ATTIC/EAVE VENTILATION GUIDELINES

Handout
251

REV 08/07

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PURPOSE: To assist in calculating the required amount of attic ventilation for a structure.

REQUIREMENTS: 2006 International Residential Code, Section R806

VENTILATION: **Enclosed attics** and **enclosed rafter spaces** formed where ceilings are applied directly to the underside of roof rafters, shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. The net free ventilating area shall not be less than 1/150 of the area of the space ventilated.

EXCEPTIONS:

1. The area may be 1/300 of the area of the space ventilated provided 50% and not more than 80% of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated, at least 3 feet (914 mm) above eave or cornice vents, with the balance of the required ventilation provided by eave or cornice vents.

2. The area may be 1/300 of the area of the space ventilated provided a vapor retarder having a transmission rate not to exceed 1 perm is installed on the warm side of the attic insulation.

The openings shall be covered with corrosion-resistant metal mesh with mesh openings of 1/8" (3.2 mm) minimum, to ¼" (6.35 mm) maximum openings.

The City of Peoria requires insulation baffles per IRC Section R806.3 (minimum 1" space provided between insulation and roof sheathing) to be installed to prevent insulation from blocking required eave or cornice vents (see pages containing Residential Attic Ventilation Calculations@ and ATypical Eave Ventilation for Roof" drawings for installation information).

Tables R806.2-A, B and C can be used as part of the plan submittal process, providing **both** of the following conditions are met:

1. If these tables are made as part of the plans (stapling to plans or loose sheets are not acceptable) and the attic area(s) is highlighted, attic ventilation calculations will not be required.

2. The locations of upper and lower vents are shown on the roof framing plan or elevations.

For ventilation figures exceeding those shown on the tables in this handout, provide manufacturer's name, ICBO, U.L. or other approved listing agencies evaluation reports.

ATTIC VENTILATION

Permits must have on-the-job-site a completed set of attic ventilation calculations or tables (whichever is applicable). The attached tables were prepared to show alternatives that can be used in attic ventilation. A Building Safety Plans Examiner will review, approve and verify the type, size and location of the attic vents.

Example: Based on a house with 1600 sq. ft. of attic space with a 550 sq. ft. separated garage attic:

Eave Vents: Using table R806.2-A for calculation of eave vents will result in 1600 sq. ft. attic using baffles and 1/300 attic ventilation will require 7 bays of full screen vents, 82 bays of 2-hole vented blocks or 54 bays of 3-hole vented blocks. The garage attic in this case will require 2 bays of full screen vents, 31 bays of 2-hole vented blocks or 20 bays of 3-hole vented block. The number of vents required will need to be multiplied by 4 for 1/150 ventilation and will need to be multiplied by 4 when baffles are not installed.

Upper Vents: (3 feet above eave vents) The most commonly used vents are gable vents, dormer vents, tile vents, ridge vents or triangular louver vents, as shown in tables 806.2-B and C. For a 1600 sq. ft. attic, using table R806.2-B will give several alternatives of gable vents, such as (5) 12 x 14, (3) 12 x 30 or (2) 18 x 18 vents. If you select to use triangular louver vents, ridge vents, dormer vents or tile vents, use table 806.2-C which will require (2) 12' triangular vents, (4) dormer vents, (16) tile vents or 32 linear feet of ridge vent. When using 1/150 ventilation, the number of vents will be multiplied by 4.

The same type of calculations will be used for the garage.

When mixing two or more types of vents, the total attic area can be divided into smaller areas and then calculated in the attached table. In the sample above, the 1600 sq. ft. attic can be vented using 6 tile vents (sufficient for 600 sq. ft) and 200 linear feet of ridge vent (sufficient for the remaining 1000 sq. ft.).

Other attic ventilation systems may be used, provided attic ventilation calculations and vent locations are shown on roof or elevation plans. 50% will be allowed for each vent area, higher feet area may be allowed if vents are listed by an approved testing agency, such as ICBO, ICC or UL

Should you have any questions, please contact the City of Peoria, Building Safety Division at 623-773-7225.

TABLE R806.2-A Eave Venting Guidelines

2006 IRC, Section R806.2. The area may be 1/300 of the area of the space ventilated provided 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.

