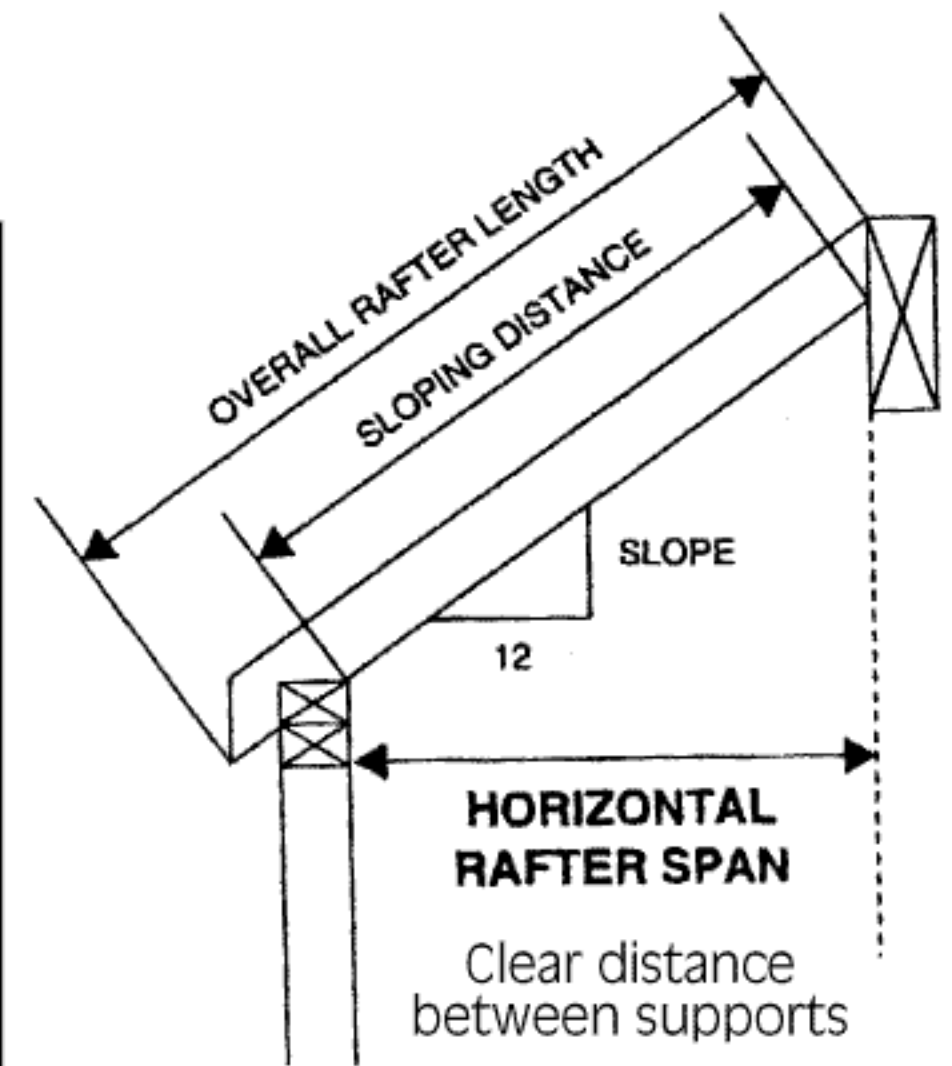


# ROOF RAFTER LENGTH

## Determining Roof Rafter Length

### Conversion Factors for Roof Rafters

SLOPE (IN 12)	SLOPE FACTOR	SLOPE (IN 12)	SLOPE FACTOR
3	1.031	12	1.474
4	1.054	13	1.414
5	1.083	14	1.537
6	1.118	15	1.601
7	1.158	16	1.667
8	1.202	17	1.734
9	1.25	18	1.803
10	1.302	19	1.873
11	1.357	20	1.944



- To convert "Rafter Span" to Sloping Distance":
1. Select slope factor for given slope in table.
  2. Multiply Horizontal Span by "Slope Factor".

### Example:

If slope is 4 in 12 and rafter span is 12'-6", then sloping distance = 12.5 x 1.054 = 13.175' or 13'-2".  
(Note: the over-all rafter length depends on the length of the overhang.)

## Cutting a Rafter Birdsmouth

1. Determine the rafter length using table above:  
Ex: Run = 20', slope = 4. Rafter Length = 21'-1" using table above.
2. Measure  $\theta$  (from Table 1) at top edge of rafter.
3. Draw the building line.
4. Draw 2/3 width line from top edge of rafter.
5. Use square to draw seat cut line from bottom edge of rafter to intersect building line.

