

Residential System Sizing Calculation

Summary

Horton Residence
Lake City, FL 32024-

Project Title:
Seth Heitzman - Hortons

Code Only
Professional Version
Climate: North

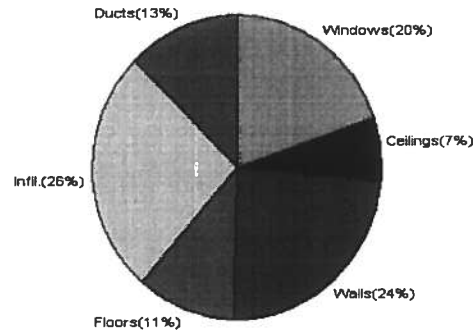
8/24/2007

Location for weather data: Gainesville - Defaults: Latitude(29) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(54gr.)			
Winter design temperature	33 F	Summer design temperature	92 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	37 F	Summer temperature difference	17 F
Total heating load calculation	6488 Btuh	Total cooling load calculation	8801 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	107.9 7000	Sensible (SHR = 0.75)	79.8 5250
Heat Pump + Auxiliary(0.0kW)	107.9 7000	Latent	78.8 1750
		Total (Electric Heat Pump)	79.5 7000

WINTER CALCULATIONS

Winter Heating Load (for 385 sqft)

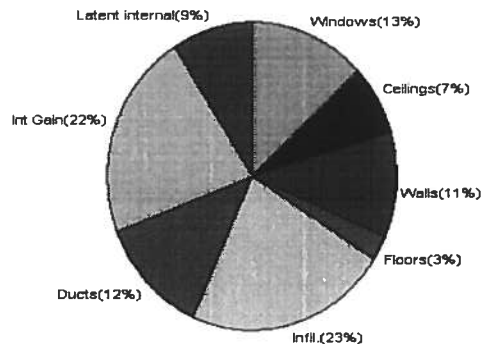
Load component		Load	
Window total	40 sqft	1288	Btuh
Wall total	472 sqft	1550	Btuh
Door total	0 sqft	0	Btuh
Ceiling total	385 sqft	454	Btuh
Floor total	385 sqft	714	Btuh
Infiltration	41 cfm	1663	Btuh
Duct loss		819	Btuh
Subtotal		6488	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		6488	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 385 sqft)

Load component		Load	
Window total	40 sqft	1158	Btuh
Wall total	472 sqft	985	Btuh
Door total	0 sqft	0	Btuh
Ceiling total	385 sqft	638	Btuh
Floor total		232	Btuh
Infiltration	36 cfm	669	Btuh
Internal gain		1920	Btuh
Duct gain		979	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Total sensible gain		6580	Btuh
Latent gain(ducts)		108	Btuh
Latent gain(infiltration)		1313	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		800	Btuh
Total latent gain		2221	Btuh
TOTAL HEAT GAIN		8801	Btuh



Version 8
For Florida residences only

EnergyGauge® System Sizing

PREPARED BY: *[Signature]*

DATE: 8-24-07

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Horton Residence

Project Title:
Seth Heitzman - Hortons

Code Only
Professional Version
Climate: North

Lake City, FL 32024-

Reference City: Gainesville (Defaults) Winter Temperature Difference: 37.0 F

8/24/2007

Component Loads for Whole House

Window	Panes/SHGC/Frame/U	Orientation	Area(sqft)	X	HTM=	Load
1	2, Clear, Metal, 0.87	N	40.0		32.2	1288 Btuh
	Window Total		40(sqft)			1288 Btuh
Walls	Type	R-Value	Area	X	HTM=	Load
1	Frame - Wood - Ext(0.09)	13.0	472		3.3	1550 Btuh
	Wall Total		472			1550 Btuh
Ceilings	Type/Color/Surface	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shin	30.0	385		1.2	454 Btuh
	Ceiling Total		385			454Btuh
Floors	Type	R-Value	Size	X	HTM=	Load
1	Raised Wood - Adj	19	385.0 sqft		1.9	714 Btuh
	Floor Total		385			714 Btuh
Envelope Subtotal:						4006 Btuh
Infiltration	Type	ACH X	Volume(cuft)	walls(sqft)	CFM=	Load
	Natural	0.80	3080	472	41.1	1663 Btuh
Ductload	(DLM of 0.144)					819 Btuh
All Zones	Sensible Subtotal All Zones					6488 Btuh

WHOLE HOUSE TOTALS

	Subtotal Sensible	6488 Btuh
	Ventilation Sensible	0 Btuh
	Total Btuh Loss	6488 Btuh

EQUIPMENT

1. Electric Heat Pump	#	7000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Horton Residence

Project Title:
Seth Heitzman - Hortons

Code Only
Professional Version
Climate: North

Lake City, FL 32024-

Key: Window types (SHGC - Shading coefficient of glass as SHGC numerical value or as clear or tint)
(Frame types - metal, wood or insulated metal)
(U - Window U-Factor or 'DEF' for default)
(HTM - ManualJ Heat Transfer Multiplier)

Key: Floor size (perimeter(p) for slab-on-grade or area for all other floor types)



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System Sizing Calculations - Winter

Residential Load - Room by Room Component Details

Horton Residence

Project Title:
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Code Only
Professional Version
Climate: North

Lake City, FL 32024-

Reference City: Gainesville (Defaults) Winter Temperature Difference: 37.0 F

8/24/2007

Component Loads for Zone #1: Main

Window	Panes/SHGC/Frame/U	Orientation	Area(sqft) X	HTM=	Load
1	2, Clear, Metal, 0.87	N	40.0	32.2	1288 Btuh
	Window Total		40(sqft)		1288 Btuh
Walls	Type	R-Value	Area X	HTM=	Load
1	Frame - Wood - Ext(0.09)	13.0	472	3.3	1550 Btuh
	Wall Total		472		1550 Btuh
Ceilings	Type/Color/Surface	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shin	30.0	385	1.2	454 Btuh
	Ceiling Total		385		454Btuh
Floors	Type	R-Value	Size X	HTM=	Load
1	Raised Wood - Adj	19	385.0 sqft	1.9	714 Btuh
	Floor Total		385		714 Btuh
	Zone Envelope Subtotal:				4006 Btuh
Infiltration	Type	ACH X	Volume(cuft)	walls(sqft)	CFM=
	Natural	0.80	3080	472	41.1
					1663 Btuh
Ductload	Pro. leak free, Supply(R6.0-Attic), Return(R6.0-Attic) (DLM of 0.144)				819 Btuh
Zone #1	Sensible Zone Subtotal				6488 Btuh