		Number of Eave Vents Required Note: Approved vent chute required at each vent		
Square Footage Attic Area	1/300 Req. Venting (50%) Low	Full Screen Vent 22 1/2" x 3 1/2"	2 Hole Vented Blocking	3 Hole Vented Blocking
	Square Feet:	BAYS	BAYS	BAYS
100	0.17	1	5	3
200	0.33		10	7
300	0.50		15	10
400	0.67	2	20	14
500	0.83		25	17
600	1.00		31	20
700	1.17	3	36	24
800	1.33		41	27
900	1.50	4	46	31
1000	1.67		51	34
1100	1.83		56	37
1200	2.00	5	61	41
1300	2.17		66	44
1400	2.33	6	71	48
1500	2.50		76	51
1600	2.67	7	82	54
1700	2.83		87	58
1800	3.00		92	61
1900	3.17	8	97	65
2000	3.33		102	68
2100	3.50	9	107	71
2200	3.67		112	75
2300	3.83		117	78
2400	4.00	10	122	82
2500	4.17		127	85
2600	4.33	11	132	88
2700	4.50		138	92
2800	4.67		143	95
2900	4.83	12	148	99
3000	5.00		153	102
4000	6.67	16	204	136
5000	8.33	20	255	170
6000	10.00	24	306	204
7000	11.67	28	357	238
8000	13.33	33	408	272
9000	15.00	37	459	306

NOTES:
1) 1/150 ventilation, multiply the number of vents in the table above by 4.
2) When insulation baffels are not used, multiply the number of vents in the table above by 4.

TABLE R806.2 - B
1/300 High Roof Venting Guidelines - Gable Vents
3 Feet Above Eave
2006 IRC, Section R806.2

Note: When using 1/150 calculations, multiply the number of vents in the table by 4.

Sq Foot	1/300 Req. Venting 50% High	Number of Gable Vents Required																						
		12x12	12x14	12x18	12x20	12x24	12x30	14x14	14x18	14x20	14x24	14x30	16x16	18x18	18x20	18x24	18x30	20x20	20x24	20x30	24x24	24x30	24x36	30x30
		Allowable Square Footage per Gable Vent																						
		0.5	0.58	0.75	0.83	1	1.25	0.68	0.88	0.97	1.16	1.46	0.88	1.13	1.25	1.5	1.88	1.38	1.66	2.08	2	2.5	3	3.1
100	0.17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
200	0.33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
300	0.50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
400	0.67	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
500	0.83	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
600	1.00	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
700	1.17	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
800	1.33	3	2	2	2	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1
900	1.50	3	3	2	2	2	1	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1
1000	1.67	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1100	1.83	4	3	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1200	2.00	4	3	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1300	2.17	4	4	3	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1400	2.33	5	4	3	3	2	2	3	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2
1500	2.50	5	4	3	3	3	2	4	3	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2
1600	2.67	5	5	4	3	3	2	4	3	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2
1700	2.83	6	5	4	3	3	2	4	3	3	2	2	3	3	2	2	2	2	2	2	2	2	2	2
1800	3.00	6	5	4	4	3	2	4	3	3	3	2	3	3	2	2	2	2	2	2	2	2	2	2
1900	3.17	6	5	4	4	3	3	5	4	3	3	2	4	3	3	2	2	2	2	2	2	2	2	2
2000	3.33	7	6	4	4	3	3	5	4	3	3	2	4	3	3	2	2	2	2	2	2	2	2	2
2100	3.50	7	6	5	4	4	3	5	4	4	3	2	4	3	3	2	2	3	2	2	2	2	2	2
2200	3.67	7	6	5	4	4	3	5	4	4	3	3	4	3	3	2	2	3	2	2	2	2	2	2
2300	3.83	8	7	5	5	4	3	6	4	4	3	3	4	3	3	3	2	3	2	2	2	2	2	2
2400	4.00	8	7	5	5	4	3	6	5	4	3	3	5	4	3	3	2	3	2	2	2	2	2	2
2500	4.17	8	7	6	5	4	3	6	5	4	4	3	5	4	3	3	2	3	3	2	2	2	2	2
2600	4.33	9	7	6	5	4	3	6	5	4	4	3	5	4	3	3	2	3	3	2	2	2	2	2
2700	4.50	9	8	6	5	5	4	7	5	5	4	3	5	4	4	3	2	3	3	2	2	2	2	2
2800	4.67	9	8	6	6	5	4	7	5	5	4	3	5	4	4	3	2	3	3	2	2	2	2	2
2900	4.83	10	8	6	6	5	4	7	5	5	4	3	5	4	4	3	3	4	3	2	2	2	2	2
3000	5.00	10	9	7	6	5	4	7	6	5	4	3	6	4	4	3	3	4	3	2	3	2	2	2
4000	6.67	13	11	9	8	7	5	10	8	7	6	5	8	6	5	4	4	5	4	3	3	3	2	2
5000	8.33	17	14	11	10	8	7	12	9	9	7	6	9	7	7	6	4	6	5	4	4	3	3	3
6000	10.00	20	17	13	12	10	8	15	11	10	9	7	11	9	8	7	5	7	6	5	5	4	3	3
7000	11.67	23	20	16	14	12	9	17	13	12	10	8	13	10	9	8	6	8	7	6	6	5	4	4
8000	13.33	27	23	18	16	13	11	20	15	14	11	9	15	12	11	9	7	10	8	6	7	5	4	4
9000	15.00	30	26	20	18	15	12	22	17	15	13	10	17	13	12	10	8	11	9	7	8	6	5	5

