

High Slope roofing

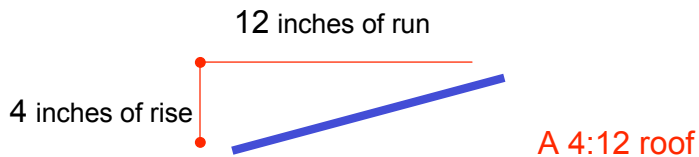
Slopes & Weights

•Material	Min. slope	Underlay	Estimated pounds per Square (100 s.f.)	\$/sq.*
•Slate	4:12	30# felt	700 - 8,000# per sq	\$1,000
•Asphalt Shingle	3:12	15# felt	205 - 320# per sq	\$118
•Wood Shake	4:12	30# felt	120# per sq	\$310
•Wood Shingle	5:12	no felt req'd	100# per sq	\$287
•Clay Tile	4 1/2:12	30# felt	9000 - 12,500# per sq	\$540
•Metal	3:12	red rosin	120# per sq.	\$545stl \$1,000 copper

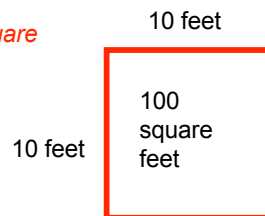
*R.S. Means 2003

Roofers measures

- Slopes
 - Measured in vertical rise in inches per foot of horizontal run



- Area
 - Base unit of measure is the *square*
 - a 10 foot by 10 foot area

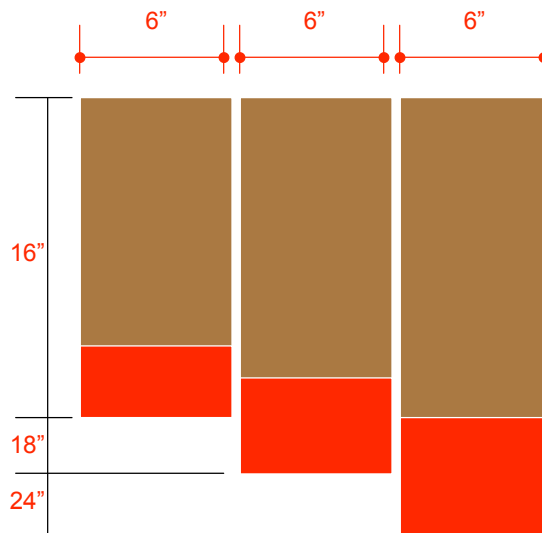


Cedar sizes

- Cedar Shingles come in three lengths, 16, 18, and 24 inches. All are about 6 inches wide and are split into smaller widths as required by the coursing.

Maximum exposures for a 4:12 roof

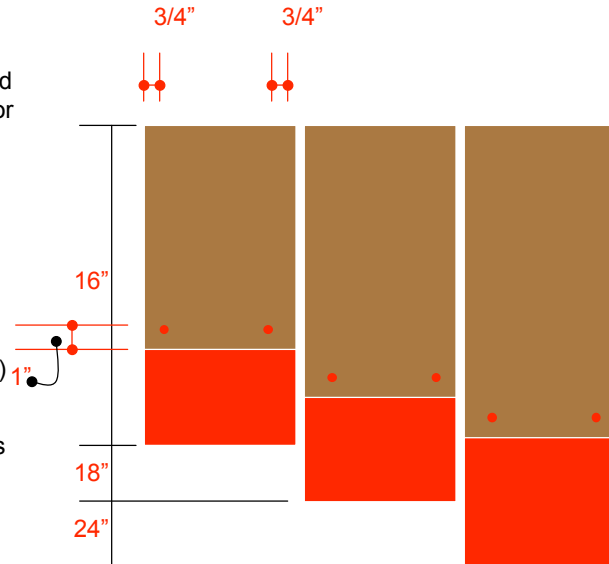
- 3 3/4" on the 16"
- 4 1/4" on the 18"
- 5 3/4" on the 24"



Nail with 2 nails per shingle, no closer than 3/4" to shingle edge and 1" above the butt line for the shingle above.