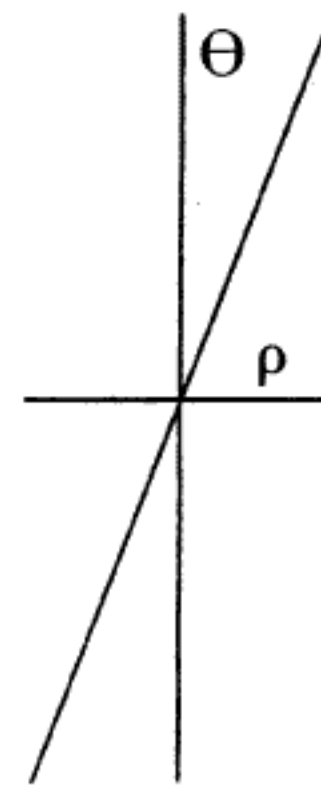
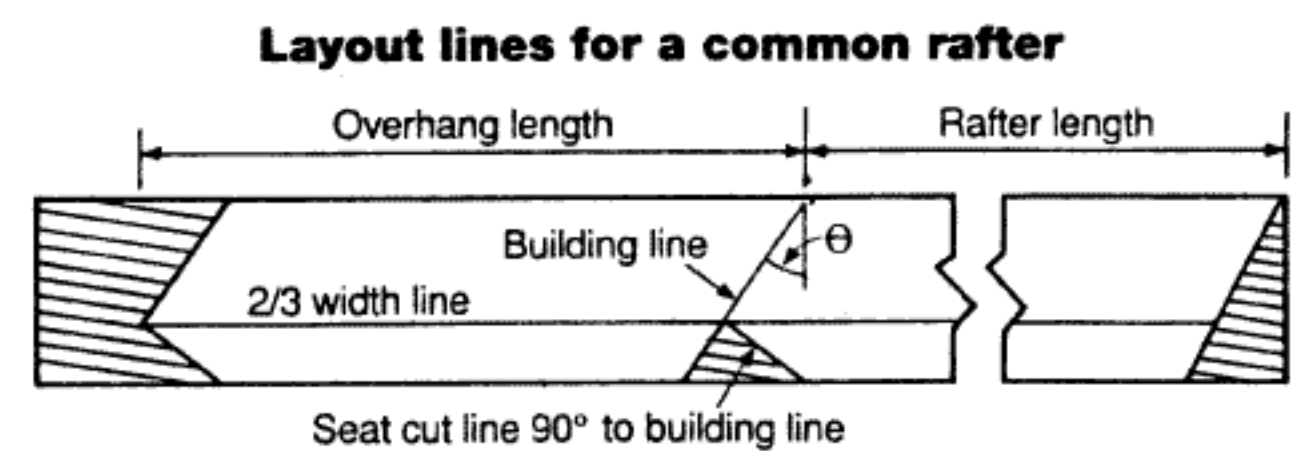
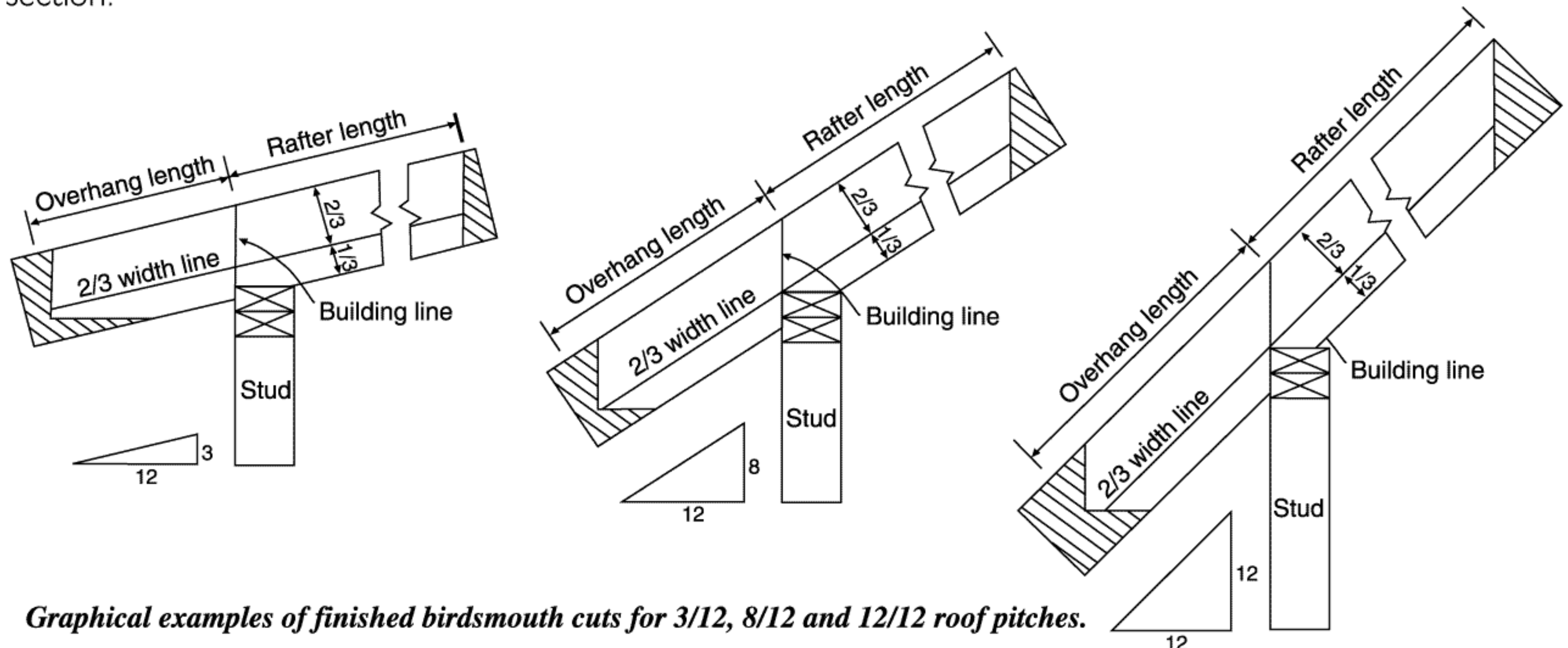