TABLE R806.2-C 1/300 High Roof Venting Guidelines
Triangle, Dormer, Ridge, Tile Vents
2006 IRC, Section R806.2

Square Footage	1/300 Reg. Venting 50% High	Triangle Gable Louver Roof Pitch												Dormer Vents Roof Pitch			Ridge Vents	Tile Vents
		4:12				5:12				6:12							Linear Feet	
		6’	8’	10’	12’	6’	8’	10’	12’	6’	8’	10’	12’	4:12	5:12	6:12		
		Allowable Square Footage Per Vent																
		1.5	2.66	4.17	6	1.88	3.33	5.21	7.5	2.25	4	6.25	9	0.71	0.86	1	0.083	0.17
100	0.17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
200	0.33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	2
300	0.50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	3
400	0.67	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	4
500	0.83	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	5
600	1.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12	6
700	1.17	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	14	7
800	1.33	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	16	8
900	1.50	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	18	9
1000	1.67	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	20	10
1100	1.83	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	22	11
1200	2.00	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	24	12
1300	2.17	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	26	13
1400	2.33	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	28	14
1500	2.50	2	2	2	2	2	2	2	2	2	2	2	2	4	3	3	30	15
1600	2.67	2	2	2	2	2	2	2	2	2	2	2	2	4	3	3	32	16
1700	2.83	2	2	2	2	2	2	2	2	2	2	2	2	4	3	3	34	17
1800	3.00	2	2	2	2	2	2	2	2	2	2	2	2	4	3	3	36	18
1900	3.17	2	2	2	2	2	2	2	2	2	2	2	2	4	4	3	38	19
2000	3.33	2	2	2	2	2	2	2	2	2	2	2	2	5	4	3	40	20
2100	3.50	2	2	2	2	2	2	2	2	2	2	2	2	5	4	4	42	21
2200	3.67	2	2	2	2	2	2	2	2	2	2	2	2	5	4	4	44	22
2300	3.83	3	2	2	2	2	2	2	2	2	2	2	2	5	4	4	46	23
2400	4.00	3	2	2	2	2	2	2	2	2	2	2	2	6	5	4	48	24
2500	4.17	3	2	2	2	2	2	2	2	2	2	2	2	6	5	4	50	25
2600	4.33	3	2	2	2	2	2	2	2	2	2	2	2	6	5	4	52	25
2700	4.50	3	2	2	2	2	2	2	2	2	2	2	2	6	5	5	54	26
2800	4.67	3	2	2	2	2	2	2	2	2	2	2	2	7	5	5	56	27
2900	4.83	3	2	2	2	3	2	2	2	2	2	2	2	7	6	5	58	28
3000	5.00	3	2	2	2	3	2	2	2	2	2	2	2	7	6	5	60	29
4000	6.67	4	3	2	2	4	2	2	2	3	2	2	2	9	8	7	80	39
5000	8.33	6	3	2	2	4	3	2	2	4	2	2	2	12	10	8	100	49
6000	10.00	7	4	2	2	5	3	2	2	4	3	2	2	14	12	10	120	59
7000	11.67	8	4	3	2	6	4	2	2	5	3	2	2	16	14	12	141	69
8000	13.33	9	5	3	2	7	4	3	2	6	3	2	2	19	16	13	161	78
9000	15.00	10	6	4	3	8	5	3	2	7	4	2	2	21	17	15	181	88

Note: When using 1/150 calculations, multiply the number of vents in the table above by 4.

Residential Attic Ventilation Calculation

Builder:_____ Inspector:_____

Model:_____ Roof Pitch:_____

Elevations:_____

Roof Square Footage

House _____
Garage _____
Patio _____
Total _____ /300 =_____ sq ft

Minimum upper or lower venting = total required/divided by 2 = sq ft*

1. Triangular Gable Vents

Size: _____ Net Area: _____ x (Quantity) _____ = _____ sq ft
Size: _____ Net Area: _____ x (Quantity) _____ = _____ sq ft
Size: _____ Net Area: _____ x (Quantity) _____ = _____ sq ft

2. Rectangular Gable Vents

Size: _____ Net Area: _____ x (Quantity) _____ = _____ sq ft
Size: _____ Net Area: _____ x (Quantity) _____ = _____ sq ft
Size: _____ Net Area: _____ x (Quantity) _____ = _____ sq ft

3. Dormer Vents

Size: _____ Net Area: _____ x (Quantity) _____ = _____ sq ft
Size: _____ Net Area: _____ x (Quantity) _____ = _____ sq ft

4. Ridge Vents

Number of Linear feet: _____ x .083 sq ft = _____ sq ft

5. Tile Vents

Quantity: _____ x .17 sq ft = _____ sq ft
Total High Vents = _____ sq ft*

#2 hole vented blocks _____ x .033 = _____ sq ft
#3 hole vented blocks _____ x .049 = _____ sq ft
Full screen vents _____ x .410 = _____ sq ft

Total Low Vents = _____ sq ft*