Nail with
 -hot dipped galvanized
 -ring shank aluminum
 -stainless steel ring shank
 (not copper - cedar tannins react to copper)

Maximum exposures for a 5:12 roof
 5" on the 16"
 5 1/2" on the 18"
 7 1/2" on the 24"



Terminology

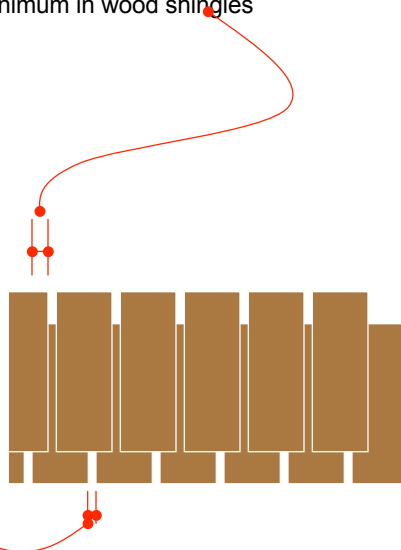
- Shingle
 - Head (thinnest)
 - Butt (thickest)



Terminology

Sidelap - the side overlap, usually 1 1/2" minimum in wood shingles

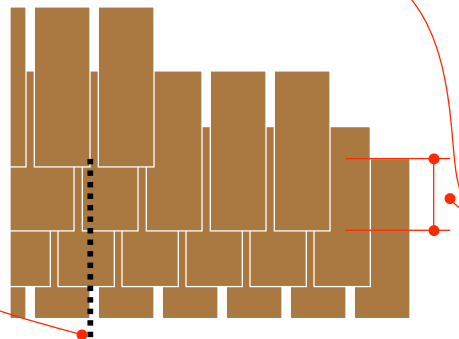
Space dry wood shingles 1/8 to 3/8 apart to allow for swelling



Terminology

Headlap the amount of the "head" of a shingle covered by the 'butt' of a shingle above

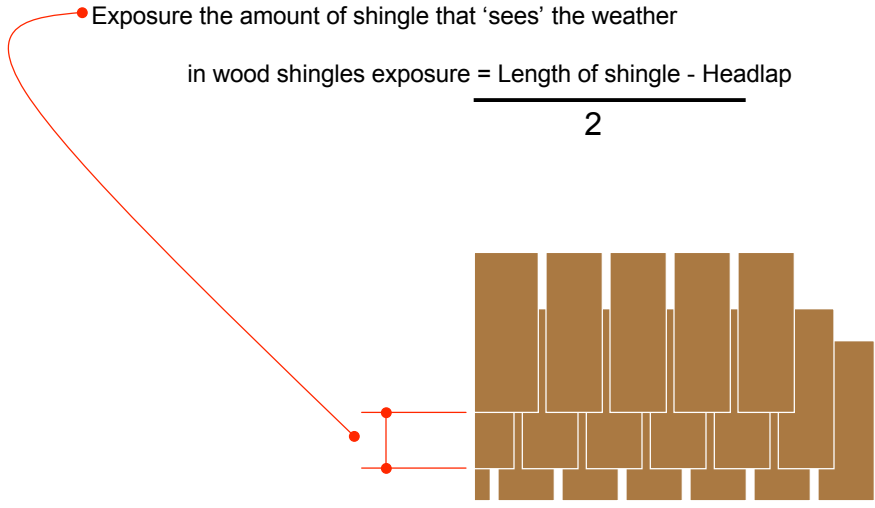
This pattern will give a "three-stepped" roof - the joints in the shingles won't line up until the 4th course



Terminology

- Exposure the amount of shingle that 'sees' the weather

$$\text{in wood shingles exposure} = \frac{\text{Length of shingle} - \text{Headlap}}{2}$$