Table 1

Slope	3	4	5	6	7	8	9	10	11	12
$\theta^\circ$	14	18	23	27	30	34	37	40	43	45
$\rho^\circ$	76	72	67	63	60	56	53	50	47	45



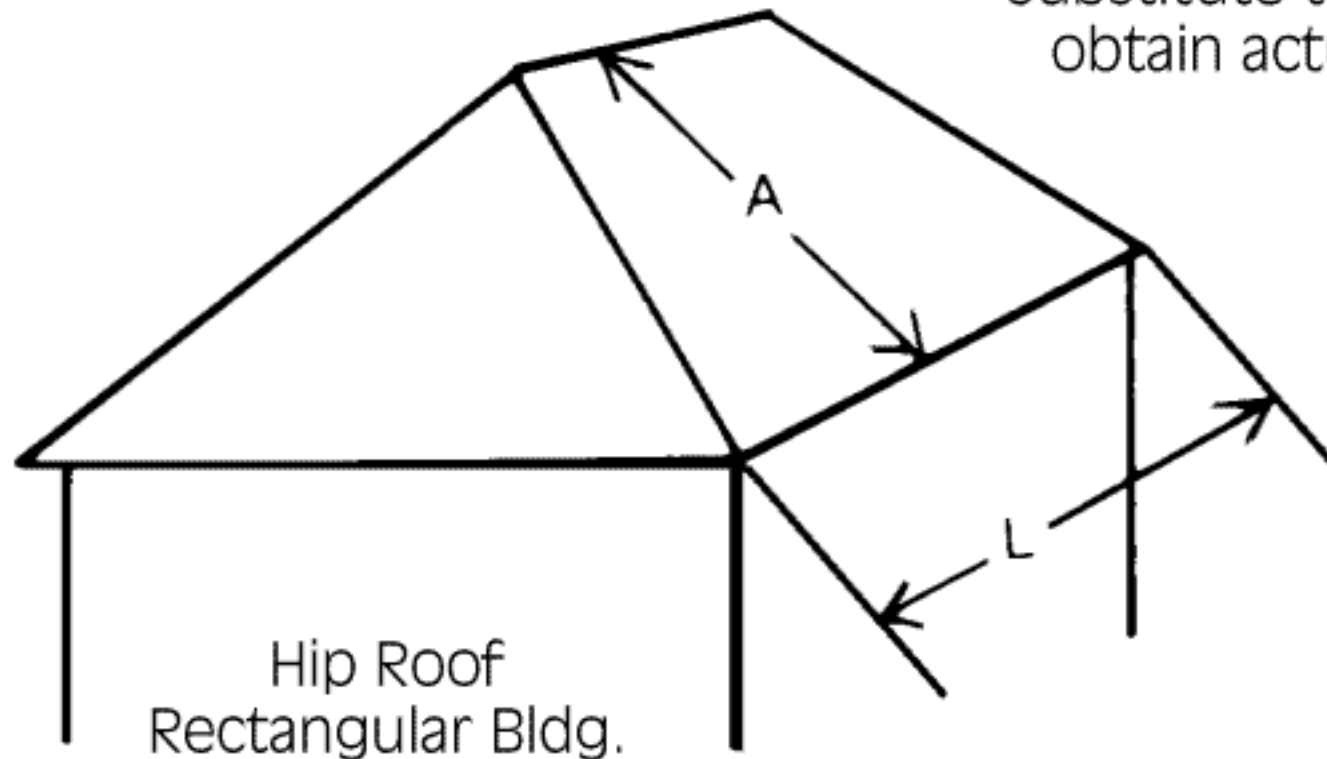
Note: the birdsmouth notch should be limited to 1/3 the rafter width to maintain 2/3 of the rafter section.