WHOLE HOUSE TOTALS

	Subtotal Sensible	6488 Btuh
	Ventilation Sensible	0 Btuh
	Total Btuh Loss	6488 Btuh

EQUIPMENT

1. Electric Heat Pump	#	7000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

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Lake City, FL 32024-

Key: Window types (SHGC - Shading coefficient of glass as SHGC numerical value or as clear or tint)
(Frame types - metal, wood or insulated metal)
(U - Window U-Factor or 'DEF' for default)
(HTM - ManualJ Heat Transfer Multiplier)

Key: Floor size (perimeter(p) for slab-on-grade or area for all other floor types)



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System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Horton Residence

Project Title:

Code Only

Lake City, FL 32024-

Seth Heitzman - Hortons

Professional Version

Climate: North

Reference City: Gainesville (Defaults)

Summer Temperature Difference: 17.0 F

8/24/2007

Component Loads for Whole House

Window	Type*		Overhang		Window Area(sqft)			HTM		Load	
	Pn/SHGC/U/InSh/ExSh/IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
1	2, Clear, 0.87, None,N,N	N	1.5ft	8ft.	40.0	0.0	40.0	29	29	1158	Btuh
	Window Total				40 (sqft)					1158	Btuh
Walls	Type		R-Value/U-Value		Area(sqft)			HTM		Load	
	Frame - Wood - Ext		13.0/0.09		472.0			2.1		985	Btuh
	Wall Total				472 (sqft)					985	Btuh
Ceilings	Type/Color/Surface		R-Value		Area(sqft)			HTM		Load	
	Vented Attic/DarkShingle		30.0		385.0			1.7		638	Btuh
	Ceiling Total				385 (sqft)					638	Btuh
Floors	Type		R-Value		Size			HTM		Load	
	Raised Wood - Adj		19.0		385 (sqft)			0.6		232	Btuh
	Floor Total				385.0 (sqft)					232	Btuh
	Envelope Subtotal:									3012 Btuh	
Infiltration	Type		ACH		Volume(cuft)			wall area(sqft)		CFM=	
	SensibleNatural		0.70		3080			472		41.1	
Internal gain			Occupants		Btuh/occupant			Appliance		Load	
			4		X 230 +			1000		1920 Btuh	
	Sensible Envelope Load:									5601 Btuh	
Duct load	(DGM of 0.175)									979 Btuh	
	Sensible Load All Zones									6580 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

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Professional Version
Climate: North

Lake City, FL 32024-

8/24/2007

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	5601 Btuh
	Sensible Duct Load	979 Btuh
	Total Sensible Zone Loads	6580 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	6580 Btuh
	Latent infiltration gain (for 54 gr. humidity difference)	1313 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	108 Btuh
	Latent occupant gain (4 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2221 Btuh
	TOTAL GAIN	8801 Btuh

EQUIPMENT

1. Central Unit	#	7000 Btuh
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*Key: Window types (Pn - Number of panes of glass)

(SHGC - Shading coefficient of glass as SHGC numerical value or as clear or tint)

(U - Window U-Factor or 'DEF' for default)

(InSh - Interior shading device: none(N), Blinds(B), Draperies(D) or Roller Shades(R))

(ExSh - Exterior shading device: none(N) or numerical value)

(BS - Insect screen: none(N), Full(F) or Half(H))

(Ornt - compass orientation)



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System Sizing Calculations - Summer

Residential Load - Room by Room Component Details

Horton Residence

Project Title:

Code Only

Seth Heitzman - Hortons

Professional Version

Lake City, FL 32024-

Climate: North

Reference City: Gainesville (Defaults)

Summer Temperature Difference: 17.0 F

8/24/2007

Component Loads for Zone #1: Main

Window	Type*		Overhang		Window Area(sqft)			HTM		Load	
	Pn/SHGC/U/InSh/ExSh/IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
1	2, Clear, 0.87, None,N,N	N	1.5ft	8ft.	40.0	0.0	40.0	29	29	1158	Btuh
	Window Total				40 (sqft)					1158	Btuh
Walls	Type		R-Value/U-Value		Area(sqft)			HTM		Load	
	Frame - Wood - Ext		13.0/0.09		472.0			2.1		985	Btuh
	Wall Total				472 (sqft)					985	Btuh
Ceilings	Type/Color/Surface		R-Value		Area(sqft)			HTM		Load	
	Vented Attic/DarkShingle		30.0		385.0			1.7		638	Btuh
	Ceiling Total				385 (sqft)					638	Btuh
Floors	Type		R-Value		Size			HTM		Load	
	Raised Wood - Adj		19.0		385 (sqft)			0.6		232	Btuh
	Floor Total				385.0 (sqft)					232	Btuh
	Zone Envelope Subtotal:									3012 Btuh	
Infiltration	Type		ACH		Volume(cuft)			wall area(sqft)		CFM=	
	SensibleNatural		0.70		3080			472		35.9	
Internal gain			Occupants		Btuh/occupant			Appliance		Load	
			4		X 230			+		1000	1920 Btuh
	Sensible Envelope Load:									5601 Btuh	
Duct load	Prop. leak free, Supply(R6.0-Attic), Return(R6.0-Attic)							(DGM of 0.175)		979 Btuh	
	Sensible Zone Load									6580 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

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Professional Version
Climate: North

Lake City, FL 32024-

8/24/2007

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	5601 Btuh
	Sensible Duct Load	979 Btuh
	Total Sensible Zone Loads	6580 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	6580 Btuh
	Latent infiltration gain (for 54 gr. humidity difference)	1313 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	108 Btuh
	Latent occupant gain (4 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2221 Btuh
	TOTAL GAIN	8801 Btuh