E.R. Hills House 1900



Lines in cedar shingles



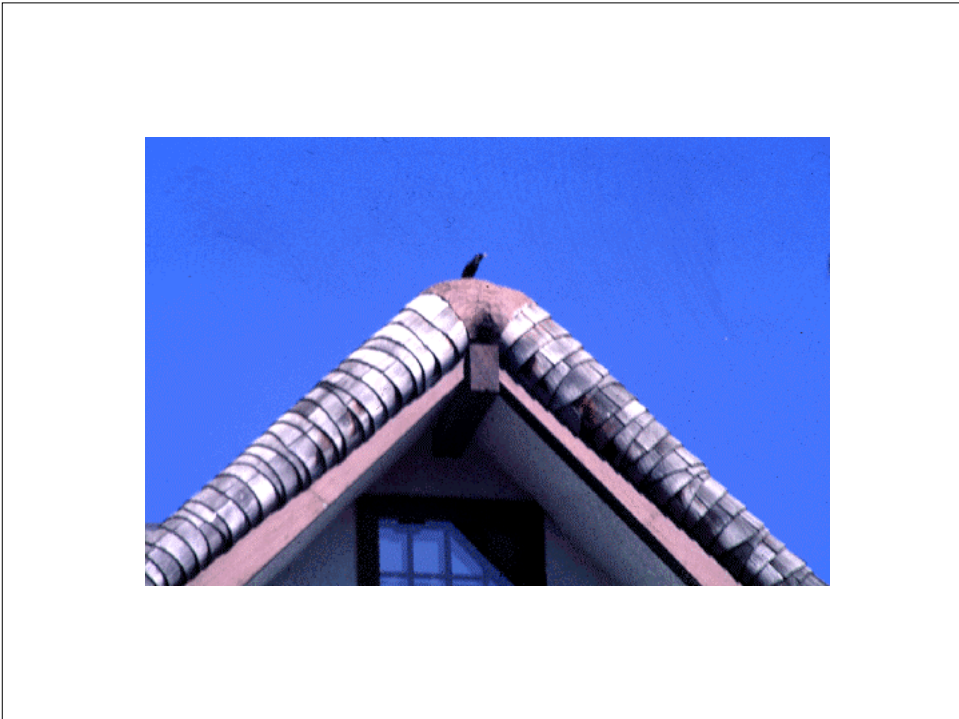
The horizontal lines - critical for Wright, are achieved in this roof by doubling the shingles every 5th course. Very simple



