

Department of Planning and Neighborhood Development

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Building Safety Office

ROOF AND ATTIC VENTING

The building code requires that enclosed attic spaces and enclosed rafter spaces have cross ventilation for each space. Such ventilation is provided by proper sized openings protected against the penetration of rain and snow and the entrance of insects, birds and rodents. A properly designed venting system will let cooler air enter at the bottom of the space and allow warmer air out at the top of the space, creating a continual movement of air.

Ventilation is necessary for several reasons. In Michigan's climate, moisture can work its way through walls and ceilings into these enclosed spaces. In winter, condensation of this moisture can occur and, if not controlled, will lead to the growth of mold and mildew followed by roof deterioration. A steady flow of air through the space will help carry the moisture to the exterior.

Ventilation is also required in cold weather because heat rising from the interior of the house may melt any snow on the roof. As this water runs down and reaches the cold surfaces along the eave, it can refreeze and cause an ice dam. The ice dam in turn will cause the water to back up under the shingles and leak into the house. Proper ventilation along with adequate insulation will help lower the attic temperature and reduce the chance of snow melting above the attic space.

In hot weather, heat can build up in an attic space and, if not removed, can radiate or be conducted to the living space below. Ventilating the attic space is the most effective way to remove heat build-up in the attic.

The Building Code specifies that the net clear area for the ventilation openings must be at least $1/150^{th}$ of the area of the attic floor. The openings must provide for cross ventilation to adequately ventilate the area.

The amount of required net clear area can be reduced to $1/300^{th}$ of the attic floor area if vents are installed at both soffits (eaves) and in the upper part of the roof. At least 20% -- preferably up to 50% -- of the opening area should be provided by the soffit vents with the balance located in the upper portion of the space to be vented.

There are four basic types of roof vents: Ridge Vents, Gable Vents, Rectangular Vents sometimes called Roof "Pots", and Soffit Vents. These vents must be used in proper combinations to be effective. For example, ridge vents should normally not be used on the same roof with either gable vents or roof pot vents.

In the case of cathedral ceilings, each rafter cavity must be vented separately. One inch of air space must be provided between the underside of the roof sheathing and the insulation.

When choosing vents, determine the amount of net free vent area (NFVA) for the type of vent desired. Note that rough openings are often much larger than the actual NFVA. Ask the supplier for the NFVA of the selected vent or check to see if the NFVA is stamped on the vent itself.

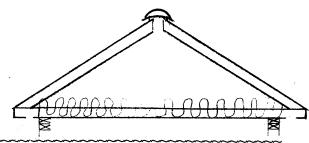
Assure that insulation does not block the free flow of air. This can be done by the installation of baffles at eave lines and other locations where insulation might otherwise contact roof sheathing.

The following illustrations indicate vent combinations that will provide proper ventilation for the examples shown. Assume an attic area of 1200 square feet for the first three examples.

EXAMPLE #1

Ridge vent used with soffit vents

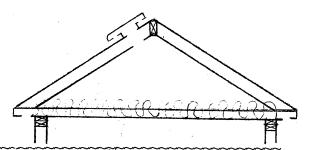
- $1/300^{\text{th}}$ of 1200 = 4.0 sq ft
- Install continuous ridge vent
- Install continuous soffit vents



EXAMPLE #2

Roof pot vents used with soffit vents

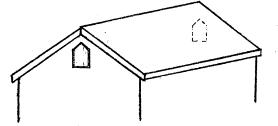
- $1/300^{\text{th}}$ of 1200 = 4.0 sq ft
- Install minimum of 5 roof pot vents (typically less than 0.5 sq ft each)
- Install continuous soffit vents



EXAMPLE #3

Gable vents, no soffit vents

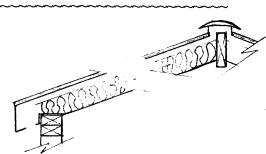
- $1/150^{th}$ of 1200 = 8.0 sq st
- Install one gable vent in each gable end to provide 4.0 sq ft of NFVA each



EXAMPLE #4

Cathedral ceiling, no attic space

- Maintain one inch air space between top of insulation and underside of roof sheathing
- Install continuous ridge vent
- Install continuous soffit vent



EXAMPLE #5

Sloped ceiling with kneewall

- Maintain one inch air space between top of insulation and underside of roof sheathing
- Area to be vented same as full attic
- Ridge vent with soffit vent provides best venting
- Other combinations of vents may be acceptable (check with your building inspector to be sure)

