

## Two Special Cases of Crawl Space Ventilation

Providing adequate ventilation for a home is particularly important in humid climates. Crawl space ventilation can be affected by two common complications:

- Structures such as carports and porches that reduce the number of foundation vents
- Vent covers that reduce the amount of air circulating through foundation vents.

### VENTILATION AROUND CARPORT SLABS AND PORCHES

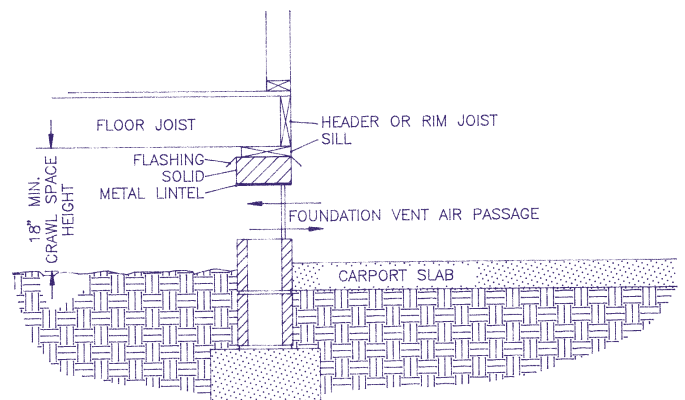
From experience over the years, it is clear that the most effective crawl space ventilating system consists of open 8-by-16-inch foundation vents spaced each 6 to 8 feet around the entire perimeter of a structure up to about 32 feet wide. Wider buildings placed over ground where water tables are near the surface occasionally require more ventilation forced by added fans in the center of the crawl space. When vents like these remain open and unblocked by shrubbery and the crawl space remains open and clear for cross-ventilation beneath the house, little if any moisture-related problems develop.

However, some construction practices interfere with adequate crawl space ventilation. For example, pouring a slab to form the floor of an attached carport blocks ventilation on an entire side of the house. An earth-filled porch slab blocks ventilation for its full length, and ductwork for heating and air-conditioning systems may fill in the entire minimum depth of a crawl space completely blocking cross-ventilation. Code minimum standards have followed a similar restricting tendency by prescribing conditions for less and less foundation vents by adding polyethylene sheeting to cover crawl spaces and reduce vent areas.

The unfortunate result of less and less foundation ventilation has been the expensive rise in the occurrence of wood rot in crawl spaces and moisture problems in the living areas of homes. South Carolina's moist climate proves that reduced ventilation in crawl spaces does not work, and so it is important that we provide and maintain adequately ventilated crawl spaces and do nothing to reduce the amount of vent area.

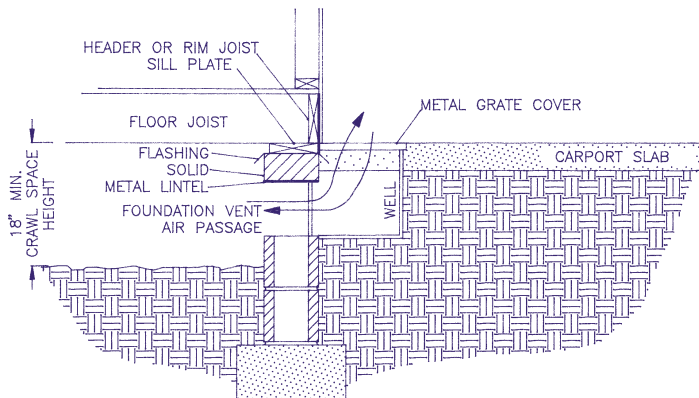
The best remedial procedure in problem cases is to cover the crawl space surface with polyethylene films. It is best, however, to use polyethylene in addition to vents around the perimeter of the building and not in place of providing those vents. Furthermore, it is important to vent through earth-filled porches and along carport foundation walls. These are the two most likely places for wood rot to occur because of inadequate continuous ventilation. Two simple methods should be used to provide vents in these too-often blocked areas.

If there is not enough space to provide standard vents as follows near a carport,



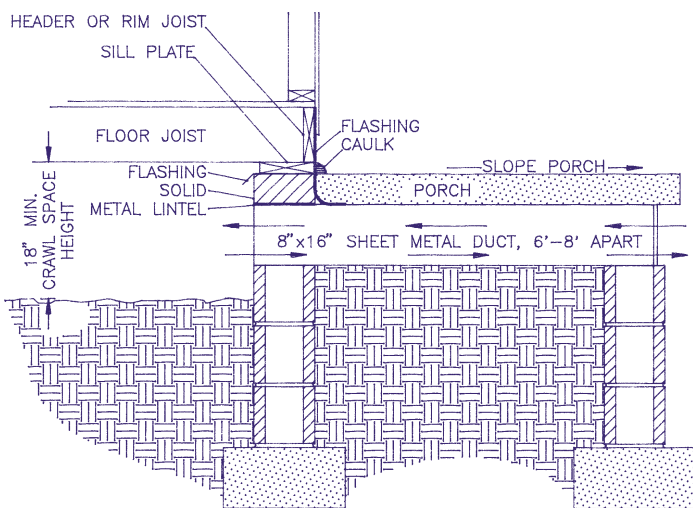
Standard Placement of Foundation Vent in Carport Foundation Wall

improve ventilation by including a vent in the well of the carport foundation wall.



Vent in Well in Carport Foundation Wall

Vent the crawl space behind earth-filled porches using an 8-by-16-inch sheet metal duct to conduct ventilating air into and out of the crawl space.