EQUIPMENT

1. Central Unit	#	7000 Btuh
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*Key: Window types (Pn - Number of panes of glass)

(SHGC - Shading coefficient of glass as SHGC numerical value or as clear or tint)

(U - Window U-Factor or 'DEF' for default)

(InSh - Interior shading device: none(N), Blinds(B), Draperies(D) or Roller Shades(R))

(ExSh - Exterior shading device: none(N) or numerical value)

(BS - Insect screen: none(N), Full(F) or Half(H))

(Ornt - compass orientation)



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Residential Window Diversity

MidSummer

Horton Residence
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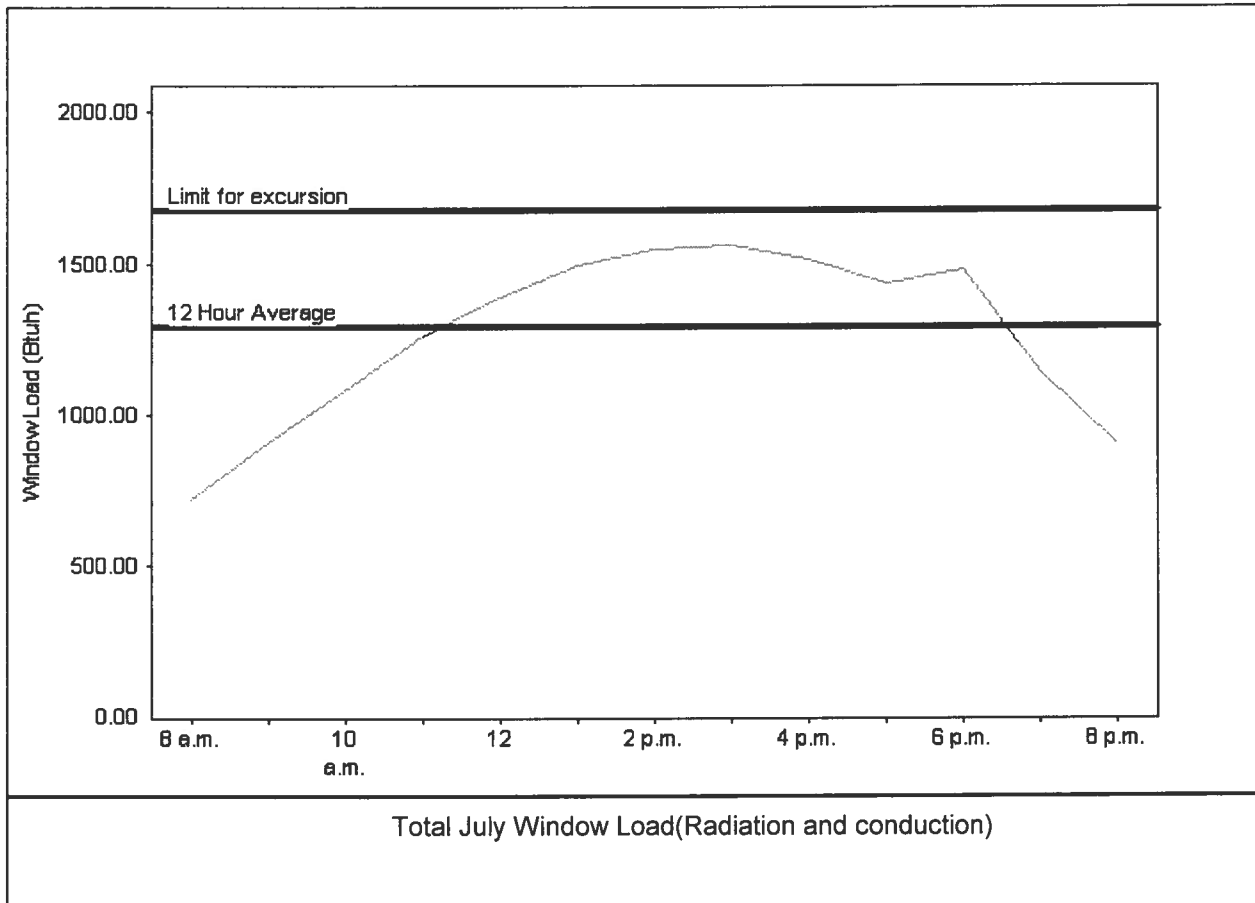
Code Only
Professional Version
Climate: North

8/24/2007

Weather data for: Gainesville - Defaults

Summer design temperature	92 F	Average window load for July	1291 Btuh
Summer setpoint	75 F	Peak window load for July	1560 Btuh
Summer temperature difference	17 F	Excursion limit(130% of Ave.)	1679 Btuh
Latitude	29 North	Window excursion (July)	None

WINDOW Average and Peak Loads



The midsummer window load for this house does not exceed the window load excursion limit.
This house has adequate midsummer window diversity.

EnergyGauge® System Sizing for Florida residences only

PREPARED BY: _____

DATE: _____

EnergyGauge® FLRCPB v4.5.2



FLORIDA DEPARTMENT OF Community Affairs



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Product Approval
USER: Public User

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FL # FL5108
Application Type New
Code Version 2004
Application Status Approved
Comments
Archived ☐

Product Manufacturer
Address/Phone/Email

MI Windows and Doors
650 W Market St
Gratz, PA 17030
(717) 365-3300 ext 2101
surich@miwd.com

Authorized Signature

Steven Ulrich
surich@miwd.com

Technical Representative

Address/Phone/Email

Quality Assurance Representative

Address/Phone/Email

Window



AAMA CERTIFICATION PROGRAM



AUTHORIZATION FOR PRODUCT CERTIFICATION

MI Windows & Doors, Inc.
P.O. Box 370
Gratz, PA 17030-0370

Attn: Bill Emley

The product described below is hereby approved for listing in the next issue of the AAMA Certified Products Directory. The approval is based on successful completion of tests, and the reporting to the Administrator of the results of tests, accompanied by related drawings, by an AAMA Accredited Laboratory.

