ¹ / ₈	1 ²⁷ / ₃₂	4 ¹ / ₁₆	5 ⁵ / ₈	1 ¹⁵ / ₁₆	80°46'
68°	5 ⁷ / ₁₆	2 ³ / ₃₂	4 ⁹ / ₃₂	2 ³ / ₁₆	4 ¹¹ / ₃₂	1 ²⁹ / ₃₂	4 ⁹ / ₃₂	1 ¹ / ₁₆	2 ³ / ₃₂	80°21'
67°	5 ¹⁷ / ₃₂	2 ⁵ / ₃₂	4 ⁷ / ₂	2 ³ / ₃₂	4 ⁹ / ₁₆	2	4 ¹⁵ / ₃₂	3 ⁴ / ₄	2 ¹ / ₈	79°56'
66°	5 ¹⁵ / ₃₂	7 ⁷ / ₈	4 ²³ / ₃₂	2 ¹³ / ₃₂	4 ²⁵ / ₃₂	2 ¹ / ₁₆	4 ¹ / ₁₆	1 ³ / ₁₆	2 ⁷ / ₃₂	79°31'
65°	5 ⁷ / ₁₆	1 ⁵ / ₁₆	4 ²⁹ / ₃₂	2 ¹ / ₂	5	2 ¹ / ₈	4 ²⁹ / ₃₂	2 ⁹ / ₃₂	2 ⁵ / ₁₆	79°06'
64°	5 ¹³ / ₃₂	1 ¹ / ₃₂	5 ¹ / ₈	2 ⁵ / ₈	5 ¹ / ₄	2 ³ / ₁₆	5 ¹ / ₈	1 ⁵ / ₁₆	2 ¹³ / ₃₂	78°41'
63°	5 ¹¹ / ₃₂	1 ³ / ₃₂	5 ¹ / ₃₂	2 ³ / ₄	5 ¹⁵ / ₃₂	2 ¹ / ₄	5 ¹¹ / ₃₂	1 ¹ / ₃₂	2 ¹ / ₂	78°17'
62°	5 ³ / ₃₂	1 ¹ / ₁₆	5 ⁹ / ₁₆	2 ²⁷ / ₃₂	5 ²³ / ₃₂	2 ¹ / ₁₆	5 ⁹ / ₁₆	1 ³ / ₃₂	2 ⁹ / ₁₆	77°53'
61°	5 ¹ / ₄	1 ⁹ / ₃₂	5 ¹³ / ₁₆	2 ³ / ₃₂	5 ¹ / ₃₂	2 ³ / ₈	5 ²⁵ / ₃₂	1 ⁵ / ₃₂	2 ² / ₃₂	77°29'
60°	5 ³ / ₁₆	1 ³ / ₈	6 ¹ / ₃₂	3 ³ / ₃₂	6 ³ / ₁₆	2 ⁷ / ₁₆	6	1 ¹ / ₄	2 ³ / ₄	77°05'
59°	5 ⁵ / ₃₂	1 ¹ / ₂	6 ⁹ / ₃₂	3 ⁷ / ₃₂	6 ⁷ / ₁₆	2 ¹ / ₂	6 ⁷ / ₃₂	1 ⁵ / ₁₆	2 ²⁷ / ₃₂	76°41'
58°	5 ⁹ / ₃₂	1 ¹⁹ / ₃₂	6 ¹ / ₂	3 ¹¹ / ₃₂	6 ¹¹ / ₁₆	2 ⁹ / ₁₆	6 ¹⁵ / ₃₂	1 ¹³ / ₃₂	2 ¹⁵ / ₁₆	76°17'
57°	5 ¹¹ / ₃₂	1 ¹¹ / ₁₆	6 ³ / ₄	3 ¹ / ₂	6 ³ / ₃₂	2 ¹⁹ / ₃₂	6 ¹ / ₁₆	1 ¹⁵ / ₃₂	3	75°54'
56°	4 ³ / ₃₂	1 ¹³ / ₁₆	7	3 ⁵ / ₈	7 ¹ / ₄	2 ² / ₃₂	6 ¹ / ₁₆	1 ⁹ / ₁₆	3 ³ / ₃₂	75°31'
55°	4 ²⁹ / ₃₂	1 ¹⁵ / ₁₆	7 ¹ / ₄	3 ³ / ₄	7 ¹ / ₂	2 ¹ / ₁₆	7 ³ / ₁₆	1 ² / ₃₂	3 ³ / ₁₆	75°08'
54°	4 ⁷ / ₈	2 ¹ / ₁₆	7 ¹⁷ / ₃₂	3 ²⁹ / ₃₂	7 ¹³ / ₁₆	2 ³ / ₄	7 ¹³ / ₃₂	1 ³ / ₄	3 ⁹ / ₃₂	74°46'
53°	4 ¹³ / ₁₆	2 ³ / ₁₆	7 ²⁵ / ₃₂	4 ¹ / ₁₆	8 ³ / ₃₂	2 ²⁵ / ₃₂	7 ² / ₃₂	1 ¹³ / ₁₆	3 ¹¹ / ₃₂	74°24'
52°	4 ²³ / ₃₂	2 ⁵ / ₁₆	8 ¹ / ₁₆	4 ³ / ₁₆	8 ¹³ / ₃₂	2 ¹ / ₁₆	7 ²⁹ / ₃₂	1 ²⁹ / ₃₂	3 ⁷ / ₁₆	74°02'
51°	4 ²¹ / ₃₂	2 ¹ / ₁₆	8 ¹ / ₃₂	4 ¹¹ / ₃₂	8 ²³ / ₃₂	2 ²⁷ / ₃₂	8 ⁵ / ₃₂	2	3 ¹⁷ / ₃₂	73°40'
50°	4 ¹⁹ / ₃₂	2 ¹⁹ / ₃₂	8 ⁵ / ₈	4 ¹ / ₂	9	2 ⁷ / ₈	8 ⁷ / ₁₆	2 ³ / ₃₂	3 ¹⁹ / ₃₂	73°18'
49°	4 ¹⁷ / ₃₂	2 ³ / ₄	8 ¹⁵ / ₁₆	4 ¹¹ / ₁₆	9 ¹ / ₃₂	2 ²⁹ / ₃₂	8 ¹¹ / ₁₆	2 ³ / ₁₆	3 ¹¹ / ₁₆	72°57'
48°	4 ¹⁵ / ₃₂	2 ²⁹ / ₃₂	9 ⁷ / ₃₂	4 ²⁷ / ₃₂	9 ² / ₃₂	2 ¹⁵ / ₁₆	8 ³ / ₃₂	2 ⁵ / ₁₆	3 ²⁵ / ₃₂	72°36'
47°	4 ¹³ / ₃₂	3 ¹ / ₁₆	9 ¹⁷ / ₃₂	5	10	2 ¹⁵ / ₁₆	9 ⁷ / ₃₂	2 ¹³ / ₃₂	3 ²⁷ / ₃₂	72°15'
46°	4 ⁵ / ₁₆	3 ⁷ / ₃₂	9 ²⁷ / ₃₂	5 ³ / ₁₆	10 ³ / ₈	2 ³ / ₃₂	9 ¹ / ₂	2 ¹ / ₂	3 ¹⁵ / ₁₆	71°54'
45°	4 ¹ / ₄	3 ¹³ / ₃₂	10 ³ / ₁₆	5 ⁵ / ₈	10 ²³ / ₃₂	2 ³ / ₃₂	9 ¹³ / ₁₆	2 ¹⁹ / ₃₂	4	71°34'
44°	4 ³ / ₃₂	3 ¹⁹ / ₃₂	10 ¹ / ₂	5 ¹ / ₁₆	11 ³ / ₃₂	3	10 ³ / ₃₂	2 ¹¹ / ₁₆	4 ¹ / ₁₆	71°14'
43°	4 ³ / ₃₂	3 ³ / ₄	10 ⁷ / ₈	5 ³ / ₄	11 ¹ / ₂	3	10 ³ / ₈	2 ¹³ / ₁₆	4 ⁵ / ₃₂	70°55'
42°	4 ¹ / ₃₂	3 ³ / ₃₂	11 ⁷ / ₃₂	5 ³ / ₃₂	11 ²⁹ / ₃₂	3	10 ¹¹ / ₁₆	2 ²⁹ / ₃₂	4 ⁷ / ₃₂	70°36'
41°	3 ¹⁵ / ₁₆	4 ⁵ / ₃₂	11 ¹⁹ / ₃₂	6 ¹ / ₁₆	*11 ¹ / ₁₆	3	11	3	4 ⁵ / ₁₆	70°17'
40°	3 ²⁷ / ₃₂	4 ³ / ₈	12	6 ¹³ / ₃₂	*11 ¹ / ₄	3	11 ⁹ / ₃₂	3 ³ / ₃₂	4 ³ / ₈	69°58'
39°	3 ²⁵ / ₃₂	4 ¹⁹ / ₃₂	*11 ¹⁹ / ₃₂	6 ⁵ / ₈	*10 ⁷ / ₈	3	11 ¹⁹ / ₃₂	3 ⁷ / ₃₂	4 ¹⁵ / ₃₂	69°40'
38°	3 ¹¹ / ₁₆	4 ²⁷ / ₃₂	*11 ³ / ₁₆	6 ⁷ / ₈	*10 ¹⁵ / ₃₂	2 ³ / ₃₂	11 ²⁹ / ₃₂	3 ⁵ / ₁₆	4 ¹ / ₃₂	69°22'
37°	3 ⁵ / ₈	5 ³ / ₃₂	*10 ¹³ / ₁₆	7 ¹ / ₈	*10 ¹ / ₈	2 ³ / ₃₂	*11 ³ / ₄	3 ¹³ / ₃₂	4 ¹⁹ / ₃₂	69°05'
36°	3 ¹⁷ / ₃₂	5 ¹¹ / ₃₂	*10 ¹⁵ / ₃₂	7 ³ / ₈	*9 ³ / ₄	2 ¹⁵ / ₁₆	*11 ⁷ / ₁₆	3 ¹ / ₂	4 ²⁷ / ₃₂	68°48'
35°	3 ⁷ / ₁₆	5 ⁵ / ₈	*10 ³ / ₃₂	7 ²¹ / ₃₂	*9 ¹³ / ₃₂	2 ²⁹ / ₃₂	*11 ⁵ / ₃₂	3 ⁵ / ₈	4 ²³ / ₃₂	68°31'
34°	3 ³ / ₈	5 ²⁹ / ₃₂	*9 ²³ / ₃₂	7 ¹⁵ / ₁₆	*9 ¹ / ₁₆	2 ⁷ / ₈	*10 ⁷ / ₈	3 ²³ / ₃₂	4 ²⁵ / ₃₂	68°15'
33°	3 ⁹ / ₃₂	6 ³ / ₁₆	*9 ³ / ₈	8 ¹ / ₄	*8 ³ / ₄	2 ²⁷ / ₃₂	*10 ¹⁹ / ₃₂	3 ¹³ / ₁₆	4 ²⁷ / ₃₂	67°59'
32°	3 ³ / ₁₆	6 ¹ / ₂	*9 ¹ / ₃₂	8 ⁹ / ₁₆	*8 ³ / ₈	2 ¹ / ₁₆	*10 ⁵ / ₁₆	3 ¹⁵ / ₁₆	4 ²⁹ / ₃₂	67°43'
31°	3 ³ / ₃₂	6 ⁷ / ₈	*8 ²³ / ₃₂	8 ¹⁵ / ₁₆	*8 ¹ / ₁₆	2 ²⁵ / ₃₂	*10 ¹ / ₁₆	4 ¹ / ₃₂	4 ³ / ₃₂	67°28'
30°	3	7 ³ / ₁₆	*8 ¹³ / ₃₂	9 ⁵ / ₁₆	*7 ³ / ₄	2 ²³ / ₃₂	*9 ¹³ / ₁₆	4 ¹ / ₈	5 ¹ / ₃₂	67°13'
29°	2 ²⁹ / ₃₂	7 ⁹ / ₁₆	*8 ¹ / ₁₆	9 ²¹ / ₃₂	*7 ⁷ / ₁₆	2 ¹ / ₁₆	*9 ⁹ / ₁₆	4 ⁷ / ₃₂	5 ³ / ₃₂	66°59'
28°	2 ¹³ / ₁₆	7 ¹³ / ₃₂	*7 ³ / ₄	10 ³ / ₃₂	*7 ¹ / ₈	2 ⁵ / ₈	*9 ⁵ / ₁₆	4 ⁵ / ₁₆	5 ⁵ / ₃₂	66°45'
27°	2 ²³ / ₃₂	8 ¹³ / ₃₂	*7 ⁷ / ₁₆	10 ¹⁷ / ₃₂	*6 ²⁷ / ₃₂	2 ¹⁹ / ₃₂	*9 ⁹ / ₃₂	4 ⁷ / ₁₆	5 ⁷ / ₃₂	66°31'
26°	2 ⁵ / ₈	8 ⁷ / ₈	*7 ¹ / ₈	11	*6 ⁹ / ₁₆	2 ¹⁷ / ₃₂	*8 ⁷ / ₈	4 ¹⁷ / ₃₂	5 ¹ / ₄	66°18'
25°	2 ¹⁷ / ₃₂	9 ¹¹ / ₃₂	*6 ²⁷ / ₃₂	11 ¹ / ₂	*6 ¹ / ₄	2 ¹⁵ / ₃₂	*8 ² / ₃₂	4 ⁵ / ₈	5 ⁵ / ₁₆	66°05'
24°	2 ⁷ / ₁₆	9 ²⁷ / ₃₂	*6 ¹⁷ / ₃₂	*11 ⁵ / ₁₆	*6	2 ¹³ / ₃₂	*8 ¹⁵ / ₃₂	4 ²³ / ₃₂	5 ³ / ₈	65°53'
23°	2 ¹¹ / ₃₂	10 ¹³ / ₃₂	*6 ⁷ / ₃₂	*11 ³ / ₈	*5 ¹¹ / ₁₆	2 ¹¹ / ₃₂	*8 ¹ / ₄	4 ¹³ / ₁₆	5 ¹³ / ₃₂	65°42'
22°	2 ¹ / ₄	11	*5 ¹⁵ / ₁₆	*10 ²⁷ / ₃₂	*5 ¹⁷ / ₁₆	2 ¹ / ₄	*8 ¹ / ₁₆	4 ²⁹ / ₃₂	5 ¹⁵ / ₃₂	65°31'
21°	2 ⁵ / ₃₂	11 ¹¹ / ₁₆	*5 ² / ₃₂	*10 ⁵ / ₁₆	*5 ⁵ / ₃₂	2 ³ / ₁₆	*7 ²⁹ / ₃₂	5	5 ¹ / ₂	65°20'
20°	2 ¹ / ₁₆	*11 ⁵ / ₈	*5 ³ / ₈	*9 ²⁵ / ₃₂	*4 ⁷ / ₈	2 ³ / ₃₂	*7 ³ / ₄	5 ¹ / ₁₆	5 ⁹ / ₁₆	65°09'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 7"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	6 ⁹ / ₁₆	2 ¹ / ₃₂	3 ²³ / ₃₂	2 ³ / ₁₆	3 ²⁵ / ₃₂	2	3 ²³ / ₃₂	5/8	2 ³ / ₃₂	80°04'
69°	6 ¹⁷ / ₃₂	2 ⁵ / ₃₂	3 ¹⁵ / ₁₆	2 ⁵ / ₁₆	3 ¹¹ / ₃₂	2 ³ / ₃₂	3 ²⁵ / ₃₂	1 ¹ / ₁₆	2 ⁷ / ₃₂	79°36'
68°	6 ¹⁵ / ₃₂	2 ⁶ / ₃₂	4 ¹ / ₈	2 ¹ / ₁₆	4 ³ / ₁₆	2 ⁵ / ₃₂	4 ¹ / ₈	3/4	2 ⁷ / ₁₆	79°07'
67°	6 ⁷ / ₁₆	7/8	4 ⁵ / ₁₆	2 ⁹ / ₁₆	4 ¹³ / ₃₂	2 ¹ / ₄	4 ⁵ / ₁₆	1 ³ / ₁₆	2 ¹³ / ₃₂	78°39'
66°	6 ¹³ / ₃₂	1 ⁵ / ₁₆	4 ¹ / ₂	2 ¹¹ / ₁₆	4 ⁵ / ₈	2 ¹¹ / ₃₂	4 ¹ / ₂	7/8	2 ¹ / ₂	78°10'
65°	6 ¹¹ / ₃₂	1 ¹ / ₃₂	4 ²³ / ₃₂	2 ¹³ / ₁₆	4 ²⁷ / ₃₂	2 ⁷ / ₁₆	4 ²³ / ₃₂	3 ¹ / ₃₂	2 ⁵ / ₈	77°42'
64°	6 ⁹ / ₃₂	1 ¹ / ₈	4 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	5 ¹ / ₁₆	2 ¹ / ₂	4 ²⁵ / ₃₂	1 ¹ / ₃₂	2 ²³ / ₃₂	77°14'
63°	6 ¹ / ₄	1 ⁹ / ₁₆	5 ¹ / ₈	3 ³ / ₃₂	5 ⁹ / ₃₂	2 ⁹ / ₁₆	5 ¹ / ₈	1 ¹ / ₈	2 ¹³ / ₁₆	76°46'
62°	6 ³ / ₁₆	1 ³ / ₃₂	5 ¹ / ₃₂	3 ⁷ / ₃₂	5 ¹⁷ / ₃₂	2 ² / ₃₂	5 ⁵ / ₁₆	1 ³ / ₁₆	2 ²⁹ / ₃₂	76°19'
61°	6 ¹ / ₈	1 ¹³ / ₃₂	5 ⁹ / ₁₆	3 ¹¹ / ₃₂	5 ³ / ₄	2 ²³ / ₃₂	5 ¹⁷ / ₃₂	1 ³ / ₃₂	3 ¹ / ₃₂	75°52'
60°	6 ¹ / ₁₆	1 ¹ / ₂	5 ²⁵ / ₃₂	3 ¹ / ₂	6	2 ²⁵ / ₃₂	5 ³ / ₄	1 ¹ / ₃₂	3 ¹ / ₈	75°24'
59°	6	1 ⁵ / ₈	6	3 ⁵ / ₈	6 ¹ / ₄	2 ²⁷ / ₃₂	5 ¹ / ₃₂	1 ⁷ / ₁₆	3 ¹ / ₃₂	74°57'
58°	5 ¹⁵ / ₁₆	1 ²³ / ₃₂	6 ⁷ / ₃₂	3 ²⁵ / ₃₂	6 ¹ / ₂	2 ¹⁵ / ₁₆	6 ³ / ₁₆	1 ¹⁷ / ₃₂	3 ⁵ / ₁₆	74°31'
57°	5 ⁷ / ₈	1 ²⁷ / ₃₂	6 ¹⁵ / ₃₂	3 ¹⁵ / ₁₆	6 ³ / ₄	2 ¹³ / ₃₂	6 ¹³ / ₃₂	1 ⁵ / ₈	3 ¹³ / ₃₂	74°04'
56°	5 ¹³ / ₁₆	1 ³ / ₃₂	6 ¹ / ₁₆	4 ¹ / ₁₆	7	3 ¹ / ₃₂	6 ⁵ / ₈	1 ²³ / ₃₂	3 ¹ / ₃₂	73°38'
55°	5 ³ / ₄	2 ³ / ₃₂	6 ¹⁵ / ₁₆	4 ⁷ / ₃₂	7 ¹ / ₄	3 ³ / ₃₂	6 ²⁷ / ₃₂	1 ¹³ / ₁₆	3 ⁵ / ₈	73°12'
54°	5 ²¹ / ₃₂	2 ⁷ / ₃₂	7 ³ / ₁₆	4 ³ / ₈	7 ¹⁷ / ₃₂	3 ⁵ / ₃₂	7 ¹ / ₁₆	1 ²⁹ / ₃₂	3 ²³ / ₃₂	72°46'
53°	5 ¹⁹ / ₃₂	2 ⁵ / ₈	7 ¹ / ₁₆	4 ⁹ / ₁₆	7 ¹³ / ₁₆	3 ¹ / ₁₆	7 ⁵ / ₁₆	2 ³ / ₃₂	3 ¹³ / ₁₆	72°21'
52°	5 ¹ / ₂	2 ¹⁷ / ₃₂	7 ¹ / ₁₆	4 ²³ / ₃₂	8 ³ / ₃₂	3 ¹ / ₄	7 ¹⁷ / ₃₂	2 ¹ / ₈	3 ²⁹ / ₃₂	71°56'
51°	5 ¹ / ₁₆	2 ²⁷ / ₃₂	7 ¹⁵ / ₁₆	4 ⁷ / ₈	8 ³ / ₈	3 ⁵ / ₃₂	7 ²⁵ / ₃₂	2 ⁷ / ₃₂	4	71°32'
50°	5 ⁵ / ₈	2 ¹³ / ₁₆	8 ⁷ / ₃₂	5 ¹ / ₁₆	8 ¹ / ₁₆	3 ⁵ / ₁₆	8	2 ⁵ / ₁₆	4 ³ / ₃₂	71°06'
49°	5 ³ / ₃₂	3	8 ¹ / ₂	5 ¹ / ₄	9	3 ³ / ₈	8 ¹ / ₄	2 ¹ / ₁₆	4 ³ / ₁₆	70°42'
48°	5 ¹ / ₁₆	3 ¹ / ₈	8 ²⁵ / ₃₂	5 ¹ / ₁₆	9 ⁵ / ₁₆	3 ¹³ / ₃₂	8 ¹ / ₂	2 ¹⁷ / ₃₂	4 ³ / ₃₂	70°18'
47°	5 ¹ / ₈	3 ⁵ / ₁₆	9 ¹ / ₁₆	5 ⁵ / ₈	9 ² / ₃₂	3 ¹ / ₁₆	8 ³ / ₄	2 ² / ₃₂	4 ³ / ₈	69°54'
46°	5 ¹ / ₃₂	3 ¹ / ₂	9 ³ / ₈	5 ¹³ / ₁₆	10	3 ⁷ / ₁₆	9	2 ²⁵ / ₃₂	4 ¹ / ₂	69°32'
45°	4 ¹⁵ / ₁₆	3 ¹ / ₁₆	9 ¹ / ₁₆	6 ¹ / ₃₂	10 ³ / ₈	3 ¹⁵ / ₃₂	9 ¹ / ₄	2 ⁷ / ₈	4 ⁹ / ₁₆	69°08'
44°	4 ⁷ / ₈	3 ⁷ / ₈	10	6 ¹ / ₄	10 ²³ / ₃₂	3 ¹⁵ / ₃₂	9 ¹ / ₂	3	4 ² / ₃₂	68°45'
43°	4 ²⁵ / ₃₂	4 ¹ / ₁₆	10 ⁵ / ₁₆	6 ¹ / ₂	11 ³ / ₃₂	3 ¹ / ₂	9 ²⁵ / ₃₂	3 ³ / ₃₂	4 ³ / ₄	68°23'
42°	4 ¹ / ₁₆	4 ⁵ / ₁₆	10 ¹¹ / ₁₆	6 ²³ / ₃₂	11 ¹ / ₂	3 ¹ / ₂	10 ¹ / ₃₂	3 ³ / ₃₂	4 ²⁷ / ₃₂	68°00'
41°	4 ¹³ / ₃₂	4 ¹⁷ / ₃₂	11 ¹ / ₃₂	6 ³ / ₃₂	11 ²⁹ / ₃₂	3 ¹ / ₂	10 ⁹ / ₁₆	3 ¹ / ₃₂	4 ¹⁵ / ₁₆	67°39'
40°	4 ¹ / ₂	4 ²⁵ / ₃₂	11 ¹³ / ₃₂	7 ⁷ / ₃₂	*11 ² / ₃₂	3 ¹ / ₂	10 ¹⁹ / ₃₂	3 ¹⁵ / ₃₂	5 ¹ / ₃₂	67°18'
39°	4 ¹³ / ₃₂	5	11 ²⁵ / ₃₂	7 ¹⁵ / ₃₂	*11 ¹ / ₄	3 ¹ / ₂	10 ²⁷ / ₃₂	3 ¹⁹ / ₃₂	5 ¹ / ₈	66°58'
38°	4 ⁵ / ₁₆	5 ¹ / ₄	*11 ² / ₃₂	7 ³ / ₄	*10 ²⁷ / ₃₂	3 ¹⁵ / ₃₂	11 ¹ / ₈	3 ¹ / ₁₆	5 ¹ / ₁₆	66°36'
37°	4 ⁷ / ₃₂	5 ¹⁷ / ₃₂	*11 ¹ / ₁₆	8 ¹ / ₃₂	*10 ¹⁵ / ₃₂	3 ¹⁵ / ₃₂	11 ¹³ / ₃₂	3 ¹ / ₁₆	5 ⁹ / ₃₂	66°16'
36°	4 ¹ / ₈	5 ¹³ / ₁₆	*11 ¹ / ₁₆	8 ⁵ / ₁₆	*10 ⁹ / ₃₂	3 ⁷ / ₁₆	11 ¹ / ₁₆	3 ¹⁵ / ₁₆	5 ¹ / ₃₂	65°56'
35°	4	6 ¹ / ₈	*10 ¹ / ₁₆	8 ⁵ / ₈	*9 ²³ / ₃₂	3 ⁷ / ₁₆	*12	4 ¹ / ₁₆	5 ⁷ / ₁₆	65°37'
34°	3 ²⁹ / ₃₂	6 ¹³ / ₃₂	*10 ⁹ / ₃₂	8 ³ / ₃₂	*9 ³ / ₈	3 ¹³ / ₃₂	*11 ¹ / ₁₆	4 ³ / ₁₆	5 ¹⁷ / ₃₂	65°18'
33°	3 ¹³ / ₁₆	6 ²³ / ₃₂	*9 ¹⁵ / ₁₆	9 ⁵ / ₁₆	*9 ¹ / ₃₂	3 ³ / ₈	*11 ⁷ / ₁₆	4 ⁵ / ₁₆	5 ¹⁹ / ₃₂	65°00'
32°	3 ²³ / ₃₂	7 ¹ / ₁₆	*9 ¹⁹ / ₃₂	9 ²¹ / ₃₂	*8 ¹¹ / ₁₆	3 ⁵ / ₁₆	*11 ⁵ / ₃₂	4 ⁷ / ₁₆	5 ¹ / ₁₆	64°41'
31°	3 ⁵ / ₈	7 ¹ / ₁₆	*9 ¹ / ₄	10 ¹ / ₁₆	*8 ¹ / ₃₂	3 ⁹ / ₃₂	*10 ²⁹ / ₃₂	4 ¹⁷ / ₃₂	5 ³ / ₄	64°24'
30°	3 ¹ / ₂	7 ²⁷ / ₃₂	*8 ²³ / ₃₂	10 ¹⁵ / ₃₂	*8 ¹ / ₃₂	3 ⁷ / ₃₂	*10 ² / ₃₂	4 ¹ / ₁₆	5 ¹³ / ₁₆	64°08'
29°	3 ¹³ / ₃₂	8 ⁷ / ₃₂	*8 ⁹ / ₁₆	10 ²⁹ / ₃₂	*7 ¹ / ₁₆	3 ¹ / ₁₆	*10 ¹³ / ₃₂	4 ²⁵ / ₃₂	5 ⁷ / ₈	63°52'
28°	3 ⁹ / ₃₂	8 ²³ / ₃₂	*8 ¹ / ₄	11 ³ / ₈	*7 ³ / ₈	3 ¹ / ₈	*10 ¹ / ₁₆	4 ²⁹ / ₃₂	5 ³ / ₃₂	63°36'
27°	3 ³ / ₁₆	9 ¹ / ₈	*7 ¹⁵ / ₁₆	11 ²⁷ / ₃₂	*7 ¹ / ₁₆	3 ¹ / ₁₆	*9 ³ / ₃₂	5 ¹ / ₃₂	6 ¹ / ₃₂	63°20'
26°	3 ¹ / ₁₆	9 ⁵ / ₈	*7 ⁵ / ₈	*11 ⁵ / ₈	*6 ²⁵ / ₃₂	3	*9 ³ / ₄	5 ⁵ / ₃₂	6 ³ / ₃₂	63°06'
25°	2 ³ / ₃₂	10 ⁵ / ₃₂	*7 ⁹ / ₃₂	*11 ³ / ₃₂	*6 ¹⁵ / ₃₂	2 ¹⁵ / ₁₆	*9 ¹⁷ / ₃₂	5 ¹ / ₄	6 ⁵ / ₃₂	62°50'
24°	2 ²⁷ / ₃₂	10 ²³ / ₃₂	*6 ³ / ₃₂	*10 ¹⁹ / ₃₂	*6 ³ / ₁₆	2 ²⁷ / ₃₂	*9 ⁵ / ₁₆	5 ³ / ₈	6 ⁷ / ₃₂	62°37'
23°	2 ²³ / ₃₂	11 ⁵ / ₁₆	*6 ² / ₃₂	*10 ³ / ₃₂	*5 ⁷ / ₈	2 ²⁶ / ₃₂	*9 ⁵ / ₃₂	5 ¹ / ₂	6 ⁹ / ₃₂	62°24'
22°	2 ⁵ / ₈	12	*6 ³ / ₈	*9 ⁵ / ₈	*5 ⁵ / ₈	2 ¹ / ₁₆	*8 ³ / ₃₂	5 ¹⁹ / ₃₂	6 ¹ / ₃₂	62°10'
21°	2 ¹⁷ / ₃₂	*11 ¹ / ₃₂	*6 ¹ / ₁₆	*9 ⁹ / ₈	*5 ¹ / ₃₂	2 ¹⁹ / ₃₂	*8 ²⁵ / ₃₂	5 ²³ / ₃₂	6 ¹³ / ₃₂	61°56'
20°	2 ¹³ / ₃₂	*10 ¹ / ₁₆	*5 ³ / ₄	*8 ² / ₃₂	*5 ¹ / ₁₆	2 ¹ / ₂	*8 ⁵ / ₈	5 ¹³ / ₁₆	6 ⁷ / ₁₆	61°44'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 8"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	7 ¹⁷ / ₃₂	1 ¹ / ₁₆	3 ⁹ / ₁₆	2 ⁷ / ₁₆	3 ⁵ / ₈	2 ⁷ / ₃₂	3 ⁹ / ₁₆	2 ¹ / ₃₂	2 ⁵ / ₁₆	79°04'
69°	7 ¹⁵ / ₃₂	3 ³ / ₄	3 ³ / ₄	2 ⁹ / ₁₆	3 ²⁷ / ₃₂	2 ⁵ / ₁₆	3 ³ / ₄	2 ³ / ₃₂	2 ⁷ / ₁₆	78°32'
68°	7 ⁷ / ₁₆	2 ⁷ / ₃₂	3 ¹⁵ / ₁₆	2 ¹¹ / ₁₆	4 ¹ / ₃₂	2 ¹³ / ₃₂	3 ¹⁵ / ₁₆	1 ³ / ₁₆	2 ⁹ / ₁₆	78°00'
67°	7 ³ / ₈	2 ⁹ / ₃₂	4 ¹ / ₈	2 ¹³ / ₁₆	4 ¹ / ₄	2 ¹ / ₈	4 ¹ / ₈	7 ⁷ / ₈	2 ² / ₃₂	77°29'
66°	7 ⁵ / ₁₆	1	4 ⁵ / ₁₆	2 ³ / ₃₂	4 ¹⁵ / ₃₂	2 ¹⁹ / ₃₂	4 ⁵ / ₁₆	1 ⁵ / ₁₆	2 ²⁵ / ₃₂	76°57'
65°	7 ¹ / ₄	1 ³ / ₃₂	4 ¹⁷ / ₃₂	3 ³ / ₃₂	4 ² / ₃₂	2 ¹ / ₁₆	4 ¹ / ₂	1 ¹ / ₃₂	2 ²⁹ / ₃₂	76°26'
64°	7 ³ / ₁₆	1 ³ / ₁₆	4 ²³ / ₃₂	3 ¹ / ₄	4 ⁷ / ₈	2 ²⁵ / ₃₂	4 ¹ / ₁₆	1 ³ / ₃₂	3	75°51'
63°	7 ¹ / ₈	1 ⁹ / ₃₂	4 ¹⁵ / ₁₆	3 ⁵ / ₈	5 ³ / ₃₂	2 ⁷ / ₈	4 ²⁹ / ₃₂	1 ³ / ₁₆	3 ¹ / ₈	75°24'
62°	7 ¹ / ₁₆	1 ⁷ / ₈	5 ¹ / ₈	3 ¹⁷ / ₃₂	5 ⁵ / ₁₆	2 ³ / ₃₂	5 ³ / ₃₂	1 ⁹ / ₃₂	3 ¹ / ₄	74°52'
61°	7	1 ¹⁵ / ₃₂	5 ⁵ / ₁₆	3 ¹ / ₁₆	5 ¹⁷ / ₃₂	3 ¹ / ₃₂	5 ⁹ / ₃₂	1 ¹ / ₃₂	3 ¹ / ₃₂	74°24'
60°	6 ¹⁵ / ₁₆	1 ¹⁹ / ₃₂	5 ¹⁷ / ₃₂	3 ²⁷ / ₃₂	5 ³ / ₄	3 ¹ / ₈	5 ¹ / ₂	1 ⁷ / ₁₆	3 ¹⁵ / ₃₂	73°53'
59°	6 ⁷ / ₈	1 ²³ / ₃₂	5 ³ / ₄	4	6	3 ³ / ₁₆	5 ¹ / ₁₆	1 ¹⁷ / ₃₂	3 ⁹ / ₁₆	73°24'
58°	6 ²⁵ / ₃₂	1 ¹³ / ₁₆	5 ³ / ₃₂	4 ⁵ / ₃₂	6 ⁷ / ₃₂	3 ⁹ / ₃₂	5 ²⁹ / ₃₂	1 ⁵ / ₈	3 ¹ / ₁₆	72°55'
57°	6 ²³ / ₃₂	1 ¹⁵ / ₁₆	6 ³ / ₁₆	4 ⁵ / ₁₆	6 ¹ / ₂	3 ¹¹ / ₃₂	6 ³ / ₃₂	1 ²³ / ₃₂	3 ¹³ / ₁₆	72°02'
56°	6 ⁵ / ₈	2 ³ / ₃₂	6 ¹³ / ₃₂	4 ¹ / ₂	6 ³ / ₄	3 ¹³ / ₃₂	6 ⁵ / ₁₆	1 ²⁷ / ₃₂	3 ²⁹ / ₃₂	71°56'
55°	6 ⁹ / ₁₆	2 ⁷ / ₃₂	6 ⁵ / ₈	4 ² / ₃₂	7	3 ¹⁵ / ₃₂	6 ¹⁷ / ₃₂	1 ¹⁵ / ₁₆	4 ¹ / ₃₂	71°27'
54°	6 ¹⁵ / ₃₂	2 ¹ / ₃₂	6 ⁷ / ₈	4 ²⁷ / ₃₂	7 ¹ / ₄	3 ¹⁷ / ₃₂	6 ³ / ₄	2 ¹ / ₁₆	4 ¹ / ₈	70°58'
53°	6 ¹ / ₃₂	2 ¹ / ₂	7 ³ / ₃₂	5 ¹ / ₃₂	7 ¹⁷ / ₃₂	3 ¹⁹ / ₃₂	6 ¹⁵ / ₁₆	2 ⁵ / ₃₂	4 ¹ / ₄	70°29'
52°	6 ⁵ / ₁₆	2 ² / ₃₂	7 ⁵ / ₁₆	5 ⁷ / ₃₂	7 ¹³ / ₁₆	3 ² / ₃₂	7 ⁵ / ₃₂	2 ⁹ / ₃₂	4 ³ / ₈	70°02'
51°	6 ³ / ₃₂	2 ¹ / ₁₆	7 ⁹ / ₁₆	5 ¹³ / ₃₂	8 ³ / ₃₂	3 ²³ / ₃₂	7 ³ / ₈	2 ¹³ / ₃₂	4 ¹⁵ / ₃₂	69°34'
50°	6 ¹ / ₈	3	7 ¹³ / ₁₆	5 ¹⁹ / ₃₂	8 ³ / ₈	3 ³ / ₄	7 ¹⁹ / ₃₂	2 ¹⁷ / ₃₂	4 ¹⁹ / ₃₂	69°06'
49°	6 ¹ / ₃₂	3 ⁵ / ₃₂	8 ¹ / ₁₆	5 ¹⁹ / ₁₆	8 ¹ / ₁₆	3 ¹³ / ₁₆	7 ¹⁵ / ₁₆	2 ⁵ / ₈	4 ¹ / ₁₆	68°40'
48°	5 ¹⁵ / ₁₆	3 ¹ / ₃₂	8 ¹ / ₃₂	6	9	3 ²⁷ / ₃₂	8 ¹ / ₁₆	2 ³ / ₄	4 ¹³ / ₁₆	68°13'
47°	5 ²⁷ / ₃₂	3 ¹⁷ / ₃₂	8 ⁵ / ₈	6 ⁷ / ₃₂	9 ⁵ / ₁₆	3 ⁷ / ₈	8 ⁹ / ₃₂	2 ⁷ / ₈	4 ²⁹ / ₃₂	67°46'
46°	5 ³ / ₄	3 ²³ / ₃₂	8 ²⁹ / ₃₂	6 ⁷ / ₁₆	9 ² / ₃₂	3 ²⁹ / ₃₂	8 ¹ / ₂	3	5	67°20'
45°	5 ² / ₃₂	3 ²⁹ / ₃₂	9 ³ / ₁₆	6 ² / ₃₂	10	3 ¹⁵ / ₁₆	8 ²³ / ₃₂	3 ¹ / ₈	5 ¹ / ₈	66°54'
44°	5 ⁹ / ₁₆	4 ¹ / ₈	9 ⁹ / ₂	6 ²⁹ / ₃₂	10 ¹ / ₃₂	3 ¹⁵ / ₁₆	8 ³ / ₃₂	3 ¹ / ₄	5 ⁷ / ₃₂	66°28'
43°	5 ¹⁵ / ₃₂	4 ³ / ₈	9 ¹³ / ₁₆	7 ¹ / ₈	10 ¹ / ₁₆	3 ¹³ / ₃₂	9 ³ / ₁₆	3 ⁸ / ₈	5 ⁵ / ₁₆	66°03'
42°	5 ³ / ₈	4 ¹⁹ / ₃₂	10 ¹ / ₈	7 ³ / ₈	11 ³ / ₃₂	3 ¹³ / ₃₂	9 ⁷ / ₁₆	3 ¹ / ₂	5 ⁷ / ₁₆	65°38'
41°	5 ¹ / ₄	4 ¹³ / ₁₆	10 ⁷ / ₁₆	7 ² / ₃₂	11 ¹⁵ / ₃₂	4	9 ¹ / ₁₆	3 ⁵ / ₈	5 ¹ / ₃₂	65°14'
40°	5 ⁵ / ₃₂	5 ¹ / ₁₆	10 ²⁵ / ₃₂	7 ¹⁵ / ₁₆	11 ²⁹ / ₃₂	4	9 ¹⁵ / ₁₆	3 ³ / ₄	5 ⁵ / ₈	64°50'
39°	5 ¹ / ₃₂	5 ⁵ / ₁₆	11 ¹ / ₈	8 ⁷ / ₃₂	*11 ² / ₃₂	4	10 ⁵ / ₃₂	3 ²⁹ / ₃₂	5 ³ / ₄	64°27'
38°	4 ¹⁵ / ₁₆	5 ¹⁹ / ₃₂	11 ¹ / ₂	8 ¹⁷ / ₃₂	*11 ¹ / ₄	4	10 ¹³ / ₃₂	4 ¹ / ₃₂	5 ²⁷ / ₃₂	64°04'
37°	4 ¹³ / ₁₆	5 ⁷ / ₈	11 ⁷ / ₈	8 ²⁷ / ₃₂	*10 ⁷ / ₈	4	10 ² / ₃₂	4 ⁵ / ₃₂	5 ¹⁵ / ₁₆	63°41'
36°	4 ²³ / ₃₂	6 ⁵ / ₃₂	*11 ³ / ₄	9 ⁵ / ₃₂	*10 ¹ / ₂	3 ³ / ₃₂	10 ²⁹ / ₃₂	4 ⁵ / ₁₆	6 ¹ / ₃₂	63°19'
35°	4 ¹⁹ / ₃₂	6 ¹⁵ / ₃₂	*11 ¹ / ₃₂	9 ¹ / ₂	*10 ³ / ₃₂	3 ¹⁵ / ₁₆	11 ³ / ₁₆	4 ⁷ / ₁₆	6 ¹ / ₈	62°58'
34°	4 ¹⁵ / ₃₂	6 ¹³ / ₁₆	*10 ³ / ₃₂	9 ⁷ / ₈	*9 ³ / ₄	3 ²⁹ / ₃₂	11 ⁷ / ₁₆	4 ¹⁹ / ₃₂	6 ⁷ / ₃₂	62°38'
33°	4 ³ / ₈	7 ¹ / ₈	*10 ⁹ / ₁₆	10 ¹ / ₄	*9 ³ / ₈	3 ⁷ / ₈	11 ¹ / ₁₆	4 ²³ / ₃₂	6 ⁵ / ₁₆	62°18'
32°	4 ¹ / ₄	7 ¹ / ₂	*10 ⁷ / ₃₂	10 ² / ₃₂	*9	3 ²⁷ / ₃₂	11 ¹⁵ / ₁₆	4 ⁷ / ₈	6 ³ / ₈	61°58'
31°	4 ¹ / ₈	7 ⁷ / ₈	*9 ⁷ / ₈	11 ¹ / ₁₆	*8 ² / ₃₂	3 ¹³ / ₁₆	*11 ²⁵ / ₃₂	5	6 ¹⁵ / ₃₂	61°40'
30°	4	8 ⁵ / ₁₆	*9 ¹ / ₂	11 ¹⁷ / ₃₂	*8 ⁵ / ₁₆	3 ³ / ₄	*11 ⁹ / ₁₆	5 ⁵ / ₃₂	6 ⁹ / ₁₆	61°22'
29°	3 ⁷ / ₈	8 ³ / ₄	*9 ⁵ / ₃₂	11 ³ / ₃₂	*8	3 ¹ / ₁₆	*11 ⁵ / ₁₆	5 ⁹ / ₃₂	6 ² / ₃₂	61°02'
28°	3 ³ / ₄	9 ⁷ / ₃₂	*8 ¹³ / ₁₆	*11 ¹ / ₃₂	*7 ¹ / ₁₆	3 ⁵ / ₈	*11 ³ / ₃₂	5 ⁷ / ₁₆	6 ²³ / ₃₂	60°43'
27°	3 ⁵ / ₈	9 ¹ / ₁₆	*8 ¹⁵ / ₃₂	*11 ¹ / ₃₂	*7 ³ / ₈	3 ⁹ / ₁₆	*10 ⁷ / ₈	5 ⁹ / ₁₆	6 ¹³ / ₁₆	60°24'
26°	3 ¹ / ₂	10 ⁷ / ₃₂	*8 ⁷ / ₈	*10 ⁹ / ₁₆	*7 ¹ / ₁₆	3 ¹ / ₂	*10 ² / ₃₂	5 ²³ / ₃₂	6 ²⁹ / ₃₂	60°06'
25°	3 ³ / ₈	10 ²⁵ / ₃₂	*7 ²⁵ / ₃₂	*10 ³ / ₃₂	*6 ²³ / ₃₂	3 ¹³ / ₃₂	*10 ⁷ / ₁₆	5 ²⁷ / ₃₂	6 ³ / ₃₂	59°49'
24°	3 ¹ / ₄	11 ³ / ₈	*7 ⁷ / ₁₆	*9 ⁵ / ₈	*6 ⁷ / ₁₆	3 ⁵ / ₁₆	*10 ¹ / ₄	6	7 ¹ / ₁₆	59°32'
23°	3 ¹ / ₈	*12	*7 ¹ / ₈	*9 ³ / ₁₆	*6 ¹ / ₈	3 ¹ / ₄	*10 ¹ / ₁₆	6 ¹ / ₈	7 ¹ / ₈	59°16'
22°	3	*11 ⁵ / ₁₆	*6 ¹³ / ₁₆	*8 ³ / ₄	*5 ¹³ / ₁₆	3 ¹ / ₈	*9 ⁷ / ₈	6 ¹ / ₄	7 ³ / ₁₆	59°02'
21°	2 ⁷ / ₈	*10 ¹ / ₁₆	*6 ¹ / ₂	*8 ⁵ / ₁₆	*5 ¹⁷ / ₃₂	3 ¹ / ₃₂	*9 ²³ / ₃₂	6 ³ / ₈	7 ¹ / ₄	58°48'
20°	2 ³ / ₄	*10 ¹ / ₁₆	*6 ⁵ / ₃₂	*7 ⁷ / ₈	*5 ¹ / ₄	2 ¹⁵ / ₁₆	*9 ⁹ / ₁₆	6 ¹⁷ / ₃₂	7 ¹ / ₃₂	58°34'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 9"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	8 ¹ / ₃ 2	2 ³ / ₃ 2	3 ¹ / ₃ 2	2 ⁵ / ₈	3 ¹ / ₂	2 ¹ / ₃ 2	3 ¹ / ₃ 2	1 ¹ / ₆	2 ¹ / ₃ 2	78°08'
69°	8 ¹ / ₃ 2	2 ⁵ / ₃ 2	3 ¹ / ₃ 2	2 ³ / ₄	3 ¹ / ₁₆	2 ¹ / ₂	3 ¹ / ₃ 2	2 ⁵ / ₃ 2	2 ² / ₃ 2	77°34'
68°	8 ¹ / ₃ 2	7 ⁸ / ₈	3 ² / ₃ 2	2 ² / ₃ 2	3 ⁷ / ₈	2 ⁵ / ₈	3 ² / ₃ 2	2 ⁷ / ₃ 2	2 ² / ₃ 2	77°00'
67°	8 ⁹ / ₈ 2	1 ⁵ / ₁₆	3 ¹ / ₃ 2	3 ¹ / ₁₆	4 ¹ / ₁₆	2 ² / ₃ 2	3 ¹ / ₁₆	2 ⁹ / ₃ 2	2 ² / ₃ 2	76°26'
66°	8 ⁷ / ₈ 2	1 ¹ / ₃ 2	4 ⁵ / ₃ 2	3 ³ / ₁₆	4 ⁹ / ₃ 2	2 ² / ₃ 2	4 ¹ / ₈	1	3 ¹ / ₃ 2	75°52'
65°	8 ⁵ / ₈ 2	1 ¹ / ₈	4 ¹ / ₃ 2	3 ¹ / ₃ 2	4 ¹ / ₃ 2	2 ¹ / ₁₆	4 ⁵ / ₁₆	1 ¹ / ₁₆	3 ⁵ / ₃ 2	75°19'
64°	8 ¹ / ₁₆	1 ¹ / ₄	4 ¹ / ₃ 2	3 ¹ / ₂	4 ¹ / ₁₆	3 ¹ / ₁₆	4 ¹ / ₂	1 ⁵ / ₈ 2	3 ⁹ / ₃ 2	74°45'
63°	8	1 ¹ / ₃ 2	4 ² / ₃ 2	3 ¹ / ₁₆	4 ² / ₃ 2	3 ⁵ / ₃ 2	4 ¹ / ₁₆	1 ¹ / ₄	3 ¹ / ₃ 2	74°12'
62°	7 ¹ / ₁₆	1 ¹ / ₁₆	4 ² / ₃ 2	3 ¹ / ₁₆	5 ³ / ₃ 2	3 ¹ / ₄	4 ⁷ / ₈	1 ¹ / ₈ 2	3 ¹ / ₃ 2	73°38'
61°	7 ¹ / ₈	1 ⁹ / ₁₆	5 ³ / ₃ 2	4	5 ⁵ / ₁₆	3 ¹ / ₃ 2	5 ¹ / ₁₆	1 ¹ / ₈ 2	3 ² / ₃ 2	73°05'
60°	7 ² / ₃ 2	1 ² / ₃ 2	5 ⁹ / ₃ 2	4 ⁵ / ₃ 2	5 ¹ / ₃ 2	3 ⁷ / ₁₆	5 ¹ / ₄	1 ¹ / ₃ 2	3 ² / ₃ 2	72°33'
59°	7 ² / ₃ 2	1 ² / ₃ 2	5 ¹ / ₃ 2	4 ⁵ / ₁₆	5 ³ / ₄	3 ¹ / ₃ 2	5 ⁷ / ₁₆	1 ⁵ / ₈	3 ² / ₃ 2	72°00'
58°	7 ⁵ / ₈	1 ² / ₃ 2	5 ¹ / ₁₆	4 ¹ / ₂	6	3 ¹ / ₃ 2	5 ⁵ / ₈	1 ² / ₃ 2	4 ¹ / ₃ 2	71°28'
57°	7 ¹ / ₃ 2	2 ¹ / ₃ 2	5 ⁷ / ₈	4 ¹ / ₁₆	6 ⁷ / ₃ 2	3 ¹ / ₁₆	5 ¹ / ₁₆	1 ¹ / ₁₆	4 ⁵ / ₃ 2	70°56'
56°	7 ¹ / ₁₆	2 ³ / ₁₆	6 ³ / ₃ 2	4 ⁷ / ₈	6 ¹ / ₃ 2	3 ³ / ₄	6	1 ¹ / ₁₆	4 ⁹ / ₃ 2	70°24'
55°	7 ³ / ₈	2 ⁵ / ₁₆	6 ⁵ / ₁₆	5 ¹ / ₃ 2	6 ² / ₃ 2	3 ² / ₃ 2	6 ³ / ₁₆	2 ¹ / ₁₆	4 ¹ / ₃ 2	69°52'
54°	7 ⁹ / ₈ 2	2 ¹ / ₃ 2	6 ¹ / ₃ 2	5 ⁷ / ₃ 2	7	3 ² / ₃ 2	6 ³ / ₈	2 ⁵ / ₃ 2	4 ¹ / ₃ 2	69°20'
53°	7 ⁹ / ₁₆	2 ⁵ / ₈	6 ² / ₃ 2	5 ¹ / ₁₆	7 ¹ / ₄	3 ¹ / ₃ 2	6 ¹ / ₃ 2	2 ⁹ / ₃ 2	4 ² / ₃ 2	68°48'
52°	7 ³ / ₃ 2	2 ² / ₃ 2	6 ¹ / ₁₆	5 ⁵ / ₈	7 ¹ / ₂	4 ¹ / ₃ 2	6 ² / ₃ 2	2 ¹ / ₃ 2	4 ² / ₃ 2	68°19'
51°	6 ³ / ₃ 2	2 ¹ / ₁₆	7 ³ / ₁₆	5 ¹ / ₃ 2	7 ² / ₃ 2	4 ³ / ₃ 2	7	2 ¹ / ₃ 2	4 ² / ₃ 2	67°49'
50°	6 ² / ₃ 2	3 ³ / ₃ 2	7 ⁷ / ₁₆	6 ¹ / ₃ 2	8 ¹ / ₁₆	4 ⁵ / ₃ 2	7 ³ / ₁₆	2 ² / ₃ 2	5 ¹ / ₃ 2	67°18'
49°	6 ² / ₃ 2	3 ³ / ₃ 2	7 ¹ / ₁₆	6 ¹ / ₄	8 ¹ / ₃ 2	4 ⁷ / ₃ 2	7 ¹ / ₃ 2	2 ² / ₃ 2	5 ⁵ / ₃ 2	66°49'
48°	6 ¹ / ₁₆	3 ¹ / ₃ 2	7 ¹ / ₁₆	6 ¹ / ₃ 2	8 ⁵ / ₈	4 ⁹ / ₃ 2	7 ¹ / ₃ 2	2 ² / ₃ 2	5 ¹ / ₄	66°20'
47°	6 ⁹ / ₁₆	3 ² / ₃ 2	8 ³ / ₁₆	6 ² / ₃ 2	8 ¹ / ₁₆	4 ⁵ / ₁₆	7 ¹ / ₃ 2	3 ¹ / ₃ 2	5 ³ / ₈	65°51'
46°	6 ¹ / ₃ 2	3 ⁷ / ₈	8 ⁷ / ₁₆	6 ¹ / ₁₆	9 ¹ / ₄	4 ¹ / ₃ 2	8	3 ⁵ / ₃ 2	5 ¹ / ₂	65°22'
45°	6 ³ / ₈	4 ¹ / ₁₆	8 ¹ / ₁₆	7 ³ / ₁₆	9 ¹ / ₃ 2	4 ³ / ₈	8 ⁷ / ₃ 2	3 ⁵ / ₁₆	5 ⁵ / ₈	64°54'
44°	6 ¹ / ₄	4 ⁹ / ₃ 2	8 ³ / ₃ 2	7 ⁷ / ₁₆	9 ¹ / ₁₆	4 ¹ / ₃ 2	8 ⁷ / ₁₆	3 ¹ / ₁₆	5 ³ / ₄	64°26'
43°	6 ¹ / ₈	4 ¹ / ₂	9 ¹ / ₄	7 ² / ₃ 2	10 ³ / ₃ 2	4 ⁷ / ₁₆	8 ² / ₃ 2	3 ⁹ / ₁₆	5 ⁷ / ₈	63°59'
42°	6	4 ³ / ₄	9 ⁹ / ₁₆	8	10 ² / ₃ 2	4 ¹ / ₃ 2	8 ⁷ / ₈	3 ² / ₃ 2	5 ³ / ₃ 2	63°32'
41°	5 ² / ₃ 2	5	9 ² / ₃ 2	8 ⁹ / ₃ 2	11 ¹ / ₃ 2	4 ¹ / ₃ 2	9 ³ / ₃ 2	3 ² / ₃ 2	6 ³ / ₃ 2	63°05'
40°	5 ² / ₃ 2	5 ¹ / ₄	10 ⁵ / ₃ 2	8 ¹ / ₃ 2	11 ⁷ / ₁₆	4 ¹ / ₂	9 ⁵ / ₁₆	4	6 ⁷ / ₃ 2	62°38'
39°	5 ² / ₃ 2	5 ¹ / ₃ 2	10 ¹ / ₂	8 ² / ₃ 2	11 ⁷ / ₈	4 ¹ / ₂	9 ¹ / ₃ 2	4 ⁵ / ₃ 2	6 ⁵ / ₁₆	62°12'
38°	5 ¹ / ₃ 2	5 ¹ / ₁₆	10 ⁷ / ₈	9 ⁷ / ₃ 2	*11 ² / ₃ 2	4 ¹ / ₂	9 ³ / ₄	4 ⁵ / ₁₆	6 ⁷ / ₁₆	61°46'
37°	5 ¹ / ₃ 2	6 ³ / ₃ 2	11 ³ / ₁₆	9 ⁹ / ₁₆	*11 ⁹ / ₃ 2	4 ¹ / ₂	9 ³ / ₃ 2	4 ¹ / ₃ 2	6 ⁹ / ₁₆	61°22'
36°	5 ⁹ / ₃ 2	6 ¹ / ₃ 2	11 ⁹ / ₁₆	9 ² / ₃ 2	*10 ² / ₃ 2	4 ¹ / ₂	10 ³ / ₁₆	4 ⁵ / ₈	6 ² / ₃ 2	60°58'
35°	5 ⁵ / ₃ 2	6 ³ / ₄	11 ¹ / ₁₆	10 ⁹ / ₃ 2	*10 ¹ / ₂	4 ¹ / ₃ 2	10 ¹ / ₃ 2	4 ² / ₃ 2	6 ² / ₃ 2	60°34'
34°	5 ¹ / ₃ 2	7 ³ / ₃ 2	*11 ¹ / ₁₆	10 ¹ / ₁₆	*10 ¹ / ₈	4 ⁷ / ₁₆	10 ⁵ / ₈	4 ¹ / ₁₆	6 ⁷ / ₈	60°12'
33°	4 ² / ₃ 2	7 ¹ / ₁₆	*11 ⁵ / ₁₆	11 ¹ / ₁₆	*9 ³ / ₄	4 ¹ / ₃ 2	10 ² / ₃ 2	5 ⁸ / ₃ 2	7	59°49'
32°	4 ² / ₃ 2	7 ¹ / ₁₆	*10 ¹ / ₁₆	11 ¹ / ₂	*9 ³ / ₈	4 ³ / ₈	11 ¹ / ₁₆	5 ¹ / ₄	7 ³ / ₃ 2	59°26'
31°	4 ⁵ / ₈	8 ³ / ₁₆	*10 ¹ / ₃ 2	11 ³ / ₃ 2	*9 ¹ / ₃ 2	4 ⁵ / ₁₆	11 ⁵ / ₁₆	5 ¹ / ₃ 2	7 ³ / ₁₆	59°04'
30°	4 ¹ / ₂	8 ⁵ / ₈	*10 ¹ / ₃	*11 ⁹ / ₁₆	*8 ² / ₃ 2	4 ⁹ / ₃ 2	11 ⁷ / ₃ 2	5 ⁹ / ₁₆	7 ⁵ / ₁₆	58°46'
29°	4 ³ / ₈	9 ³ / ₃ 2	*9 ³ / ₄	*11 ³ / ₃ 2	*8 ⁵ / ₁₆	4 ⁷ / ₃ 2	11 ³ / ₄	5 ² / ₃ 2	7 ¹ / ₃ 2	58°25'
28°	4 ⁷ / ₃ 2	9 ¹ / ₃ 2	*9 ³ / ₈	*10 ⁵ / ₈	*8	4 ⁵ / ₃ 2	11 ³ / ₃ 2	5 ² / ₃ 2	7 ¹ / ₂	58°00'
27°	4 ³ / ₃ 2	10 ³ / ₃ 2	*9 ¹ / ₁₆	*10 ³ / ₁₆	*7 ² / ₃ 2	4 ³ / ₃ 2	*11 ¹ / ₁₆	6 ¹ / ₁₆	7 ¹ / ₃ 2	57°40'
26°	3 ¹ / ₁₆	10 ⁵ / ₈	*8 ¹ / ₁₆	*9 ³ / ₄	*7 ⁵ / ₁₆	4	*11 ⁹ / ₃ 2	6 ⁷ / ₃ 2	7 ¹ / ₁₆	57°21'
25°	3 ¹ / ₁₆	11 ³ / ₁₆	*8 ¹ / ₃ 2	*9 ⁵ / ₁₆	*7	3 ² / ₃ 2	*11 ¹ / ₃ 2	6 ³ / ₈	7 ² / ₃ 2	57°02'
24°	3 ² / ₃ 2	11 ¹ / ₁₆	*8	*8 ⁷ / ₈	*6 ¹ / ₁₆	3 ¹ / ₃ 2	*11 ³ / ₁₆	6 ¹ / ₃ 2	7 ⁷ / ₈	56°44'
23°	3 ¹ / ₂	*11 ¹ / ₃ 2	*7 ⁵ / ₈	*8 ¹ / ₃ 2	*6 ³ / ₈	3 ² / ₃ 2	*11	6 ¹ / ₁₆	7 ¹ / ₁₆	56°28'
22°	3 ³ / ₈	*10 ² / ₃ 2	*7 ⁵ / ₁₆	*8 ³ / ₃ 2	*6 ¹ / ₁₆	3 ⁵ / ₈	*10 ² / ₃ 2	6 ² / ₃ 2	8 ¹ / ₃ 2	56°12'
21°	3 ⁷ / ₃ 2	*10 ⁹ / ₃ 2	*6 ³ / ₃ 2	*7 ² / ₃ 2	*5 ³ / ₄	3 ¹ / ₂	*10 ² / ₃ 2	7	8 ¹ / ₈	55°55'
20°	3 ¹ / ₁₆	*9 ¹ / ₁₆	*6 ⁵ / ₈	*7 ⁹ / ₃ 2	*5 ¹ / ₃ 2	3 ¹ / ₃ 2	*10 ¹ / ₃ 2	7 ³ / ₁₆	8 ³ / ₁₆	55°40'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 10"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	9 ¹³ / ₃₂	2 ³ / ₃₂	3 ⁹ / ₃₂	2 ²⁵ / ₃₂	3 ¹¹ / ₃₂	2 ¹⁹ / ₃₂	3 ⁹ / ₃₂	2 ³ / ₃₂	2 ¹¹ / ₁₆	77°20'
69°	9 ¹¹ / ₃₂	1 ¹³ / ₁₆	3 ⁷ / ₁₆	2 ¹⁵ / ₁₆	3 ⁷ / ₃₂	2 ²³ / ₃₂	3 ⁷ / ₁₆	2 ⁵ / ₃₂	2 ¹³ / ₁₆	76°44'
68°	9 ⁹ / ₃₂	7 ⁸ / ₃₂	3 ⁵ / ₈	3 ³ / ₃₂	3 ²³ / ₃₂	2 ¹³ / ₁₆	3 ⁵ / ₈	7 ⁸ / ₃₂	2 ³ / ₁₆	76°08'
67°	9 ³ / ₁₆	3 ¹ / ₃₂	3 ²⁵ / ₃₂	3 ¹ / ₄	3 ²⁹ / ₃₂	2 ¹⁵ / ₁₆	3 ²⁵ / ₃₂	1 ¹⁵ / ₁₆	3 ³ / ₃₂	75°30'
66°	9 ¹ / ₈	1 ¹ / ₁₆	3 ¹⁵ / ₁₆	3 ¹³ / ₃₂	4 ¹ / ₈	3 ¹ / ₁₆	3 ¹⁵ / ₁₆	1 ¹ / ₃₂	3 ⁷ / ₃₂	74°53'
65°	9 ¹ / ₁₆	1 ⁵ / ₃₂	4 ¹ / ₈	3 ¹⁹ / ₃₂	4 ⁵ / ₁₆	3 ³ / ₁₆	4 ¹ / ₈	1 ³ / ₃₂	3 ³ / ₈	74°17'
64°	8 ³ / ₃₂	1 ¹ / ₄	4 ⁵ / ₁₆	3 ³ / ₄	4 ¹ / ₂	3 ⁵ / ₁₆	4 ⁹ / ₃₂	1 ³ / ₁₆	3 ¹ / ₂	73°41'
63°	8 ² / ₃₂	1 ³ / ₈	4 ¹ / ₂	3 ²⁹ / ₃₂	4 ²³ / ₃₂	3 ¹³ / ₃₂	4 ¹⁵ / ₃₂	1 ⁹ / ₃₂	3 ² / ₁₆	73°06'
62°	8 ¹ / ₁₆	1 ¹⁵ / ₃₂	4 ² / ₁₆	4 ³ / ₃₂	4 ²⁹ / ₃₂	3 ¹ / ₂	4 ⁵ / ₈	1 ³ / ₈	3 ²⁵ / ₃₂	72°30'
61°	8 ³ / ₄	1 ¹ / ₃₂	4 ² / ₃₂	4 ¹ / ₄	5 ¹ / ₈	3 ⁵ / ₈	4 ¹³ / ₁₆	1 ¹⁵ / ₃₂	3 ²⁹ / ₃₂	71°56'
60°	8 ² / ₃₂	1 ²³ / ₃₂	5 ¹ / ₃₂	4 ⁷ / ₁₆	5 ⁵ / ₁₆	3 ²³ / ₃₂	5	1 ⁹ / ₁₆	4 ¹ / ₁₆	71°20'
59°	8 ⁹ / ₁₆	1 ¹³ / ₁₆	5 ⁷ / ₃₂	4 ⁵ / ₈	5 ¹⁷ / ₃₂	3 ¹³ / ₁₆	5 ⁵ / ₃₂	1 ¹¹ / ₁₆	4 ³ / ₁₆	70°45'
58°	8 ¹ / ₂	1 ³ / ₁₆	5 ⁷ / ₁₆	4 ¹³ / ₁₆	5 ³ / ₄	3 ²⁹ / ₃₂	5 ¹¹ / ₃₂	1 ²⁵ / ₃₂	4 ¹¹ / ₃₂	70°10'
57°	8 ³ / ₈	2 ³ / ₃₂	5 ⁵ / ₈	5	6	4	5 ¹⁷ / ₃₂	1 ²⁹ / ₃₂	4 ¹⁵ / ₃₂	69°34'
56°	8 ⁹ / ₃₂	2 ⁷ / ₃₂	5 ¹³ / ₁₆	5 ³ / ₁₆	6 ⁷ / ₃₂	4 ³ / ₃₂	5 ²³ / ₃₂	2	4 ¹⁹ / ₃₂	69°01'
55°	8 ³ / ₁₆	2 ³ / ₈	6	5 ³ / ₈	6 ¹⁵ / ₃₂	4 ⁵ / ₃₂	5 ⁷ / ₈	2 ¹ / ₈	4 ³ / ₄	68°26'
54°	8 ³ / ₃₂	2 ¹⁷ / ₃₂	6 ⁷ / ₃₂	5 ¹⁹ / ₃₂	6 ¹ / ₁₆	4 ¹ / ₄	6 ¹ / ₁₆	2 ¹ / ₄	4 ⁷ / ₈	67°54'
53°	7 ³ / ₃₂	2 ¹¹ / ₁₆	6 ¹³ / ₃₂	5 ¹³ / ₁₆	6 ¹⁵ / ₁₆	4 ¹¹ / ₃₂	6 ¹ / ₄	2 ¹¹ / ₃₂	5	67°20'
52°	7 ⁷ / ₈	2 ²⁷ / ₃₂	6 ⁵ / ₈	6	7 ³ / ₁₆	4 ¹³ / ₃₂	6 ⁷ / ₁₆	2 ¹ / ₂	5 ¹ / ₈	66°46'
51°	7 ³ / ₄	3	6 ²⁷ / ₃₂	6 ⁷ / ₃₂	7 ¹⁵ / ₃₂	4 ¹ / ₂	6 ⁵ / ₈	2 ⁵ / ₈	5 ⁹ / ₃₂	66°14'
50°	7 ² / ₃₂	3 ³ / ₁₆	7 ¹ / ₁₆	6 ⁷ / ₁₆	7 ²³ / ₃₂	4 ⁹ / ₁₆	6 ¹³ / ₁₆	2 ³ / ₄	5 ¹³ / ₃₂	65°42'
49°	7 ¹⁷ / ₃₂	3 ³ / ₈	7 ⁹ / ₃₂	6 ¹¹ / ₁₆	8	4 ⁹ / ₈	7	2 ⁷ / ₈	5 ⁹ / ₁₆	65°10'
48°	7 ⁷ / ₁₆	3 ⁹ / ₁₆	7 ¹ / ₂	6 ¹⁵ / ₁₆	8 ⁵ / ₁₆	4 ¹¹ / ₁₆	7 ³ / ₁₆	3 ¹ / ₃₂	5 ¹¹ / ₁₆	64°39'
47°	7 ⁵ / ₁₆	3 ³ / ₄	7 ³ / ₄	7 ³ / ₁₆	8 ¹⁹ / ₃₂	4 ³ / ₄	7 ³ / ₈	3 ⁵ / ₃₂	5 ¹³ / ₁₆	64°07'
46°	7 ³ / ₁₆	3 ³ / ₃₂	7 ³ / ₃₂	7 ⁷ / ₁₆	8 ²⁹ / ₃₂	4 ²⁵ / ₃₂	7 ⁹ / ₁₆	3 ⁵ / ₁₆	5 ¹⁵ / ₁₆	63°36'
45°	7 ¹ / ₁₆	4 ³ / ₁₆	8 ⁷ / ₃₂	7 ¹¹ / ₁₆	9 ⁷ / ₃₂	4 ²⁷ / ₃₂	7 ³ / ₄	3 ⁷ / ₁₆	6 ³ / ₃₂	63°05'
44°	6 ¹³ / ₁₆	4 ¹³ / ₃₂	8 ¹⁷ / ₃₂	7 ¹⁵ / ₁₆	9 ¹⁷ / ₃₂	4 ⁷ / ₈	7 ³ / ₃₂	3 ¹⁹ / ₃₂	6 ⁷ / ₃₂	62°35'
43°	6 ¹³ / ₁₆	4 ⁵ / ₈	8 ²³ / ₃₂	8 ⁷ / ₃₂	9 ⁷ / ₈	4 ²⁹ / ₃₂	8 ⁵ / ₃₂	3 ³ / ₄	6 ¹¹ / ₃₂	62°05'
42°	6 ¹¹ / ₁₆	4 ⁷ / ₈	9	8 ¹⁷ / ₃₂	10 ⁷ / ₃₂	4 ¹⁵ / ₁₆	8 ¹ / ₃₂	3 ²⁹ / ₃₂	6 ¹ / ₂	61°36'
41°	6 ⁹ / ₁₆	5 ¹ / ₈	9 ⁹ / ₃₂	8 ²⁷ / ₃₂	10 ¹⁹ / ₃₂	4 ³ / ₃₂	8 ¹⁷ / ₃₂	4 ¹ / ₁₆	6 ⁵ / ₈	61°07'
40°	6 ⁷ / ₁₆	5 ³ / ₈	9 ⁹ / ₁₆	9 ⁵ / ₃₂	11	4 ³ / ₃₂	8 ³ / ₄	4 ⁷ / ₃₂	6 ³ / ₄	60°38'
39°	6 ³ / ₃₂	5 ² / ₃₂	9 ⁷ / ₈	9 ¹ / ₂	11 ³ / ₈	5	8 ¹⁵ / ₁₆	4 ³ / ₈	6 ⁷ / ₈	60°10'
38°	6 ⁵ / ₃₂	5 ¹⁵ / ₁₆	10 ³ / ₁₆	9 ²⁷ / ₃₂	11 ²⁵ / ₃₂	5	9 ¹ / ₈	4 ¹⁷ / ₃₂	7	59°42'
37°	6 ¹ / ₃₂	6 ¹ / ₄	10 ¹ / ₂	10 ⁷ / ₃₂	*11 ²⁵ / ₃₂	5	9 ⁵ / ₁₆	4 ¹¹ / ₁₆	7 ¹ / ₈	59°15'
36°	5 ⁷ / ₈	6 ⁹ / ₁₆	10 ²⁷ / ₃₂	10 ⁹ / ₁₆	*11 ¹¹ / ₃₂	5	9 ¹⁷ / ₃₂	4 ⁷ / ₈	7 ¹ / ₄	58°48'
35°	5 ³ / ₄	6 ²⁹ / ₃₂	11 ⁷ / ₃₂	10 ³ / ₃₂	*10 ¹⁵ / ₁₆	4 ³ / ₃₂	9 ²³ / ₃₂	5 ¹ / ₃₂	7 ³ / ₈	58°22'
34°	5 ¹⁹ / ₃₂	7 ¹ / ₄	11 ⁹ / ₁₆	11 ³ / ₈	*10 ¹⁷ / ₃₂	4 ³ / ₃₂	9 ²⁹ / ₃₂	5 ⁷ / ₃₂	7 ¹ / ₂	57°57'
33°	5 ⁷ / ₁₆	7 ⁵ / ₈	11 ¹⁵ / ₁₆	11 ²⁷ / ₃₂	*10 ¹ / ₈	4 ¹⁵ / ₁₆	10 ³ / ₃₂	5 ³ / ₈	7 ⁵ / ₈	57°32'
32°	5 ⁵ / ₁₆	8	*11 ² / ₃₂	*11 ¹¹ / ₁₆	*9 ²⁵ / ₃₂	4 ²⁹ / ₃₂	10 ⁵ / ₁₆	5 ⁹ / ₁₆	7 ³ / ₄	57°08'
31°	5 ³ / ₃₂	8 ¹³ / ₃₂	*11 ¹ / ₄	*11 ¹ / ₄	*9 ³ / ₈	4 ⁷ / ₈	10 ¹ / ₂	5 ³ / ₄	7 ⁷ / ₈	56°44'
30°	5	8 ²⁷ / ₃₂	*10 ²⁷ / ₃₂	*10 ¹³ / ₁₆	*9 ¹ / ₃₂	4 ¹³ / ₁₆	10 ¹¹ / ₁₆	5 ¹⁵ / ₁₆	8	56°20'
29°	4 ²⁷ / ₃₂	9 ⁵ / ₁₆	*10 ⁷ / ₁₆	*10 ³ / ₈	*8 ¹¹ / ₁₆	4 ³ / ₄	10 ⁷ / ₈	6 ³ / ₃₂	8 ¹ / ₈	55°57'
28°	4 ¹¹ / ₁₆	9 ²⁵ / ₃₂	*10 ¹ / ₁₆	*9 ³ / ₃₂	*8 ⁵ / ₁₆	4 ¹¹ / ₁₆	11 ¹ / ₁₆	6 ⁹ / ₃₂	8 ⁷ / ₃₂	55°36'
27°	4 ¹ / ₃₂	10 ⁵ / ₁₆	*9 ¹ / ₁₆	*9 ⁹ / ₁₆	*7 ³ / ₃₂	4 ⁵ / ₈	11 ¹ / ₄	6 ¹⁵ / ₃₂	8 ¹¹ / ₃₂	55°14'
26°	4 ³ / ₈	10 ⁷ / ₈	*9 ⁵ / ₁₆	*9 ⁵ / ₃₂	*7 ⁵ / ₈	4 ¹⁷ / ₃₂	11 ⁷ / ₁₆	6 ² / ₃₂	8 ⁷ / ₁₆	54°53'
25°	4 ⁷ / ₃₂	11 ¹⁵ / ₃₂	*8 ¹⁵ / ₁₆	*8 ³ / ₄	*7 ⁹ / ₃₂	4 ⁷ / ₁₆	11 ⁵ / ₈	6 ²⁷ / ₃₂	8 ⁹ / ₁₆	54°32'
24°	4 ¹ / ₁₆	*11 ²⁹ / ₃₂	*8 ⁹ / ₁₆	*8 ¹ / ₃₂	*6 ¹⁵ / ₁₆	4 ¹¹ / ₃₂	11 ¹³ / ₁₆	7 ¹ / ₃₂	8 ²¹ / ₃₂	54°13'
23°	3 ²⁹ / ₃₂	*11 ¹ / ₄	*8 ³ / ₁₆	*7 ³ / ₃₂	*6 ⁵ / ₈	4 ⁷ / ₃₂	*12	7 ⁷ / ₃₂	8 ³ / ₄	53°53'
22°	3 ³ / ₄	*10 ⁵ / ₈	*7 ²⁷ / ₃₂	*7 ⁹ / ₁₆	*6 ⁵ / ₁₆	4 ¹ / ₈	*11 ³ / ₁₆	7 ¹³ / ₃₂	8 ²⁷ / ₃₂	53°36'
21°	3 ¹⁹ / ₃₂	*10 ¹ / ₃₂	*7 ¹⁵ / ₃₂	*7 ³ / ₁₆	*6	4	*11 ² / ₃₂	7 ¹⁹ / ₃₂	8 ¹⁵ / ₁₆	53°18'
20°	3 ¹³ / ₃₂	*9 ⁷ / ₁₆	*7 ¹ / ₈	*6 ¹³ / ₁₆	*5 ¹ / ₁₆	3 ⁷ / ₈	*11 ¹ / ₂	7 ²⁵ / ₃₂	9 ¹ / ₃₂	53°01'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 11"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	10 ^{1 1/32}	3/4	3 1/8	2 1 5/16	3 7/32	2 3/4	3 1/8	2 3/32	2 2 7/32	76°38'
69°	10 9/32	1 3/16	3 9/32	3 3/32	3 1 3/32	2 7/8	3 9/32	1 3/16	3	75°59'
68°	10 3/16	2 9/32	3 7/16	3 9/32	3 1 9/32	3	3 1 5/32	7/8	3 1/8	75°20'
67°	10 1/8	1	3 5/8	3 7/16	3 3/4	3 1/8	3 5/8	3 1/32	3 9/32	74°42'
66°	10 1/32	1 1/16	3 2 5/32	3 1 9/32	3 1 5/16	3 1/4	3 2 5/32	1 1/32	3 7/16	74°03'
65°	9 3 1/32	1 3/16	3 1 5/16	3 2 5/32	4 1/8	3 3/8	3 1 5/16	1 1/8	3 9/16	73°24'
64°	9 7/8	1 9/32	4 1/8	3 3 1/32	4 9/16	3 1/2	4 9/32	1 7/32	3 2 3/32	72°46'
63°	9 1 3/16	1 7/8	4 9/32	4 1/8	4 1 7/32	3 5/8	4 1/4	1 5/16	3 7/8	72°08'
62°	9 2 3/32	1 1/2	4 1 5/32	4 5/16	4 2 3/32	3 3/4	4 1/16	1 1 3/32	4	72°08'
61°	9 5/8	1 1 9/32	4 5/8	4 1/2	4 2 9/32	3 2 7/32	4 1 9/32	1 1/2	4 5/32	70°52'
60°	9 1 7/32	1 2 3/32	4 1 3/16	4 1 1/16	5 3/32	3 3 1/32	4 3/4	1 1 9/32	4 5/16	70°15'
59°	9 7/16	1 2 7/32	5	4 7/8	5 5/16	4 1/16	4 1 5/16	1 2 3/32	4 7/16	69°37'
58°	9 5/16	1 3 3/32	5 5/32	5 1/16	5 1 7/32	4 3/16	5 3/32	1 1 3/16	4 1 9/32	69°00'
57°	9 7/32	2 1/8	5 1 1/32	5 9/32	5 3/4	4 9/32	5 1/4	1 1 5/16	4 3/4	68°24'
56°	9 1/8	2 1/4	5 1 7/32	5 1 5/32	5 3 1/32	4 1 3/32	5 7/16	2 1/16	4 2 9/32	67°48'
55°	9	2 1 3/32	5 2 3/32	5 1 1/16	6 3/16	4 1 5/32	5 1 9/32	2 5/32	5 1/32	67°12'
54°	8 2 9/32	2 9/16	5 2 9/32	5 2 9/32	6 7/16	4 9/16	5 2 5/32	2 9/32	5 3/16	66°35'
53°	8 2 5/32	2 2 3/32	6 1/16	6 1/8	6 1 1/16	4 2 1/32	5 1 5/16	2 1 3/32	5 1 1/32	66°00'
52°	8 2 1/32	2 7/8	6 9/32	6 1 1/32	6 2 9/32	4 3/4	6 1/8	2 9/16	5 1/2	65°24'
51°	8 1 7/32	3 1/16	6 1 5/32	6 9/16	7 5/32	4 2 7/32	6 3/32	2 1 1/16	5 5/8	64°48'
50°	8 7/16	3 7/32	6 1 1/16	6 1 3/16	7 1 3/32	4 2 9/32	6 1 5/32	2 1 3/16	5 2 5/32	64°14'
49°	8 5/16	3 1 3/32	6 7/8	7 1/16	7 1 1/16	5	6 5/8	2 3 1/32	5 1 5/16	63°40'
48°	8 5/32	3 1 9/32	7 3/32	7 5/16	7 3 1/32	5 1/16	6 1 3/16	3 3/32	6 3/32	63°05'
47°	8 1/32	3 2 5/32	7 5/16	7 9/16	8 1/4	5 1/8	7	3 1/4	6 1/4	62°32'
46°	7 2 9/32	4	7 1 7/32	7 1 3/16	8 1 7/32	5 3/16	7 5/32	3 1 3/32	6 3/8	61°59'
45°	7 2 5/32	4 7/32	7 2 5/32	8 3/32	8 2 7/32	5 1/4	7 1 1/32	3 9/16	6 1 7/32	61°27'
44°	7 5/8	4 1 5/32	8	8 3/8	9 5/32	5 5/16	7 1/2	3 2 3/32	6 1 1/16	60°53'
43°	7 1/2	4 1 1/16	8 7/32	8 1 1/16	9 1 5/32	5 3/8	7 1 1/16	3 7/8	6 1 3/16	60°21'
42°	7 1 1/32	4 1 5/16	8 1 5/32	9	9 1 3/16	5 1 3/32	7 7/8	4 1 3/32	6 2 1/32	59°52'
41°	7 7/32	5 3/16	8 3/4	9 5/16	10 5/32	5 7/16	8 1/32	4 3/16	7 1/8	59°20'
40°	7 1/16	5 1 5/32	9	9 2 1/32	10 1 7/32	5 1 5/32	8 7/32	4 3/8	7 1/4	58°50'
39°	6 2 9/32	5 3/4	9 1/4	10 1/32	10 2 9/32	5 1 5/32	8 3/8	4 1 7/32	7 1 3/32	58°20'
38°	6 2 5/32	6 1/32	9 9/16	10 3/8	11 5/16	5 1/2	8 9/16	4 2 3/32	7 9/16	57°50'
37°	6 5/8	6 1 1/32	9 7/8	10 3/4	11 2 3/32	5 1/2	8 2 3/32	4 7/8	7 1 1/16	57°20'
36°	6 1 5/32	6 2 1/32	10 3/16	11 5/32	*11 1 1/16	5 1/2	8 2 9/32	5 1/16	7 2 7/32	56°51'
35°	6 5/16	7	10 1 7/32	11 1 9/32	*11 1 3/32	5 1/2	9 3/32	5 1/4	7 3 1/32	56°22'
34°	6 5/32	7 1 1/32	10 7/8	12	*10 3 1/32	5 1 5/32	9 1/4	5 7/16	8 1/8	55°56'
33°	6	7 2 3/32	11 1/4	*11 1 7/32	*10 9/16	5 7/16	9 7/16	5 5/8	8 1/4	55°28'
32°	5 2 7/32	8 1/8	11 5/8	*11 3/32	*10 5/32	5 7/16	9 1 9/32	5 1 3/16	8 1 3/32	55°02'
31°	5 2 1/32	8 1 7/32	12	*10 1 1/16	*9 2 5/32	5 3/8	9 2 5/32	6 1/32	8 1 7/32	54°36'
30°	5 1/2	8 3 1/32	*11 1 9/32	*10 1/4	*9 1 3/32	5 1 1/32	9 1 5/16	6 7/32	8 2 1/32	54°11'
29°	5 1 1/32	9 7/16	*11 3/16	*9 2 7/32	*9 1 3/32	5 9/32	10 1/8	6 7/16	8 1 3/16	53°46'
28°	5 5/32	9 2 9/32	*10 1 1/16	*9 7/16	*8 2 1/32	5 7/32	10 9/32	6 5/8	8 1 5/16	53°22'
27°	5	10 7/16	*10 1 3/32	*9 1 3/32	*8 9/32	5 5/32	10 7/16	6 2 7/32	9 1/16	52°58'
26°	4 1 3/16	11	*10	*8 2 1/32	*7 1 5/16	5 1/16	10 5/8	7 1/32	9 3/16	52°35'
25°	4 2 1/32	11 5/8	*9 1 9/32	*8 9/32	*7 1 9/32	4 3 1/32	10 2 5/32	7 1/4	9 5/16	52°14'
24°	4 1 5/32	*11 3/4	*9 7/32	*7 2 9/32	*7 1/4	4 7/8	10 1 5/16	7 1 5/32	9 7/16	51°53'
23°	4 9/32	*11 3/32	*8 1 3/16	*7 1 7/32	*6 2 9/32	4 2 5/32	11 3/32	7 2 1/32	9 1 7/32	51°32'
22°	4 1/8	*10 1/2	*8 7/16	*7 3/16	*6 9/16	4 2 1/32	11 1/4	7 7/8	9 2 1/32	51°12'
21°	3 1 5/16	*9 2 9/32	*8 1/16	*6 1 3/16	*6 1/4	4 1/8	11 3/8	8 3/32	9 3/4	50°53'
20°	3 3/4	*9 1 1/32	*7 2 1/32	*6 1 5/32	*5 1 5/16	4 3/8	11 1 7/32	8 5/16	9 7/8	50°34'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

12" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	11 ⁹ / ₃₂	³ / ₄	3	3 ³ / ₃₂	3 ³ / ₃₂	2 ²⁹ / ₃₂	3	2 ³ / ₃₂	3	75°59'
69°	11 ³ / ₁₆	1 ³ / ₁₆	3 ¹ / ₈	3 ¹ / ₄	3 ¹ / ₄	3 ¹ / ₃₂	3 ¹ / ₈	1 ³ / ₁₆	3 ¹ / ₈	75°19'
68°	11 ¹ / ₈	2 ⁹ / ₃₂	3 ⁹ / ₃₂	3 ⁷ / ₁₆	3 ⁷ / ₁₆	3 ⁵ / ₃₂	3 ⁹ / ₃₂	⁷ / ₈	3 ⁹ / ₃₂	74°39'
67°	11 ¹ / ₃₂	1	3 ⁷ / ₁₆	3 ⁵ / ₈	3 ⁵ / ₈	3 ⁵ / ₁₆	3 ⁷ / ₁₆	3 ¹ / ₁₆	3 ⁷ / ₁₆	73°58'
66°	10 ³ / ₃₂	1 ³ / ₃₂	3 ¹⁹ / ₃₂	3 ²⁵ / ₃₂	3 ²⁵ / ₃₂	3 ⁷ / ₁₆	3 ¹⁹ / ₃₂	1 ¹ / ₁₆	3 ¹⁹ / ₃₂	73°17'
65°	10 ⁷ / ₈	1 ³ / ₁₆	3 ²⁵ / ₃₂	3 ³ / ₃₂	3 ³ / ₃₂	3 ⁹ / ₁₆	3 ³ / ₄	1 ¹ / ₈	3 ³ / ₄	72°37'
64°	10 ²⁵ / ₃₂	1 ⁹ / ₃₂	3 ¹⁵ / ₁₆	4 ¹ / ₈	4 ¹ / ₈	3 ¹ / ₁₆	3 ²⁹ / ₃₂	1 ⁷ / ₃₂	3 ²⁹ / ₃₂	71°56'
63°	10 ¹¹ / ₁₆	1 ³ / ₈	4 ³ / ₃₂	4 ⁵ / ₁₆	4 ⁵ / ₁₆	3 ¹³ / ₁₆	4 ¹ / ₁₆	1 ⁵ / ₁₆	4 ¹ / ₁₆	71°16'
62°	10 ¹⁵ / ₃₂	1 ¹ / ₂	4 ¹ / ₄	4 ¹ / ₂	4 ¹ / ₂	3 ¹⁵ / ₁₆	4 ⁷ / ₃₂	1 ¹³ / ₃₂	4 ⁷ / ₃₂	70°36'
61°	10 ¹ / ₂	1 ⁵ / ₈	4 ⁷ / ₁₆	4 ¹ / ₁₆	4 ¹ / ₁₆	4 ¹ / ₁₆	4 ³ / ₈	1 ¹ / ₃₂	4 ³ / ₈	60°56'
60°	10 ¹³ / ₃₂	1 ²³ / ₃₂	4 ¹⁹ / ₃₂	4 ²⁹ / ₃₂	4 ²⁹ / ₃₂	4 ³ / ₁₆	4 ¹⁷ / ₃₂	1 ⁵ / ₈	4 ¹⁷ / ₃₂	69°17'
59°	10 ⁹ / ₃₂	1 ²⁷ / ₃₂	4 ³ / ₄	5 ³ / ₃₂	5 ³ / ₃₂	4 ⁵ / ₁₆	4 ¹ / ₁₆	1 ²³ / ₃₂	4 ¹ / ₁₆	68°37'
58°	10 ³ / ₁₆	2	4 ¹⁵ / ₁₆	5 ¹ / ₁₆	5 ¹ / ₁₆	4 ⁷ / ₁₆	4 ²⁷ / ₃₂	1 ²⁷ / ₃₂	4 ²⁷ / ₃₂	67°58'
57°	10 ¹ / ₁₆	2 ¹ / ₈	5 ³ / ₃₂	5 ¹⁷ / ₃₂	5 ¹⁷ / ₃₂	4 ⁹ / ₁₆	5	1 ¹⁵ / ₁₆	5	67°20'
56°	9 ¹⁵ / ₁₆	2 ¹ / ₄	5 ⁹ / ₃₂	5 ³ / ₄	5 ³ / ₄	4 ¹ / ₁₆	5 ⁵ / ₃₂	2 ¹ / ₁₆	5 ⁵ / ₃₂	66°42'
55°	9 ²⁷ / ₃₂	2 ¹³ / ₃₂	5 ⁷ / ₁₆	5 ¹⁵ / ₁₆	5 ¹⁵ / ₁₆	4 ²⁵ / ₃₂	5 ⁵ / ₁₆	2 ³ / ₁₆	5 ⁵ / ₁₆	66°04'
54°	9 ²³ / ₃₂	2 ⁹ / ₁₆	5 ⁵ / ₈	6 ⁵ / ₃₂	6 ⁵ / ₃₂	4 ⁷ / ₈	5 ¹⁵ / ₃₂	2 ⁵ / ₁₆	5 ¹⁵ / ₃₂	65°26'
53°	9 ¹⁹ / ₃₂	2 ²³ / ₃₂	5 ¹³ / ₁₆	6 ³ / ₈	6 ³ / ₈	5	5 ⁵ / ₈	2 ⁷ / ₁₆	5 ⁵ / ₈	64°49'
52°	9 ¹⁵ / ₃₂	2 ⁷ / ₈	5 ³ / ₃₂	6 ⁵ / ₃₂	6 ⁵ / ₃₂	5 ³ / ₃₂	5 ¹³ / ₁₆	2 ¹⁹ / ₃₂	5 ¹³ / ₁₆	64°12'
51°	9 ⁵ / ₁₆	3 ¹ / ₁₆	6 ⁵ / ₃₂	6 ⁷ / ₈	6 ⁷ / ₈	5 ³ / ₁₆	5 ¹⁵ / ₁₆	2 ²³ / ₃₂	5 ¹⁵ / ₁₆	63°34'
50°	9 ³ / ₁₆	3 ¹ / ₄	6 ¹ / ₃₂	7 ¹ / ₈	7 ¹ / ₈	5 ⁹ / ₃₂	6 ¹ / ₈	2 ⁷ / ₈	6 ¹ / ₈	62°58'
49°	9 ¹ / ₁₆	3 ⁷ / ₁₆	6 ¹⁷ / ₃₂	7 ³ / ₈	7 ³ / ₈	5 ⁹ / ₈	6 ⁹ / ₃₂	3	6 ⁹ / ₃₂	62°22'
48°	8 ²⁹ / ₃₂	3 ⁵ / ₈	6 ²³ / ₃₂	7 ⁵ / ₈	7 ⁵ / ₈	5 ⁷ / ₁₆	6 ⁷ / ₁₆	3 ⁵ / ₃₂	6 ⁷ / ₁₆	61°46'
47°	8 ²⁵ / ₃₂	3 ¹³ / ₁₆	6 ¹⁵ / ₁₆	7 ¹⁵ / ₁₆	7 ¹⁵ / ₁₆	5 ¹⁷ / ₃₂	6 ¹⁹ / ₃₂	3 ¹ / ₁₆	6 ¹⁹ / ₃₂	61°11'
46°	8 ⁵ / ₈	4 ¹ / ₃₂	7 ¹ / ₈	8 ³ / ₁₆	8 ³ / ₁₆	5 ¹⁹ / ₃₂	6 ³ / ₄	3 ¹⁵ / ₃₂	6 ³ / ₄	60°36'
45°	8 ¹ / ₂	4 ¹ / ₄	7 ¹ / ₃₂	8 ¹ / ₂	8 ¹ / ₂	5 ²¹ / ₃₂	6 ¹⁵ / ₁₆	3 ⁵ / ₈	6 ¹⁵ / ₁₆	60°00'
44°	8 ¹ / ₃₂	4 ⁷ / ₁₆	7 ⁹ / ₁₆	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	5 ²³ / ₃₂	7 ¹ / ₁₆	3 ²⁵ / ₃₂	7 ¹ / ₁₆	59°25'
43°	8 ³ / ₁₆	4 ¹¹ / ₁₆	7 ²⁵ / ₃₂	9 ³ / ₃₂	9 ³ / ₃₂	5 ²⁵ / ₃₂	7 ¹ / ₄	3 ¹⁵ / ₁₆	7 ¹ / ₄	58°51'
42°	8 ¹ / ₃₂	4 ¹⁵ / ₁₆	8	9 ⁷ / ₁₆	9 ⁷ / ₁₆	5 ¹³ / ₁₆	7 ¹³ / ₃₂	4 ¹ / ₈	7 ¹³ / ₃₂	58°17'
41°	7 ⁷ / ₈	5 ³ / ₃₂	8 ¹ / ₄	9 ³ / ₄	9 ³ / ₄	5 ⁷ / ₈	7 ⁹ / ₁₆	4 ⁵ / ₁₆	7 ⁹ / ₁₆	57°44'
40°	7 ²³ / ₃₂	5 ¹⁵ / ₃₂	8 ¹ / ₂	10 ¹ / ₈	10 ¹ / ₈	5 ²⁹ / ₃₂	7 ²³ / ₃₂	4 ¹⁵ / ₃₂	7 ²³ / ₃₂	57°11'
39°	7 ⁹ / ₁₆	5 ³ / ₄	8 ³ / ₄	10 ¹⁵ / ₃₂	10 ¹⁵ / ₃₂	5 ¹⁵ / ₁₆	7 ⁷ / ₈	4 ² / ₃₂	7 ⁷ / ₈	56°40'
38°	7 ⁵ / ₈	6 ¹ / ₁₆	9	10 ²⁷ / ₃₂	10 ²⁷ / ₃₂	5 ³ / ₃₂	8 ⁵ / ₃₂	4 ² / ₃₂	8 ⁵ / ₃₂	56°08'
37°	7 ¹ / ₃₂	6 ³ / ₈	9 ⁹ / ₃₂	11 ¹ / ₄	11 ¹ / ₄	5 ³ / ₃₂	8 ³ / ₁₆	5 ¹ / ₃₂	8 ³ / ₁₆	55°38'
36°	7 ¹ / ₁₆	6 ¹¹ / ₁₆	9 ⁹ / ₁₆	11 ¹¹ / ₁₆	11 ¹¹ / ₁₆	6	8 ¹¹ / ₃₂	5 ⁷ / ₃₂	8 ¹¹ / ₃₂	55°07'
35°	6 ⁷ / ₈	7 ¹ / ₃₂	9 ⁷ / ₈	*11 ⁷ / ₈	*11 ⁷ / ₈	6	8 ¹⁷ / ₃₂	5 ¹³ / ₃₂	8 ¹⁷ / ₃₂	54°37'
34°	6 ²³ / ₃₂	7 ⁷ / ₈	10 ⁵ / ₁₆	*11 ¹ / ₁₆	*11 ¹ / ₁₆	6	8 ¹ / ₁₆	5 ⁵ / ₈	8 ¹ / ₁₆	54°08'
33°	6 ¹⁷ / ₃₂	7 ³ / ₄	10 ¹⁷ / ₃₂	*11	*11	5 ³ / ₃₂	8 ²⁷ / ₃₂	5 ¹³ / ₁₆	8 ²⁷ / ₃₂	53°39'
32°	6 ⁸ / ₈	8 ¹ / ₈	10 ⁷ / ₈	*10 ⁹ / ₁₆	*10 ⁹ / ₁₆	5 ³ / ₃₂	9	6 ¹ / ₃₂	9	53°10'
31°	6 ³ / ₁₆	8 ⁹ / ₁₆	11 ³ / ₃₂	*10 ⁵ / ₃₂	*10 ⁵ / ₃₂	5 ¹⁵ / ₁₆	9 ⁵ / ₃₂	6 ¹ / ₄	9 ⁵ / ₃₂	52°42'
30°	6	9	11 ⁵ / ₈	*9 ²⁵ / ₃₂	*9 ²⁵ / ₃₂	5 ⁷ / ₈	9 ⁵ / ₁₆	6 ¹⁵ / ₃₂	9 ⁵ / ₁₆	52°14'
29°	5 ¹⁵ / ₁₆	9 ¹ / ₂	11 ¹³ / ₃₂	*9 ³ / ₈	*9 ³ / ₈	5 ¹³ / ₁₆	9 ¹⁵ / ₃₂	6 ¹¹ / ₁₆	9 ¹⁵ / ₃₂	51°48'
28°	5 ⁵ / ₈	9 ³ / ₃₂	*11 ⁹ / ₁₆	*9	*9	5 ³ / ₄	9 ⁵ / ₈	6 ²⁹ / ₃₂	9 ⁵ / ₈	51°22'
27°	5 ¹ / ₁₆	10 ¹⁵ / ₃₂	*11 ¹ / ₈	*8 ⁵ / ₈	*8 ⁵ / ₈	5 ¹ / ₁₆	9 ³ / ₄	7 ⁷ / ₈	9 ³ / ₄	50°58'
26°	5 ¹ / ₄	11 ¹ / ₁₆	*10 ²³ / ₃₂	*8 ⁹ / ₃₂	*8 ⁹ / ₃₂	5 ¹⁹ / ₃₂	9 ⁷ / ₈	7 ³ / ₈	9 ⁷ / ₈	50°32'
25°	5 ¹ / ₁₆	11 ²¹ / ₃₂	*10 ⁵ / ₁₆	*7 ²⁹ / ₃₂	*7 ²⁹ / ₃₂	5 ¹ / ₂	10 ¹ / ₃₂	7 ¹⁹ / ₃₂	10 ¹ / ₃₂	50°09'
24°	4 ⁷ / ₈	*11 ²⁵ / ₃₂	*9 ²⁹ / ₃₂	*7 ⁹ / ₁₆	*7 ⁹ / ₁₆	5 ¹³ / ₃₂	10 ⁵ / ₃₂	7 ²⁷ / ₃₂	10 ⁵ / ₃₂	49°47'
23°	4 ¹ / ₁₆	*11 ¹ / ₁₆	*9 ¹ / ₂	*7 ³ / ₁₆	*7 ³ / ₁₆	5 ⁹ / ₃₂	10 ³ / ₃₂	8 ¹ / ₁₆	10 ³ / ₃₂	49°23'
22°	4 ¹ / ₂	*10 ¹⁵ / ₃₂	*9 ¹ / ₁₆	*6 ⁷ / ₈	*6 ⁷ / ₈	5 ⁵ / ₃₂	10 ¹³ / ₃₂	8 ⁵ / ₁₆	10 ¹³ / ₃₂	49°02'
21°	4 ⁵ / ₁₆	*9 ⁷ / ₈	*8 ²¹ / ₃₂	*6 ¹ / ₂	*6 ¹ / ₂	5 ¹ / ₃₂	10 ¹⁷ / ₃₂	8 ¹⁷ / ₃₂	10 ¹⁷ / ₃₂	48°41'
20°	4 ³ / ₃₂	*9 ⁹ / ₃₂	*8 ¹ / ₄	*6 ³ / ₁₆	*6 ³ / ₁₆	4 ⁷ / ₈	10 ²¹ / ₃₂	8 ²⁵ / ₃₂	10 ²¹ / ₃₂	48°21'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

11" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*11 ² / ₃ ² / ₂	3/4	2 ² / ₃ ² / ₂	3 ⁷ / ₃ ² / ₂	2 ¹ / ₅ ¹ / ₆	3 ¹ / ₃ ² / ₂	2 ² / ₃ ² / ₂	2 ³ / ₃ ² / ₂	3 ¹ / ₈	75°23'
69°	*11 ² / ₃ ² / ₂	1 ³ / ₁₆	3	3 ¹ / ₃ ² / ₂	3 ³ / ₂ ² / ₂	3 ³ / ₁₆	3	1 ³ / ₁₆	3 ⁹ / ₃₂	74°42'
68°	*11 ² / ₃ ² / ₂	2 ⁹ / ₃₂	3 ¹ / ₈	3 ¹ / ₃ ² / ₂	3 ⁹ / ₃₂	3 ⁵ / ₁₆	3 ¹ / ₈	7/8	3 ¹ / ₅ ² / ₂	73°58'
67°	*11 ¹ / ₁₆	1	3 ⁹ / ₃₂	3 ³ / ₄	3 ¹ / ₁₆	3 ¹ / ₃ ² / ₂	3 ⁶ / ₃₂	3 ¹ / ₃ ² / ₂	3 ⁵ / ₈	73°16'
66°	11 ¹ / ₁₆	1 ¹ / ₁₆	3 ⁷ / ₁₆	3 ¹ / ₅ ¹ / ₆	3 ¹ / ₉ ² / ₂	3 ⁵ / ₈	3 ⁷ / ₁₆	1 ¹ / ₃ ² / ₂	3 ² / ₅ ² / ₂	72°33'
65°	11 ⁷ / ₈	1 ³ / ₁₆	3 ¹ / ₉ ² / ₂	4 ¹ / ₈	3 ² / ₅ ² / ₂	3 ³ / ₄	3 ⁹ / ₁₆	1 ¹ / ₈	3 ¹ / ₅ ¹ / ₆	71°51'
64°	11 ² / ₃ ² / ₂	1 ⁹ / ₃₂	3 ³ / ₄	4 ⁵ / ₁₆	3 ³ / ₁ ² / ₂	3 ² / ₉ ² / ₂	3 ² / ₃ ² / ₂	1 ⁷ / ₃₂	4 ³ / ₃₂	71°08'
63°	11 ¹ / ₁₆	1 ³ / ₈	3 ² / ₉ ² / ₂	4 ¹ / ₇ ² / ₂	4 ¹ / ₈	4 ¹ / ₃₂	3 ⁷ / ₈	1 ⁵ / ₁₆	4 ¹ / ₄	70°27'
62°	11 ⁹ / ₁₆	1 ¹ / ₂	4 ¹ / ₁₆	4 ² / ₃ ² / ₂	4 ⁵ / ₁₆	4 ⁵ / ₃₂	4	1 ¹ / ₃ ² / ₂	4 ⁷ / ₁₆	69°44'
61°	11 ¹ / ₃ ² / ₂	1 ¹ / ₉ ² / ₂	4 ³ / ₁₆	4 ² / ₉ ² / ₂	4 ¹ / ₂	4 ⁵ / ₁₆	4 ⁵ / ₃₂	1 ¹ / ₇ ² / ₂	4 ¹ / ₉ ² / ₂	69°03'
60°	11 ¹ / ₃ ² / ₂	1 ² / ₃ ² / ₂	4 ¹ / ₃ ² / ₂	5 ³ / ₃₂	4 ¹ / ₁ ² / ₂	4 ⁷ / ₁₆	4 ⁵ / ₁₆	1 ⁵ / ₈	4 ³ / ₄	68°22'
59°	11 ¹ / ₄	1 ² / ₃ ² / ₂	4 ¹ / ₂	5 ⁵ / ₁₆	4 ⁷ / ₈	4 ⁹ / ₁₆	4 ⁷ / ₁₆	1 ³ / ₄	4 ¹ / ₅ ¹ / ₆	67°41'
58°	11 ¹ / ₈	1 ³ / ₁ ² / ₂	4 ¹ / ₁ ² / ₂	5 ¹ / ₇ ² / ₂	5 ¹ / ₁₆	4 ¹ / ₁ ² / ₂	4 ¹ / ₉ ² / ₂	1 ² / ₇ ² / ₂	5 ³ / ₃₂	67°00'
57°	11	2 ¹ / ₈	4 ² / ₃ ² / ₂	5 ³ / ₄	5 ⁹ / ₃₂	4 ¹ / ₃ ² / ₂	4 ³ / ₄	1 ³ / ₃ ² / ₂	5 ¹ / ₄	66°20'
56°	10 ¹ / ₅ ¹ / ₆	2 ¹ / ₄	5	5 ³ / ₁ ² / ₂	5 ¹ / ₅ ² / ₂	4 ¹ / ₅ ¹ / ₆	4 ² / ₉ ² / ₂	2 ³ / ₃ ² / ₂	5 ⁷ / ₁₆	65°40'
55°	10 ² / ₃ ² / ₂	2 ¹ / ₃ ² / ₂	5 ⁵ / ₃₂	6 ³ / ₁₆	5 ¹ / ₁ ² / ₂	5 ¹ / ₁₆	5 ¹ / ₃₂	2 ⁷ / ₃₂	5 ¹ / ₉ ² / ₂	64°59'
54°	10 ¹ / ₉ ² / ₂	2 ⁹ / ₁₆	5 ⁵ / ₁₆	6 ⁷ / ₁₆	5 ² / ₉ ² / ₂	5 ⁹ / ₃₂	5 ³ / ₁₆	2 ¹ / ₃ ² / ₂	5 ² / ₅ ² / ₂	64°19'
53°	10 ⁷ / ₁₆	2 ² / ₃ ² / ₂	5 ¹ / ₂	6 ¹ / ₁ ² / ₂	6 ¹ / ₈	5 ⁹ / ₃₂	5 ¹ / ₁ ² / ₂	2 ¹ / ₅ ² / ₂	5 ¹ / ₅ ¹ / ₆	63°40'
52°	10 ⁵ / ₁₆	2 ⁷ / ₈	5 ² / ₁ ² / ₂	6 ² / ₉ ² / ₂	6 ¹ / ₃ ² / ₂	5 ¹ / ₃ ² / ₂	5 ¹ / ₂	2 ¹ / ₉ ² / ₂	6 ¹ / ₈	63°00'
51°	10 ⁵ / ₃₂	3 ¹ / ₁₆	5 ¹ / ₃ ² / ₂	7 ⁵ / ₃₂	6 ⁹ / ₁₆	5 ¹ / ₂	5 ⁵ / ₈	2 ³ / ₄	6 ⁹ / ₃₂	62°21'
50°	10 ¹ / ₃ ² / ₂	3 ⁷ / ₃₂	6	7 ¹ / ₃ ² / ₂	6 ¹ / ₃ ² / ₂	5 ⁵ / ₈	5 ² / ₃ ² / ₂	2 ⁷ / ₈	6 ¹ / ₅ ² / ₂	61°42'
49°	9 ⁷ / ₈	3 ¹ / ₃ ² / ₂	6 ⁵ / ₃₂	7 ¹ / ₁ ² / ₂	7 ¹ / ₁₆	5 ² / ₃ ² / ₂	5 ¹ / ₁ ² / ₂	3 ¹ / ₃₂	6 ⁵ / ₈	61°04'
48°	9 ² / ₃ ² / ₂	3 ¹ / ₉ ² / ₂	6 ¹ / ₁ ² / ₂	7 ³ / ₁ ² / ₂	7 ⁵ / ₁₆	5 ¹ / ₃ ² / ₂	6 ³ / ₃₂	3 ¹ / ₁₆	6 ¹ / ₃ ² / ₂	60°27'
47°	9 ⁹ / ₁₆	3 ² / ₅ ² / ₂	6 ¹ / ₃ ² / ₂	8 ¹ / ₄	7 ⁹ / ₁₆	5 ² / ₉ ² / ₂	6 ¹ / ₄	3 ¹ / ₃ ² / ₂	7	59°48'
46°	9 ¹ / ₃ ² / ₂	4	6 ² / ₃ ² / ₂	8 ¹ / ₇ ² / ₂	7 ¹ / ₃ ² / ₂	6	6 ³ / ₈	3 ¹ / ₂	7 ⁵ / ₃₂	59°11'
45°	9 ¹ / ₄	4 ⁷ / ₃₂	6 ² / ₉ ² / ₂	8 ² / ₃ ² / ₂	8 ³ / ₃₂	6 ¹ / ₁₆	6 ¹ / ₇ ² / ₂	3 ² / ₃ ² / ₂	7 ¹ / ₃ ² / ₂	58°34'
44°	9 ³ / ₃₂	4 ¹ / ₅ ² / ₂	7 ³ / ₃₂	9 ⁵ / ₃₂	8 ³ / ₈	6 ⁵ / ₃₂	6 ¹ / ₁ ² / ₂	3 ¹ / ₁₆	7 ¹ / ₂	57°53'
43°	8 ¹ / ₁ ² / ₂	4 ¹ / ₁ ² / ₂	7 ⁵ / ₁₆	9 ¹ / ₃ ² / ₂	8 ¹ / ₁ ² / ₂	6 ⁷ / ₃₂	6 ¹ / ₃ ² / ₂	4	7 ¹ / ₁ ² / ₂	57°22'
42°	8 ³ / ₄	4 ¹ / ₅ ² / ₂	7 ¹ / ₇ ² / ₂	9 ¹ / ₃ ² / ₂	9	6 ⁹ / ₃₂	6 ³ / ₃ ² / ₂	4 ³ / ₁₆	7 ⁷ / ₈	56°46'
41°	8 ¹ / ₃ ² / ₂	5 ³ / ₁₆	7 ³ / ₄	10 ⁵ / ₃₂	9 ⁵ / ₁₆	6 ¹ / ₃ ² / ₂	7 ¹ / ₈	4 ¹ / ₃ ² / ₂	8 ¹ / ₃ ² / ₂	56°11'
40°	8 ¹ / ₃ ² / ₂	5 ¹ / ₅ ² / ₂	7 ³ / ₁ ² / ₂	10 ¹ / ₇ ² / ₂	9 ² / ₁ ² / ₂	6 ¹ / ₃ ² / ₂	7 ¹ / ₄	4 ¹ / ₇ ² / ₂	8 ³ / ₃₂	55°35'
39°	8 ¹ / ₄	5 ³ / ₄	8 ³ / ₁₆	10 ² / ₉ ² / ₂	10 ¹ / ₃₂	6 ⁷ / ₁₆	7 ¹ / ₃ ² / ₂	4 ² / ₃ ² / ₂	8 ³ / ₈	55°01'
38°	8 ¹ / ₁₆	6 ¹ / ₃₂	8 ⁷ / ₁₆	11 ⁵ / ₁₆	10 ³ / ₈	6 ¹ / ₅ ² / ₂	7 ⁹ / ₁₆	4 ¹ / ₅ ¹ / ₆	8 ⁹ / ₁₆	54°27'
37°	7 ⁷ / ₈	6 ¹ / ₃ ² / ₂	8 ¹ / ₁ ² / ₂	11 ² / ₃ ² / ₂	10 ³ / ₄	6 ¹ / ₂	7 ¹ / ₁ ² / ₂	5 ¹ / ₈	8 ² / ₃ ² / ₂	53°55'
36°	7 ¹ / ₁ ² / ₂	6 ² / ₃ ² / ₂	8 ¹ / ₅ ² / ₂	*11 ⁵ / ₁₆	11 ⁵ / ₃₂	6 ¹ / ₇ ² / ₂	7 ² / ₇ ² / ₂	5 ¹ / ₁₆	8 ² / ₉ ² / ₂	53°22'
35°	7 ¹ / ₂	7	9 ⁷ / ₃₂	*11 ¹ / ₃ ² / ₂	11 ⁹ / ₃₂	6 ¹ / ₇ ² / ₂	7 ³ / ₃ ² / ₂	5 ¹ / ₇ ² / ₂	9 ³ / ₃₂	52°50'
34°	7 ⁵ / ₁₆	7 ¹ / ₃ ² / ₂	9 ¹ / ₃₂	*10 ³ / ₁ ² / ₂	12	6 ¹ / ₇ ² / ₂	8 ¹ / ₈	5 ³ / ₄	9 ¹ / ₄	52°19'
33°	7 ¹ / ₈	7 ² / ₃ ² / ₂	9 ¹ / ₃ ² / ₂	*10 ⁹ / ₁₆	*11 ¹ / ₇ ² / ₂	6 ¹ / ₇ ² / ₂	8 ¹ / ₄	5 ³ / ₃₂	9 ¹ / ₁₆	51°49'
32°	6 ¹ / ₈ ¹ / ₆	8 ¹ / ₈	10 ¹ / ₈	*10 ⁵ / ₁₆	*11 ³ / ₃₂	6 ¹ / ₇ ² / ₂	8 ¹ / ₃ ² / ₂	6 ³ / ₁₆	9 ¹ / ₃₂	51°19'
31°	6 ³ / ₄	8 ¹ / ₇ ² / ₂	10 ¹ / ₅ ² / ₂	*9 ² / ₅ ² / ₂	*10 ¹ / ₁ ² / ₂	6 ¹ / ₂	8 ¹ / ₇ ² / ₂	6 ⁷ / ₁₆	9 ² / ₅ ² / ₂	50°49'
30°	6 ¹ / ₃ ² / ₂	8 ³ / ₃₂	10 ¹ / ₃ ² / ₂	*9 ¹ / ₃ ² / ₂	*10 ¹ / ₄	6 ¹ / ₅ ² / ₂	8 ² / ₃ ² / ₂	6 ² / ₃ ² / ₂	9 ¹ / ₅ ¹ / ₆	50°20'
29°	6 ¹ / ₃ ² / ₂	9 ⁷ / ₁₆	11 ⁷ / ₃₂	*9 ¹ / ₃₂	*9 ² / ₇ ² / ₂	6 ¹ / ₃ ² / ₂	8 ¹ / ₃ ² / ₂	6 ² / ₉ ² / ₂	10 ¹ / ₈	49°52'
28°	6 ¹ / ₈	9 ² / ₉ ² / ₂	11 ¹ / ₇ ² / ₂	*8 ² / ₁ ² / ₂	*9 ⁷ / ₁₆	6 ³ / ₈	8 ¹ / ₅ ¹ / ₆	7 ⁵ / ₃₂	10 ⁹ / ₃₂	49°24'
27°	5 ¹ / ₅ ¹ / ₆	10 ⁷ / ₁₆	11 ³ / ₃ ² / ₂	*8 ⁹ / ₃₂	*9 ¹ / ₃₂	6 ⁹ / ₃₂	9 ¹ / ₁₆	7 ³ / ₈	10 ⁷ / ₁₆	48°56'
26°	5 ³ / ₈	11	*11 ¹ / ₇ ² / ₂	*7 ¹ / ₅ ¹ / ₆	*8 ³ / ₁ ² / ₂	6 ⁷ / ₃₂	9 ³ / ₁₆	7 ⁵ / ₈	10 ⁶ / ₈	48°30'
25°	5 ¹ / ₃ ² / ₂	11 ⁵ / ₈	*11 ¹ / ₈	*7 ¹ / ₉ ² / ₂	*8 ⁹ / ₃₂	6 ¹ / ₈	9 ⁵ / ₁₆	7 ² / ₉ ² / ₂	10 ² / ₅ ² / ₂	48°05'
24°	5 ⁵ / ₁₆	*11 ³ / ₄	*10 ² / ₃ ² / ₂	*7 ¹ / ₄	*7 ² / ₉ ² / ₂	6 ¹ / ₃₂	9 ⁷ / ₁₆	8 ⁵ / ₃₂	10 ¹ / ₅ ¹ / ₆	47°39'
23°	5 ³ / ₃₂	*11 ³ / ₃₂	*10 ¹ / ₄	*6 ² / ₉ ² / ₂	*7 ¹ / ₃₂	5 ² / ₉ ² / ₂	9 ¹ / ₃₂	8 ¹ / ₃ ² / ₂	11 ³ / ₃₂	47°16'
22°	4 ⁷ / ₈	*10 ¹ / ₂	*9 ¹ / ₃ ² / ₂	*6 ⁹ / ₁₆	*7 ³ / ₁₆	5 ² / ₃₂	9 ² / ₃₂	8 ¹ / ₁ ² / ₂	11 ¹ / ₄	46°53'
21°	4 ¹ / ₁ ² / ₂	*9 ² / ₉ ² / ₂	*9 ¹ / ₃ ² / ₂	*6 ¹ / ₄	*6 ¹ / ₃ ² / ₂	5 ⁵ / ₈	9 ³ / ₄	8 ¹ / ₅ ¹ / ₆	11 ³ / ₈	46°31'
20°	4 ¹ / ₃ ² / ₂	*9 ¹ / ₃ ² / ₂	*8 ³ / ₃₂	*5 ¹ / ₅ ¹ / ₆	*6 ¹ / ₅ ² / ₂	5 ¹ / ₃ ² / ₂	9 ⁷ / ₈	9 ⁷ / ₃₂	11 ¹ / ₃ ² / ₂	46°09'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

10" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*10 ² ¹ / ₃₂	2 ³ / ₃₂	2 ¹ ¹ / ₁₆	3 ¹ ¹ / ₃₂	2 ² ⁵ / ₃₂	3 ³ / ₁₆	2 ¹ ¹ / ₁₆	2 ³ / ₃₂	3 ³ / ₃₂	74°45'
69°	*10 ² ³ / ₃₂	1 ³ / ₁₆	2 ² ⁷ / ₃₂	3 ¹ ⁷ / ₃₂	2 ¹ ⁵ / ₁₆	3 ¹ ¹ / ₃₂	2 ¹ ³ / ₁₆	2 ⁵ / ₃₂	3 ¹ / ₁₆	74°01'
68°	*10 ² ⁵ / ₃₂	7/8	2 ² ¹ / ₃₂	3 ² ⁸ / ₃₂	3 ³ / ₃₂	3 ¹ ⁵ / ₃₂	2 ¹ ¹ / ₃₂	3 ⁷ / ₈	3 ⁵ / ₈	73°16'
67°	*10 ⁷ / ₈	3 ¹ / ₃₂	3 ³ / ₃₂	3 ² ⁹ / ₃₂	3 ¹ / ₄	3 ⁵ / ₈	3 ³ / ₃₂	1 ⁵ / ₁₆	3 ² ⁵ / ₃₂	72°31'
66°	*10 ³ ¹ / ₃₂	1 ¹ / ₁₆	3 ¹ / ₄	4 ¹ / ₈	3 ¹ ³ / ₃₂	3 ² ⁵ / ₃₂	3 ⁷ / ₃₂	1 ¹ / ₃₂	3 ¹ ⁵ / ₁₆	71°46'
65°	*11 ¹ / ₃₂	1 ⁵ / ₃₂	3 ³ / ₈	4 ⁵ / ₁₆	3 ¹ ⁹ / ₃₂	3 ¹ ⁵ / ₁₆	3 ³ / ₈	1 ¹ / ₈	4 ¹ / ₈	71°02'
64°	*11 ¹ / ₈	1 ¹ / ₄	3 ¹ ⁷ / ₃₂	4 ¹ / ₂	3 ¹ / ₄	4 ³ / ₃₂	3 ¹ / ₂	1 ¹ / ₃₂	4 ³ / ₃₂	70°18'
63°	*11 ⁷ / ₃₂	1 ³ / ₈	3 ² ¹ / ₃₂	4 ² ³ / ₃₂	3 ² ⁹ / ₃₂	4 ¹ / ₄	3 ² ¹ / ₃₂	1 ⁵ / ₁₆	4 ¹ ⁵ / ₃₂	69°33'
62°	*11 ⁵ / ₁₆	1 ⁵ / ₃₂	3 ¹ ³ / ₁₆	4 ² ⁹ / ₃₂	4 ³ / ₃₂	4 ³ / ₈	3 ² ⁵ / ₃₂	1 ¹ ³ / ₃₂	4 ⁵ / ₈	68°50'
61°	*11 ¹ / ₁₆	1 ¹ ⁹ / ₃₂	3 ¹ ¹ / ₃₂	5 ¹ / ₈	4 ¹ / ₄	4 ¹ ⁷ / ₃₂	3 ² ⁹ / ₃₂	1 ¹ / ₂	4 ¹ ³ / ₁₆	68°07'
60°	*11 ⁹ / ₁₆	1 ² ³ / ₃₂	4 ³ / ₃₂	5 ⁵ / ₁₆	4 ⁷ / ₁₆	4 ¹ ¹ / ₁₆	4 ¹ / ₁₆	1 ⁵ / ₈	5	67°23'
59°	*11 ² ¹ / ₃₂	1 ¹ ³ / ₁₆	4 ¹ / ₄	5 ¹ ⁷ / ₃₂	4 ⁵ / ₈	4 ¹ ³ / ₁₆	4 ³ / ₁₆	1 ² ³ / ₃₂	5 ⁵ / ₃₂	66°40'
58°	*11 ² ⁵ / ₃₂	1 ¹ ¹ / ₃₂	4 ³ / ₈	5 ³ / ₄	4 ¹ ³ / ₁₆	4 ¹ ³ / ₃₂	4 ¹ ¹ / ₃₂	1 ² ⁷ / ₃₂	5 ¹ ¹ / ₃₂	65°58'
57°	*11 ¹ ⁵ / ₁₆	2 ³ / ₃₂	4 ¹ ⁷ / ₃₂	6	5	5 ³ / ₃₂	4 ¹ ⁵ / ₃₂	1 ¹ ⁵ / ₁₆	5 ¹ ⁷ / ₃₂	65°15'
56°	11 ¹ ⁵ / ₁₆	2 ⁷ / ₃₂	4 ¹ ¹ / ₁₆	6 ⁷ / ₃₂	5 ³ / ₁₆	5 ¹ / ₄	4 ¹ ⁹ / ₃₂	2 ¹ / ₁₆	5 ² ³ / ₃₂	64°32'
55°	11 ² ⁵ / ₃₂	2 ³ / ₈	4 ² ⁷ / ₃₂	6 ¹ ⁵ / ₃₂	5 ³ / ₈	5 ³ / ₈	4 ³ / ₄	2 ³ / ₁₆	5 ⁷ / ₈	63°51'
54°	11 ² ¹ / ₃₂	2 ¹ ⁷ / ₃₂	5	6 ¹ ¹ / ₁₆	5 ¹ ⁹ / ₃₂	5 ¹ / ₂	4 ⁷ / ₈	2 ¹ / ₁₆	6 ¹ / ₁₆	63°09'
53°	11 ¹ / ₂	2 ¹ ¹ / ₁₆	5 ¹ / ₈	6 ¹ ⁵ / ₁₆	5 ¹ / ₁₆	5 ⁵ / ₈	5	2 ¹ ³ / ₃₂	6 ¹ / ₄	62°27'
52°	11 ¹ ¹ / ₃₂	2 ² ⁷ / ₃₂	5 ³ / ₃₂	7 ³ / ₁₆	6	5 ³ / ₄	5 ¹ / ₈	2 ¹ ⁹ / ₃₂	6 ⁷ / ₁₆	61°45'
51°	11 ³ / ₁₆	3	5 ⁷ / ₁₆	7 ¹ ⁵ / ₃₂	6 ⁷ / ₃₂	5 ⁷ / ₈	5 ⁹ / ₃₂	2 ² ³ / ₃₂	6 ⁵ / ₈	61°04'
50°	11 ¹ / ₃₂	3 ³ / ₁₆	5 ¹ ⁹ / ₃₂	7 ² ³ / ₃₂	6 ⁷ / ₁₆	6	5 ¹ ³ / ₃₂	2 ⁷ / ₈	6 ¹ ³ / ₁₆	60°25'
49°	10 ⁷ / ₈	3 ³ / ₈	5 ² ⁵ / ₃₂	8	6 ¹ ¹ / ₁₆	6 ¹ / ₈	5 ⁹ / ₁₆	3 ³ / ₃₂	7	59°43'
48°	10 ¹ ¹ / ₁₆	3 ⁹ / ₁₆	5 ¹ ⁵ / ₁₆	8 ⁵ / ₁₆	6 ¹ ⁵ / ₁₆	6 ¹ / ₄	5 ¹ ¹ / ₁₆	3 ¹ / ₁₆	7 ³ / ₁₆	59°03'
47°	10 ¹ ⁷ / ₃₂	3 ¹ / ₄	6 ³ / ₃₂	8 ¹ ⁹ / ₃₂	7 ³ / ₁₆	6 ¹ ¹ / ₃₂	5 ¹ ³ / ₁₆	3 ¹ ¹ / ₃₂	7 ³ / ₈	58°23'
46°	10 ¹ ¹ / ₃₂	3 ² ¹ / ₃₂	6 ⁹ / ₃₂	8 ² ⁹ / ₃₂	7 ¹ / ₁₆	6 ¹ / ₁₆	5 ¹ ⁵ / ₁₆	3 ¹ / ₂	7 ⁹ / ₁₆	57°43'
45°	10 ³ / ₁₆	4 ³ / ₁₆	6 ⁷ / ₁₆	9 ⁷ / ₃₂	7 ¹ ¹ / ₁₆	6 ¹ ⁷ / ₃₂	6 ³ / ₃₂	3 ¹ ¹ / ₁₆	7 ³ / ₄	57°06'
44°	10	4 ¹ ³ / ₃₂	6 ⁵ / ₈	9 ¹ ⁷ / ₃₂	7 ¹ ⁵ / ₁₆	6 ⁵ / ₈	6 ⁷ / ₃₂	3 ² ⁷ / ₃₂	7 ³ ¹ / ₃₂	56°26'
43°	9 ¹ ³ / ₁₆	4 ⁵ / ₈	6 ¹ ³ / ₁₆	9 ⁷ / ₈	7 ³ / ₃₂	6 ² ³ / ₃₂	6 ¹ ¹ / ₃₂	4 ³ / ₃₂	8 ⁵ / ₃₂	55°48'
42°	9 ² ¹ / ₃₂	4 ⁷ / ₈	7	10 ⁷ / ₃₂	8 ¹ ⁷ / ₃₂	6 ¹ ³ / ₁₆	6 ¹ / ₂	4 ⁷ / ₃₂	8 ¹ ¹ / ₃₂	55°11'
41°	9 ¹ ⁵ / ₃₂	5 ¹ / ₈	7 ³ / ₁₆	10 ¹ ⁹ / ₃₂	8 ² ⁷ / ₃₂	6 ⁷ / ₈	6 ⁵ / ₈	4 ¹ ³ / ₃₂	8 ¹ ⁷ / ₃₂	54°33'
40°	9 ¹ / ₄	5 ³ / ₈	7 ¹ ³ / ₃₂	11	9 ⁵ / ₃₂	6 ¹ ⁵ / ₁₆	6 ³ / ₄	4 ¹ ⁹ / ₃₂	8 ³ / ₄	53°57'
39°	9 ¹ / ₁₆	5 ² ¹ / ₃₂	7 ⁵ / ₈	11 ³ / ₈	9 ¹ / ₂	7	6 ⁷ / ₈	4 ² ⁵ / ₃₂	8 ¹ ⁵ / ₁₆	53°20'
38°	8 ⁷ / ₈	5 ¹ ⁵ / ₁₆	7 ² ⁷ / ₃₂	11 ² ⁵ / ₃₂	9 ² ⁷ / ₃₂	7 ¹ / ₁₆	7	5	9 ¹ / ₈	52°44'
37°	8 ² ¹ / ₃₂	6 ¹ / ₄	8 ¹ / ₁₆	*11 ² ⁵ / ₃₂	10 ⁷ / ₃₂	7 ³ / ₃₂	7 ¹ / ₈	5 ³ / ₁₆	9 ⁵ / ₁₆	52°08'
36°	8 ¹ ⁵ / ₃₂	6 ⁹ / ₁₆	8 ⁹ / ₃₂	*11 ¹ ¹ / ₃₂	10 ⁹ / ₁₆	7 ¹ / ₈	7 ¹ / ₄	5 ¹ ³ / ₃₂	9 ¹ ⁷ / ₃₂	51°34'
35°	8 ¹ / ₄	6 ² ⁹ / ₃₂	8 ¹ ⁷ / ₃₂	*10 ¹ ⁵ / ₁₆	10 ³ ¹ / ₃₂	7 ⁵ / ₃₂	7 ³ / ₈	5 ⁵ / ₈	9 ² ³ / ₃₂	50°59'
34°	8 ¹ / ₁₆	7 ¹ / ₄	8 ² ⁵ / ₃₂	*10 ¹ ⁷ / ₃₂	11 ³ / ₈	7 ³ / ₁₆	7 ¹ / ₂	5 ² ⁷ / ₃₂	9 ² ⁹ / ₃₂	50°25'
33°	7 ² ⁷ / ₃₂	7 ⁵ / ₈	9 ¹ / ₁₆	*10 ¹ / ₈	11 ² ⁷ / ₃₂	7 ³ / ₁₆	7 ⁵ / ₈	6 ³ / ₃₂	10 ³ / ₃₂	49°53'
32°	7 ⁵ / ₈	8	9 ¹ ¹ / ₃₂	*9 ² ⁵ / ₃₂	*11 ¹ ¹ / ₁₆	7 ³ / ₁₆	7 ³ / ₄	6 ⁵ / ₁₆	10 ⁵ / ₁₆	49°20'
31°	7 ¹ ³ / ₃₂	8 ⁷ / ₁₆	9 ⁵ / ₈	*9 ³ / ₈	*11 ¹ / ₄	7 ³ / ₁₆	7 ⁷ / ₈	6 ⁹ / ₁₆	10 ¹ / ₂	48°48'
30°	7 ³ / ₁₆	8 ² ⁷ / ₃₂	9 ¹ ⁵ / ₁₆	*9 ¹ / ₃₂	*10 ¹ ³ / ₁₆	7 ⁵ / ₃₂	8	6 ¹ ³ / ₁₆	10 ¹ ¹ / ₁₆	48°18'
29°	6 ³ ¹ / ₃₂	9 ⁹ / ₃₂	10 ⁷ / ₃₂	*8 ¹ ¹ / ₁₆	*10 ³ / ₈	7 ¹ / ₈	8 ¹ / ₈	7 ¹ / ₁₆	10 ⁷ / ₈	47°47'
28°	6 ³ / ₄	9 ² ⁵ / ₃₂	10 ¹ ⁹ / ₃₂	*8 ⁵ / ₁₆	*9 ³ ¹ / ₃₂	7 ¹ / ₁₆	8 ³ / ₃₂	7 ¹ ¹ / ₃₂	11 ¹ / ₁₆	47°17'
27°	6 ¹ ⁷ / ₃₂	10 ⁵ / ₁₆	10 ³ ³ / ₃₂	*7 ³ ¹ / ₃₂	*9 ⁹ / ₁₆	7	8 ¹ ¹ / ₃₂	7 ¹ ⁹ / ₃₂	11 ¹ / ₄	46°48'
26°	6 ⁵ / ₁₆	10 ⁷ / ₈	11 ³ / ₈	*7 ⁵ / ₈	*9 ⁵ / ₃₂	6 ¹ ⁵ / ₁₆	8 ⁷ / ₁₆	7 ⁷ / ₈	11 ¹ / ₁₆	46°20'
25°	6 ³ / ₃₂	11 ¹ ⁵ / ₃₂	11 ¹ ³ / ₁₆	*7 ⁹ / ₃₂	*8 ³ / ₄	6 ² ⁷ / ₃₂	8 ⁹ / ₁₆	8 ⁵ / ₃₂	11 ⁵ / ₈	45°52'
24°	5 ² ⁷ / ₃₂	*11 ² ⁹ / ₃₂	*11 ¹ ¹ / ₁₆	*6 ¹ ⁵ / ₁₆	*3 ¹ ¹ / ₃₂	6 ³ / ₄	8 ² ¹ / ₃₂	8 ⁷ / ₁₆	11 ¹ ³ / ₁₆	45°24'
23°	5 ⁵ / ₈	*11 ¹ / ₄	*11 ³ / ₁₆	*6 ⁵ / ₈	*7 ⁸ ¹ / ₃₂	6 ⁵ / ₈	8 ³ / ₄	8 ³ / ₄	12	44°56'
22°	5 ³ / ₈	*10 ⁵ / ₈	*10 ² ³ / ₃₂	*6 ⁵ / ₁₆	*7 ⁹ / ₁₆	6 ¹ / ₂	8 ² ⁷ / ₃₂	9 ¹ / ₁₆	*11 ¹ ³ / ₁₆	44°33'
21°	5 ¹ / ₈	*10 ¹ ³ / ₃₂	*10 ¹ / ₄	*6	*7 ³ / ₁₆	6 ¹ ¹ / ₃₂	8 ¹ ⁵ / ₁₆	9 ³ / ₈	*11 ² ¹ / ₃₂	44°11'
20°	4 ¹ ⁵ / ₁₆	*9 ⁷ / ₁₆	*9 ² ⁷ / ₃₂	*5 ¹ ¹ / ₁₆	*6 ¹ ³ / ₁₆	6 ³ / ₁₆	9 ¹ / ₃₂	9 ¹ ¹ / ₁₆	*11 ¹ / ₂	43°48'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

9" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*9 ⁹ / ₁₆	2 ³ / ₃₂	2 ¹ / ₃₂	3 ¹ / ₂	2 ⁵ / ₈	3 ¹ / ₃₂	2 ¹ / ₃₂	1 ¹ / ₁₆	3 ¹ / ₃₂	74°06'
69°	*9 ⁵ / ₈	2 ⁵ / ₃₂	2 ⁵ / ₈	3 ¹ / ₁₆	2 ³ / ₄	3 ¹ / ₂	2 ² / ₃₂	2 ⁵ / ₃₂	3 ¹ / ₃₂	73°19'
68°	*9 ¹ / ₁₆	7 ⁷ / ₈	2 ² / ₃₂	3 ⁷ / ₈	2 ² / ₃₂	3 ¹ / ₁₆	2 ² / ₃₂	2 ⁷ / ₃₂	3 ² / ₃₂	72°32'
67°	*9 ² / ₃₂	1 ⁵ / ₁₆	2 ² / ₃₂	4 ¹ / ₁₆	3 ¹ / ₁₆	3 ¹ / ₁₆	2 ² / ₃₂	1 ⁵ / ₁₆	3 ¹ / ₁₆	71°46'
66°	*9 ² / ₃₂	1 ¹ / ₃₂	3 ¹ / ₃₂	4 ⁹ / ₃₂	3 ¹ / ₁₆	4	3 ¹ / ₃₂	1	4 ¹ / ₈	71°00'
65°	*9 ¹ / ₁₆	1 ¹ / ₈	3 ⁵ / ₃₂	4 ¹ / ₃₂	3 ¹ / ₃₂	4 ⁵ / ₃₂	3 ⁵ / ₃₂	1 ³ / ₃₂	4 ⁵ / ₁₆	70°13'
64°	*10 ¹ / ₃₂	1 ¹ / ₄	3 ⁹ / ₃₂	4 ¹ / ₁₆	3 ¹ / ₂	4 ⁵ / ₁₆	3 ⁹ / ₃₂	1 ¹ / ₁₆	4 ¹ / ₂	69°26'
63°	*10 ¹ / ₈	1 ¹ / ₃₂	3 ¹ / ₃₂	4 ² / ₃₂	3 ¹ / ₁₆	4 ¹ / ₃₂	3 ¹ / ₃₂	1 ³ / ₃₂	4 ¹ / ₁₆	68°40'
62°	*10 ³ / ₁₆	1 ⁷ / ₁₆	3 ¹ / ₃₂	5 ³ / ₃₂	3 ¹ / ₁₆	4 ⁵ / ₈	3 ¹ / ₃₂	1 ³ / ₈	4 ⁷ / ₈	67°54'
61°	*10 ⁵ / ₁₆	1 ⁹ / ₁₆	3 ¹ / ₁₆	5 ⁵ / ₁₆	4	4 ² / ₃₂	3 ² / ₃₂	1 ⁵ / ₃₂	5 ¹ / ₁₆	67°08'
60°	*10 ¹ / ₃₂	1 ² / ₃₂	3 ¹ / ₁₆	5 ¹ / ₃₂	4 ⁵ / ₃₂	4 ¹ / ₁₆	3 ² / ₃₂	1 ⁹ / ₃₂	5 ¹ / ₄	66°24'
59°	*10 ¹ / ₂	1 ² / ₃₂	3 ¹ / ₁₆	5 ³ / ₄	4 ⁵ / ₁₆	5 ³ / ₃₂	3 ² / ₃₂	1 ¹ / ₁₆	5 ¹ / ₁₆	65°38'
58°	*10 ⁵ / ₈	1 ² / ₃₂	4 ¹ / ₁₆	6	4 ¹ / ₂	5 ¹ / ₄	4 ¹ / ₃₂	1 ¹ / ₁₆	5 ⁵ / ₈	64°53'
57°	*10 ³ / ₄	2 ¹ / ₃₂	4 ³ / ₁₆	6 ⁷ / ₃₂	4 ² / ₃₂	5 ¹ / ₃₂	4 ⁵ / ₃₂	1 ² / ₃₂	5 ¹ / ₁₆	64°08'
56°	*10 ⁷ / ₈	2 ³ / ₁₆	4 ¹ / ₃₂	6 ¹ / ₃₂	4 ⁷ / ₈	5 ⁹ / ₁₆	4 ⁹ / ₃₂	2 ³ / ₃₂	6	63°23'
55°	*11	2 ⁵ / ₁₆	4 ¹ / ₃₂	6 ² / ₃₂	5 ¹ / ₃₂	5 ² / ₃₂	4 ¹ / ₃₂	2 ⁵ / ₃₂	6 ³ / ₁₆	62°41'
54°	*11 ¹ / ₈	2 ¹ / ₃₂	4 ⁵ / ₈	7	5 ³ / ₃₂	5 ⁷ / ₈	4 ¹ / ₃₂	2 ⁹ / ₃₂	6 ³ / ₈	61°55'
53°	*11 ⁹ / ₃₂	2 ⁵ / ₈	4 ³ / ₄	7 ¹ / ₄	5 ¹ / ₁₆	6	4 ² / ₃₂	2 ¹ / ₃₂	6 ¹ / ₃₂	61°11'
52°	*11 ⁷ / ₁₆	2 ² / ₃₂	4 ² / ₃₂	7 ¹ / ₂	5 ⁵ / ₈	6 ⁵ / ₃₂	4 ² / ₃₂	2 ¹ / ₁₆	6 ² / ₃₂	60°28'
51°	*11 ⁹ / ₃₂	2 ¹ / ₁₆	5 ¹ / ₃₂	7 ² / ₃₂	5 ¹ / ₁₆	6 ⁹ / ₃₂	4 ² / ₃₂	2 ¹ / ₁₆	7	59°45'
50°	*11 ³ / ₄	3 ³ / ₃₂	5 ³ / ₁₆	8 ¹ / ₁₆	6 ¹ / ₃₂	6 ⁷ / ₁₆	5 ¹ / ₃₂	2 ² / ₃₂	7 ³ / ₁₆	59°03'
49°	*11 ⁵ / ₁₆	3 ⁹ / ₃₂	5 ⁵ / ₁₆	8 ¹ / ₃₂	6 ¹ / ₄	6 ⁹ / ₁₆	5 ¹ / ₈	3	7 ¹ / ₃₂	58°18'
48°	11 ⁷ / ₈	3 ¹ / ₃₂	5 ¹ / ₃₂	8 ⁵ / ₈	6 ¹ / ₃₂	6 ¹ / ₁₆	5 ¹ / ₄	3 ³ / ₃₂	7 ¹ / ₃₂	57°36'
47°	11 ¹ / ₁₆	3 ² / ₃₂	5 ⁵ / ₈	8 ¹ / ₁₆	6 ² / ₃₂	6 ¹ / ₁₆	5 ³ / ₈	3 ⁵ / ₁₆	7 ¹ / ₁₆	56°55'
46°	11 ¹ / ₂	3 ⁷ / ₈	5 ² / ₃₂	9 ¹ / ₄	6 ¹ / ₁₆	6 ¹ / ₁₆	5 ¹ / ₂	3 ¹ / ₃₂	3	56°13'
45°	11 ⁵ / ₁₆	4 ¹ / ₁₆	5 ¹ / ₁₆	9 ¹ / ₃₂	7 ³ / ₁₆	7 ¹ / ₁₆	5 ⁵ / ₈	3 ² / ₃₂	8 ⁷ / ₃₂	55°31'
44°	11 ¹ / ₈	4 ⁹ / ₃₂	6 ³ / ₃₂	9 ¹ / ₁₆	7 ¹ / ₃₂	7 ³ / ₁₆	5 ³ / ₄	3 ¹ / ₁₆	8 ⁷ / ₁₆	54°50'
43°	10 ² / ₃₂	4 ¹ / ₂	6 ¹ / ₄	10 ⁹ / ₃₂	7 ² / ₃₂	7 ⁹ / ₃₂	5 ⁷ / ₈	4	8 ² / ₃₂	54°09'
42°	10 ² / ₃₂	4 ³ / ₄	6 ⁷ / ₁₆	10 ² / ₃₂	8	7 ³ / ₈	5 ³ / ₃₂	4 ³ / ₁₆	8 ³ / ₈	53°30'
41°	10 ¹ / ₂	5	6 ¹ / ₃₂	11 ¹ / ₃₂	8 ⁹ / ₃₂	7 ¹ / ₃₂	6 ³ / ₃₂	4 ³ / ₈	9 ³ / ₃₂	52°50'
40°	10 ⁹ / ₃₂	5 ¹ / ₄	6 ² / ₃₂	11 ⁷ / ₁₆	8 ¹ / ₃₂	7 ⁹ / ₁₆	6 ⁷ / ₃₂	4 ⁹ / ₁₆	9 ⁵ / ₁₆	52°12'
39°	10 ¹ / ₁₆	5 ¹ / ₃₂	6 ³ / ₃₂	11 ⁷ / ₈	8 ² / ₃₂	7 ² / ₃₂	6 ⁵ / ₁₆	4 ² / ₃₂	9 ¹ / ₃₂	51°33'
38°	9 ⁷ / ₈	5 ¹ / ₁₆	7 ⁵ / ₃₂	*11 ² / ₃₂	9 ⁷ / ₃₂	7 ² / ₃₂	6 ⁷ / ₁₆	5	9 ³ / ₄	50°55'
37°	9 ⁵ / ₈	6 ³ / ₃₂	7 ¹ / ₃₂	*11 ⁹ / ₃₂	9 ⁹ / ₁₆	7 ² / ₃₂	6 ⁹ / ₁₆	5 ⁷ / ₃₂	9 ³ / ₃₂	50°16'
36°	9 ¹ / ₃₂	6 ¹ / ₃₂	7 ⁹ / ₁₆	*10 ² / ₃₂	9 ¹ / ₃₂	7 ² / ₃₂	6 ² / ₃₂	5 ⁷ / ₁₆	10 ³ / ₁₆	49°39'
35°	9 ³ / ₁₆	6 ³ / ₄	7 ² / ₃₂	*10 ¹ / ₂	10 ⁹ / ₃₂	7 ² / ₃₂	6 ² / ₃₂	5 ² / ₃₂	10 ¹ / ₃₂	49°04'
34°	8 ¹ / ₁₆	7 ³ / ₃₂	8	*10 ¹ / ₈	10 ¹ / ₁₆	7 ¹ / ₁₆	6 ⁷ / ₈	5 ⁷ / ₈	10 ⁵ / ₈	48°26'
33°	8 ² / ₃₂	7 ⁷ / ₁₆	8 ¹ / ₄	*9 ³ / ₄	11 ¹ / ₁₆	7 ³ / ₃₂	7	6 ¹ / ₈	10 ² / ₃₂	47°52'
32°	8 ¹ / ₃₂	7 ¹ / ₁₆	8 ¹ / ₂	*9 ³ / ₈	11 ¹ / ₂	8	7 ¹ / ₈	6 ³ / ₈	11 ¹ / ₁₆	47°16'
31°	8 ¹ / ₄	8 ¹ / ₁₆	8 ³ / ₄	*9 ¹ / ₃₂	11 ³ / ₃₂	8	7 ⁷ / ₃₂	6 ² / ₃₂	11 ⁵ / ₁₆	46°42'
30°	8	8 ⁵ / ₈	9	*8 ² / ₃₂	*11 ⁹ / ₁₆	8	7 ⁵ / ₁₆	6 ² / ₃₂	11 ¹ / ₃₂	46°09'
29°	7 ³ / ₄	9 ¹ / ₁₆	9 ¹ / ₄	*8 ⁵ / ₁₆	*11 ³ / ₃₂	7 ³ / ₃₂	7 ¹ / ₃₂	7 ³ / ₁₆	11 ³ / ₄	45°34'
28°	7 ¹ / ₃₂	9 ¹ / ₃₂	9 ¹ / ₁₆	*8	*10 ⁵ / ₈	7 ¹ / ₁₆	7 ¹ / ₂	7 ¹ / ₃₂	11 ³ / ₃₂	45°01'
27°	7 ⁹ / ₃₂	10 ³ / ₃₂	9 ⁷ / ₈	*7 ² / ₃₂	*10 ³ / ₁₆	7 ² / ₃₂	7 ¹ / ₃₂	7 ³ / ₄	*11 ¹ / ₁₆	44°31'
26°	7 ¹ / ₃₂	10 ⁵ / ₈	10 ¹ / ₄	*7 ⁵ / ₁₆	*9 ³ / ₄	7 ¹ / ₁₆	7 ¹ / ₁₆	8 ¹ / ₁₆	*11 ⁹ / ₃₂	44°02'
25°	6 ³ / ₄	11 ³ / ₁₆	10 ⁵ / ₈	*7	*9 ⁵ / ₁₆	7 ³ / ₄	7 ² / ₃₂	8 ³ / ₈	*11 ¹ / ₃₂	43°32'
24°	6 ¹ / ₂	11 ¹ / ₁₆	11	*6 ¹ / ₁₆	*8 ⁷ / ₈	7 ² / ₃₂	7 ⁷ / ₈	8 ¹ / ₁₆	*11 ¹ / ₁₆	43°04'
23°	6 ¹ / ₄	*11 ¹ / ₃₂	11 ⁷ / ₁₆	*5 ³ / ₈	*8 ¹ / ₃₂	7 ⁹ / ₁₆	7 ¹ / ₁₆	9 ¹ / ₃₂	*11	42°36'
22°	6	*10 ² / ₃₂	11 ² / ₃₂	*6 ¹ / ₁₆	*8 ³ / ₃₂	7 ¹ / ₃₂	8 ¹ / ₃₂	9 ³ / ₈	*10 ² / ₃₂	42°10'
21°	5 ³ / ₄	*10 ⁹ / ₃₂	*11 ⁹ / ₁₆	*5 ³ / ₄	*7 ² / ₃₂	7 ¹ / ₄	8 ¹ / ₈	9 ² / ₃₂	*10 ² / ₃₂	41°43'
20°	5 ¹ / ₃₂	*9 ¹ / ₁₆	*11 ¹ / ₃₂	*5 ¹ / ₃₂	*7 ⁹ / ₃₂	7 ³ / ₃₂	8 ³ / ₁₆	10 ¹ / ₁₆	*10 ¹ / ₃₂	41°15'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

8" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*8 1/2	1 1/16	2 5/16	3 5/8	2 7/16	3 1/2	2 5/16	1 1/16	3 9/16	73°27'
69°	*8 9/16	3/4	2 7/16	3 2 7/32	2 9/16	3 1 1/16	2 7/16	3/4	3 3/4	72°39'
68°	*8 5/8	2 7/32	2 9/16	4 1/32	2 1 1/16	3 2 7/32	2 9/16	13/16	3 1 5/16	71°50'
67°	*8 1 1/16	2 9/32	2 2 1/32	4 1/4	2 1 3/16	4	2 2 1/32	2 9/32	4 1/8	71°01'
66°	*8 3/4	1	2 2 5/32	4 1 5/32	2 3 1/32	4 3/16	2 2 5/32	3 1/32	4 5/16	70°12'
65°	*8 1 3/16	1 3/32	2 2 9/32	4 2 1/32	3 3/32	4 3/8	2 2 9/32	1 1/16	4 1/2	69°24'
64°	*8 7/8	1 1/16	3 1/32	4 7/8	3 1/4	4 1 7/32	3	1 5/32	4 1 1/16	68°36'
63°	*8 3 1/32	1 9/32	3 1/8	5 3/32	3 3/8	4 2 3/32	3 1/8	1 1/4	4 2 9/32	67°47'
62°	*9 1/32	1 3/8	3 1/4	5 1/16	3 1 7/32	4 7/8	3 1/4	1 1 1/32	5 3/32	66°59'
61°	*9 1/8	1 1 5/32	3 3/8	5 1 7/32	3 1 1/16	5 1/16	3 1 1/32	1 7/16	5 9/32	66°12'
60°	*9 1/4	1 1 9/32	3 1/2	5 3/4	3 2 7/32	5 7/32	3 1 5/32	1 7/32	5 1/2	65°29'
59°	*9 5/16	1 2 3/32	3 5/8	6	4	5 3/8	3 9/16	1 5/8	5 1 1/16	64°36'
58°	*9 1 3/32	1 1 3/16	3 2 3/32	6 7/32	4 5/32	5 9/16	3 1 1/16	1 3/4	5 2 9/32	63°49'
57°	*9 1 7/32	1 1 5/16	3 2 7/32	6 1/2	4 5/16	5 2 3/32	3 1 3/16	1 7/8	6 3/32	63°02'
56°	*9 2 1/32	2 3/32	3 3 1/32	6 3/4	4 1/2	5 2 9/32	3 2 9/32	1 3 1/32	6 5/16	62°15'
55°	*9 2 5/32	2 7/32	4 3/32	7	4 2 1/32	6 1/16	4 1/32	2 3/32	6 1 7/32	61°30'
54°	*9 7/8	2 1 1/32	4 7/32	7 1/4	4 2 7/32	6 7/32	4 1/8	2 7/32	6 3/4	60°42'
53°	*10	2 1/2	4 1 1/32	7 1 7/32	5 1/32	6 1 3/32	4 1/4	2 1 1/32	6 1 5/16	59°56'
52°	*10 1/8	2 2 1/32	4 1 5/32	7 1 3/16	5 3/32	6 9/16	4 3/8	2 1/2	7 3/32	59°11'
51°	*10 9/32	2 1 3/16	4 1 9/32	8 3/32	5 1 3/32	6 2 3/32	4 1 5/32	2 5/8	7 3/8	58°24'
50°	*10 7/16	3	4 2 3/32	8 3/8	5 1 9/32	6 7/8	4 1 9/32	2 2 5/32	7 1 9/32	57°40'
49°	*10 1 9/32	3 5/32	4 2 7/32	8 1 1/16	5 1 3/16	7 1/32	4 1 1/16	2 1 5/16	7 1 3/16	56°53'
48°	*10 3/4	3 1 1/32	4 3 1/32	9	6	7 3/16	4 1 3/16	3 1/16	8 1/16	56°09'
47°	*10 1 5/16	3 1 7/32	5 3/32	9 5/16	6 7/32	7 1 1/32	4 2 9/32	3 1/4	8 9/32	55°25'
46°	*11 1/8	3 2 3/32	5 1/4	9 2 1/32	6 7/16	7 1/2	5	3 1 3/32	8 1/2	54°41'
45°	*11 5/16	3 2 9/32	5 3/8	10	6 2 1/32	7 5/8	5 1/8	3 9/16	8 2 3/32	53°58'
44°	*11 1/2	4 1/8	5 1/2	10 1 1/32	6 2 9/32	7 2 5/32	5 7/32	3 3/4	8 3 1/32	53°14'
43°	*11 2 3/32	4 3/8	5 2 1/32	10 1 1/16	7 1/8	7 2 9/32	5 5/16	3 1 5/16	9 3/16	52°31'
42°	*11 3 1/32	4 1 9/32	5 1 3/16	11 3/32	7 3/8	8 1/32	5 7/16	4 1/8	9 7/16	51°48'
41°	11 2 5/32	4 1 5/16	5 1 3/32	11 1 5/32	7 2 1/32	8 5/32	5 1 7/32	4 5/16	9 1 1/16	51°05'
40°	11 9/16	5 1/16	6 1/8	11 2 9/32	7 1 5/16	8 9/32	5 5/8	4 1/2	9 1 5/16	50°24'
39°	11 5/16	5 5/16	6 9/32	*11 2 1/32	8 7/32	8 3/8	5 3/4	4 2 3/32	10 5/32	49°43'
38°	11 1/16	5 1 9/32	6 7/16	*11 1/4	8 1 7/32	8 1/2	5 2 7/32	4 1 5/16	10 1 3/32	49°02'
37°	10 1 3/16	5 7/8	6 5/8	*10 7/8	8 2 7/32	8 1 9/32	5 1 5/16	5 1/8	10 2 1/32	48°23'
36°	10 9/16	6 5/32	6 2 5/32	*10 1/2	9 5/32	8 1 1/16	6 1/32	5 3/8	10 2 9/32	47°44'
35°	10 5/16	6 1 5/32	6 3 1/32	*10 3/32	9 1/2	8 3/4	6 1/8	5 1 9/32	11 3/16	47°05'
34°	10 1/16	6 1 3/16	7 5/32	*9 3/4	9 7/8	8 1 3/16	6 7/32	5 2 7/32	11 7/16	46°27'
33°	9 2 5/32	7 1/8	7 1 1/32	*9 3/8	10 1/4	8 7/8	6 5/16	6 3/32	11 1 1/16	45°50'
32°	9 1 7/32	7 1/2	7 9/16	*9	10 2 1/32	8 1 5/16	6 3/8	6 1 1/32	11 5/16	45°12'
31°	9 9/32	7 7/8	7 2 5/32	*8 2 1/32	11 1/16	8 3 1/32	6 1 5/32	6 5/8	*11 2 5/32	44°33'
30°	9	8 5/16	8	*8 5/16	11 1 7/32	9	6 9/16	6 2 9/32	*11 9/16	43°54'
29°	8 2 3/32	8 3/4	8 1/4	*8	11 3 1/32	9	6 2 1/32	7 3/16	*11 5/16	43°19'
28°	8 7/16	9 7/32	8 1/2	*7 1 1/16	*11 1 7/32	9	6 2 3/32	7 1/2	*11 3/32	42°42'
27°	8 5/32	9 1 1/16	8 3/4	*7 3/8	*11 1/32	8 3 1/32	6 1 3/16	7 1 3/16	*10 7/8	42°08'
26°	7 2 9/32	10 7/32	9 1/16	*7 1/16	*10 9/16	8 1 5/16	6 2 9/32	8 1/8	*10 2 1/32	41°35'
25°	7 1 9/32	10 2 5/32	9 3/8	*6 2 3/32	*10 3/32	8 7/8	6 3 1/32	8 1 5/32	*10 7/16	41°03'
24°	7 5/16	11 3/8	9 2 3/32	*6 7/16	*9 5/8	8 2 5/32	7 1/16	8 1 3/16	*10 1/4	40°32'
23°	7	12	10 1/16	*6 1/8	*9 3/16	8 1 1/16	7 1/8	9 7/32	*10 1/16	40°02'
22°	6 2 3/32	*11 5/16	10 1 5/32	*5 1 3/16	*8 3/4	8 9/16	7 3/16	9 1 9/32	*9 7/8	39°32'
21°	6 7/16	*10 1 1/16	10 2 9/32	*5 1 7/32	*8 5/16	8 1 3/32	7 1/4	9 3 1/32	*9 2 3/32	39°04'
20°	6 5/32	*10 1/16	11 1 3/32	*5 1/4	*7 7/8	8 1/4	7 1 3/32	10 3/8	*9 9/16	38°34'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

7" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*7 7/16	2 1/32	2 3/32	3 2 5/32	2 3/16	3 2 1/32	2 3/32	5/8	3 2 3/32	72°49'
69°	*7 1/2	3/32	2 3/16	3 3 1/32	2 5/16	3 1 3/16	2 7/32	1 1/16	3 2 9/32	71°57'
68°	*7 1 7/32	2 5/32	2 5/16	4 3/16	2 7/16	4	2 5/16	2 5/32	4 1/8	71°06'
67°	*7 1 9/32	7/8	2 1 3/32	4 1 3/32	2 9/16	4 3/16	2 1 3/32	2 7/32	4 5/16	70°16'
66°	*7 1 1/32	1 5/16	2 1/2	4 5/8	2 1 1/16	4 3/8	2 1/2	1 5/16	4 1/2	69°25'
65°	*7 2 3/32	1 1/32	2 5/8	4 2 7/32	2 1 3/16	4 9/16	2 5/8	1	4 2 3/32	68°35'
64°	*7 2 5/32	1 1/8	2 2 3/32	5 1/16	2 1 5/16	4 3/4	2 2 3/32	1 3/32	4 2 9/32	67°43'
63°	*7 2 7/32	1 3/16	2 2 7/32	5 3/32	3 3/32	4 1 5/16	2 1 3/16	1 3/16	5 1/8	66°53'
62°	*7 2 9/32	1 9/32	2 1 9/16	5 1 7/32	3 7/32	5 1/8	2 2 9/32	1 9/32	5 5/16	66°03'
61°	*8	1 1 3/32	3 1/32	5 3/4	3 1 1/32	5 5/16	3 1/32	1 3/8	5 1 7/32	65°13'
60°	*8 3/32	1 1/2	3 5/32	6	3 1/2	5 1 7/32	3 1/8	1 1 5/32	5 3/4	64°24'
59°	*8 5/32	1 5/8	3 1/4	6 1/4	3 5/8	5 2 3/32	3 7/32	1 9/16	5 3 1/32	63°32'
58°	*8 1/4	1 2 3/32	3 3/8	6 1/2	3 2 5/32	5 2 9/32	5 5/16	1 2 1/32	6 3/16	62°43'
57°	*8 1 1/32	1 2 7/32	3 1 9/32	6 3/4	3 1 9/16	6 3/32	3 1 3/32	1 2 5/32	6 1 3/32	61°54'
56°	*8 7/16	1 3 1/32	3 9/16	7	4 1/16	6 9/32	3 1 7/32	1 7/8	6 5/8	61°06'
55°	*8 1 7/32	2 3/32	3 1 1/16	7 1/4	4 7/32	6 1 5/32	3 5/8	2	6 2 7/32	60°17'
54°	*8 2 1/32	2 7/32	3 2 5/32	7 1 7/32	4 3/8	6 2 1/32	3 2 3/32	2 1/8	7 1/16	59°28'
53°	*8 3/4	2 3/8	3 7/8	7 1 3/16	4 9/16	6 2 7/32	3 1 3/16	2 1/4	7 5/16	58°39'
52°	*8 7/8	2 1 7/32	4	8 3/32	4 2 3/32	7 1/32	3 2 9/32	2 3/8	7 1 7/32	57°51'
51°	*9	2 2 1/32	4 3/8	8 3/8	4 7/8	7 3/16	4	2 1 7/32	7 2 5/32	57°03'
50°	*9 1/8	2 1 3/16	4 7/32	8 1 1/16	5 1/16	7 3/8	4 3/32	2 2 1/32	8	56°16'
49°	*9 1/4	3	4 1 1/32	9	5 1/4	7 9/16	4 3/16	2 1 3/16	8 1/4	55°28'
48°	*9 1/16	3 1/8	4 7/16	9 5/16	5 7/16	7 1 1/16	4 9/32	2 3 1/32	8 1/2	54°40'
47°	*9 9/16	3 5/16	4 9/16	9 2 1/32	5 5/8	7 1 3/16	4 3/8	3 3/32	8 3/4	53°53'
46°	*9 2 3/32	3 1/2	4 2 1/32	10	5 1 3/16	7 1 5/32	4 1/2	3 1/4	9	53°08'
45°	*9 2 9/32	3 1 1/16	4 2 5/32	10 3/8	6 1/32	8 9/32	4 9/16	3 7/16	9 1/4	52°21'
44°	*10 3/32	3 7/8	4 2 9/32	10 2 3/32	6 1/4	8 7/16	4 2 1/32	3 1 9/32	9 1/2	51°35'
43°	*10 1/4	4 1/16	5 1/32	11 3/32	6 1/2	8 5/8	4 3/4	3 2 5/32	9 2 5/32	50°48'
42°	*10 1 9/32	4 5/16	5 5/32	11 1/2	6 2 3/32	8 2 5/32	4 2 7/32	3 3/32	10 1/32	50°02'
41°	*10 1 1/16	4 1 3/32	5 9/32	11 2 3/32	6 3 1/32	8 1 9/16	4 1 9/16	4 5/32	10 9/16	49°18'
40°	*10 7/8	4 2 5/32	5 1 3/32	*11 2 1/32	7 7/32	9 3/32	5 1/32	4 1 1/32	10 1 9/32	48°34'
39°	*11 3/32	5	5 1 7/32	*11 1/4	7 1 5/32	9 1/4	5 1/8	4 9/16	10 2 7/32	47°51'
38°	*11 3/8	5 1/4	5 2 1/32	*10 2 3/32	7 3/4	9 3/8	5 3/16	4 3/4	11 1/8	47°08'
37°	*11 5/8	5 1 9/32	5 1 3/16	*10 1 5/32	8 1/32	9 1/2	5 9/32	4 3 1/32	11 1 3/32	46°25'
36°	*11 7/8	5 1 1/16	5 1 9/16	*10 3/32	8 5/16	9 5/8	5 1 3/32	5 7/32	11 1 1/16	45°44'
35°	11 1 3/16	6 1/8	6 3/32	*9 2 3/32	8 5/8	9 3/4	5 7/16	5 7/16	12	45°02'
34°	11 1/2	6 1 3/32	6 1/4	*9 3/8	8 3 1/32	9 7/8	5 1 7/32	5 1 1/16	*11 1 1/16	44°18'
33°	11 7/32	6 2 3/32	6 7/16	*9 1 3/32	9 5/16	9 3 1/32	5 1 9/32	5 1 5/16	*11 7/16	43°38'
32°	10 2 9/32	7 1/16	6 1 9/32	*8 1 1/16	9 2 1/32	10 1/16	5 1 1/16	6 3/16	*11 3/32	42°56'
31°	10 1 9/32	7 1/16	6 2 5/32	*8 1 3/32	10 1/16	10 1/8	5 3/4	6 1 5/32	*10 2 3/32	42°16'
30°	10 9/32	7 2 7/32	6 1 5/16	*8 1 3/2	10 1 5/32	10 3/16	5 1 3/16	6 2 5/32	*10 2 1/32	41°36'
29°	9 1 5/16	8 7/32	7 5/32	*7 1 1/16	10 2 9/32	10 1/4	5 7/8	7 1/16	*10 1 3/32	40°57'
28°	9 2 1/32	8 2 1/32	7 3/8	*7 3/8	11 3/8	10 9/32	5 3 1/32	7 1 3/32	*10 3/16	40°19'
27°	9 5/16	9 3/32	7 1 9/32	*7 1/16	11 2 7/32	10 9/32	6 1/32	7 2 3/32	*9 3 1/32	39°42'
26°	9 1/2	9 1 9/32	7 1 3/16	*6 2 3/32	*11 5/8	10 9/32	6 3/32	8 1/16	*9 3/4	39°06'
25°	8 1 1/16	10 5/32	8 1/16	*6 1 5/32	*11 3/32	10 1/4	6 5/32	8 7/16	*9 1 7/32	38°29'
24°	8 3/8	10 2 3/32	8 1 3/32	*6 3/16	*10 1 9/32	10 3/16	6 7/32	8 1 3/16	*9 5/16	37°55'
23°	8 1/16	11 5/16	8 1 9/32	*5 7/8	*10 3/32	10 1/8	6 9/32	9 7/32	*9 6/32	37°21'
22°	7 2 3/32	12	9 3/32	*5 5/8	*9 5/8	10 1/32	6 1 1/32	9 5/8	*8 3 1/32	36°48'
21°	7 3/8	*11 1 1/32	9 1 3/32	*5 1 1/32	*9 1/8	9 2 9/32	6 1 9/32	10 1/16	*8 2 5/32	36°16'
20°	7 1/32	*10 1 1/16	9 2 3/32	*5 1/16	*8 2 1/32	9 3/4	6 7/16	10 1/2	*8 5/8	35°44'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

6" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*6 ³ / ₈	1 ⁹ / ₃₂	1 ⁷ / ₈	3 ²⁹ / ₃₂	1 ³ / ₃₂	3 ¹ / ₁₆	1 ² / ₃₂	1 ⁹ / ₃₂	3 ² / ₃₂	72°10'
69°	*6 ⁷ / ₁₆	2 ¹ / ₃₂	1 ¹⁵ / ₁₆	4 ¹ / ₈	2 ¹ / ₁₆	4	1 ¹⁵ / ₁₆	2 ¹ / ₃₂	4 ¹ / ₁₆	71°17'
68°	*6 ¹ / ₈	2 ³ / ₃₂	2 ¹ / ₃₂	4 ¹ / ₃₂	2 ³ / ₁₆	4 ³ / ₁₆	2 ¹ / ₃₂	2 ³ / ₃₂	4 ⁹ / ₃₂	70°24'
67°	*6 ¹ / ₂	2 ⁵ / ₃₂	2 ¹ / ₈	4 ⁹ / ₁₆	2 ⁹ / ₃₂	4 ³ / ₈	2 ¹ / ₈	2 ⁵ / ₃₂	4 ¹⁵ / ₃₂	69°32'
66°	*6 ⁹ / ₁₆	7 ¹ / ₈	2 ⁷ / ₃₂	4 ²⁵ / ₃₂	2 ¹³ / ₃₂	4 ¹⁹ / ₃₂	2 ⁷ / ₃₂	2 ⁷ / ₃₂	4 ¹¹ / ₁₆	68°39'
65°	*6 ⁵ / ₈	1 ⁵ / ₁₆	2 ⁵ / ₁₆	5	2 ¹ / ₂	4 ²⁵ / ₃₂	2 ⁵ / ₁₆	1 ⁵ / ₁₆	4 ²⁹ / ₃₂	67°47'
64°	*6 ¹ / ₁₆	1 ¹ / ₃₂	2 ¹³ / ₃₂	5 ¹ / ₄	2 ⁵ / ₈	5	2 ¹³ / ₃₂	1	5 ¹ / ₈	66°53'
63°	*6 ³ / ₄	1 ³ / ₃₂	2 ¹ / ₂	5 ¹⁵ / ₃₂	2 ³ / ₄	5 ³ / ₁₆	2 ¹ / ₂	1 ³ / ₃₂	5 ¹ / ₃₂	66°01'
62°	*6 ¹ / ₈	1 ³ / ₁₆	2 ¹⁹ / ₃₂	5 ²³ / ₃₂	2 ²⁷ / ₃₂	5 ¹³ / ₃₂	2 ¹⁹ / ₃₂	1 ⁵ / ₃₂	5 ⁹ / ₁₆	65°07'
61°	*6 ⁷ / ₈	1 ⁹ / ₃₂	2 ¹¹ / ₁₆	5 ³ / ₃₂	2 ³ / ₃₂	5 ¹⁹ / ₃₂	2 ² / ₃₂	1 ¹ / ₄	5 ²⁵ / ₃₂	64°16'
60°	*6 ¹⁵ / ₁₆	1 ³ / ₈	2 ⁵ / ₃₂	6 ³ / ₁₆	3 ³ / ₃₂	5 ¹³ / ₁₆	2 ³ / ₄	1 ¹ / ₃₂	6	63°26'
59°	*7	1 ¹ / ₂	2 ⁷ / ₈	6 ⁷ / ₁₆	3 ⁷ / ₃₂	6	2 ²⁷ / ₃₂	1 ⁷ / ₁₆	6 ⁷ / ₃₂	62°32'
58°	*7 ¹ / ₁₆	1 ¹⁹ / ₃₂	2 ³ / ₃₂	6 ¹¹ / ₁₆	3 ¹¹ / ₃₂	6 ⁷ / ₃₂	2 ¹⁵ / ₁₆	1 ⁹ / ₁₆	6 ⁵ / ₃₂	61°40'
57°	*7 ⁵ / ₃₂	1 ¹ / ₁₆	3 ¹ / ₁₆	6 ³ / ₃₂	3 ¹ / ₂	6 ⁷ / ₁₆	3	1 ² / ₃₂	6 ¹ / ₁₆	60°49'
56°	*7 ¹ / ₄	1 ¹³ / ₁₆	3 ¹ / ₈	7 ¹ / ₄	3 ⁵ / ₈	6 ⁵ / ₈	3 ³ / ₃₂	1 ³ / ₄	6 ¹⁵ / ₁₆	59°58'
55°	*7 ⁵ / ₁₆	1 ¹⁵ / ₁₆	3 ⁷ / ₃₂	7 ¹ / ₂	3 ³ / ₄	6 ²⁷ / ₃₂	3 ³ / ₁₆	1 ⁷ / ₈	7 ³ / ₁₆	59°08'
54°	*7 ¹³ / ₃₂	2 ¹ / ₁₆	3 ⁵ / ₁₆	7 ¹³ / ₁₆	3 ²⁹ / ₃₂	7 ¹³ / ₃₂	3 ⁹ / ₃₂	1 ¹³ / ₃₂	7 ¹³ / ₃₂	58°16'
53°	*7 ¹ / ₂	2 ³ / ₁₆	3 ¹³ / ₃₂	8 ³ / ₃₂	4 ¹ / ₁₆	7 ¹ / ₄	3 ¹¹ / ₃₂	2 ³ / ₃₂	7 ² / ₃₂	57°25'
52°	*7 ⁵ / ₈	2 ⁵ / ₁₆	3 ¹ / ₂	8 ¹³ / ₃₂	4 ³ / ₁₆	7 ⁵ / ₃₂	3 ⁷ / ₁₆	2 ⁷ / ₃₂	7 ² / ₃₂	56°33'
51°	*7 ²³ / ₃₂	2 ⁷ / ₁₆	3 ¹⁹ / ₃₂	8 ²³ / ₃₂	4 ¹¹ / ₃₂	7 ¹¹ / ₁₆	3 ¹⁷ / ₃₂	2 ¹¹ / ₃₂	8 ⁵ / ₃₂	55°44'
50°	*7 ²⁷ / ₃₂	2 ¹⁹ / ₃₂	3 ¹¹ / ₁₆	9	4 ¹ / ₂	7 ²⁹ / ₃₂	3 ¹⁹ / ₃₂	2 ¹⁵ / ₃₂	8 ⁷ / ₁₆	54°53'
49°	*7 ³ / ₃₂	2 ³ / ₄	3 ²⁵ / ₃₂	9 ¹¹ / ₃₂	4 ¹ / ₁₆	8 ³ / ₃₂	3 ¹¹ / ₁₆	2 ⁵ / ₈	8 ¹¹ / ₁₆	54°02'
48°	*8 ³ / ₃₂	2 ²⁹ / ₃₂	3 ⁷ / ₈	9 ²¹ / ₃₂	4 ²⁷ / ₃₂	8 ⁵ / ₁₆	3 ²⁵ / ₃₂	2 ³ / ₄	8 ³ / ₃₂	53°12'
47°	*8 ⁷ / ₃₂	3 ¹ / ₁₆	3 ³ / ₃₂	10	5	8 ¹⁷ / ₃₂	3 ²⁷ / ₃₂	2 ²⁹ / ₃₂	9 ⁷ / ₃₂	52°24'
46°	*8 ¹¹ / ₃₂	3 ⁷ / ₃₂	4 ¹ / ₁₆	10 ³ / ₈	5 ³ / ₁₆	8 ³ / ₄	3 ¹⁵ / ₁₆	3 ¹ / ₁₆	9 ¹ / ₂	51°34'
45°	*8 ¹ / ₂	3 ¹³ / ₃₂	4 ⁵ / ₃₂	10 ²³ / ₃₂	5 ³ / ₈	8 ¹⁵ / ₁₆	4	3 ⁷ / ₃₂	9 ¹³ / ₁₆	50°46'
44°	*8 ²¹ / ₃₂	3 ¹⁹ / ₃₂	4 ¹ / ₄	11 ³ / ₃₂	5 ⁹ / ₁₆	9 ⁵ / ₃₂	4 ¹ / ₁₆	3 ³ / ₈	10 ³ / ₃₂	49°56'
43°	*8 ¹³ / ₁₆	3 ³ / ₄	4 ¹¹ / ₃₂	11 ¹ / ₂	5 ³ / ₄	9 ¹¹ / ₃₂	4 ⁵ / ₃₂	3 ¹⁷ / ₃₂	10 ³ / ₈	49°08'
42°	*8 ³ / ₃₂	3 ³ / ₃₂	4 ⁷ / ₁₆	11 ²⁹ / ₃₂	5 ³ / ₃₂	9 ⁹ / ₁₆	4 ⁷ / ₃₂	3 ²³ / ₃₂	10 ¹¹ / ₁₆	48°20'
41°	*9 ⁵ / ₃₂	4 ⁵ / ₃₂	4 ⁹ / ₁₆	*11 ¹ / ₁₆	6 ³ / ₁₆	9 ³ / ₄	4 ⁵ / ₁₆	3 ²⁹ / ₃₂	11	47°32'
40°	*9 ¹ / ₃₂	4 ³ / ₈	4 ²¹ / ₃₂	*11 ¹ / ₄	6 ¹³ / ₃₂	9 ³ / ₃₂	4 ³ / ₈	4 ³ / ₃₂	11 ⁹ / ₃₂	46°45'
39°	*9 ⁹ / ₁₆	4 ¹⁹ / ₃₂	4 ³ / ₄	*10 ⁷ / ₈	6 ⁵ / ₈	10 ⁵ / ₃₂	4 ¹⁵ / ₃₂	4 ⁹ / ₃₂	11 ¹⁹ / ₃₂	45°58'
38°	*9 ³ / ₄	4 ²⁷ / ₃₂	4 ⁷ / ₈	*10 ¹⁵ / ₃₂	6 ⁷ / ₈	10 ¹¹ / ₃₂	4 ¹⁷ / ₃₂	4 ¹⁵ / ₃₂	11 ²⁹ / ₃₂	45°09'
37°	*10	5 ³ / ₃₂	4 ³ / ₃₂	*10 ¹ / ₈	7 ¹ / ₈	10 ¹⁷ / ₃₂	4 ¹⁹ / ₃₂	4 ¹¹ / ₁₆	*11 ³ / ₄	44°24'
36°	*10 ⁷ / ₃₂	5 ¹ / ₃₂	5 ³ / ₃₂	*9 ³ / ₄	7 ⁵ / ₈	10 ²³ / ₃₂	4 ²¹ / ₃₂	4 ²⁹ / ₃₂	*11 ⁷ / ₁₆	43°39'
35°	*10 ¹⁵ / ₃₂	5 ⁵ / ₈	5 ⁷ / ₃₂	*9 ¹³ / ₃₂	7 ²¹ / ₃₂	10 ⁷ / ₈	4 ²³ / ₃₂	5 ⁵ / ₃₂	*11 ⁵ / ₃₂	42°52'
34°	*10 ³ / ₄	5 ²⁹ / ₃₂	5 ¹¹ / ₃₂	*9 ¹ / ₁₆	7 ¹⁵ / ₁₆	11 ¹ / ₃₂	4 ²⁵ / ₃₂	5 ³ / ₈	*10 ⁷ / ₈	42°08'
33°	*11 ¹ / ₃₂	6 ³ / ₁₆	5 ¹⁵ / ₃₂	*8 ³ / ₄	8 ¹ / ₄	11 ³ / ₁₆	4 ²⁷ / ₃₂	5 ⁵ / ₈	*10 ¹⁹ / ₃₂	41°24'
32°	*11 ⁵ / ₁₆	6 ¹ / ₂	5 ¹⁹ / ₃₂	*8 ³ / ₈	8 ⁹ / ₁₆	11 ¹¹ / ₃₂	4 ²⁹ / ₃₂	5 ²⁹ / ₃₂	*10 ⁵ / ₁₆	40°40'
31°	*11 ² / ₃₂	6 ⁷ / ₈	5 ³ / ₄	*8 ¹ / ₁₆	8 ¹⁵ / ₁₆	11 ¹⁵ / ₃₂	4 ³ / ₃₂	6 ³ / ₁₆	*10 ¹ / ₁₆	39°57'
30°	12	7 ³ / ₁₆	5 ⁷ / ₈	*7 ³ / ₄	9 ⁵ / ₁₆	11 ⁵ / ₈	5 ¹ / ₃₂	6 ¹⁵ / ₃₂	*9 ¹³ / ₁₆	39°14'
29°	11 ⁵ / ₈	7 ⁹ / ₁₆	6 ¹ / ₃₂	*7 ⁷ / ₁₆	9 ²¹ / ₃₂	11 ²³ / ₃₂	5 ³ / ₃₂	6 ³ / ₄	*9 ⁹ / ₁₆	38°33'
28°	10 ⁹ / ₃₂	7 ³ / ₃₂	6 ⁷ / ₃₂	*7 ¹ / ₈	10 ³ / ₃₂	11 ¹³ / ₁₆	5 ⁵ / ₃₂	7 ³ / ₃₂	*9 ⁵ / ₁₆	37°51'
27°	10 ²⁹ / ₃₂	8 ¹³ / ₃₂	6 ³ / ₈	*6 ²⁷ / ₃₂	10 ¹⁷ / ₃₂	11 ²⁹ / ₃₂	5 ⁷ / ₃₂	7 ¹³ / ₃₂	*9 ³ / ₃₂	37°10'
26°	10 ¹⁷ / ₃₂	8 ⁷ / ₈	6 ⁹ / ₁₆	*6 ⁹ / ₁₆	11	11 ³ / ₃₂	5 ¹ / ₄	7 ²⁵ / ₃₂	*8 ⁷ / ₈	36°30'
25°	10 ⁵ / ₃₂	9 ¹ / ₃₂	6 ³ / ₄	*6 ¹ / ₄	11 ¹ / ₂	12	5 ⁵ / ₁₆	8 ¹ / ₈	*8 ² / ₃₂	35°51'
24°	9 ²⁵ / ₃₂	9 ²⁷ / ₃₂	6 ¹⁵ / ₁₆	*6	*11 ¹⁵ / ₁₆	12	5 ³ / ₈	8 ¹ / ₂	*8 ¹⁵ / ₃₂	35°13'
23°	9 ³ / ₈	10 ¹³ / ₃₂	7 ⁵ / ₃₂	*5 ¹¹ / ₁₆	*11 ³ / ₈	11 ³ / ₃₂	5 ¹³ / ₃₂	8 ²⁹ / ₃₂	*8 ¹ / ₄	34°36'
22°	9	11	7 ¹³ / ₃₂	*5 ⁷ / ₁₆	*10 ²⁷ / ₃₂	11 ¹⁵ / ₁₆	5 ¹⁵ / ₃₂	9 ³ / ₈	*8 ¹ / ₁₆	34°00'
21°	8 ⁵ / ₈	11 ¹ / ₁₆	7 ¹ / ₁₆	*5 ⁵ / ₃₂	*10 ⁵ / ₁₆	11 ²⁷ / ₃₂	5 ¹ / ₂	9 ²⁷ / ₃₂	*7 ²⁹ / ₃₂	33°23'
20°	8 ⁷ / ₃₂	*11 ⁵ / ₈	8	*4 ⁷ / ₈	*9 ²⁵ / ₃₂	11 ³ / ₄	5 ⁹ / ₁₆	10 ⁵ / ₁₆	*7 ³ / ₄	32°48'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

5" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*5 ⁵ / ₁₆	1 ⁷ / ₃₂	1 ¹⁹ / ₃₂	4 ¹ / ₃₂	1 ¹¹ / ₁₆	3 ³ / ₃₂	1 ¹⁹ / ₃₂	1 ⁷ / ₃₂	4	71°35'
69°	*5 ³ / ₈	1 ⁹ / ₃₂	1 ¹⁷ / ₃₂	4 ¹ / ₄	1 ²⁵ / ₃₂	4 ⁵ / ₃₂	1 ² / ₃₂	1 ⁹ / ₃₂	4 ⁷ / ₃₂	70°40'
68°	*5 ¹ / ₃₂	2 ¹ / ₃₂	1 ³ / ₄	4 ¹⁵ / ₃₂	1 ⁷ / ₈	4 ³ / ₈	1 ³ / ₄	2 ¹ / ₃₂	4 ⁷ / ₁₆	69°45'
67°	*5 ⁷ / ₁₆	2 ³ / ₃₂	1 ¹³ / ₁₆	4 ¹¹ / ₁₆	1 ³ / ₃₂	4 ¹⁹ / ₃₂	1 ³ / ₁₆	2 ³ / ₃₂	4 ² / ₃₂	68°50'
66°	*5 ¹ / ₂	2 ⁵ / ₃₂	1 ²⁹ / ₃₂	4 ¹⁵ / ₁₆	2 ¹ / ₁₆	4 ²⁵ / ₃₂	1 ²⁹ / ₃₂	2 ⁵ / ₃₂	4 ⁷ / ₈	67°56'
65°	*5 ¹⁷ / ₃₂	2 ⁷ / ₃₂	1 ³ / ₃₂	5 ⁵ / ₃₂	2 ⁵ / ₃₂	5	1 ³ / ₃₂	2 ⁷ / ₃₂	5 ³ / ₃₂	67°02'
64°	*5 ⁹ / ₁₆	2 ⁹ / ₃₂	2 ¹ / ₁₆	5 ¹³ / ₃₂	2 ¹ / ₄	5 ⁷ / ₃₂	2 ¹ / ₁₆	2 ⁹ / ₃₂	5 ⁵ / ₁₆	66°06'
63°	*5 ⁵ / ₈	1	2 ³ / ₈	5 ² / ₃₂	2 ¹¹ / ₃₂	5 ¹ / ₁₆	2 ³ / ₈	3 ¹ / ₃₂	5 ¹ / ₃₂	65°12'
62°	*5 ² / ₃₂	1 ¹ / ₁₆	2 ⁷ / ₃₂	5 ⁷ / ₈	2 ⁷ / ₁₆	5 ² / ₃₂	2 ⁷ / ₁₆	1 ¹ / ₁₆	5 ² / ₃₂	64°17'
61°	*5 ² / ₃₂	1 ¹ / ₈	2 ⁹ / ₃₂	6 ¹ / ₈	2 ⁹ / ₁₆	5 ⁷ / ₈	2 ⁹ / ₃₂	1 ¹ / ₈	6	63°24'
60°	*5 ²⁵ / ₃₂	1 ⁷ / ₃₂	2 ³ / ₈	6 ¹³ / ₃₂	2 ² / ₃₂	6 ³ / ₃₂	2 ¹ / ₃₂	1 ⁷ / ₃₂	6 ¹ / ₄	62°30'
59°	*5 ² / ₃₂	1 ⁵ / ₁₆	2 ⁷ / ₁₆	6 ²¹ / ₃₂	2 ²⁵ / ₃₂	6 ⁵ / ₁₆	2 ¹³ / ₃₂	1 ⁹ / ₃₂	6 ¹ / ₂	61°34'
58°	*5 ² / ₃₂	1 ¹³ / ₃₂	2 ¹⁷ / ₃₂	6 ¹⁵ / ₁₆	2 ⁷ / ₈	6 ¹⁷ / ₃₂	2 ⁷ / ₂	1 ³ / ₈	6 ²³ / ₃₂	60°42'
57°	*5 ³ / ₃₂	1 ¹ / ₂	2 ¹⁹ / ₃₂	7 ³ / ₁₆	3	6 ³ / ₄	2 ⁷ / ₁₆	1 ¹⁵ / ₃₂	6 ³ / ₃₂	59°48'
56°	*6 ¹ / ₃₂	1 ⁵ / ₈	2 ² / ₃₂	7 ¹⁵ / ₃₂	3 ³ / ₃₂	7	2 ⁵ / ₈	1 ⁹ / ₁₆	7 ¹ / ₄	58°54'
55°	*6 ³ / ₃₂	1 ²³ / ₃₂	2 ³ / ₄	7 ³ / ₄	3 ⁷ / ₃₂	7 ⁷ / ₃₂	2 ²³ / ₃₂	1 ² / ₃₂	7 ¹ / ₂	58°02'
54°	*6 ³ / ₁₆	1 ² / ₃₂	2 ¹³ / ₁₆	8 ¹ / ₁₆	3 ¹¹ / ₃₂	7 ⁷ / ₁₆	2 ²⁵ / ₃₂	1 ²⁵ / ₃₂	7 ³ / ₄	57°08'
53°	*6 ¹ / ₄	1 ¹⁵ / ₁₆	2 ⁷ / ₈	8 ¹¹ / ₃₂	3 ¹⁵ / ₃₂	7 ¹¹ / ₁₆	2 ²⁷ / ₃₂	1 ⁷ / ₈	8	56°14'
52°	*6 ¹ / ₃₂	2 ¹ / ₁₆	2 ³ / ₃₂	8 ²¹ / ₃₂	3 ¹⁹ / ₃₂	7 ¹⁵ / ₁₆	2 ¹⁵ / ₁₆	2	8 ⁹ / ₃₂	55°21'
51°	*6 ⁷ / ₁₆	2 ³ / ₁₆	3 ¹ / ₈	8 ³ / ₃₂	3 ²³ / ₃₂	8 ³ / ₁₆	3	2 ³ / ₃₂	8 ⁹ / ₁₆	54°27'
50°	*6 ¹⁷ / ₃₂	2 ⁵ / ₁₆	3 ¹ / ₈	9 ⁹ / ₃₂	3 ⁷ / ₈	8 ¹³ / ₃₂	3 ¹ / ₁₆	2 ⁷ / ₃₂	8 ²⁷ / ₃₂	53°36'
49°	*6 ⁵ / ₈	2 ⁷ / ₁₆	3 ⁵ / ₁₆	9 ⁵ / ₈	4	8 ²¹ / ₃₂	3 ¹ / ₈	2 ¹¹ / ₃₂	9 ¹ / ₈	53°41'
48°	*6 ³ / ₄	2 ⁹ / ₁₆	3 ⁹ / ₃₂	9 ¹ / ₃₂	4 ⁵ / ₃₂	8 ²⁹ / ₃₂	3 ³ / ₁₆	2 ¹⁵ / ₃₂	9 ¹ / ₁₆	51°50'
47°	*6 ² / ₃₂	2 ²³ / ₃₂	3 ¹¹ / ₃₂	10 ⁵ / ₁₆	4 ⁹ / ₁₆	9 ⁹ / ₃₂	3 ¹ / ₄	2 ⁹ / ₈	9 ²³ / ₃₂	50°58'
46°	*6 ³ / ₃₂	2 ⁷ / ₈	3 ¹³ / ₃₂	10 ¹¹ / ₁₆	4 ¹⁵ / ₃₂	9 ¹³ / ₃₂	3 ¹ / ₃₂	2 ³ / ₄	10 ¹ / ₃₂	50°06'
45°	*7 ¹ / ₁₆	3	3 ¹ / ₂	11 ¹ / ₁₆	4 ⁵ / ₈	9 ² / ₃₂	3 ¹³ / ₃₂	2 ²⁹ / ₃₂	10 ¹ / ₃₂	49°12'
44°	*7 ³ / ₃₂	3 ⁵ / ₃₂	3 ⁹ / ₁₆	11 ⁷ / ₁₆	4 ²⁵ / ₃₂	9 ²⁹ / ₃₂	3 ¹⁵ / ₃₂	3 ¹ / ₁₆	10 ² / ₃₂	48°22'
43°	*7 ¹ / ₃₂	3 ⁹ / ₁₆	3 ² / ₃₂	11 ⁷ / ₈	4 ³ / ₃₂	10 ⁶ / ₃₂	3 ¹⁷ / ₃₂	3 ¹ / ₁₆	10 ³ / ₃₂	47°30'
42°	*7 ¹ / ₂	3 ¹ / ₂	3 ²³ / ₃₂	*11 ²³ / ₃₂	5 ¹ / ₈	10 ¹³ / ₃₂	3 ⁹ / ₁₆	3 ¹ / ₃₂	11 ⁵ / ₁₆	46°40'
41°	*7 ⁵ / ₈	3 ¹ / ₁₆	3 ¹³ / ₁₆	*11 ⁵ / ₁₆	5 ¹ / ₁₆	10 ¹ / ₁₆	3 ⁵ / ₈	3 ¹⁷ / ₃₂	11 ² / ₃₂	45°50'
40°	*7 ²⁵ / ₃₂	3 ⁷ / ₈	3 ⁷ / ₈	*10 ²⁹ / ₃₂	5 ¹ / ₂	10 ²⁹ / ₃₂	3 ¹ / ₁₆	3 ¹ / ₁₆	12	45°00'
39°	*7 ¹⁵ / ₁₆	4 ¹ / ₁₆	3 ³ / ₃₂	*10 ¹⁷ / ₃₂	5 ¹ / ₁₆	11 ⁵ / ₃₂	3 ³ / ₄	3 ⁷ / ₈	*11 ² / ₃₂	44°10'
38°	*8 ¹ / ₈	4 ⁹ / ₃₂	4 ¹ / ₁₆	*10 ⁵ / ₃₂	5 ²⁹ / ₃₂	11 ¹³ / ₃₂	3 ¹³ / ₁₆	4 ¹ / ₁₆	*11 ⁵ / ₁₆	43°20'
37°	*8 ⁵ / ₁₆	4 ¹ / ₂	4 ¹ / ₈	*9 ¹³ / ₁₆	6 ¹ / ₈	11 ² / ₃₂	3 ⁷ / ₈	4 ¹ / ₄	*11	42°30'
36°	*8 ¹ / ₂	4 ³ / ₄	4 ⁷ / ₃₂	*9 ¹⁵ / ₃₂	6 ¹ / ₃₂	11 ²⁹ / ₃₂	3 ¹⁵ / ₁₆	4 ¹⁵ / ₃₂	*10 ¹ / ₁₆	41°42'
35°	*8 ²³ / ₃₂	4 ³ / ₃₂	4 ⁵ / ₁₆	*9 ³ / ₃₂	6 ¹⁹ / ₃₂	*11 ²⁷ / ₃₂	3 ³ / ₃₂	4 ¹ / ₁₆	*10 ³ / ₈	40°53'
34°	*8 ¹⁵ / ₁₆	5 ¹ / ₄	4 ¹³ / ₃₂	*8 ²⁵ / ₃₂	6 ²⁷ / ₃₂	*11 ⁵ / ₈	4 ¹ / ₃₂	4 ²⁹ / ₃₂	*10 ³ / ₃₂	40°04'
33°	*9 ⁵ / ₃₂	5 ¹ / ₂	4 ¹ / ₂	*8 ⁷ / ₁₆	7 ³ / ₃₂	*11 ¹³ / ₃₂	4 ³ / ₃₂	5 ⁵ / ₃₂	*9 ¹³ / ₁₆	39°16'
32°	*9 ¹³ / ₃₂	5 ²⁵ / ₃₂	4 ¹⁹ / ₃₂	*8 ¹ / ₈	7 ³ / ₈	*11 ³ / ₁₆	4 ¹ / ₈	5 ¹³ / ₃₂	*9 ⁹ / ₁₆	38°30'
31°	*9 ¹ / ₁₆	6 ¹ / ₁₆	4 ²³ / ₃₂	*7 ¹³ / ₁₆	7 ¹ / ₁₆	*11	4 ³ / ₁₆	5 ² / ₈	*9 ⁹ / ₃₂	37°43'
30°	*10	6 ³ / ₈	4 ¹³ / ₁₆	*7 ¹ / ₂	8	*10 ²⁷ / ₃₂	4 ¹ / ₄	5 ¹⁵ / ₁₆	*9 ¹ / ₃₂	36°56'
29°	*10 ⁹ / ₃₂	6 ¹ / ₁₆	4 ¹⁵ / ₁₆	*7 ⁷ / ₃₂	8 ⁵ / ₁₆	*10 ¹ / ₁₆	4 ⁹ / ₃₂	6 ⁷ / ₃₂	*8 ²⁵ / ₃₂	36°10'
28°	*10 ⁵ / ₈	7	5 ¹ / ₁₆	*6 ²⁹ / ₃₂	8 ¹ / ₁₆	*10 ¹ / ₃₂	4 ¹ / ₃₂	6 ¹ / ₂	*8 ¹ / ₃₂	35°26'
27°	*11	7 ³ / ₈	5 ⁵ / ₃₂	*6 ⁵ / ₈	9 ¹ / ₁₆	*10 ¹³ / ₃₂	4 ³ / ₈	6 ²⁷ / ₃₂	*8 ⁹ / ₃₂	34°40'
26°	*11 ³ / ₈	7 ¹³ / ₁₆	5 ⁹ / ₃₂	*6 ³ / ₈	9 ¹⁵ / ₃₂	*10 ⁵ / ₁₆	4 ¹³ / ₃₂	7 ⁵ / ₃₂	*8 ¹ / ₁₆	33°57'
25°	*11 ²⁷ / ₃₂	8 ⁹ / ₃₂	5 ⁷ / ₁₆	*6 ¹ / ₁₆	9 ²⁹ / ₃₂	*10 ³ / ₁₆	4 ¹⁵ / ₃₂	7 ¹⁷ / ₃₂	*7 ²⁷ / ₃₂	33°13'
24°	11 ²⁷ / ₃₂	8 ³ / ₄	5 ¹ / ₃₂	*5 ¹³ / ₁₆	10 ³ / ₈	*10 ¹ / ₈	4 ¹ / ₂	7 ²⁹ / ₃₂	*7 ⁵ / ₈	32°32'
23°	11 ⁷ / ₃₂	9 ¹ / ₄	5 ²³ / ₃₂	*5 ⁷ / ₃₂	10 ⁷ / ₈	*10 ¹ / ₁₆	4 ¹ / ₃₂	8 ⁵ / ₁₆	*7 ⁷ / ₁₆	31°50'
22°	10 ³ / ₄	9 ³ / ₄	5 ²⁹ / ₃₂	*5 ¹ / ₄	11 ⁷ / ₁₆	*10	4 ¹⁹ / ₃₂	8 ²⁵ / ₃₂	*7 ¹ / ₄	31°10'
21°	10 ⁵ / ₁₆	10 ³ / ₈	6 ³ / ₃₂	*5	*11 ¹⁵ / ₁₆	*10	4 ⁵ / ₈	9 ¹ / ₄	*7 ¹ / ₁₆	30°29'
20°	9 ²⁷ / ₃₂	11	6 ⁵ / ₁₆	*4 ²³ / ₃₂	*11 ¹ / ₃₂	*10	4 ² / ₃₂	9 ³ / ₄	*6 ⁷ / ₈	29°50'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

4" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*4 ¹ / ₄	⁷ / ₁₆	1 ⁵ / ₁₆	4 ⁵ / ₃₂	1 ³ / ₈	4 ³ / ₃₂	1 ⁵ / ₁₆	⁷ / ₁₆	4 ³ / ₈	71°04'
69°	*4 ⁹ / ₃₂	¹ / ₂	1 ³ / ₈	4 ³ / ₈	1 ¹⁵ / ₃₂	4 ⁵ / ₁₆	1 ³ / ₈	¹ / ₂	4 ¹¹ / ₃₂	70°06'
68°	*4 ⁵ / ₁₆	1 ⁷ / ₃₂	1 ¹ / ₁₆	4 ¹⁹ / ₃₂	1 ⁷ / ₁₆	4 ¹⁷ / ₃₂	1 ¹ / ₁₆	1 ⁷ / ₃₂	4 ⁹ / ₁₆	69°10'
67°	*4 ³ / ₈	1 ⁹ / ₃₂	1 ¹ / ₂	4 ²⁷ / ₃₂	1 ⁵ / ₈	4 ³ / ₄	1 ¹ / ₂	1 ⁹ / ₃₂	4 ²⁵ / ₃₂	68°14'
66°	*4 ¹³ / ₃₂	2 ¹ / ₃₂	1 ⁹ / ₁₆	5 ¹ / ₁₆	1 ¹¹ / ₁₆	4 ³¹ / ₃₂	1 ⁹ / ₁₆	2 ¹ / ₃₂	5 ³ / ₃₂	67°17'
65°	*4 ¹³ / ₃₂	2 ³ / ₃₂	1 ⁵ / ₈	5 ⁵ / ₁₆	1 ²⁵ / ₃₂	5 ³ / ₁₆	1 ⁵ / ₈	1 ¹ / ₁₆	5 ¹ / ₄	66°22'
64°	*4 ⁷ / ₁₆	³ / ₄	1 ¹¹ / ₁₆	5 ¹⁷ / ₃₂	1 ²⁷ / ₃₂	5 ¹³ / ₃₂	1 ¹¹ / ₁₆	³ / ₄	5 ⁵ / ₂	65°24'
63°	*4 ¹ / ₂	2 ⁷ / ₃₂	1 ³ / ₄	5 ²⁵ / ₃₂	1 ¹⁵ / ₁₆	5 ²¹ / ₃₂	1 ³ / ₄	1 ³ / ₁₆	5 ²³ / ₃₂	64°28'
62°	*4 ¹⁷ / ₃₂	⁷ / ₈	1 ¹³ / ₁₆	6 ¹ / ₃₂	2 ¹ / ₂	5 ²⁹ / ₃₂	1 ¹³ / ₁₆	⁷ / ₈	5 ³¹ / ₃₂	63°30'
61°	*4 ¹⁹ / ₃₂	1 ⁵ / ₁₆	1 ⁷ / ₈	6 ⁵ / ₁₆	2 ³ / ₂	6 ¹ / ₈	1 ⁷ / ₈	1 ⁵ / ₁₆	6 ³ / ₃₂	62°36'
60°	*4 ⁵ / ₈	1 ¹ / ₃₂	1 ⁵ / ₁₆	6 ⁹ / ₁₆	2 ³ / ₁₆	6 ³ / ₈	1 ²⁹ / ₃₂	1 ¹ / ₃₂	6 ¹⁵ / ₃₂	61°41'
59°	*4 ¹¹ / ₁₆	1 ³ / ₃₂	2	6 ²⁷ / ₃₂	2 ⁹ / ₃₂	6 ³ / ₄	1 ³¹ / ₃₂	1 ³ / ₃₂	6 ²³ / ₃₂	60°44'
58°	*4 ³ / ₄	1 ³ / ₁₆	2 ¹ / ₁₆	7 ¹ / ₈	2 ³ / ₈	6 ²⁷ / ₃₂	2 ³ / ₃₂	1 ⁵ / ₃₂	6 ³¹ / ₃₂	59°48'
57°	*4 ²⁵ / ₃₂	1 ¹ / ₄	2 ¹ / ₈	7 ³ / ₈	2 ¹⁵ / ₃₂	7 ³ / ₃₂	2 ³ / ₃₂	1 ¹ / ₄	7 ⁷ / ₃₂	58°52'
56°	*4 ²⁷ / ₃₂	1 ¹¹ / ₃₂	2 ⁵ / ₃₂	7 ¹¹ / ₁₆	2 ⁹ / ₁₆	7 ¹¹ / ₃₂	2 ⁵ / ₃₂	1 ⁵ / ₁₆	7 ¹ / ₂	57°57'
55°	*4 ⁷ / ₈	1 ⁷ / ₁₆	2 ⁷ / ₃₂	7 ²¹ / ₃₂	2 ²¹ / ₃₂	7 ¹⁹ / ₃₂	2 ⁷ / ₃₂	1 ¹³ / ₃₂	7 ²⁵ / ₃₂	57°01'
54°	*4 ³¹ / ₃₂	1 ¹⁷ / ₃₂	2 ⁹ / ₃₂	8 ³ / ₃₂	2 ³ / ₄	7 ⁷ / ₈	2 ⁹ / ₃₂	1 ¹ / ₂	8 ¹ / ₁₆	56°05'
53°	*5	1 ⁵ / ₈	2 ¹¹ / ₃₂	8 ¹⁹ / ₃₂	2 ⁷ / ₈	8 ¹ / ₈	2 ⁵ / ₁₆	1 ⁹ / ₃₂	8 ¹¹ / ₃₂	55°09'
52°	*5 ¹ / ₁₆	1 ³ / ₄	2 ¹³ / ₃₂	8 ²⁹ / ₃₂	2 ³¹ / ₃₂	8 ¹³ / ₃₂	2 ³ / ₈	1 ¹¹ / ₁₆	8 ³ / ₈	54°14'
51°	*5 ⁵ / ₃₂	1 ²⁷ / ₃₂	2 ¹⁵ / ₃₂	9 ¹ / ₄	3 ¹ / ₁₆	8 ²⁵ / ₃₂	2 ⁷ / ₁₆	1 ²⁵ / ₃₂	8 ¹⁵ / ₁₆	53°17'
50°	*5 ⁷ / ₃₂	1 ⁵ / ₁₆	2 ¹⁷ / ₃₂	9 ⁹ / ₁₆	3 ³ / ₁₆	8 ¹⁵ / ₁₆	2 ¹ / ₂	1 ²⁹ / ₃₂	9 ⁷ / ₃₂	52°26'
49°	*5 ¹¹ / ₃₂	2 ¹ / ₁₆	2 ¹⁹ / ₃₂	9 ²⁹ / ₃₂	3 ⁹ / ₃₂	9 ⁷ / ₃₂	2 ⁹ / ₁₆	2	9 ¹⁷ / ₃₂	51°28'
48°	*5 ¹³ / ₃₂	2 ⁵ / ₃₂	2 ⁵ / ₈	10 ¹ / ₄	3 ¹³ / ₃₂	9 ¹ / ₂	2 ¹⁹ / ₃₂	2 ¹ / ₈	9 ²⁷ / ₃₂	50°34'
47°	*5 ¹ / ₂	2 ⁹ / ₃₂	2 ¹¹ / ₁₆	10 ⁵ / ₈	3 ¹⁷ / ₃₂	9 ²⁵ / ₃₂	2 ²¹ / ₃₂	2 ³ / ₃₂	10 ³ / ₁₆	49°39'
46°	*5 ¹⁹ / ₃₂	2 ¹³ / ₃₂	2 ³ / ₄	11	3 ²¹ / ₃₂	10 ¹ / ₁₆	2 ²³ / ₃₂	2 ¹¹ / ₃₂	10 ¹ / ₂	48°45'
45°	*5 ²¹ / ₃₂	2 ¹⁷ / ₃₂	2 ¹³ / ₁₆	11 ³ / ₈	3 ²⁵ / ₃₂	10 ¹¹ / ₃₂	2 ³ / ₄	2 ¹⁵ / ₃₂	10 ²⁷ / ₃₂	47°52'
44°	*5 ²⁵ / ₃₂	2 ³¹ / ₃₂	2 ⁷ / ₈	11 ¹³ / ₁₆	3 ¹⁵ / ₁₆	10 ⁵ / ₈	2 ¹³ / ₁₆	2 ¹⁹ / ₃₂	11 ³ / ₁₆	46°57'
43°	*5 ⁷ / ₈	2 ¹³ / ₁₆	2 ¹⁵ / ₁₆	*11 ²⁵ / ₃₂	4 ¹ / ₁₆	10 ¹⁵ / ₁₆	2 ²⁷ / ₃₂	2 ³ / ₄	11 ⁹ / ₁₆	46°03'
42°	*6	2 ¹⁵ / ₁₆	3	*11 ³ / ₈	4 ⁷ / ₃₂	11 ¹ / ₄	2 ²⁹ / ₃₂	2 ⁷ / ₈	11 ¹⁵ / ₁₆	45°09'
41°	*6 ¹ / ₈	3 ³ / ₃₂	3 ¹ / ₃₂	*11	4 ³ / ₈	11 ⁹ / ₁₆	2 ¹⁵ / ₁₆	3 ³ / ₃₂	*11 ¹¹ / ₁₆	44°18'
40°	*6 ⁷ / ₃₂	3 ⁹ / ₃₂	3 ³ / ₃₂	*10 ⁵ / ₈	4 ¹⁷ / ₃₂	11 ⁷ / ₈	3	3 ³ / ₁₆	*11 ¹¹ / ₃₂	43°24'
39°	*6 ³ / ₈	3 ¹⁵ / ₃₂	3 ⁵ / ₃₂	*10 ⁷ / ₃₂	4 ¹¹ / ₁₆	*11 ¹³ / ₁₆	3 ¹ / ₃₂	3 ¹¹ / ₃₂	*11	42°32'
38°	*6 ¹ / ₂	3 ⁵ / ₈	3 ⁷ / ₃₂	*9 ⁷ / ₈	4 ²⁷ / ₃₂	*11 ¹ / ₂	3 ³ / ₃₂	3 ¹ / ₂	*10 ²¹ / ₃₂	41°38'
37°	*6 ¹⁹ / ₃₂	3 ¹³ / ₁₆	3 ⁹ / ₃₂	*9 ¹⁷ / ₃₂	5 ¹ / ₃₂	*11 ³ / ₁₆	3 ¹ / ₈	3 ¹¹ / ₁₆	*10 ¹¹ / ₃₂	40°46'
36°	*6 ¹³ / ₁₆	4	3 ¹¹ / ₃₂	*9 ³ / ₁₆	5 ⁷ / ₃₂	*10 ¹⁵ / ₁₆	3 ¹ / ₁₆	3 ⁷ / ₈	*10 ⁷ / ₃₂	39°53'
35°	*6 ³¹ / ₃₂	4 ⁷ / ₃₂	3 ¹³ / ₃₂	*8 ²⁶ / ₃₂	5 ¹³ / ₃₂	*10 ²¹ / ₃₂	3 ⁷ / ₃₂	4 ¹ / ₁₆	*9 ²³ / ₃₂	39°00'
34°	*7 ⁵ / ₃₂	4 ⁷ / ₁₆	3 ¹⁵ / ₃₂	*8 ¹⁷ / ₃₂	5 ⁵ / ₈	*10 ¹³ / ₃₂	3 ¹ / ₄	4 ¹ / ₄	*9 ⁷ / ₁₆	38°08'
33°	*7 ¹¹ / ₃₂	4 ²¹ / ₃₂	3 ¹⁷ / ₃₂	*8 ³ / ₁₆	5 ²⁷ / ₃₂	*10 ⁵ / ₃₂	3 ⁵ / ₁₆	4 ¹⁵ / ₃₂	*9 ¹ / ₈	37°18'
32°	*7 ⁹ / ₁₆	4 ²⁹ / ₃₂	3 ¹⁹ / ₃₂	*7 ²⁹ / ₃₂	6 ¹ / ₁₆	*9 ¹⁵ / ₁₆	3 ¹¹ / ₃₂	4 ¹¹ / ₁₆	*8 ²⁷ / ₃₂	36°27'
31°	*7 ²⁵ / ₃₂	5 ¹ / ₈	3 ¹¹ / ₁₆	*7 ¹⁹ / ₃₂	6 ⁵ / ₁₆	*9 ²³ / ₃₂	3 ³ / ₈	4 ²⁹ / ₃₂	*8 ¹⁹ / ₃₂	35°36'
30°	*8	5 ¹³ / ₃₂	3 ³ / ₄	*7 ⁵ / ₁₆	6 ⁹ / ₁₆	*9 ¹ / ₂	3 ¹³ / ₃₂	5 ⁵ / ₃₂	*8 ⁵ / ₁₆	34°46'
29°	*8 ¹ / ₄	5 ¹¹ / ₁₆	3 ²⁷ / ₃₂	*7 ¹ / ₃₂	6 ²⁷ / ₃₂	*9 ⁵ / ₁₆	3 ⁷ / ₁₆	5 ¹³ / ₃₂	*8 ¹ / ₁₆	33°56'
28°	*8 ¹ / ₂	5 ³ / ₁₆	3 ¹⁵ / ₁₆	*6 ³ / ₄	7 ¹ / ₈	*9 ¹ / ₈	3 ¹ / ₂	5 ¹¹ / ₁₆	*7 ¹³ / ₁₆	33°08'
27°	*8 ¹³ / ₁₆	6 ⁹ / ₃₂	4	*6 ⁷ / ₁₆	7 ⁷ / ₁₆	*8 ¹⁵ / ₁₆	3 ¹⁷ / ₃₂	5 ³¹ / ₃₂	*7 ¹⁹ / ₃₂	32°19'
26°	*9 ¹ / ₈	6 ⁵ / ₈	4 ¹ / ₁₆	*6 ³ / ₁₆	7 ³ / ₄	*8 ²⁵ / ₃₂	3 ⁹ / ₁₆	6 ³ / ₃₂	*7 ¹¹ / ₃₂	31°30'
25°	*9 ¹⁵ / ₃₂	7	4 ³ / ₁₆	*5 ²⁹ / ₃₂	8 ¹ / ₈	*8 ⁵ / ₈	3 ¹⁹ / ₃₂	6 ⁵ / ₈	*7 ⁷ / ₈	30°42'
24°	*9 ¹³ / ₁₆	7 ¹¹ / ₃₂	4 ¹ / ₄	*5 ⁵ / ₈	8 ¹⁷ / ₃₂	*8 ¹⁵ / ₃₂	3 ⁵ / ₈	6 ³¹ / ₃₂	*6 ²⁹ / ₃₂	29°56'
23°	*10 ⁷ / ₃₂	7 ³ / ₄	4 ⁸ / ₈	*5 ⁸ / ₈	8 ¹⁵ / ₁₆	*8 ¹¹ / ₃₂	3 ²¹ / ₃₂	7 ¹¹ / ₃₂	*6 ¹¹ / ₁₆	29°10'
22°	*10 ²¹ / ₃₂	8 ¹ / ₄	4 ¹ / ₂	*5 ¹ / ₈	9 ¹³ / ₃₂	*8 ¹ / ₄	3 ¹¹ / ₁₆	7 ³ / ₄	*6 ¹⁵ / ₃₂	28°25'
21°	*11 ³ / ₃₂	8 ³ / ₄	4 ⁵ / ₈	*4 ²⁷ / ₃₂	9 ⁷ / ₈	*8 ⁵ / ₃₂	3 ²³ / ₃₂	8 ³ / ₁₆	*6 ³ / ₃₂	27°40'
20°	*11 ¹¹ / ₁₆	9 ⁹ / ₃₂	4 ²³ / ₃₂	*4 ¹⁹ / ₃₂	10 ⁷ / ₁₆	*8 ³ / ₃₂	3 ³ / ₄	8 ²¹ / ₃₂	*6 ³ / ₃₂	26°57'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

3" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*3 ³ / ₁₆	1 ¹ / ₈ 2	1	4 ¹ / ₄	1 ¹ / ₁₆	4 ⁷ / ₃₂	1	1 ¹ / ₃₂	4 ⁷ / ₃₂	70°37'
69°	*3 ⁷ / ₃₂	1 ³ / ₃₂	1 ¹ / ₃₂	4 ¹⁵ / ₃₂	1 ¹ / ₈	4 ⁷ / ₁₆	1 ¹ / ₃₂	3 ¹ / ₈	4 ¹⁵ / ₃₂	69°39'
68°	*3 ⁷ / ₃₂	7 ¹ / ₁₆	1 ³ / ₃₂	4 ²³ / ₃₂	1 ⁵ / ₃₂	4 ¹¹ / ₁₆	1 ³ / ₃₂	7 ¹ / ₁₆	4 ¹¹ / ₁₆	68°41'
67°	*3 ¹ / ₄	1 ⁵ / ₃₂	1 ¹ / ₈	4 ¹⁵ / ₁₆	1 ⁷ / ₃₂	4 ² / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	4 ² / ₃₂	67°43'
66°	*3 ⁹ / ₃₂	1 ⁷ / ₃₂	1 ³ / ₁₆	5 ³ / ₁₆	1 ⁹ / ₃₂	5 ¹ / ₈	1 ³ / ₁₆	1 ¹ / ₂	5 ³ / ₃₂	66°46'
65°	*3 ⁵ / ₁₆	9 ¹ / ₁₆	1 ¹ / ₄	5 ⁷ / ₁₆	1 ¹¹ / ₃₂	5 ³ / ₈	1 ¹ / ₄	9 ¹ / ₁₆	5 ¹³ / ₃₂	65°48'
64°	*3 ¹¹ / ₃₂	5 ¹ / ₈	1 ⁹ / ₃₂	5 ¹¹ / ₁₆	1 ¹³ / ₃₂	5 ¹ / ₃₂	1 ⁹ / ₃₂	1 ⁹ / ₃₂	5 ¹ / ₈	64°49'
63°	*3 ³ / ₈	2 ¹ / ₃₂	1 ¹¹ / ₃₂	5 ¹⁵ / ₁₆	1 ¹⁵ / ₃₂	5 ² / ₃₂	1 ¹¹ / ₃₂	2 ¹ / ₃₂	5 ¹ / ₈	63°52'
62°	*3 ¹³ / ₃₂	2 ³ / ₃₂	1 ³ / ₈	6 ³ / ₁₆	1 ¹⁷ / ₃₂	6 ³ / ₃₂	1 ³ / ₈	1 ¹ / ₁₆	6 ¹ / ₈	62°53'
61°	*3 ⁷ / ₁₆	3 ¹ / ₄	1 ⁷ / ₁₆	6 ¹⁵ / ₃₂	1 ⁵ / ₈	6 ¹¹ / ₃₂	1 ⁷ / ₁₆	3 ¹ / ₄	6 ³ / ₈	61°56'
60°	*3 ¹⁵ / ₃₂	1 ³ / ₁₆	1 ¹⁵ / ₃₂	6 ²³ / ₃₂	1 ¹¹ / ₁₆	6 ¹⁹ / ₃₂	1 ¹⁵ / ₃₂	1 ³ / ₁₆	6 ²¹ / ₃₂	61°00'
59°	*3 ¹ / ₂	7 ¹ / ₈	1 ¹ / ₂	7	1 ³ / ₄	6 ²⁷ / ₃₂	1 ¹ / ₂	7 ¹ / ₈	6 ²⁹ / ₃₂	60°00'
58°	*3 ¹⁷ / ₃₂	1 ⁵ / ₁₆	1 ⁹ / ₁₆	7 ³ / ₃₂	1 ¹³ / ₁₆	7 ¹ / ₈	1 ⁹ / ₁₆	2 ⁹ / ₃₂	7 ³ / ₁₆	59°03'
57°	*3 ⁹ / ₁₆	1	1 ¹⁹ / ₃₂	7 ⁷ / ₁₆	1 ⁷ / ₈	7 ³ / ₈	1 ¹⁹ / ₃₂	1	7 ¹⁵ / ₃₂	58°05'
56°	*3 ⁵ / ₈	1 ¹ / ₁₆	1 ²¹ / ₃₂	7 ²⁷ / ₃₂	1 ³ / ₃₂	7 ²¹ / ₃₂	1 ²¹ / ₃₂	1 ¹ / ₁₆	7 ³ / ₄	57°08'
55°	*3 ² / ₃₂	1 ¹ / ₈	1 ¹¹ / ₁₆	8 ⁵ / ₃₂	2 ¹ / ₃₂	7 ¹⁵ / ₁₆	1 ¹¹ / ₁₆	1 ¹ / ₈	8 ¹ / ₃₂	56°11'
54°	*3 ²³ / ₃₂	1 ³ / ₁₆	1 ³ / ₄	8 ¹⁵ / ₃₂	2 ³ / ₃₂	8 ⁷ / ₃₂	1 ²³ / ₃₂	1 ³ / ₁₆	8 ¹¹ / ₃₂	55°13'
53°	*3 ³ / ₄	1 ⁹ / ₃₂	1 ²⁵ / ₃₂	8 ³ / ₄	2 ⁵ / ₃₂	8 ¹ / ₂	1 ²⁵ / ₃₂	1 ¹ / ₄	8 ⁵ / ₈	54°14'
52°	*3 ¹³ / ₁₆	1 ¹¹ / ₃₂	1 ²⁷ / ₃₂	9 ³ / ₃₂	2 ⁹ / ₃₂	8 ²⁵ / ₃₂	1 ¹³ / ₁₆	1 ¹¹ / ₃₂	8 ¹⁵ / ₁₆	53°18'
51°	*3 ⁷ / ₈	1 ⁷ / ₁₆	1 ⁷ / ₈	9 ⁷ / ₁₆	2 ¹¹ / ₃₂	9 ³ / ₃₂	1 ²⁷ / ₃₂	1 ¹³ / ₃₂	9 ¹ / ₄	52°21'
50°	*3 ²⁹ / ₃₂	1 ¹⁷ / ₃₂	1 ²⁹ / ₃₂	9 ²⁵ / ₃₂	2 ⁷ / ₁₆	9 ³ / ₈	1 ²⁹ / ₃₂	1 ¹ / ₂	9 ⁹ / ₁₆	51°24'
49°	*3 ³ / ₃₂	1 ⁵ / ₈	1 ¹⁵ / ₁₆	10 ¹ / ₈	2 ¹⁷ / ₃₂	9 ¹¹ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁹ / ₃₂	9 ²⁹ / ₃₂	50°27'
48°	*4 ¹ / ₃₂	1 ²³ / ₃₂	2	10 ¹⁵ / ₃₂	2 ⁵ / ₈	10	1 ³ / ₃₂	1 ¹¹ / ₁₆	10 ¹ / ₄	49°31'
47°	*4 ³ / ₃₂	1 ¹³ / ₁₆	2 ¹ / ₃₂	10 ⁷ / ₈	2 ²³ / ₃₂	10 ⁵ / ₁₆	2	1 ²⁵ / ₃₂	10 ¹⁹ / ₃₂	48°35'
46°	*4 ⁵ / ₃₂	1 ²⁹ / ₃₂	2 ¹ / ₁₆	11 ¹ / ₄	2 ¹³ / ₁₆	10 ²¹ / ₃₂	2 ¹ / ₁₆	1 ⁷ / ₈	10 ¹⁵ / ₁₆	47°38'
45°	*4 ¹ / ₄	2	2 ¹ / ₈	11 ² / ₃₂	2 ²⁹ / ₃₂	11	2 ³ / ₃₂	1 ³ / ₃₂	11 ⁵ / ₁₆	46°40'
44°	*4 ⁵ / ₁₆	2 ³ / ₃₂	2 ⁵ / ₃₂	*11 ¹⁵ / ₁₆	3	11 ⁵ / ₁₆	2 ⁷ / ₈	2 ¹ / ₁₆	11 ²³ / ₃₂	45°44'
43°	*4 ¹³ / ₃₂	2 ³ / ₁₆	2 ³ / ₁₆	*11 ¹ / ₂	3 ¹ / ₈	11 ² / ₃₂	2 ⁷ / ₃₂	2 ⁵ / ₃₂	*11 ²⁹ / ₃₂	44°48'
42°	*4 ¹⁵ / ₃₂	2 ⁵ / ₁₆	2 ¹ / ₄	*11 ¹ / ₈	3 ¹ / ₄	12	2 ⁷ / ₃₂	2 ⁹ / ₃₂	*11 ¹⁷ / ₃₂	43°52'
41°	*4 ⁹ / ₁₆	2 ⁷ / ₁₆	2 ⁹ / ₃₂	*10 ³ / ₄	3 ³ / ₈	*11 ⁵ / ₈	2 ¹ / ₄	2 ¹³ / ₃₂	*11 ⁵ / ₃₂	42°56'
40°	*4 ²¹ / ₃₂	2 ⁹ / ₁₆	2 ⁵ / ₁₆	*10 ³ / ₈	3 ¹⁵ / ₃₂	*11 ¹ / ₄	2 ⁹ / ₃₂	2 ¹⁷ / ₃₂	*10 ¹³ / ₁₆	42°00'
39°	*4 ³ / ₄	2 ²³ / ₃₂	2 ³ / ₈	*10 ¹³ / ₃₂	3 ¹⁹ / ₃₂	*10 ⁷ / ₈	2 ⁵ / ₁₆	2 ²³ / ₃₂	*10 ¹⁵ / ₃₂	41°06'
38°	*4 ⁷ / ₈	2 ²⁷ / ₃₂	2 ¹³ / ₃₂	*9 ¹ / ₁₆	3 ³ / ₄	*10 ⁹ / ₁₆	2 ¹¹ / ₃₂	2 ²⁵ / ₃₂	*10 ¹ / ₈	40°10'
37°	*5	3	2 ¹ / ₁₆	*9 ⁵ / ₁₆	3 ⁷ / ₈	*10 ⁹ / ₃₂	2 ³ / ₈	2 ¹⁵ / ₁₆	*9 ¹³ / ₁₆	39°14'
36°	*5	3 ¹ / ₈	2 ¹ / ₂	*9	4	*10	2 ¹³ / ₃₂	3 ¹ / ₁₆	*9 ¹⁵ / ₃₂	38°17'
35°	*5 ⁷ / ₃₂	3 ⁵ / ₁₆	2 ¹⁷ / ₃₂	*8 ² / ₃₂	4 ⁵ / ₃₂	*9 ¹¹ / ₁₆	2 ⁷ / ₁₆	3 ⁷ / ₃₂	*9 ⁵ / ₃₂	37°22'
34°	*5 ³ / ₈	3 ¹⁵ / ₃₂	2 ⁹ / ₁₆	*8 ¹ / ₃₂	4 ⁵ / ₁₆	*9 ¹³ / ₃₂	2 ¹⁵ / ₃₂	3 ³ / ₈	*8 ⁷ / ₈	36°28'
33°	*5 ¹ / ₂	3 ²¹ / ₃₂	2 ⁵ / ₈	*8 ¹ / ₃₂	4 ¹⁵ / ₃₂	*9 ¹ / ₈	2 ¹ / ₂	3 ⁹ / ₁₆	*8 ⁹ / ₁₆	35°33'
32°	*5 ²¹ / ₃₂	3 ²⁷ / ₃₂	2 ³ / ₃₂	*7 ³ / ₄	4 ²¹ / ₃₂	*8 ⁷ / ₈	2 ¹⁷ / ₃₂	3 ³ / ₄	*8 ³ / ₃₂	34°39'
31°	*5 ¹³ / ₁₆	4 ¹ / ₃₂	2 ²³ / ₃₂	*7 ⁷ / ₁₆	4 ²⁷ / ₃₂	*8 ⁵ / ₈	2 ⁹ / ₁₆	3 ¹⁵ / ₁₆	*8 ¹ / ₃₂	33°45'
30°	*6	4 ¹ / ₄	2 ³ / ₄	*7 ⁵ / ₃₂	5 ¹ / ₃₂	*8 ¹³ / ₃₂	2 ⁹ / ₁₆	4 ¹ / ₈	*7 ³ / ₄	32°52'
29°	*6 ³ / ₁₆	4 ¹⁵ / ₃₂	2 ¹³ / ₁₆	*6 ⁷ / ₈	5 ¹ / ₄	*8 ⁵ / ₃₂	2 ¹⁹ / ₃₂	4 ¹¹ / ₃₂	*7 ¹ / ₂	31°59'
28°	*6 ³ / ₈	4 ¹¹ / ₁₆	2 ²⁷ / ₃₂	*6 ¹⁹ / ₃₂	5 ¹ / ₂	*7 ¹⁵ / ₁₆	2 ⁵ / ₈	4 ⁹ / ₁₆	*7 ⁷ / ₃₂	31°05'
27°	*6 ¹⁹ / ₃₂	4 ¹⁵ / ₁₆	2 ⁷ / ₈	*6 ⁵ / ₁₆	5 ²³ / ₃₂	*7 ³ / ₄	2 ²¹ / ₃₂	4 ¹³ / ₁₆	*7	30°13'
26°	*6 ¹³ / ₁₆	5 ⁷ / ₃₂	2 ¹⁵ / ₁₆	*6 ³ / ₃₂	5 ³ / ₃₂	*7 ¹⁷ / ₃₂	2 ¹ / ₁₆	5 ¹ / ₁₆	*6 ³ / ₄	29°20'
25°	*7 ³ / ₃₂	5 ¹ / ₂	3	*5 ²⁵ / ₃₂	6 ¹ / ₄	*7 ⁵ / ₁₆	2 ²³ / ₃₂	5 ⁵ / ₁₆	*6 ¹ / ₂	28°27'
24°	*7 ⁷ / ₈	5 ²⁵ / ₃₂	3 ¹ / ₃₂	*5 ¹ / ₂	6 ¹⁷ / ₃₂	*7 ¹ / ₈	2 ²⁹ / ₃₂	5 ¹⁹ / ₃₂	*6 ⁹ / ₃₂	27°37'
23°	*7 ¹¹ / ₁₆	6 ³ / ₃₂	3 ⁹ / ₃₂	*5 ¹ / ₄	6 ²⁷ / ₃₂	*6 ³ / ₃₂	2 ³ / ₄	5 ²⁹ / ₃₂	*6 ¹ / ₃₂	26°46'
22°	*8	6 ⁷ / ₁₆	3 ⁵ / ₈	*5	7 ³ / ₁₆	*6 ¹³ / ₁₆	2 ³ / ₄	6 ¹ / ₄	*5 ¹³ / ₁₆	25°55'
21°	*8 ³ / ₈	6 ²⁷ / ₃₂	3 ⁷ / ₃₂	*4 ³ / ₄	7 ⁹ / ₁₆	*6 ² / ₃₂	2 ²⁹ / ₃₂	6 ⁵ / ₈	*5 ⁵ / ₈	25°05'
20°	*8 ²⁵ / ₃₂	7 ⁷ / ₃₂	3 ⁹ / ₃₂	*4 ¹ / ₂	8	*6 ¹ / ₂	2 ¹ / ₁₆	7 ¹ / ₃₂	*5 ¹³ / ₃₂	24°15'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

2" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*2 1/8	1/4	1 1/16	4 5/16	2 3/32	4 9/32	1 1/16	1/4	4 5/16	70°16'
69°	*2 5/32	9/32	2 3/32	4 1 7/32	3/4	4 1 7/32	2 3/32	9/32	4 1 7/32	69°17'
68°	*2 1/16	5/16	2 5/32	4 2 5/32	2 5/32	4 5/8	3/4	5/32	4 2 5/32	68°18'
67°	*2 1/16	5/16	2 5/32	5 1/32	1 5/16	5	2 5/32	5/16	5 1/32	67°20'
66°	*2 1/16	1 1/32	1 3/16	5 9/32	7/8	5 7/32	1 3/16	1 1/32	5 9/32	66°20'
65°	*2 7/32	3/8	2 7/32	5 1 7/32	2 9/32	5 1/2	2 7/32	3/8	5 1/2	65°21'
64°	*2 7/32	1 3/32	7/8	5 2 5/32	3 1/32	5 3/4	7/8	1 3/32	5 3/4	64°22'
63°	*2 1/4	7/16	2 9/32	6 1/32	1	6	2 9/32	7/16	6	63°23'
62°	*2 9/32	1/2	1 5/16	6 9/32	1 1/32	6 1/4	1 5/16	1 5/32	6 9/32	62°23'
61°	*2 9/32	1 7/32	3 1/32	6 9/16	1 3/32	6 1/2	3 1/32	1 7/32	6 1 7/32	61°24'
60°	*2 5/16	9/16	1	6 2 7/32	1 1/8	6 2 5/32	1	9/16	6 1 3/16	60°27'
59°	*2 1 1/32	1 9/32	1 1/32	7 3/32	1 3/16	7 1/32	1 1/32	1 9/32	7 1/16	59°27'
58°	*2 3/8	2 1/32	1 1/16	7 3/8	1 3/32	7 5/16	1 1/16	5/8	7 1 1/32	58°28'
57°	*2 3/8	1 1/16	1 3/32	7 1 1/16	1 9/32	7 1 9/32	1 1/16	1 1/16	7 5/8	57°29'
56°	*2 1 3/32	3/4	1 1/8	7 3 1/32	1 1 1/32	7 7/8	1 3/32	2 3/32	7 1 5/16	56°30'
55°	*2 7/16	2 5/32	1 1/8	8 9/32	1 3/8	8 3/16	1 1/8	2 5/32	8 1/4	55°32'
54°	*2 1 5/32	2 7/32	1 5/32	8 1 9/32	1 7/16	8 1 5/32	1 5/32	1 3/16	8 3/16	54°33'
53°	*2 1/2	2 9/32	1 3/16	8 1 5/16	1 1/2	8 2 5/32	1 3/16	7/8	8 7/8	53°34'
52°	*2 1 7/32	1 5/16	1 7/32	9 1/4	1 7/32	9 3/32	1 7/32	1 5/16	9 3/16	52°34'
51°	*2 7/16	1	1 1/4	9 1 9/32	1 9/32	9 7/16	1 1/4	3 1/32	9 1/2	51°37'
50°	*2 5/8	1 1/16	1 9/32	9 1 5/16	1 2 1/32	9 3/4	1 9/32	1 1/32	9 2 7/32	50°38'
49°	*2 2 1/32	1 1/8	1 5/16	10 9/32	1 2 3/32	10 3/32	1 5/16	1 3/32	10 3/16	49°41'
48°	*2 1 1/16	1 3/16	1 1 1/32	10 5/8	1 2 5/32	10 7/16	1 5/16	1 5/32	10 1 7/32	48°42'
47°	*2 3/4	1 1/4	1 1 1/32	11 1/32	1 2 7/32	10 1 3/16	1 1 1/32	1 3/32	10 2 9/32	47°42'
46°	*2 2 5/32	1 5/16	1 3/8	11 1/16	1 2 9/32	11 5/32	1 3/8	1 9/32	11 9/32	46°43'
45°	*2 2 7/32	1 3/8	1 1 3/32	11 2 7/32	1 3 1/32	11 7/32	1 1 3/32	1 3/8	11 1 1/16	45°45'
44°	*2 7/8	1 5/32	1 7/16	*11 3/4	2 3/32	11 7/8	1 7/16	1 7/16	*11 2 9/32	44°46'
43°	*2 1 5/16	1 7/32	1 5/32	*11 1 1/32	2 1/8	*11 2 3/32	1 7/16	1 1/2	*11 1 7/32	43°49'
42°	*3	1 5/8	1 1/2	*10 1 5/16	2 3/16	*11 1 1/32	1 5/32	1 1 9/32	*11 1/8	42°50'
41°	*3 1/16	1 1 1/16	1 1/2	*10 1 9/32	2 9/32	*10 3 1/32	1 1/2	1 2 3/32	*10 3/4	41°52'
40°	*3 1/8	1 2 5/32	1 7/32	*10 7/32	2 1 1/32	*10 1 9/32	1 7/32	1 3/4	*10 1 3/32	40°55'
39°	*3 3/16	1 7/8	1 9/16	*9 7/8	2 7/16	*10 1/4	1 9/16	1 2 7/32	*10 1/16	39°58'
38°	*3 1/4	1 3 1/32	1 9/32	*9 1/2	2 1 7/32	*9 1 5/16	1 9/16	1 1 5/16	*9 2 3/32	39°00'
37°	*3 5/16	2 1/16	1 5/8	*9 9/32	2 5/8	*9 9/8	1 5/32	2 3/32	*9 3/8	38°03'
36°	*3 1 3/32	2 5/32	1 5/8	*8 2 7/32	2 2 3/32	*9 9/16	1 5/8	2 5/32	*9 1/16	37°05'
35°	*3 1/2	2 9/32	1 2 1/32	*8 1 7/32	2 1 3/16	*9	1 5/8	2 1/4	*8 3/4	36°07'
34°	*3 1 9/32	2 3/8	1 1 1/16	*8 7/32	2 1 5/16	*8 1 1/16	1 2 1/32	2 3/8	*8 7/16	35°11'
33°	*3 1 1/16	2 1/2	1 2 3/32	*7 2 9/32	3 1/32	*8 1 3/32	1 2 1/32	2 1/2	*8 5/32	34°12'
32°	*3 2 5/32	2 5/8	1 3/4	*7 7/8	3 5/32	*8 1/8	1 1 1/16	2 5/8	*7 7/8	33°14'
31°	*3 3/8	2 2 5/32	1 3/4	*7 5/16	3 9/32	*7 7/8	1 2 3/32	2 3/4	*7 1 9/32	32°17'
30°	*4	2 2 9/32	1 2 5/32	*7 3/32	3 1 3/32	*7 1 9/32	1 2 3/32	2 7/8	*7 5/16	31°19'
29°	*4 1/8	3 1/16	1 1 3/16	*6 3/4	3 9/16	*7 5/16	1 3/4	3 1/32	*7 1/32	30°21'
28°	*4 1/4	3 3/32	1 1 1/16	*6 1/2	3 2 3/32	*7 3/32	1 3/4	3 3/16	*6 2 5/32	29°25'
27°	*4 1 3/32	3 1 3/32	1 2 7/32	*6 3/32	3 7/8	*6 2 7/32	1 2 5/32	3 1 1/32	*6 1/2	28°29'
26°	*4 9/16	3 1 9/32	1 7/8	*5 1 5/16	4 1/32	*6 5/8	1 2 5/32	3 1 7/32	*6 1/4	27°32'
25°	*4 2 3/32	3 2 5/32	1 2 9/32	*5 1 1/16	4 7/32	*6 3/8	1 1 3/16	3 3/4	*6	26°37'
24°	*4 2 9/32	4	1 1 5/16	*5 7/16	4 1 3/32	*6 5/32	1 1 3/16	3 1 5/16	*5 2 5/32	25°41'
23°	*5 3/32	4 7/32	1 3 1/32	*5 3/16	4 5/8	*5 1 5/16	1 2 7/32	4 5/32	*5 1 7/32	24°47'
22°	*5 5/16	4 7/16	2	*4 1 5/16	4 7/8	*5 3/4	1 2 7/32	4 1 3/32	*5 1/2	23°51'
21°	*5 1 7/32	4 2 3/32	2	*4 1 1/16	5 1/8	*5 1 7/32	1 7/8	4 1 1/16	*5 1/16	22°58'
20°	*5 2 7/32	5 1/32	2 1/32	*4 7/16	5 1 3/32	*5 1 1/32	1 7/8	4 3 1/32	*4 7/8	22°03'

* Angle exceeds 45°. Pitch given for complement.

HIP & VALLEY FRAMING ANGLES

FOR ROOF SLOPE PITCH

1" HORIZONTAL TO VERTICAL 12"

ANGLE D IN PLAN	R1	R2	R3	P1	P2-C3	P3	C1	C2	C4-C5	C6
70°	*1 1/16	1/8	1 1/32	4 1 1/32	3/8	4 1 1/32	1 1/32	1/8	4 1 1/32	70°04'
69°	*1 1/16	1/8	1 1/32	4 1 9/32	3/8	4 1 9/32	1 1/32	5/32	4 1 9/32	69°03'
68°	*1 1/16	5/32	3/8	4 2 7/32	13/32	4 2 7/32	3/8	5/32	4 2 7/32	68°03'
67°	*1 5/32	5/32	3/8	5 1/16	1 5/32	5 1/16	3/8	5/32	5 1/16	67°04'
66°	*1 3/32	3/16	1 3/32	5 5/16	7/16	5 5/16	1 3/32	3/16	5 5/16	66°05'
65°	*1 3/32	3/16	1 3/32	5 9/16	1 5/32	5 9/16	1 3/32	3/16	5 9/16	65°05'
64°	*1 3/32	7/32	7/16	5 13/32	1 5/32	5 13/32	7/16	7/32	5 13/32	64°05'
63°	*1 7/8	7/32	7/16	6 3/32	1/2	6 3/32	7/16	7/32	6 3/32	63°05'
62°	*1 7/8	1/4	1 5/32	6 1 1/32	1 7/32	6 1 1/32	1 5/32	1/4	6 1 1/32	62°06'
61°	*1 7/8	1/4	1 5/32	6 5/8	1 7/32	6 1 9/32	1 5/32	9/32	6 5/8	61°06'
60°	*1 5/32	9/32	1/2	6 2 9/32	9/16	6 7/8	1/2	9/32	6 2 9/32	60°06'
59°	*1 5/32	5/16	1/2	7 3/16	1 9/32	7 5/32	1/2	5/16	7 5/32	59°06'
58°	*1 5/32	5/16	1 7/32	7 1 5/32	5/8	7 1/16	1 7/32	5/16	7 1 5/32	58°06'
57°	*1 3/16	1 1/32	1 7/32	7 3/4	5/8	7 3/4	1 7/32	1 1/32	7 3/4	57°06'
56°	*1 3/16	3/8	9/16	8 1/16	2 1/32	8 1/32	9/16	3/8	8 1/16	56°06'
55°	*1 7/32	1 3/32	9/16	8 3/8	1 1/16	8 1 1/32	9/16	1 3/32	8 3/8	55°07'
54°	*1 1/4	7/16	1 9/32	8 1 1/16	2 3/32	8 2 1/32	1 9/32	7/16	8 1 1/16	54°07'
53°	*1 1/4	7/16	1 9/32	9	3/4	8 3 1/32	1 9/32	1 5/32	9	53°08'
52°	*1 9/32	1 5/32	5/8	9 3/8	2 5/32	9 5/16	5/8	1 5/32	9 1 1/32	52°08'
51°	*1 9/32	1/2	5/8	9 1 1/16	1 1/16	9 5/8	5/8	1/2	9 2 1/32	51°09'
50°	*1 5/16	1 7/32	2 1/32	10 1/32	2 7/32	10	2 1/32	1 7/32	10	50°10'
49°	*1 5/16	9/16	2 1/32	10 3/8	7/8	10 1 1/32	2 1/32	9/16	10 1 1/32	49°10'
48°	*1 1 1/32	1 9/32	1 1/16	10 5/4	2 9/32	10 2 3/32	2 1/32	1 9/32	10 2 3/32	48°11'
47°	*1 3/8	5/8	1 1/16	11 1/8	1 5/16	11 1/8	1 1/16	5/8	11 3/32	47°11'
46°	*1 3/8	2 1/32	2 3/32	11 1 7/32	3 1/32	11 1/2	1 1/16	2 1/32	11 1/2	46°11'
45°	*1 1 3/32	1 1/16	2 3/32	11 2 1/32	1	11 7/8	2 3/32	1 1/16	11 2 9/32	45°12'
44°	*1 7/16	3/4	2 3/32	*11 5/8	1 1/32	*11 2 3/32	2 3/32	2 3/32	*11 2 1/32	44°12'
43°	*1 5/32	2 5/32	3/4	*11 7/32	1 1/16	*11 1 1/32	2 3/32	2 5/32	*11 9/32	43°13'
42°	*1 1/2	1 3/16	3/4	*10 2 7/32	1 3/32	*10 1 5/16	3/4	1 3/16	*10 7/8	42°14'
41°	*1 1 7/32	7/8	3/4	*10 1 5/32	1 1/8	*10 9/16	3/4	2 7/32	*10 1/2	41°14'
40°	*1 9/16	2 9/32	2 5/32	*10 3/32	1 3/16	*10 3/16	3/4	2 9/32	*10 5/32	40°14'
39°	*1 9/32	3 1/32	2 5/32	*9 5/8	1 1/4	*9 1 3/16	2 5/32	1 5/16	*9 1 3/16	39°16'
38°	*1 5/8	1	2 5/32	*9 1 3/32	1 9/32	*9 1/2	2 5/32	1	*9 1 5/32	38°16'
37°	*1 2 1/32	1 1/16	1 5/16	*9 1/16	1 5/16	*9 3/16	2 5/32	1 1/32	*9 1/8	37°17'
36°	*1 2 3/32	1 1/8	1 3/16	*8 3/4	1 3/8	*8 7/8	1 8/16	1 3/32	*8 1 3/16	36°17'
35°	*1 3/4	1 5/32	1 3/16	*8 7/16	1 7/16	*8 9/16	1 3/16	1 5/32	*8 1/2	35°18'
34°	*1 2 5/32	1 7/32	2 7/32	*8 1/8	1 1/2	*8 1/4	1 3/16	1 7/32	*8 3/16	34°18'
33°	*1 2 7/32	1 9/32	2 7/32	*7 2 7/32	1 1 7/32	*7 1 5/16	2 7/32	1 9/32	*7 7/8	33°20'
32°	*1 2 9/32	1 1 1/32	2 7/32	*7 1 7/32	1 1 9/32	*7 2 1/32	2 7/32	1 1 1/32	*7 9/16	32°20'
31°	*1 1 5/16	1 1 3/32	7/8	*7 1/4	1 2 1/32	*7 3/8	2 7/32	1 1 3/32	*7 5/16	31°21'
30°	*2	1 1/2	7/8	*6 1 5/16	1 2 3/32	*7 3/32	7/8	1 1/2	*7 1/32	30°21'
29°	*2 1/16	1 9/16	7/8	*6 1 1/16	1 2 5/32	*6 2 7/32	7/8	1 9/16	*6 3/4	29°22'
28°	*2 1/8	1 2 1/32	7/8	*6 1 3/32	1 7/8	*6 9/16	7/8	1 2 1/32	*6 1/2	28°22'
27°	*2 7/32	1 3/4	7/8	*6 1/8	1 1 5/16	*6 9/32	7/8	1 2 3/32	*6 7/32	27°23'
26°	*2 9/32	1 1 3/16	2 9/32	*5 7/8	2 1/32	*6 1/32	2 9/32	1 1 3/16	*5 3 1/32	26°24'
25°	*2 3/8	1 1 5/16	2 9/32	*5 5/8	2 1/8	*5 2 5/32	2 9/32	1 1 5/16	*5 2 3/32	25°25'
24°	*2 1 5/32	2 1/32	2 9/32	*5 3/8	2 1/4	*5 1 7/32	2 9/32	2 1/32	*5 7/16	24°26'
23°	*2 9/16	2 1/8	1 5/16	*5 1/8	2 1 1/32	*5 9/32	2 9/32	2 5/32	*5 7/32	23°27'
22°	*2 1 1/16	2 1/4	1 5/16	*4 7/8	2 1 5/32	*5 1/16	1 5/16	2 9/32	*4 3 1/32	22°28'
21°	*2 2 5/32	2 1 3/32	1 5/16	*4 5/8	2 1 9/32	*4 2 7/32	1 5/16	2 1 3/32	*4 2 3/32	21°30'
20°	*2 1 5/16	2 9/16	3 1/32	*4 3/8	2 3/4	*4 5/8	1 5/16	2 9/16	*4 1/2	20°32'

* Angle exceeds 45°. Pitch given for complement.