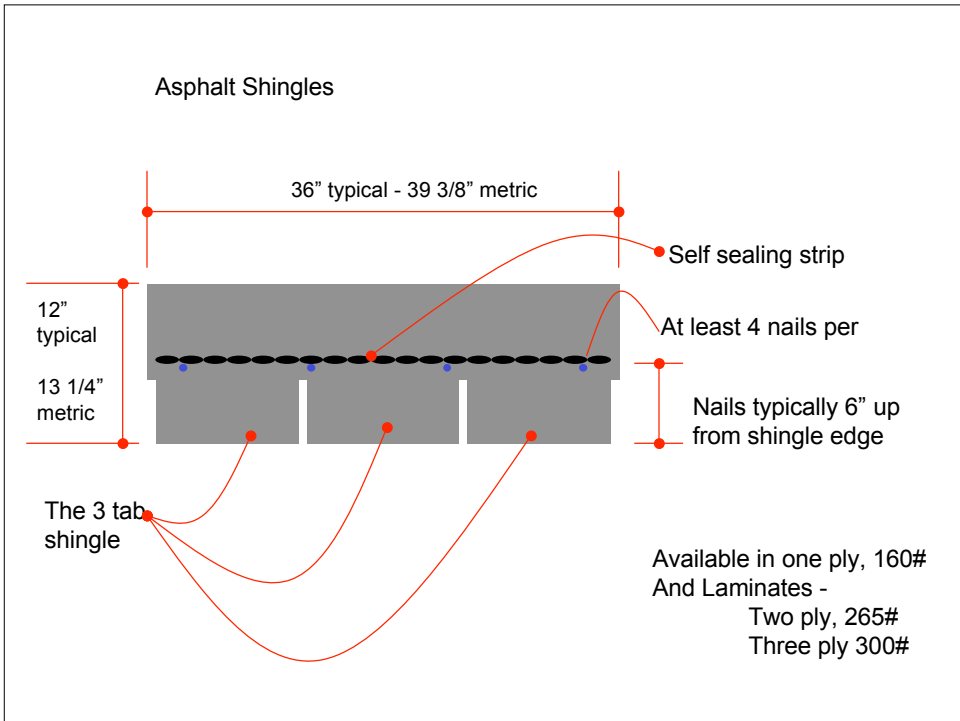


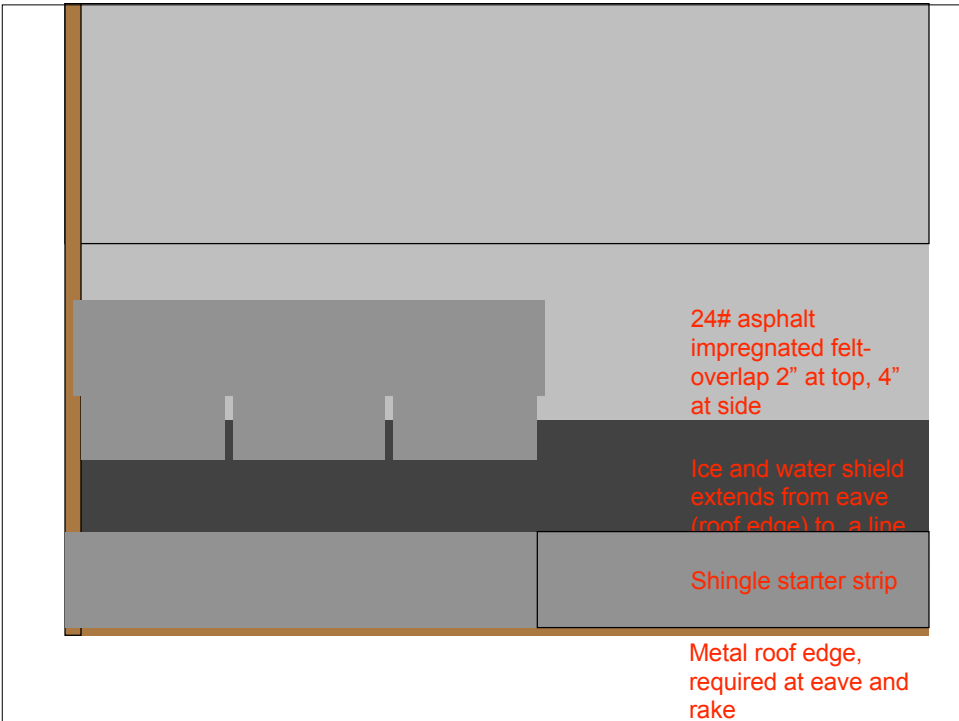
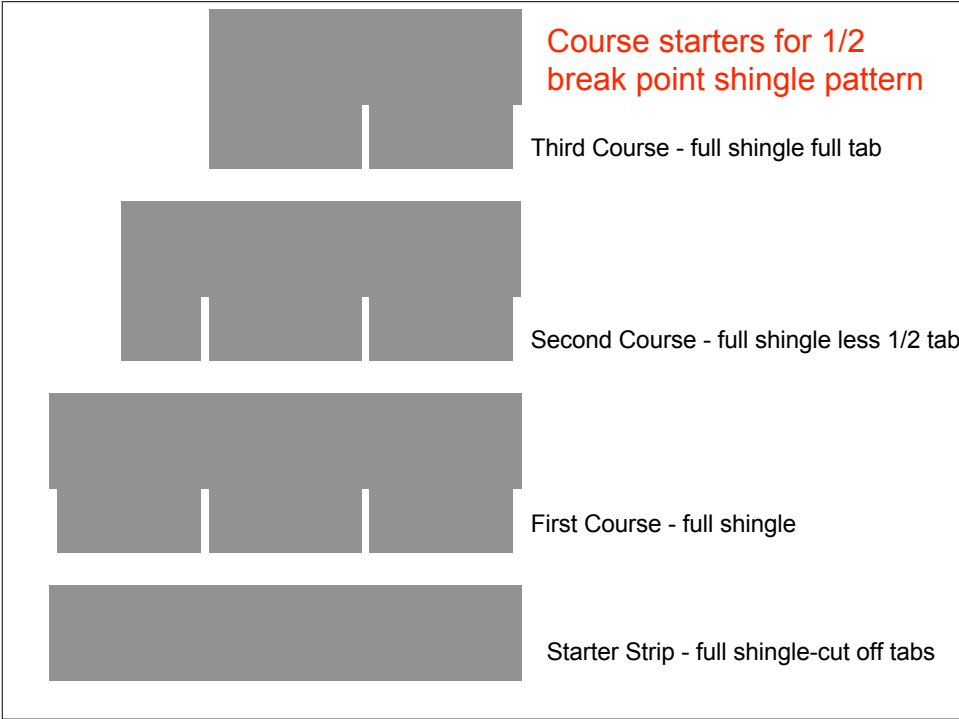