1. The listing below will be added to the next published AAMA Certified Products Directory.

SPECIFICATION		RECORD OF PRODUCT TESTED				LABEL ORDER NO.
AIA AMMADA 101/L.S. 2-87 H-RES-3862						
COMP/ NY AND PLANT LOCATION	CODE NO.	SERIES MODEL & PRODUCT DESCRIPTION	MAXIMUM SIZE TESTED		By Request	
MI Window & Doors, Inc. (Oldemar, FL) MI Window & Doors, Inc. (Brynmn, TN)	MTL-8 MTL-9	185/3165 SH (Fin) (AL)(ODD)(OG) (ASTM)	FRAME 20' x 52'	GLASS 2'10" x 27'		

2. This Certification will expire May 14, 2008 and requires validation until then by continued listing in the current AAMA Certified Products Directory.

3. Product Tested and Reported by: Architectural Testing, Inc.

Report No.: 01-50360.02

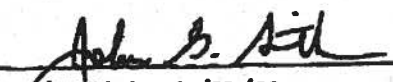
Date of Report: June 14, 2004

NOTE: PLEASE REVIEW,
AND ADVISE ALL IMMEDIATELY
IF DATA, ISSUES SHOWN, NEEDS
CORRECTION.

Date: At July 1, 2005

cc: AAMA
JGS/dt
ACP-04 (Rev. 5/03)

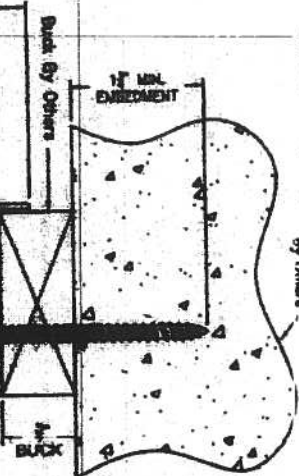
Validated for Certification:


Associated Laboratories, Inc.

Authorized for Certification:

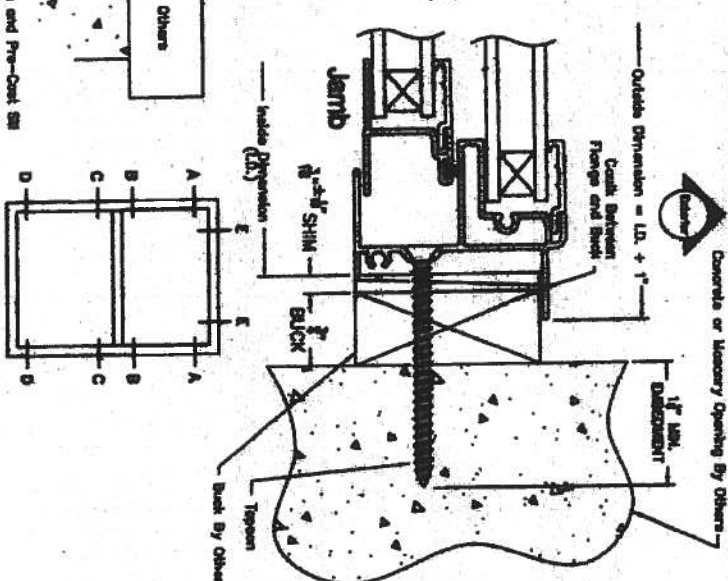
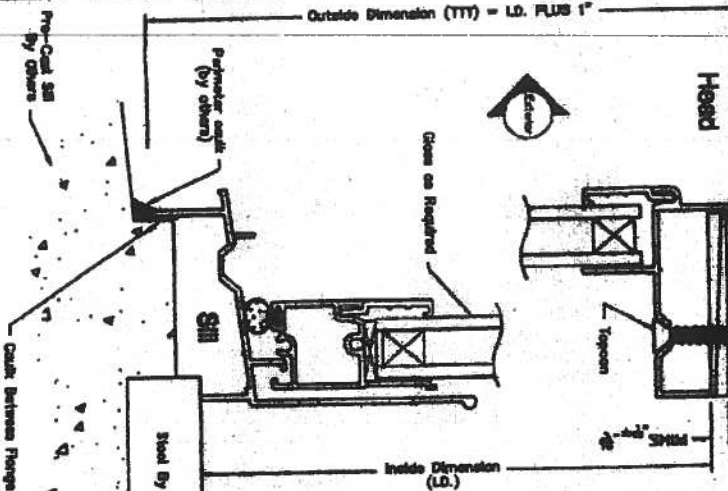

American Architectural Manufacturers Association

Concrete header (shown) or steel lintel
By Others



1. Before installation, crack back of flange, or face of buck.
2. 3/16" dia. masonry Toppcon must be of a length in hole
3. 1/4" embedment into masonry or concrete.
4. Shim as required with lead bearing shims at each installation anchor as shown.
5. All factory applied holes not designated for Toppcon anchor should be filled with #10 screws of sufficient length to provide min. 5/8" embedment into wood buck.
6. Letter designations on the Toppcon location chart indicate where anchors are to be installed using the elevation as a key.
7. If exact window size is not given, use anchor quantity for next larger window in chart.
8. For continuous head and sill units & triple, use the same fastener schedule for each unit in the main frame except ignore the intermediate joints.

ONE BY (3/4) BUCKS (SHOWN)



TWO BY (1 1/2) BUCKS

TWO BY" bucks are engineered and fastened to the masonry opening BY OTHERS.

Follow the same instructions and fastener requirements for "one by" bucks except use #10 screws of sufficient length for 1 1/4" minimum embedment into buck.