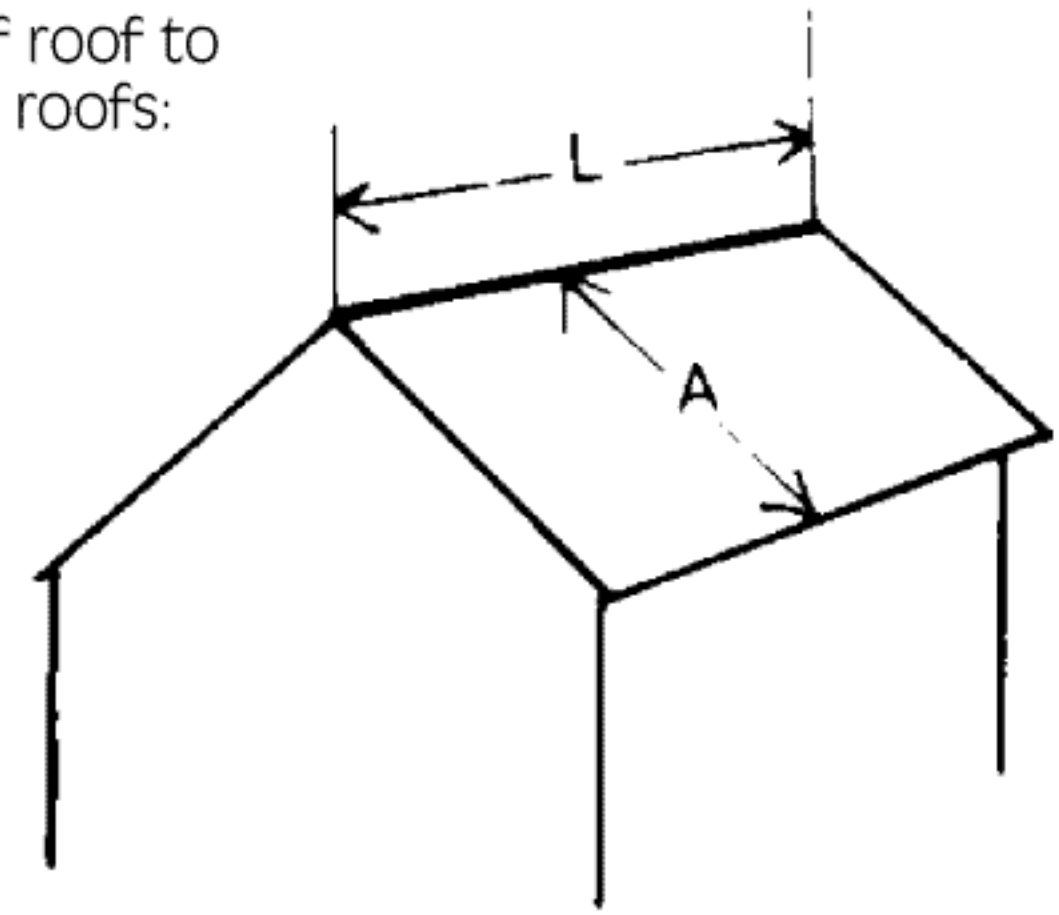
Graphical examples of finished birdsmouth cuts for 3/12, 8/12 and 12/12 roof pitches.

