

ATAS International, Inc.

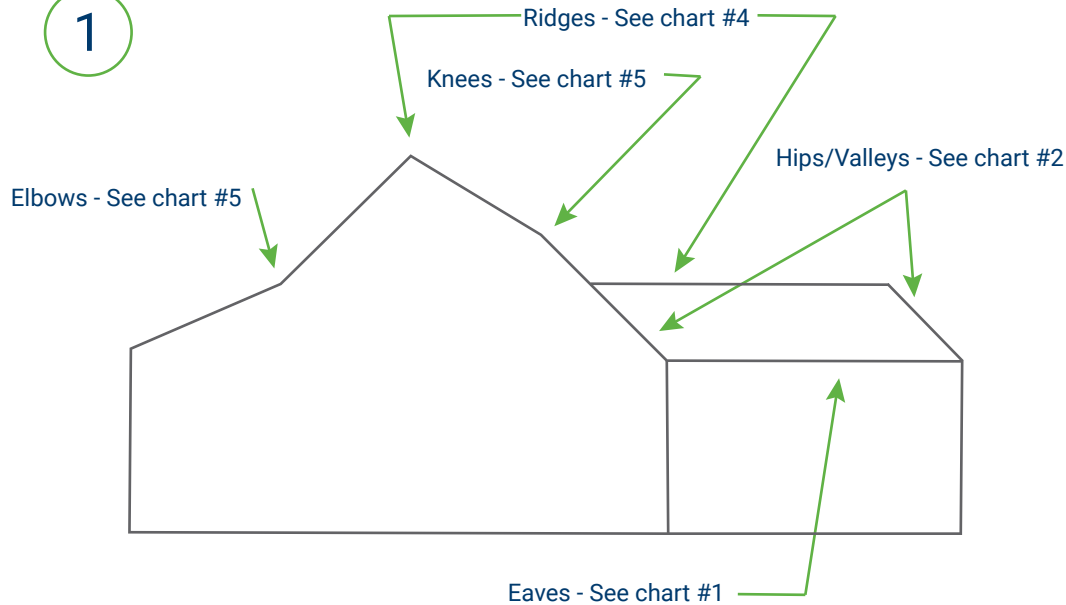
Sustainable Building Envelope Technology

SLOPES & ANGLES

**A COURTESY TO THE ROOFING INDUSTRY:
CHARTS FOR PLANNING**

ILLUSTRATIONS

1



The attached charts are provided as a courtesy of ATAS International, Inc. for customer use.

The illustration to the left, show you which chart to use in regards to a particular roof area closure problem.

1. When using any particular chart, just note the roof slopes and/or pitches being utilized and follow same on the chart to find the forming angle of the trims involved.

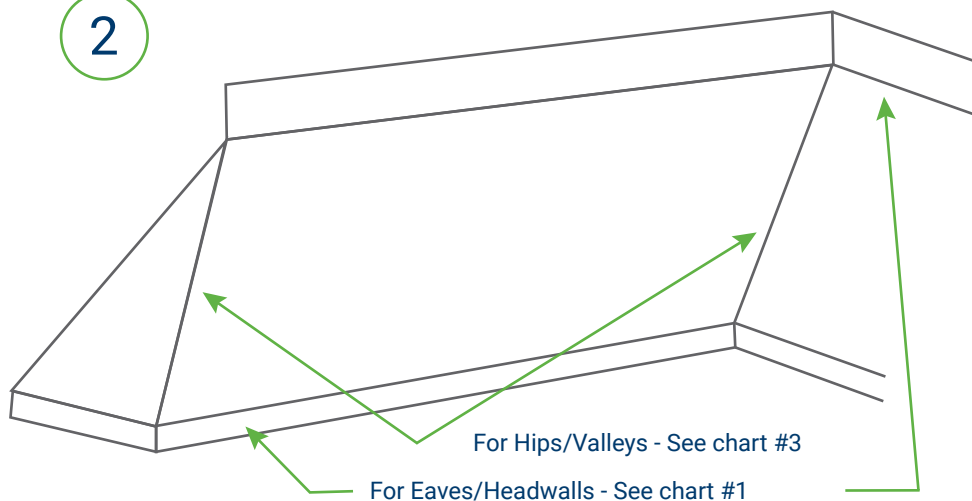
On the first illustration to the left, let's assume that the slopes involved at the ridge are 12/12 meeting an 11/12. You would, as indicated, go to chart #4 and then follow the 12/12 pitch on either the vertical or horizontal listing and follow that line until it intersects with the 11/12 pitch line. In this case you will notice that the ridge cap will be formed to a 92 included angle.

