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WELCOME TO BRADEN ROOFING NEWS™ VOL. III
GUIDE TO VENTILATION

We at Braden Roofing would like to take a moment to thank you, our customers, for your continued support. We appreciate your interest and kind comments regarding the Braden Roofing News articles. We will work hard to have additional articles ready in the near future. As always, if you have any comments or suggestions regarding past or future editions of the BRN newsletter, we welcome your input.

This article will be a bit more complicated than previous BRN issues due to the more complicated nature of the subject matter. Don't get discouraged. It is not necessary to be an expert. Feel free to skim this article for whatever information may be appropriate to whatever questions you may have. If, however, you should choose to become an expert, this article is a very good place to start.

In this article, we will answer questions such as:

"Why do we need ventilation?"

"What kinds of ventilation work best?"

"How many vents should I use?"

"Is it possible to have too much ventilation?"

Let us first of all look at the question of why we need ventilation. Improper ventilation will cause all kinds of nasty problems, starting with heat buildup and condensation.

Heat buildup can lead to problems such as excessive energy consumption in the summertime (an especially overheated attic makes the house hotter and thus requires more air conditioner usage) and the premature ageing of asphalt shingles (and most shingle manufacturers' warranties void if

the attic does have proper ventilation). A heat-damaged shingle will literally destroy itself from the inside-out. Heat damage usually manifests itself as blisters which form inside the asphalt of the shingle, but rise to the surface, breaking the granulation. Sometimes shingle granulation will simply flake away in large patches. We can see a great example of this in the picture HEAT DAMAGE. Other times, heat damage will manifest itself as large continuous cracks (called "crazing") in the shingle surface (SEE PICTURE "CRAZING").

On occasion, we will look at a roof which appears to be completely worn out, and a homeowner will tell us that the roof is only ten years old. Ninety five percent of the time, there is a major problem with the roof ventilation. It is very sad when we have to tell the homeowner that their thirty year roof is indeed worn out in only ten years, and the manufacturer's warranty won't be worth a dead horse because the roof does not have adequate ventilation. Ouch.

Heat buildup tends not to be as much of a problem on wood shingles or shakes. First of all, wood shingles just don't get as hot as composition. Whereas on a blazing hot summer day a

fahrenheit, wood shingles will tend to max out at about 110 degrees. Still hot, but nothing compared to the scorching heat of an asphalt shingle. Secondly, wood shingles tend to naturally breathe air between the shingles, whereas a composition roof seals tight against itself. Some roofers will even go so far as to say that wood shingle roofs do not need a ventilation system because they "self-ventilate". Nonetheless, at Braden Roofing, we feel that it is wise to install a proper venting system even on a wood roof.

As bad as heat buildup is, condensation leads to even worse problems. Condensation, of course, refers to water passing from a gas state (vapor, steam, or humidity) to a solid state (such as the water droplets on the side of a glass of iced tea on a hot steamy summer day). When moisture in the air condenses, water droplets form. Water droplets below the roofline can lead to wood rot, damaged insulation, and mold. In picture WOOD ROT, we see moisture-damaged plywood. In extreme cases, water may actually form thick enough droplets to "rain" inside an attic! Yikes!

A brief note on mold is called for. Mold issues have gotten a lot of attention in the last ten to twenty years because houses are built differently than they were, say, thirty to forty years ago. Recently constructed houses have a much greater emphasis on energy efficiency, and therefore, have less free air movement. This lack of air movement provides mold a chance to get a foothold inside houses and buildings. Mold also requires moisture. With a little bit of moisture, conditions in today's homes are frequently favorable for the formation of mold colonies. With the right conditions, some kinds of mold can be downright nasty and lead to health problems. However, the worst molds tend to require a long period of time to develop, a lot of moisture, very little variation in air temperature, a severe lack of air flow, and a lack of sunlight. A properly vented roof will not usually have these conditions. Molds can form from two roof issues; ventilation and roof leaks. In picture MOLD, we see a soffit which has some considerable mold staining due to ventilation deficiencies.

HEAT DAMAGE

Excessive heat in an improperly vented attic can destroy a roof from the inside-out.

"CRAZING"

Sometimes heat-damaged shingles will have long cracks in the shingles surface, called "Crazing"

Wood Rot: Moisture build-up can severely damage plywood

Mold: A moldy soffit. This kind of mold is usually due to ventilation problems.