## CALCULATING GUIDE FOR ROOFING SQ. FOOTAGE

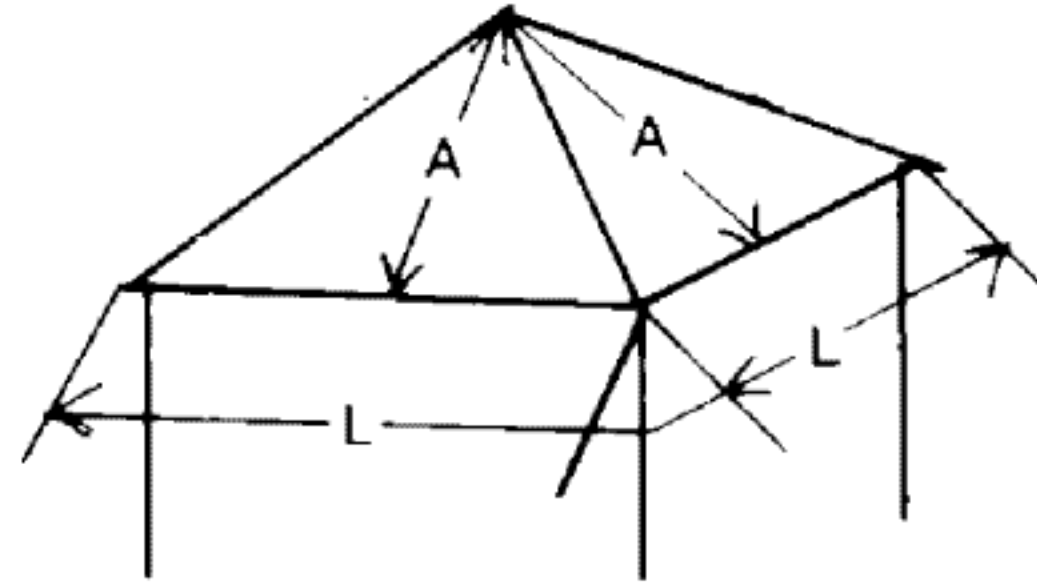
Substitute the formulas given under each type of roof to obtain actual square foot area for the following roofs:



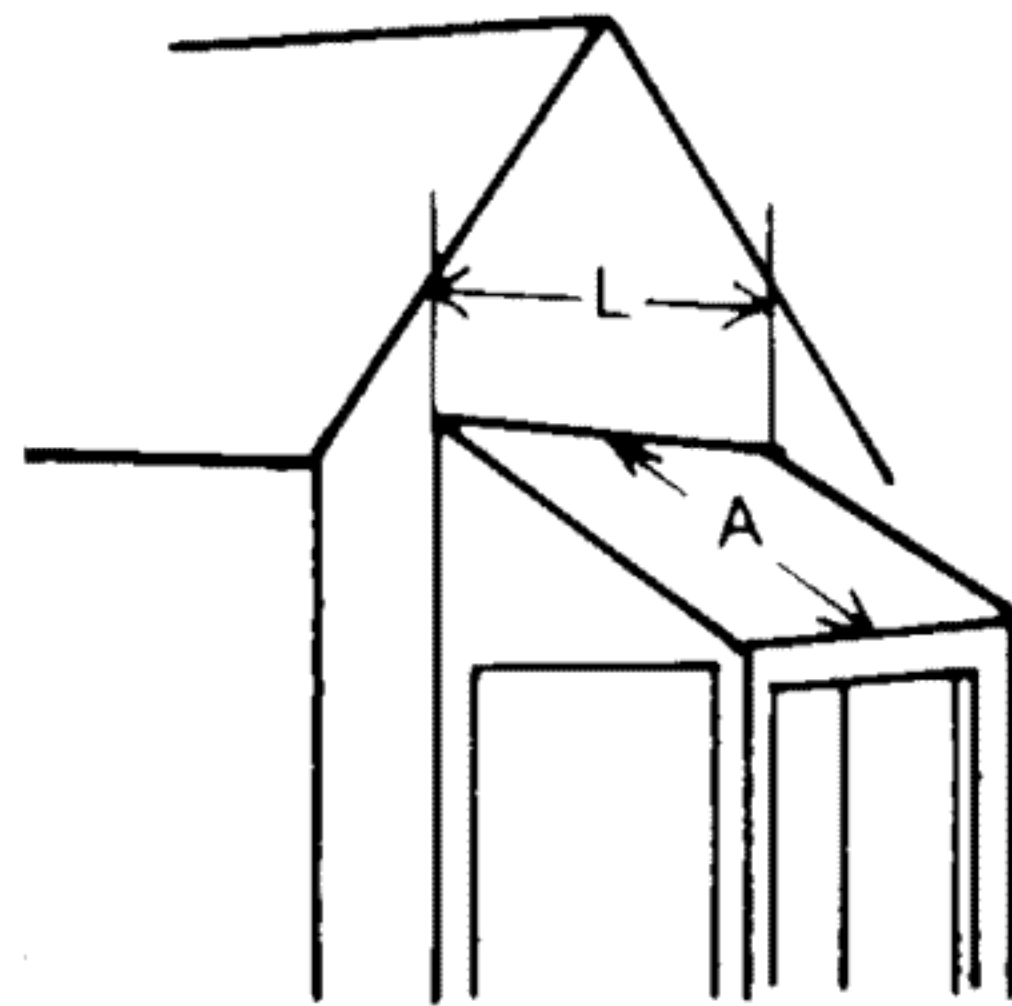
Hip Roof  
Rectangular Bldg.  
Area =  $2 \times A \times L$