2 TAPCON LOCATION CHART

FASTENER LOCATIONS					
CHG SHEET	WINDOW ID SIZE	UP TO CRGS	DRILL 1 TO BARS	DRILL 1 TO STUDS	DRILL 1 TO STUDS
12	18 1/2 x 25	A	A	A	A
12	18 1/2 x 31 1/2	A	A	A	A
12	18 1/2 x 37 1/2	A	A	A	A
12	18 1/2 x 43 1/2	A	A	A	A
12	18 1/2 x 49 1/2	A	A	A	A
12	18 1/2 x 55 1/2	A	A	A	A
12	18 1/2 x 61 1/2	A	A	A	A
12	18 1/2 x 67 1/2	A	A	A	A
12	18 1/2 x 73 1/2	A	A	A	A
12	18 1/2 x 79 1/2	A	A	A	A
12	18 1/2 x 85 1/2	A	A	A	A
12	18 1/2 x 91 1/2	A	A	A	A
12	18 1/2 x 97 1/2	A	A	A	A
12	18 1/2 x 103 1/2	A	A	A	A
12	18 1/2 x 109 1/2	A	A	A	A
12	18 1/2 x 115 1/2	A	A	A	A
12	18 1/2 x 121 1/2	A	A	A	A
12	18 1/2 x 127 1/2	A	A	A	A
12	18 1/2 x 133 1/2	A	A	A	A
12	18 1/2 x 139 1/2	A	A	A	A
12	18 1/2 x 145 1/2	A	A	A	A
12	18 1/2 x 151 1/2	A	A	A	A
12	18 1/2 x 157 1/2	A	A	A	A
12	18 1/2 x 163 1/2	A	A	A	A
12	18 1/2 x 169 1/2	A	A	A	A
12	18 1/2 x 175 1/2	A	A	A	A
12	18 1/2 x 181 1/2	A	A	A	A
12	18 1/2 x 187 1/2	A	A	A	A
12	18 1/2 x 193 1/2	A	A	A	A
12	18 1/2 x 199 1/2	A	A	A	A
12	18 1/2 x 205 1/2	A	A	A	A
12	18 1/2 x 211 1/2	A	A	A	A
12	18 1/2 x 217 1/2	A	A	A	A
12	18 1/2 x 223 1/2	A	A	A	A
12	18 1/2 x 229 1/2	A	A	A	A
12	18 1/2 x 235 1/2	A	A	A	A
12	18 1/2 x 241 1/2	A	A	A	A
12	18 1/2 x 247 1/2	A	A	A	A
12	18 1/2 x 253 1/2	A	A	A	A
12	18 1/2 x 259 1/2	A	A	A	A
12	18 1/2 x 265 1/2	A	A	A	A
12	18 1/2 x 271 1/2	A	A	A	A
12	18 1/2 x 277 1/2	A	A	A	A
12	18 1/2 x 283 1/2	A	A	A	A
12	18 1/2 x 289 1/2	A	A	A	A
12	18 1/2 x 295 1/2	A	A	A	A
12	18 1/2 x 301 1/2	A	A	A	A
12	18 1/2 x 307 1/2	A	A	A	A
12	18 1/2 x 313 1/2	A	A	A	A
12	18 1/2 x 319 1/2	A	A	A	A
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12	18 1/2 x 361 1/2	A	A	A	A
12	18 1/2 x 367 1/2	A	A	A	A
12	18 1/2 x 373 1/2	A	A	A	A
12	18 1/2 x 379 1/2	A	A	A	A
12	18 1/2 x 385 1/2	A	A	A	A
12	18 1/2 x 391 1/2	A	A	A	A
12	18 1/2 x 397 1/2	A	A	A	A
12	18 1/2 x 403 1/2	A	A	A	A
12	18 1/2 x 409 1/2	A	A	A	A
12	18 1/2 x 415 1/2	A	A	A	A
12	18 1/2 x 421 1/2	A	A	A	A
12	18 1/2 x 427 1/2	A	A	A	A
12	18 1/2 x 433 1/2	A	A	A	A
12	18 1/2 x 439 1/2	A	A	A	A
12	18 1/2 x 445 1/2	A	A	A	A
12	18 1/2 x 451 1/2	A	A	A	A
12	18 1/2 x 457 1/2	A	A	A	A
12	18 1/2 x 463 1/2	A	A	A	A
12	18 1/2 x 469 1/2	A	A	A	A
12	18 1/2 x 475 1/2	A	A	A	A
12	18 1/2 x 481 1/2	A	A	A	A
12	18 1/2 x 487 1/2	A	A	A	A
12	18 1/2 x 493 1/2	A	A	A	A
12	18 1/2 x 499 1/2	A	A	A	A
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12	18 1/2 x 529 1/2	A	A	A	A
12	18 1/2 x 535 1/2	A	A	A	A
12	18 1/2 x 541 1/2	A	A	A	A
12	18 1/2 x 547 1/2	A	A	A	A
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12	18 1/2 x 565 1/2	A	A	A	A
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12	18 1/2 x 793 1/2	A	A	A	A
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- COMMUNITY PLANNING
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FL #
Application Type
Code Version
Application Status
Comments
Archived

Product Manufacturer
Address/Phone/Email

TAMKO Building Products, Inc.
PO Box 1404
Joplin, MO 64802
(800) 641-4691 ext 2394
fred_oconnor@tamko.com

Authorized Signature

Frederick O'Connor
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Technical Representative

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Quality Assurance Representative
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Category
Subcategory

Roofing
Asphalt Shingles

Compliance Method

Certification Mark or Listing

Certification Agency

Underwriters Laboratories Inc.

Referenced Standard and Year (of Standard)

Standard
ASTM D 3462

Year
2001

Equivalence of Product Standards
Certified By

Product Approval Method

Method 1 Option A

Date Submitted
Date Validated
Date Pending FBC Approval
Date Approved

06/09/2005
06/20/2005
06/25/2005
06/29/2005

Summary of Products

FL #	Model, Number or Name	Description
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slopes of 2:12 or greater. Not approved for use in HVHZ.