To further illustrate, the elbow transition on the left side let's assume has the above 11/12 pitch roof meeting a 4/12 slope roof coming from the eave - in this case you refer to chart #5 and following the two involved pitches slope to find that the transition trim should be formed to an included angle of 156.

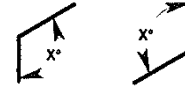
All of the attached charts work the same way and should ease your planning problems in regard to forming properly angled closures for your structure.

2. The second illustration to the left shows a mansard or canopy situation where the slopes/pitches may be greater than the norm. (12/12).

2



EAVE/HEAD (BOTH VERTICAL) TO SLOPE



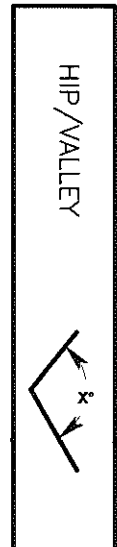
SLOPE AND/OR ANGLE	INCLUDED ANGLE
1/12 SLOPE	95°
2/12 SLOPE	99°
3/12 SLOPE	104°
4/12 SLOPE	108°
5/12 SLOPE	113°
6/12 SLOPE	117°
7/12 SLOPE	120°
8/12 SLOPE	124°
9/12 SLOPE	127°
10/12 SLOPE	130°
11/12 SLOPE	133°
12/12 SLOPE	135°
50° SLOPE	140°
55° SLOPE	145°
60° SLOPE	150°
65° SLOPE	155°
70° SLOPE	160°
75° SLOPE	165°
80° SLOPE	170°
85° SLOPE	175°

EAVE/HEADWALL (BOTH VERTICAL) FORMING ANGLE CHART





















TO FIND HIP AND/OR VALLEY INCLUDED ANGLE CROSS PITCH TO PITCH			PITCH											
PITCH	DEGREE	FACTOR	1	2	3	4	5	6	7	8	9	10	11	12
1	4.7636417° OR 4°-45'-49"	1.003466 X FLAT AREA OR RUN	173°	170°	166°	163°	159°	156°	152°	149°	145°	142°	138°	135°
2	9.4623222° OR 9°-27'-45"	1.013794 X FLAT AREA OR RUN	170°	168°	163°	160°	156°	152°	150°	148°	143°	140°	137°	134°
3	14.036243° OR 14°-02'-10"	1.030776 X FLAT AREA OR RUN	166°	163°	160°	157°	153°	151°	148°	145°	141°	138°	135°	133°
4	18.434949° OR 18°-26'-06"	1.054093 X FLAT AREA OR RUN	163°	160°	157°	154°	151°	148°	145°	143°	139°	137°	134°	131°
5	22.619865° OR 22°-37'-12"	1.083333 X FLAT AREA OR RUN	159	156	153	151	148	145	143°	140°	138°	135°	133°	130°
6	26.585051° OR 26°-33'-54"	1.118034 X FLAT AREA OR RUN	156	152	150	148	145	143	141°	139°	136°	134°	131°	129°
7	30.256437° OR 30°-15'-23"	1.157704 X FLAT AREA OR RUN	152	150	148	145	143	141	139°	137°	135°	131°	129°	128°
8	33.690068° OR 33°-41'-24"	1.201850 X FLAT AREA OR RUN	149	147	145	143	140	139	137°	135°	132°	130°	128°	126°
9	36.869898° OR 36°-52'-12"	1.250000 X FLAT AREA OR RUN	145°	143°	141°	139°	138°	136°	135°	132°	130°	129°	126°	125°
10	39.805571° OR 39°-48'-20"	1.301708 X FLAT AREA OR RUN	142°	140°	138°	137°	135°	134°	131°	130°	128°	126°	125°	123°
11	42.510447° OR 42°-30'-38"	1.356568 X FLAT AREA OR RUN	138°	137°	135°	134°	133°	131°	129°	128°	126°	125°	123°	121°
12	45.000000° OR 45°-00'-00"	1.414214 X FLAT AREA OR RUN	135°	134°	133°	131°	130°	129°	128°	126°	125°	123°	121°	120°