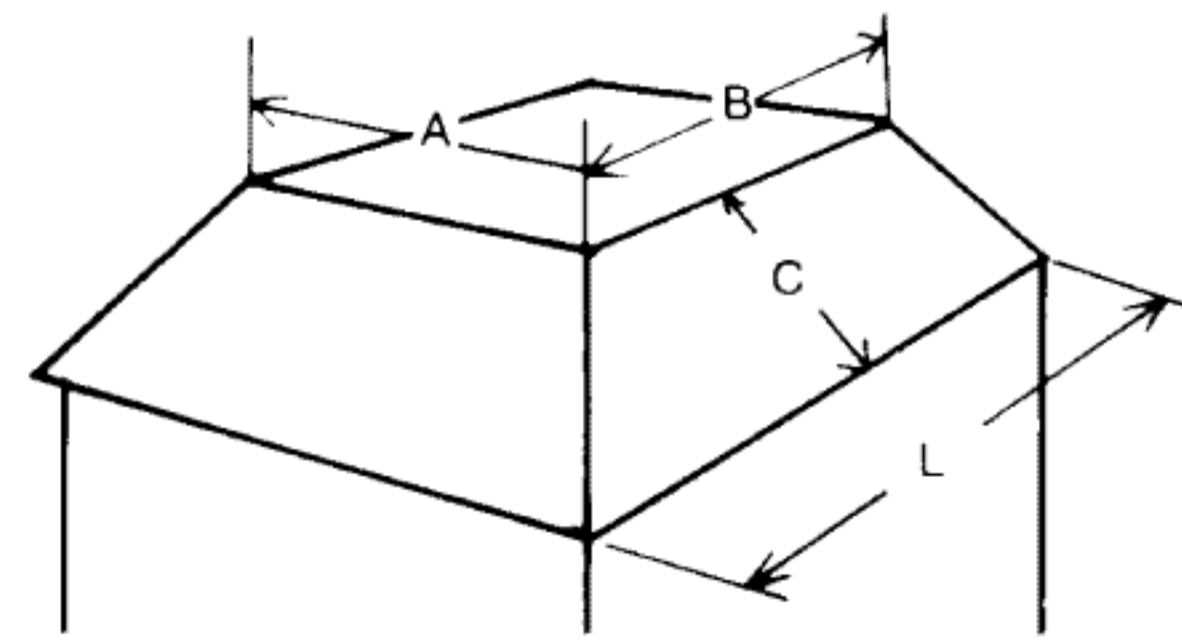
Gable Roof  
Area =  $2 \times A \times L$



Hip Roof  
Square Bldg.  
Area =  $2 \times A \times L$  or  
 $2 \times A' \times L'$