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 Tallahassee, Florida 32399-2100

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Product Approval Accepts:





**Underwriters
Laboratories Inc.**

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Tel: 1 847 271 8801

June 17, 2005

Tamko Roofing Products
Ms. Kerri Eden
P.O. Box 1404
220 W. 4th Street
Joplin, MO 64802-1404

Our Reference: R2919

This is to confirm that "Elite Glass-Seal AR", "Heritage 30 AR", "Heritage 50 AR", "Glass-Seal AR" manufactured at Tuscaloosa, AL and "Elite Glass-Seal AR", "Heritage 30 AR", "Heritage XL AR", "Heritage 50 AR" manufactured at Frederick, MD and "Heritage 30 AR", "Heritage XL AR", and "Heritage 50 AR" manufactured in Dallas, TX are UL Listed asphalt glass mat shingles and have been evaluated in accordance with ANSI/UL 790, Class A (ASTM E108), ASTM D3462, ASTM D3161 or UL 997 modified to 110 mph when secured with four nails.

Let me know if you have any further questions.

Very truly yours,

Alpesh Patel (Ext. 42522)
Engineer Project
Fire Protection Division

Reviewed by,

Randall K. Laymon (Ext. 42687)
Engineer Sr Staff
Fire Protection Division



Application Instructions for HERITAGE® VINTAGE™ AR – Phillipsburg KS LAMINATED ASPHALT SHINGLES

THESE ARE THE MANUFACTURER'S APPLICATION INSTRUCTIONS FOR THE ROOFING CONDITIONS DESCRIBED. TAMKO BUILDING PRODUCTS, INC. ASSUMES NO RESPONSIBILITY FOR LEAKS OR OTHER ROOFING DEFECTS RESULTING FROM FAILURE TO FOLLOW THE MANUFACTURER'S INSTRUCTIONS.

THIS PRODUCT IS COVERED BY A LIMITED WARRANTY, THE TERMS OF WHICH ARE PRINTED ON THE WRAPPER.

IN COLD WEATHER (BELOW 40°F), CARE MUST BE TAKEN TO AVOID DAMAGE TO THE EDGES AND CORNERS OF THE SHINGLES.

IMPORTANT: It is not necessary to remove the plastic strip from the back of the shingles.

1. ROOF DECK

These shingles are for application to roof decks capable of receiving and retaining fasteners, and to inclines of not less than 2 in. per foot. For roofs having pitches 2 in. per foot to less than 4 in. per foot, refer to special instructions titled "Low Slope Application". Shingles must be applied properly. TAMKO assumes no responsibility for leaks or defects resulting from improper application, or failure to properly prepare the surface to be roofed over.

NEW ROOF DECK CONSTRUCTION: Roof deck must be smooth, dry and free from warped surfaces. It is recommended that metal drip edges be installed at eaves and rakes.

PLYWOOD: All plywood shall be exterior grade as defined by the American Plywood Association. Plywood shall be a minimum of 3/8 in. thickness and applied in accordance with the recommendations of the American Plywood Association.

SHEATHING BOARDS: Boards shall be well-seasoned tongue-and-groove boards and not over 6 in. nominal width. Boards shall be a 1 in. nominal minimum thickness. Boards shall be properly spaced and nailed.

TAMKO does not recommend re-roofing over existing roof.

2. VENTILATION

Inadequate ventilation of attic spaces can cause accumulation of moisture in winter months and a build up of heat in the summer. These conditions can lead to:

1. Vapor Condensation
2. Buckling of shingles due to deck movement.
3. Rotting of wood members.
4. Premature failure of roof.

To insure adequate ventilation and circulation of air, place louvers of sufficient size high in the gable ends and/or install continuous ridge and soffit vents. FHA minimum property standards require one square foot of net free ventilation area to each 150 square feet of space to be vented, or one square foot per 300 square feet if a vapor barrier is installed on the warm side of the ceiling or if at least one half of the ventilation is provided near the ridge. If the ventilation openings are screened, the total area should be doubled.

IT IS PARTICULARLY IMPORTANT TO PROVIDE ADEQUATE VENTILATION.

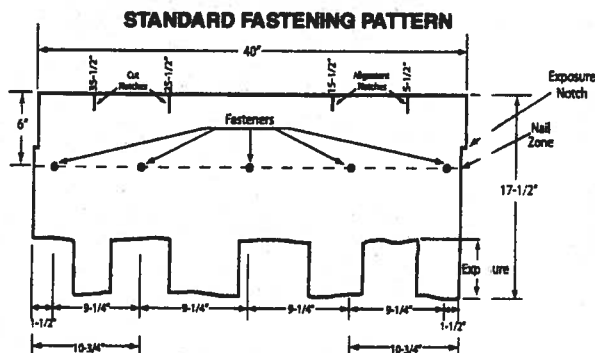
3. FASTENERS

WIND CAUTION: Extreme wind velocities can damage these shingles after application when proper sealing of the shingles does not occur. This can especially be a problem if the shingles are applied in cooler months or in areas on the roof that do not receive direct sunlight. These conditions may impede the sealing of the adhesive strips on the shingles. The inability to seal down may be compounded by prolonged cold weather conditions and/or blowing dust. In these situations, hand sealing of the shingles is recommended. Shingles must also be fastened according to the fastening instructions described below.

Correct placement of the fasteners is critical to the performance of the shingle. If the fasteners are not placed as shown in the diagram and described below, this will result in the termination of TAMKO's liabilities under the limited warranty. TAMKO will not be responsible for damage to shingles caused by winds in excess of the applicable miles per hour as stated in the limited warranty. See limited warranty for details.

FASTENING PATTERNS: Fasteners must be placed 1 in. from the top edge of the shingle located horizontally as follows:

1) Standard Fastening Pattern. (For use on decks with slopes 2 in. per foot to 21 in. per foot.) One fastener 1-1/2 in. back from each end, one 10-3/4 in. back from each end and one 20 in. from one end of the shingle for a total of 5 fasteners. (See standard fastening pattern illustrated below).



2) Mansard or Steep Slope Fastening Pattern. (For use on decks with slopes greater than 21 in. per foot.) Use standard fastening instructions with four additional nails placed 6 in. from the butt edge of the shingle making certain nails are covered by the next successive course of shingles.