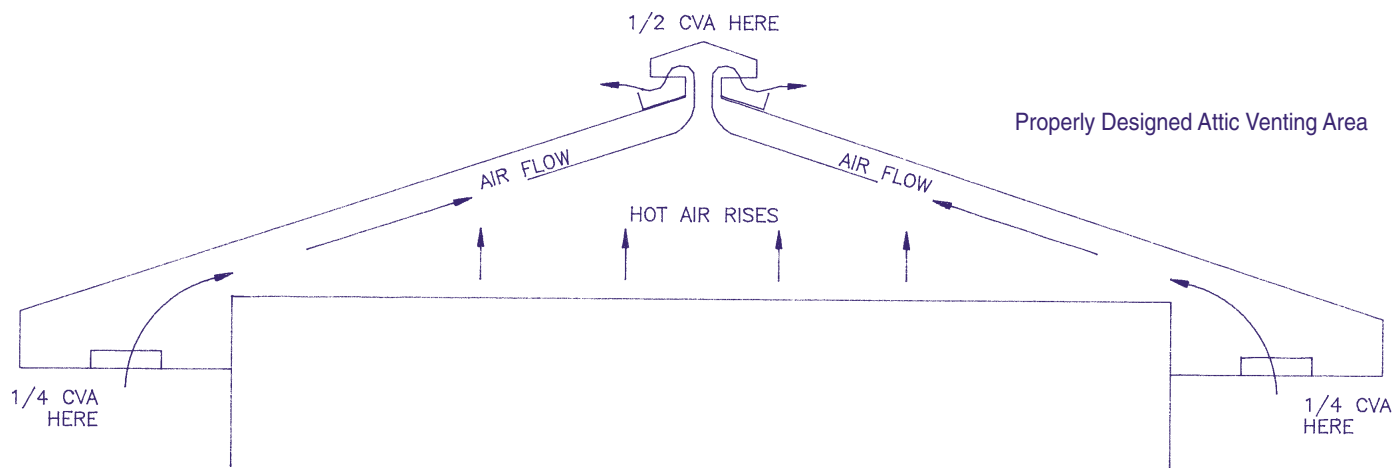
Vent for Earth-Filled Porch

## VENTILATION AREA NEEDS IN ATTICS AND CRAWL SPACES

Clear Vent Area (CVA) means *the area available through the surface of a ventilating material through which air may pass*. Materials commonly used for ventilating purposes in the structure of a house include foundation vents, soffit vents and ridge area vents.

The effectiveness of these materials in accomplishing the jobs of providing ventilating air and removing moisture vapor from crawl spaces and attics is dependent upon the amount of air that can flow through the vents. Vent covers are therefore measured and stamped with a rating such as "CVA 50," which means that 50 square inches of clear ventilating area is available. A material such as a ridge vent may be rated per linear foot or may come in 3- or 4-foot lengths and be rated per 3 or 4 feet. Product literature is another source of information of the CVA available.

One square foot of CVA for each 150 square feet of floor area above (crawl space) or ceiling area below (attic) is necessary for houses. In the crawl space this usually means about one foundation vent every 6 to 8 feet around the entire foundation wall. In the attic, the ventilating area must be located with half the CVA in low eave or soffit vent intakes for the cooler air and half high in the ridge area of the roof as the outlet for warm air as shown in the illustration below:



Do not be fooled by the appearance of a vent cover. Nearly all foundation vents are 8-by-16 inches to fit into the space of an absent concrete block.

- 8 x 16 inches = 128 square inches in area, but this area is not clear vent area.
- Insect screen wire reduces the area by nearly 50 percent to about 65-70 square inches.
- Reinforcement or decoration reduces the area further, so that CVAs of foundation vents run from about 30 to 70 square inches depending on how much area is covered by patterned decoration or reinforcement and insect screening.

For example:

Assume we have a 1500 square foot house.

1.  $\frac{1500}{150}$  Floor area above = 10 sq. ft. CVA spaced evenly around foundation wall for adequate ventilation of crawl space and attic.  
Each 150 sq. ft. needs 1 sq. ft. CVA

(1 sq. ft.)

2. 10 sq. feet = 10 (12 x 12) = 1440 square inches  
CVA TOTAL NEEDED.

3. Vent Cover A = CVA 30 rating

$$\frac{1440}{30} = 48 \text{ vents with CVA 30}$$

OR

- Vent Cover B = CVA 70 rating

$$\frac{1440}{70} = 20.57 \text{ or } 21 \text{ vents with CVA 70}$$

Using this same 1500-square-foot house with a 1500-square-foot ceiling area, we would locate half of our CVA high in the ridge area and half low in the eaves like this:

- 1440 square inches of vent area needed
- Locate half (720 square inches) at the roof ridge. Locate the other half (720 square inches) in the eaves or put 360 square inches in the soffit of one side of the house — spaced evenly in the soffit — and the other 360 square inches on the opposite side of the house, as illustrated above.

These two ventilating systems have provided adequate ventilation over the years in South Carolina residences. The crawl space system may be assisted by covering the soil surface with a vapor-retarding barrier to slow the vaporization of soil moisture into the air of the crawl space. In addition to venting out moisture vapor, the ventilation system serves to vent out other gases such as those formed from residues of chlorodone used in termite treatment; pentachlorophenol, used in treated wood; and radon gases. Thus, the crawl space ventilation system protects both the structure of the house and the health of its occupants.

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