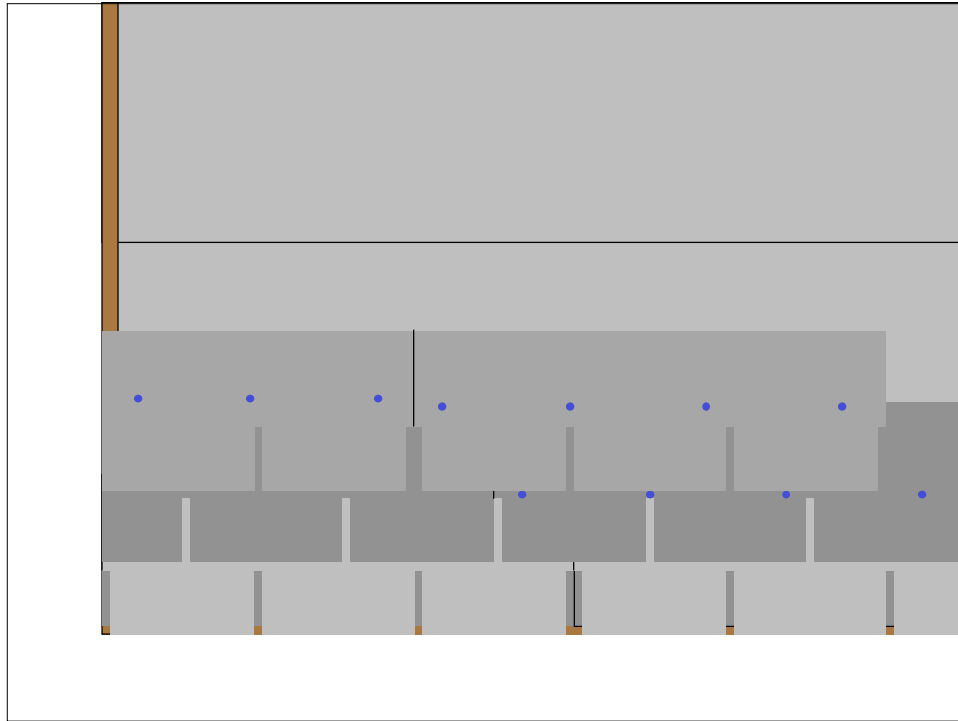








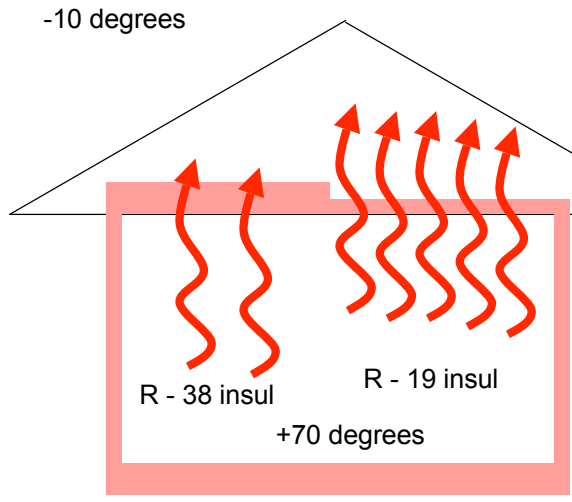




Endangered Icicles

- The contemporary wood framed building uses interior vapor barriers, high insulation values and exterior draft barriers to keep the energy inside the house.
- These efforts have made the roof covered with snow having icicles hanging from the gutters a thing of the past.... In fact icicles are now considered a sign of a failure in the detailing or construction of the roof.