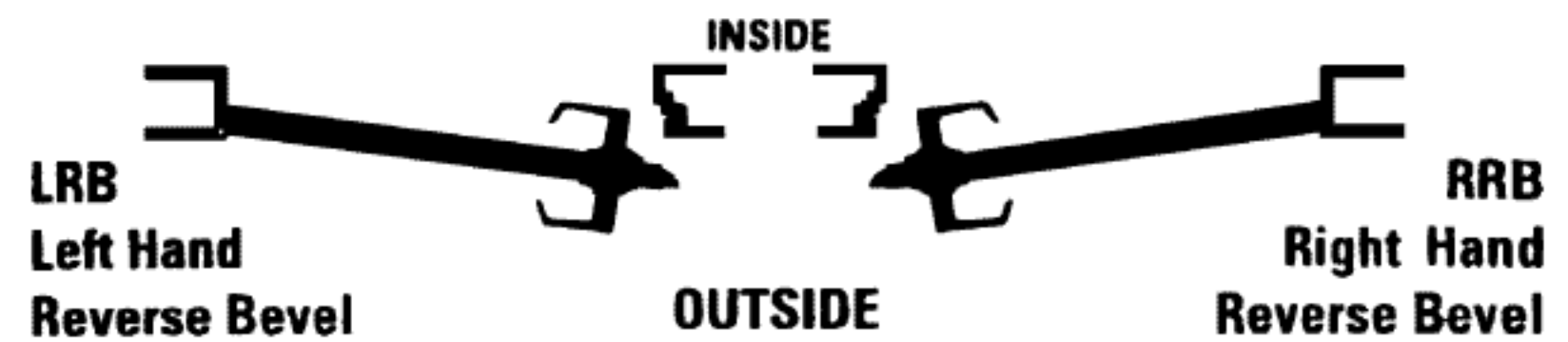
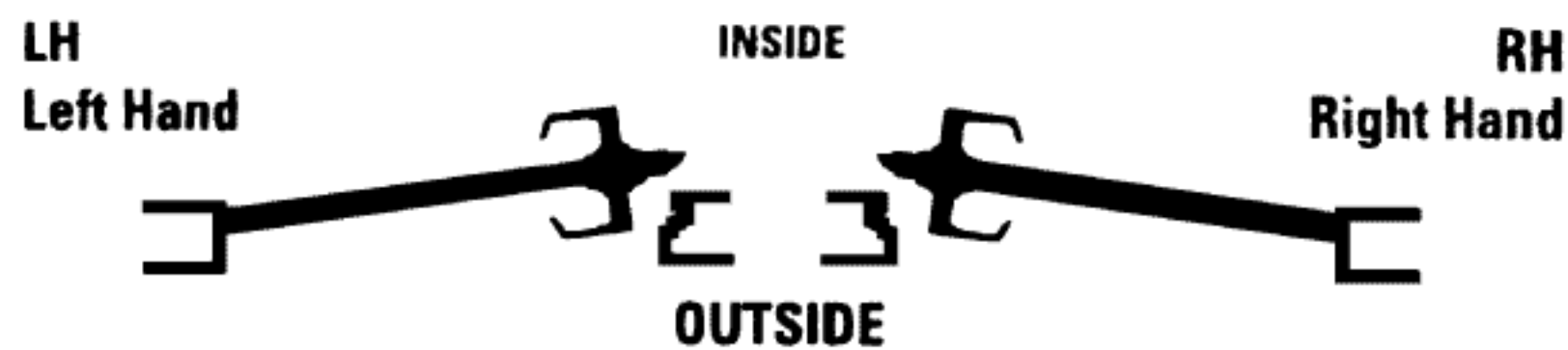


Shed Roof  
Area =  $A \times L$



Mansard Roof  
Area =  
 $(2 \times A \times C) + (2 \times C \times L) + (A \times B)$