(Continued)

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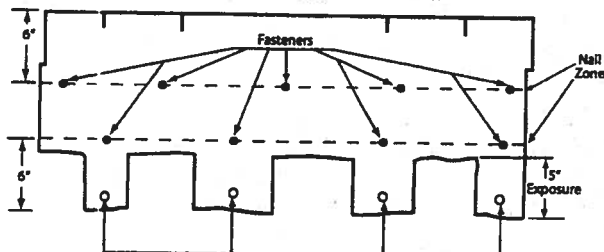


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• HERITAGE® VINTAGE™ AR – Phillipsburg KS LAMINATED ASPHALT SHINGLES

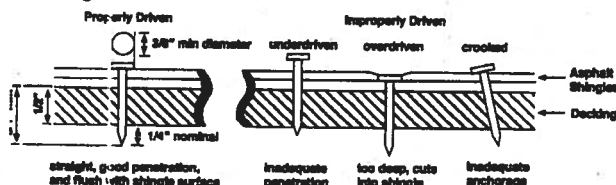
Each shingle tab must be sealed underneath with quick setting asphalt adhesive cement immediately upon installation. Spots of cement must be equivalent in size to a \$.25 piece and applied to shingles with a 5 in. exposure, use 9 fasteners per shingle.

MANSARD FASTENING PATTERN



Apply under each tab 1" diameter asphalt adhesive cement.

NAILS: TAMKO recommends the use of nails as the preferred method of application. Standard type roofing nails should be used. Nail shanks should be made of minimum 12 gauge wire, and a minimum head diameter of 3/8 in. Nails should be long enough to penetrate 3/4 in. into the roof deck. Where the deck is less than 3/4 in. thick, the nails should be long enough to penetrate completely through plywood decking and extend at least 1/8 in. through the roof deck. Drive nail head flush with the shingle surface.



4. UNDERLAYMENT

UNDERLAYMENT: An underlayment consisting of asphalt saturated felt must be applied over the entire deck before the installation of TAMKO shingles. Failure to add underlayment can cause premature failure of the shingles and leaks which are not covered by TAMKO's limited warranty. Apply the felt when the deck is dry. On roof decks 4 in. per foot and greater apply the felt parallel to the eaves lapping each course of the felt over the lower course at least 2 in. Where ends join, lap the felt 4 in. If left exposed, the underlayment felt may be adversely affected by moisture and weathering. Laying of the underlayment and the shingle application must be done together.

Products which are acceptable for use as underlayment are:

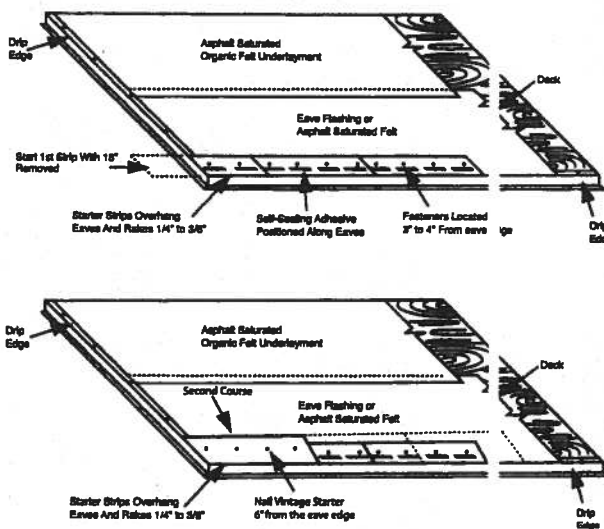
- TAMKO No. 15 Asphalt Saturated Organic Felt
- A non-perforated asphalt saturated organic felt which meets ASTM: D226, Type I or ASTM D4869, Type I
- Any TAMKO non-perforated asphalt saturated organic felt
- TAMKO TW Metal and Tile Underlayment, TW Underlayment and Moisture Guard Plus® (additional ventilation maybe required. Contact TAMKO's technical services department for more information)

In areas where ice builds up along the eaves or a back-up of water from frozen or clogged gutters is a potential problem, TAMKO's Moisture Guard Plus® waterproofing underlayment (or any specialty eaves flashing product) may be applied to eaves, rakes, ridges, valleys, around chimneys, skylights or dormers to help prevent water damage. Contact TAMKO's Technical Services Department for more information. TAMKO does not recommend the use of any substitute products as shingle underlayment.

5. APPLICATION INSTRUCTIONS

STARTER COURSE: Two starter course layers must be applied prior to application of Heritage Vintage AR Shingles.

The first starter course may consist of TAMKO Shingle Starter, three tab self-sealing type shingles or a 9 inch wide strip of mineral surface roll roofing. If three tab self-sealing shingles are used, remove the exposed tab portion and install with the factory applied adhesive adjacent to the eaves. If using three tab self-sealing shingles or shingle starter, remove 18 in. from first shingle to offset the end joints of the Vintage Starter. Attach the first starter course with approved fasteners along a line parallel to and 3 in. to 4 in. above the eave edge. The starter course should overhang both the eave and rake edge 1/4 in. to 3/8 in. Over the first starter course, install Heritage Vintage Starter AR and begin at the left rake edge with a full size shingle and continue across the roof nailing the Heritage Vintage Starter AR along a line parallel to and 6 in. from the eave edge.