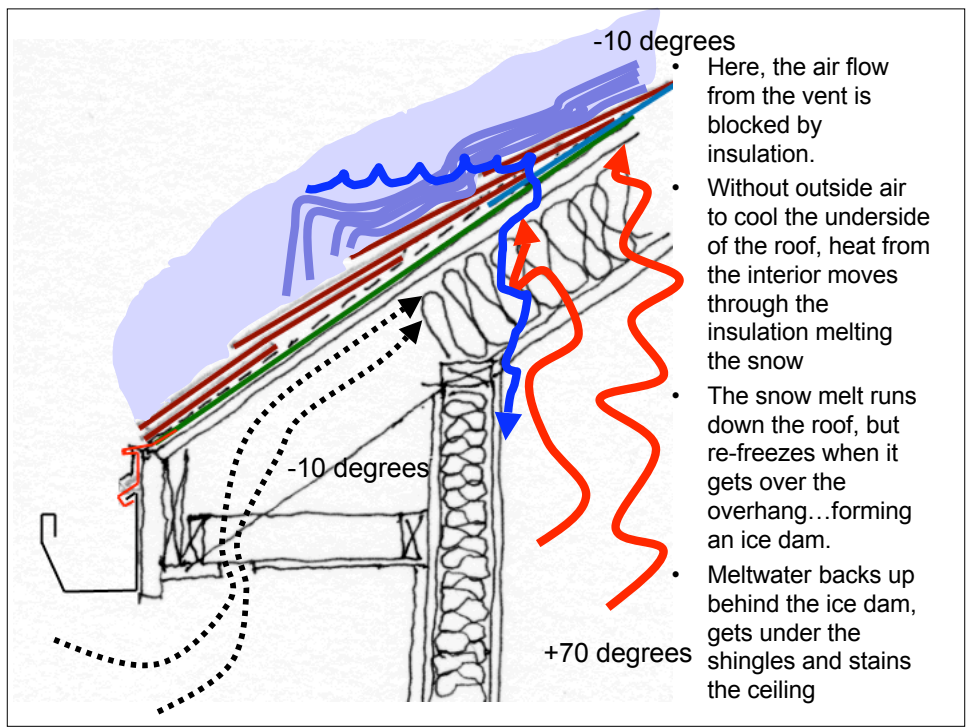
Ice dams



Heat moves from higher to lower temperatures (a basic law of thermodynamics...nature's effort to keep all things in balance)

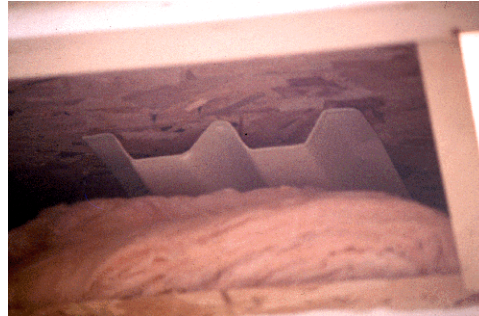
Insulation only slows the flow of heat...it doesn't stop it

"R" value is thermal Resistance...the higher the "R" value of the insulation, the slower heat



Chutes & Baffles

To preserve the minimum 1 - 2 inches of vent space above the insulation, polystyrene chutes or baffles are often stapled to the underside of the sheathing near the eave vent.