HIP AND/OR VALLEY TRUE FORMING ANGLE CHART

CHART #2



MANSARD TYPE HIP/VALLEY TRUE FORMING ANGLE CHART

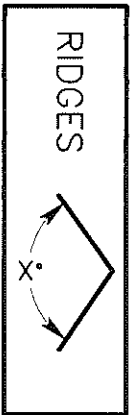
TO FIND HIP/VALLEY INCLUDED ANGLE BETWEEN TWO ANGLE ROOFS JUST CROSS PITCH TO PITCH ON CHART.			PITCH	12	50°	55°	60°	65°	70°	75°	80°	85°	90°
PITCH	SLOPE	FACTOR											
	12/12	1.414214		120°	117°	114°	111°	107°	104°	101°	97	94	90° GABL
	14.30/12	1.55572		117°	114°	112°	108°	105°	102°	99°	96	93	90° GABL
	17.14/12	1.74345		114°	112°	109°	106°	103°	101°	98°	95	93	90° GABL
	20.78/12	2.00000		111°	108°	106°	104°	102°	100°	96°	94	93	90° GABL
	25.73/12	2.36620		107°	105°	103°	102°	100°	98°	96°	94	92	90° GABL
	32.97/12	2.92380		104°	102°	101°	100°	98°	97°	95°	93	92	90° GABL
	44.78/12	3.86370		101°	99°	98°	96°	96°	95°	94°	93	91	90° GABL
	68.06/12	5.75877		97°	96°	95°	94°	94°	93°	93°	92°	91°	90° GABL
	137.06/12	11.47371		94°	93°	93°	93°	92°	92°	91°	91°	90°	90° GABL
	INFINITY	INFINITY		90° GABL	90° GABL	90° GABL	90° GABL	90° GABL	90° GABL	90° GABL	90° GABL	90° GABL	90°



TO FIND RIDGE INCLUDED ANGLE: CROSS PITCH TO PITCH			PITCH											
PITCH	DEGREE	FACTOR	1	2	3	4	5	6	7	8	9	10	11	12
1	4.7636417° OR 4'-45"-49"	1.003466 X FLAT AREA OR RUN	170°	166°	161°	157°	153°	149°	145°	142°	138°	135°	133°	130°
2	9.4623222° OR 9'-27"-45"	1.013794 X FLAT AREA OR RUN	166°	161°	157°	152°	148°	144°	140°	137°	134°	131°	128°	126°
3	14.036243° OR 14'-02"-10"	1.030776 X FLAT AREA OR RUN	161°	157°	152°	148°	143°	139°	136°	132°	129°	126°	123°	121°
4	18.434949° OR 18'-26"-06"	1.054093 X FLAT AREA OR RUN	157°	152°	148°	143°	139°	135°	131°	128°	125°	122°	119°	117°
5	22.619865° OR 22'-37"-12"	1.083333 X FLAT AREA OR RUN	153°	148°	143°	139°	135°	131°	127°	124°	121°	118°	115°	112°
6	26.565051° OR 26'-33"-54"	1.118034 X FLAT AREA OR RUN	149°	144°	139°	135°	131°	127°	123°	120°	117°	114°	111°	108°
7	30.256437° OR 30'-15"-23"	1.157704 X FLAT AREA OR RUN	145°	140°	136°	131°	127°	123°	119°	116°	113°	110°	107°	105°
8	33.690068° OR 33'-41"-24"	1.201850 X FLAT AREA OR RUN	142°	137°	132°	128°	124°	120°	116°	113°	109°	107°	104°	101°
9	36.869898° OR 36'-52"-12"	1.250000 X FLAT AREA OR RUN	138°	134°	129°	125°	121°	117°	113°	109°	106°	103°	101°	98°
10	39.805571° OR 39'-48"-20"	1.301708 X FLAT AREA OR RUN	135°	131°	126°	122°	118°	114°	110°	107°	103°	100°	98°	95°
11	42.510447° OR 42'-30"-38"	1.356568 X FLAT AREA OR RUN	133°	128°	123°	119°	115°	111°	107°	104°	101°	98°	95°	92°
12	45.000000° OR 45'-00"-00"	1.414214 X FLAT AREA OR RUN	130°	126°	121°	117°	112°	108°	105°	101°	98°	95°	92°	90°