## DOOR HANDING & HARDWARE



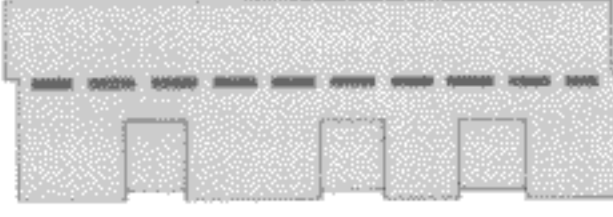
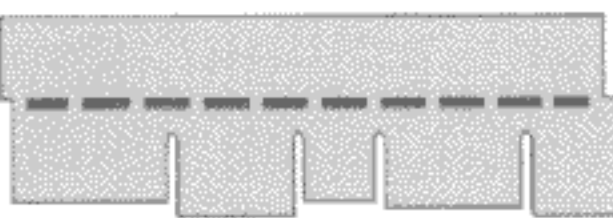
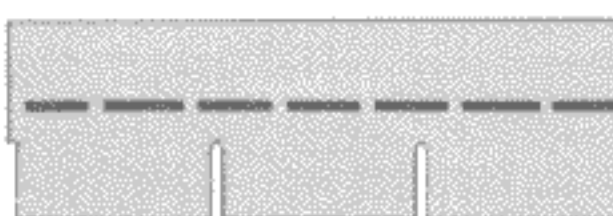
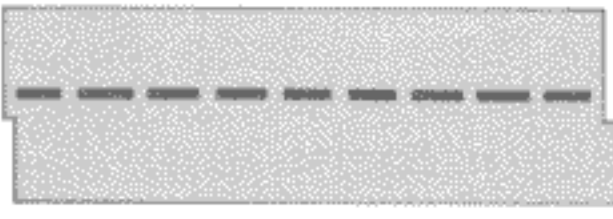
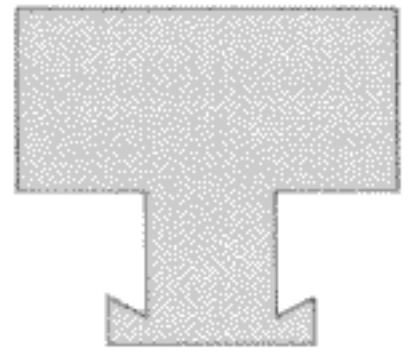
U.S. STANDARD FINISHES	DESCRIPTION OF FINISH	BHMA
1B	Bright Black	601
2G	Plain Zinc Plate	603
3	Bright Brass	605
4	Satin Brass	606
5	Satin Brass, Oxidized	609
7	Bright Brass, Nickel Oxidized & Highlighted	610
9	Bright Bronze	611
9A	Bright Bronze, No Lacquer	N/A
10	Satin Bronze	612
10A	Antique Bronze, Lacquered	641
10B	Antique Bronze, Oiled	613
14	Bright Nickel	618

U.S. STANDARD FINISHES	DESCRIPTION OF FINISH	BHMA
14A	Bright Nickel, Oxidized & Highlighted	N/A
14B	Black Nickel, Bright	N/A
15	Satin Nickel	619
15A	Satin Nickel, Nickel Oxidized & Highlighted	620
17A	Black Nickel, Dull	621
20	Statuary Bronze, Light	623
20A	Statuary Bronze, Dark	624
26	Bright Chromium Plated	625
26D	Satin Chromium Plated	626
32	Stainless Steel Metal, Bright	629
32D	Stainless Steel Metal, Satin	630
USP	Prime Coat	600

### Nailing Schedule For Roofing

TYPE OF ROOFING	SHINGLES PER SQUARE	LENGTH OF NAIL	NAILS PER SQUARE	POUNDS PER SQUARE (APPROXIMATE)		LABOR HOURS PER SQUARE
				12 GA. BY 7/16" HEAD	11 GA. BY 7/16" HEAD	
Roll Roofing on new deck	-	1"	252	.73	1.12	1
Roll Roofing over old roofing	-	1¾"	252	1.43	1.78	1¼
19" Selvage over old shingles	-	1¼"	181	1.83	1.07	1
3 Tab Sq. Butt on new deck	80	1¼"	336	1.22	1.44	1½
3 Tab Sq. Butt Re-roofing	80	1¾"	504	2.38	3.01	1¾

### Shingles

PRODUCT	CONFIGURATION	PER SQUARE			SIZE		EXPOSURE	UNDERWRITERS LABORATORIES LISTING
		APPROXIMATE SHIPPING WEIGHT	SHINGLES	BUNDLES	WIDTH	LENGTH		
Self-sealing random-tab strip shingle  Multi-thickness	Various edge, surface texture and application treatments	240# to 360#	64 to 90	3, 4 or 5	11½" to 14"	36" to 40"	4" to 6"	A or C -Many wind resistant
Self-sealing random-tab strip shingle  Single-thickness	Various edge, surface texture and application treatments	240# to 300#	65 to 80	3 or 4	12" to 13¼"	36" to 40"	5" to 5⅝"	A or C -Many wind resistant
Self-sealing square-tab strip shingle  Three-tab	Two-tab or Four-tab	215# to 325#	65 to 80	3 or 4	12" to 13¼"	36" to 40"	5" to 5⅝"	A or C -All wind resistant
	Three-tab	215# to 300#	65 to 80	3 or 4	12" to 13¼"	36" to 40"	5" to 5⅝"	
Self-sealing square-tab strip shingle  No-cutout	Various edge, surface texture treatments	215# to 290#	65 to 81	3 or 4	12" to 13¼"	36" to 40"	5" to 5⅝"	A or C -All wind resistant
Individual interlocking shingle  Basic design	Several design variations	180# to 250#	72 to 120	3 or 4	18" to 22¼"	20" to 22½"	-	A or C -Many wind resistant