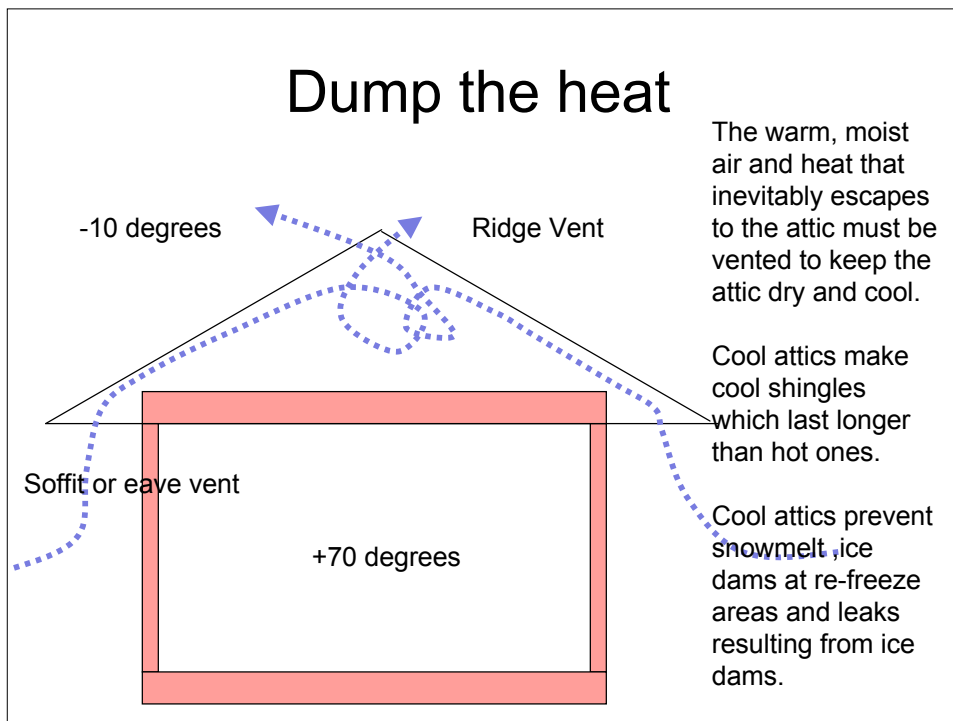
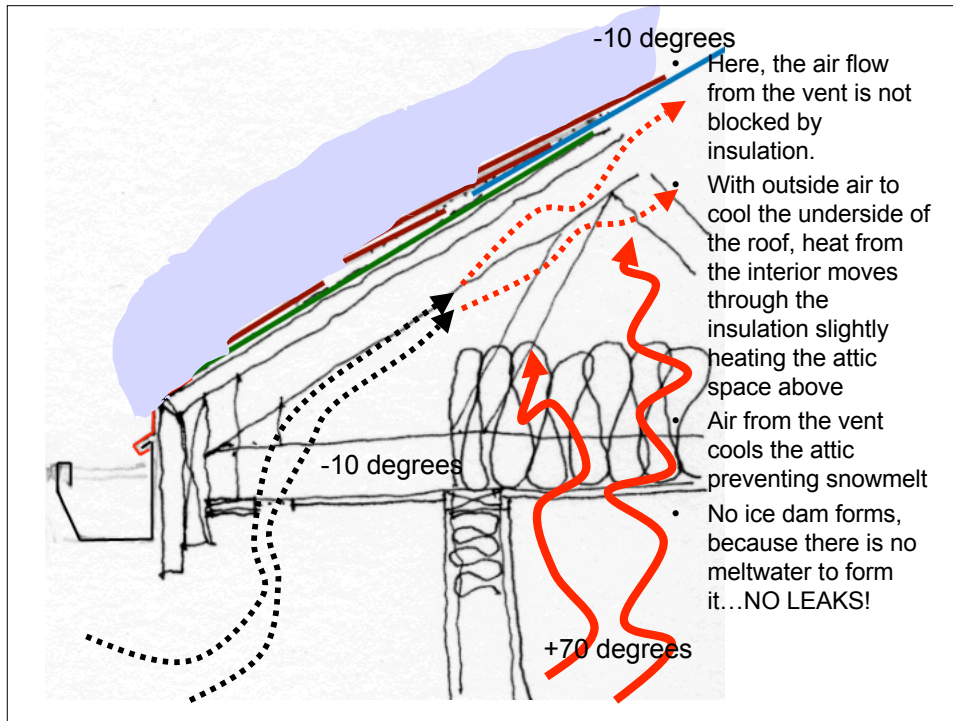


As long as the insulation doesn't get pushed out into the eave, blocking the vent, no airflow problems should occur.