RIDGE TRUE FORMING ANGLE CHART

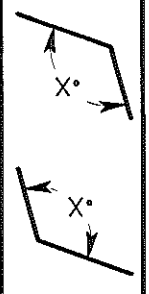
CHART #4



TRANSITION (KNEE AND/OR ELBOW TYPE) TRUE FORMING ANGLE CHART

TO FIND TRANSITIONS INCLUDED ANGLE BETWEEN TWO SLOPED ROOFS JUST CROSS PITCH TO PITCH ON CHART.			PITCH											
PITCH	DEGREE	FACTOR	1	2	3	4	5	6	7	8	9	10	11	12
1	4.7636417° OR 4°-45'-49"	1.003466 X FLAT AREA OR RUN	N/A	175°	171°	166°	162°	158°	155°	151°	148°	145°	142°	140°
2	9.4623222° OR 9°-27'-45"	1.013794 X FLAT AREA OR RUN	175°	N/A	175°	171°	167°	163°	159°	156°	153°	150°	147°	145°
3	14.036243° OR 14°-02'-10"	1.030776 X FLAT AREA OR RUN	171°	175°	N/A	176°	171°	167°	164°	160°	157°	154°	152°	149°
4	18.434949° OR 18°-26'-06"	1.054093 X FLAT AREA OR RUN	166°	171°	176°	N/A	176°	172°	168°	165°	162°	159°	156°	153°
5	22.619865° OR 22°-37'-12"	1.083333 X FLAT AREA OR RUN	162°	167°	171°	176°	N/A	176°	172°	169°	166°	163°	160°	158°
6	26.565051° OR 26°-33'-54"	1.118034 X FLAT AREA OR RUN	158°	163°	167°	172°	176°	N/A	176°	173°	170°	167°	164°	162°
7	30.256437° OR 30°-15'-23"	1.157704 X FLAT AREA OR RUN	155°	159°	164°	169°	172°	176°	N/A	177°	173°	170°	168°	165°
8	33.690068° OR 33°-41'-24"	1.201850 X FLAT AREA OR RUN	151°	156°	160°	165°	169°	173°	177°	N/A	177°	174°	171°	169°
9	36.869898° OR 36°-52'-12"	1.250000 X FLAT AREA OR RUN	148°	153°	157°	162°	166°	170°	173°	177°	N/A	177°	174°	172°
10	39.805571° OR 39°-48'-20"	1.301708 X FLAT AREA OR RUN	145°	150°	154°	159°	163°	167°	170°	174°	177°	N/A	177°	175°
11	42.510447° OR 42°-30'-38"	1.356568 X FLAT AREA OR RUN	142°	147°	152°	156°	160°	164°	168°	171°	174°	177°	N/A	178°
12	45.000000° OR 45°-00'-00"	1.414214 X FLAT AREA OR RUN	140°	145°	149°	153°	158°	162°	165°	169°	172°	175°	178°	N/A

TRANSITIONS (KNEE AND/OR ELBOW)





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Sustainable Building Envelope Technology

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This belongs to: _____

