Ventilation guidelines

Proper attic ventilation may be one of the least understood concepts in residential (steep-slope) roofing among home owners—they frequently are confused by proposals to increase their houses' ventilation capabilities, and roofing contractors often inadequately explain the benefits of proper ventilation.

To simplify the matter for a home owner, a contractor should explain that proper attic ventilation has two primary purposes: to lower attic temperature and remove excess moisture.

Advantages

Lowering attic temperature has several benefits. For example, a cooler attic relates directly to lower cooling-load requirements and utility bills for an air-conditioned home. If a home owner asks a contractor to quantify the savings, the contractor should explain that quantifying savings is difficult because savings depend on a number of factors, such as weather (e.g., How hot will it get and for how long?); amount and effectiveness of attic insulation; an air-conditioning unit's efficiency; and temperature at which a home owner sets his thermostat.

Another benefit of proper attic ventilation is that it lowers a roof deck's temperature, which can reduce the stresses placed on plywood sheathing or other engineered wood products used as roof decking.

Lowering attic temperature also can help optimize asphalt shingles' life spans because heat is a primary aging mechanism of asphalt. When asphalt is exposed to elevated temperatures for a prolonged time period, it dries out, becomes brittle and is more vulnerable to cracking.

Although asphalt shingles eventually will dry out, reducing the amount of heat to which they are subjected will slow this natural aging process.

Lowering attic temperature also will minimize ice damming. By lowering an attic's temperature during winter conditions, the amount of melting snow on a roof will be reduced, thereby decreasing the amount of water available to contribute to ice dams.

Removing excess moisture from an attic also has its benefits. Improving attic ventilation will reduce the potential for condensation to form on structural wood members (e.g., joists, rafters). Condensation that forms on these wood components can promote rotting and deterioration of the wood. In addition, condensation can cause mold and mildew.

Recommendations

To achieve proper attic ventilation, NRCA recommends a contractor install a minimum of 1 square foot (0.09 m^2) of net free ventilation area for every 150 square feet (13.5 m^2) of attic space, measured at the attic floor level (i.e., ceiling). Net free venting area is the size of a vent's opening minus the space displaced by any screening material or louvers. Manufacturers of prefabricated vents typically indicate a unit's net free venting area either on the vent or its packaging.

NRCA also suggests that an attic's ventilation be balanced between an eave and ridge, meaning there should be about the same amount of net free venting space at an eave as there is at a ridge. When a ventilation area is balanced in this manner, air will enter an attic at the lower end (i.e., eave), rise as it is warmed and exit at the upper end (i.e., ridge).

Other options

It is possible to achieve attic ventilation by mechanical means. Electric fans or power vents can be installed to expel air from an attic area. If power vents are used, NRCA suggests the units be capable of moving 1 cubic foot (0.03 m^3) of air per minute per square foot (0.09 m^2) of ceiling area.

When installing a power vent, a roofing contractor should consider installing vents in an attic to allow air to be drawn into the attic area to replace air being expelled by the power vent. Without sufficient intake vents, a power vent will expel air drawn from a building's interior.

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