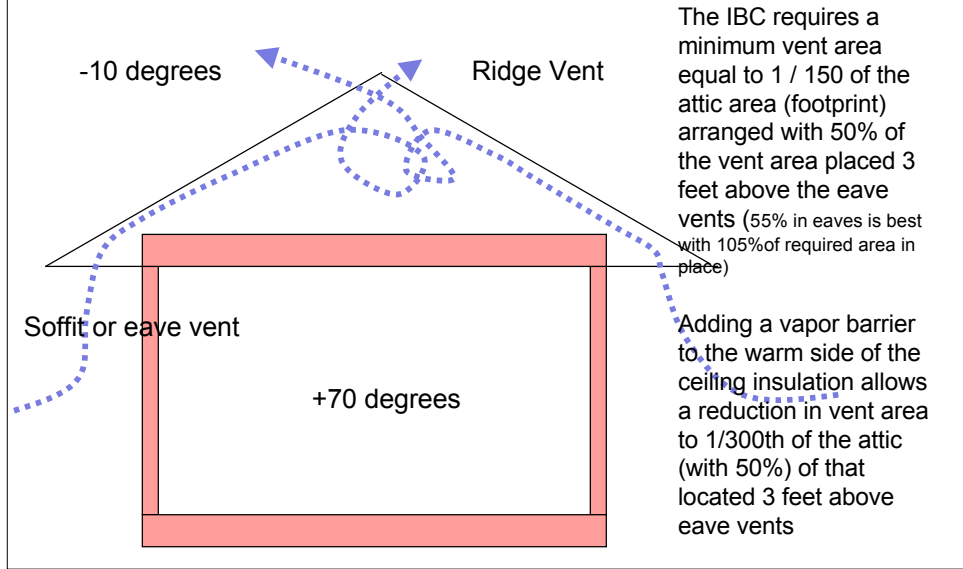
Ice Guard

- Because ice dam related moisture leaks can lead to accelerated rot and even failure of the roof / wall connection, many towns require a layer of bituthene-like material be installed as the base course for the shingles. This material acts as a waterproofing (shingles are only water resistant) and extends from the eave to a point one to four feet inside of the wall / roof intersection.

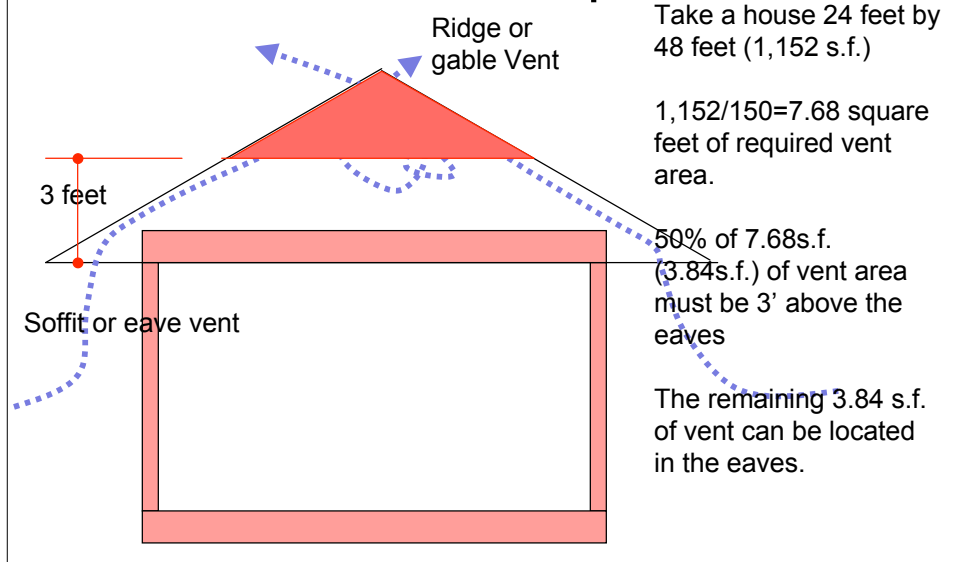




Codes & Vents

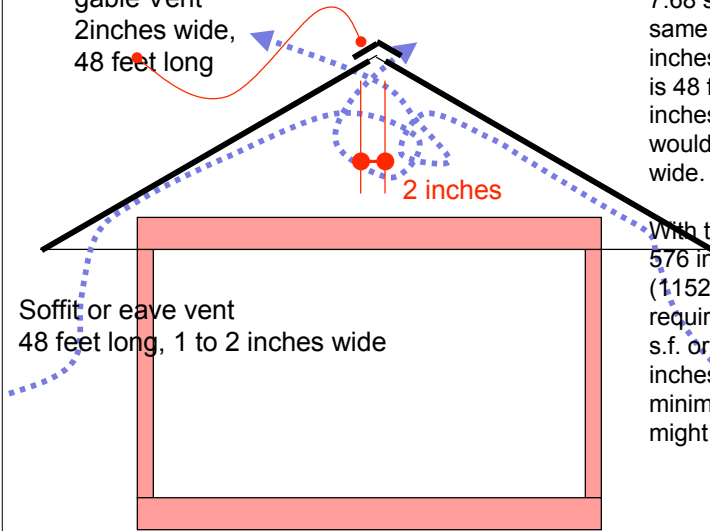


Vent example



Vent example

Ridge or
gable Vent
2 inches wide,
48 feet long



Soffit or eave vent
48 feet long, 1 to 2 inches wide

7.68 s.f. of vent is the same as 1,106 square inches of vent. If the ridge is 48 feet long, (576 inches) the ridge vent would have to be 2 inches wide.

With two eave vents being 576 inches long each, (1152 total inches) the required eave vents, (7.68 s.f. or 1,106 square inches) could be the code minimum 1 inch wide...2" might be better.