Note: Do not allow Vintage Starter AR joints to be visible between shingle tabs. Cutting of the starter may be required

HERITAGE VINTAGE STARTER AR
12 1/2" x 36" 20 PIECES PER BUNDLE
60 LINEAL FT. PER BUNDLE

(Continued)

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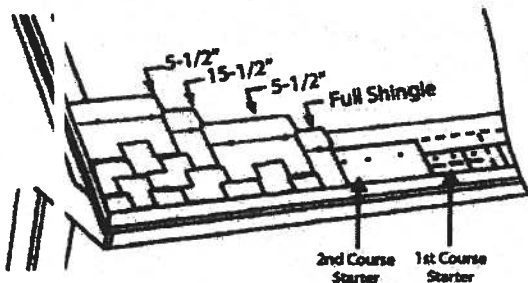
2



(CONTINUED from Pg. 2)

• HERITAGE® VINTAGE™ AR – Phillipsburg, KS LAMINATED ASPHALT SHINGLES

SHINGLE APPLICATION: Start the first course at the left rake edge with a full size shingle and overhang the rake edge 1/4 in. to 3/8 in.. To begin the second course, align the right side of the shingle with the 5-1/2 in. alignment notch on the first course shingle making sure to align the exposure notch. (See shingle illustration on next page) Cut the appropriate amount from the rake edge so the overhang is 1/4" to 3/8". For the third course, align the shingle with the 15-1/2 in. alignment notch at the top of the second course shingle, again being sure to align the exposure notch. Cut the appropriate amount from the rake edge. To begin the fourth course, align the shingle with the 5-1/2 in. alignment notch from the third course shingle while aligning the exposure notch. Cut the appropriate amount from the rake edge. Continue up the rake in as many courses as necessary using the same formula as outlined above. Cut pieces may be used to complete courses at the right side. As you work across the roof, install full size shingles taking care to align the exposure notches. Shingle joints should be no closer than 4 in.



6. LOW SLOPE APPLICATION

On pitches 1 in. per foot to 4 in. per foot cover the deck with two layers of underlayment. Begin by applying the underlayment in a 19 in. wide strip along the eaves and overhanging the drip edge by 1/4 to 3/4 in. Place a full 36 in. wide sheet over the 19 in. wide starter piece, completely overlapping it. All succeeding courses will be positioned to overlap the preceding course by 19 in. If winter temperatures average 25°F or less, thoroughly cement the laps of the entire underlayment to each other with plastic cement from eaves and rakes to a point of a least 24 in. inside the interior wall line of the building. As an alternative, TAMKO's Moisture Guard Plus self-adhering waterproofing underlayment may be used in lieu of the cemented felts.

7. VALLEY APPLICATION

TAMKO recommends an open valley construction with Heritage Vintage AR shingle:

To begin, center a sheet of TAMKO Moisture Guard Plus, TW Underlayment or TW Metal & Tile Underlayment in the valley.

After the underlayment has been secured, install the recommended corrosion resistant metal (26 gauge galvanized metal or an equivalent) in the valley. Secure the valley metal to the roof deck. Overlaps should be 12" and cemented.

Following valley metal application; a 9" to 12" wide strip of TAMKO Moisture Guard Plus, TW Underlayment or TW Metal & Tile Underlayment should be applied along the edges of the metal valley flashing (max. 6" onto metal valley flashing) and on top of the valley underlayment. The valley will be completed with shingle application.

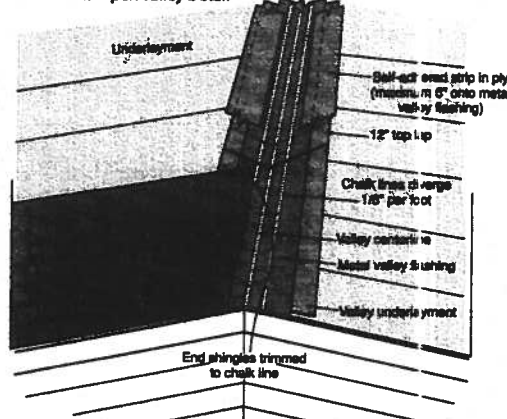
SHINGLE APPLICATION INSTRUCTIONS (OPEN VALLEY)

- Snap two chalk lines, one on each side of the valley centerline over the full length of the valley flashing. Locate the upper ends of the chalk lines 3" to either side of the valley centerline.
- The lower end should diverge from each other by 1/8" per foot. Thus, for an 8' long valley, the chalk lines should be 7" either side of the centerline at the eaves and for a 16' valley 6".

As shingles are applied toward the valley, trim the last shingle in each course to fit on the chalk line. Never use a shingle trimmed to less than 12" in length to finish a course running into a valley. If necessary, trim the adjacent shingle in the course to allow a longer portion to be used.

- Clip 1" from the upper corner of each shingle on a 45° angle to direct water into the valley and prevent it from penetrating between the courses.
- Form a tight seal by cementing the shingle to the valley lining with a 3" width of asphalt plastic cement (conforming to ASTM D 4588).

VINTAGE Open Valley Detail



• CAUTION:

Adhesive must be applied in smooth, thin, even layers.

Excessive use of adhesive will cause blistering to this product.

TAMKO assumes no responsibility for blistering.

(Continued)

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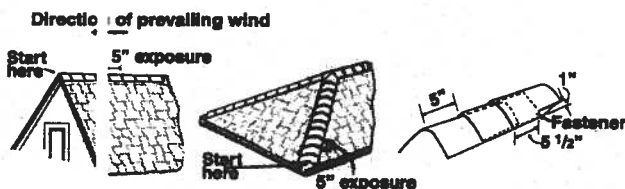
• HERITAGE® VINTAGE™ AR – Phillipsburg, KS LAMINATED ASPHALT SHINGLES

8. HIP AND RIDGE FASTENING DETAIL

Apply the shingles with a 5 in. exposure beginning at the bottom of the hip or from the end of the ridge opposite the direction of the prevailing winds. Secure each shingle with one fastener on each side, 5-1/2 in. back from the exposed end and 1 in. up from the edge. TAMKO recommends the use of TAMKO Heritage Vintage Hip & Ridge shingle products.

Fasteners should be 1/4 in. longer than the ones used for shingles.

IMPORTANT: PRIOR TO INSTALLATION, CARE NEEDS TO BE TAKEN TO PREVENT DAMAGE WHICH CAN OCCUR WHILE BENDING SHINGLE IN COLD WEATHER.



THESE ARE THE MANUFACTURER'S APPLICATION INSTRUCTIONS FOR THE ROOFING CONDITIONS DESCRIBED. TAMKO BUILDING PRODUCTS, INC. ASSUMES NO RESPONSIBILITY FOR LEAKS OR OTHER ROOFING DEFECTS RESULTING FROM FAILURE TO FOLLOW THE MANUFACTURER'S INSTRUCTIONS.

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