Molds forming from ventilation problems can sometimes be fairly nasty but it is extremely rare for such toxic molds to form from roof leaks. A well-vented roof will almost never be conducive to such toxic molds, even if it does leak. Furthermore, once a moisture problem is corrected (either from a roof leak or a lack of ventilation), the molds almost invariably die off and cease to be a problem. Molds are rarely a long-term problem due to roof leakage or deficient attic ventilation. If you have any questions on mold issues, it is always a good idea to consult a mold expert.

Hopefully, we can all now agree on the importance of having proper air ventilation inside an attic. Let's take a moment to talk about the various kinds of vents. There are two general kinds of air vents, intake vents and outtake vents. There are just a few kinds of intake vents and a whole lot of outtake vents. Briefly stated, an intake vent allows air to flow inside and attic space, whereas an outtake vent allows trapped attic air to escape. Both kinds of vents are important. In general, it is best to have a balance of intake and outtake vents. In other words, if a roof has 400 square inches of outtake venting, it should also have 400 square inches of intake venting. This is sometimes much easier said than done. Another principle of roof ventilation is that we should not mix different kinds of outtake vents on the same roof. We will discuss these principles in far greater detail later on in this newsletter.

A brief summary of venting systems:

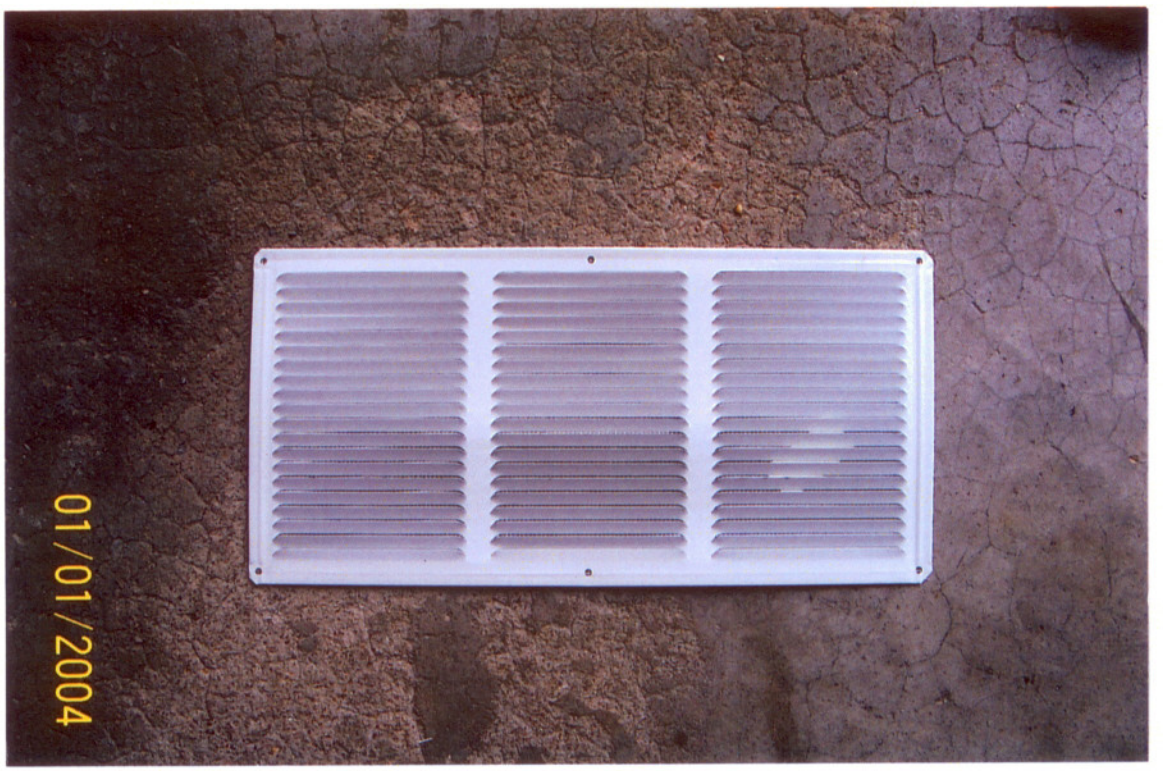
INTAKE VENTS

1. Soffit vents.
2. Drip-edge (starter) vents.
3. Fascia board vents.

OUTTAKE VENTS

1. Gravity vents (aka "dead air" vents, "passive" vents, "static vents", "turtles")
2. Turbines.
3. Ridge vents.
4. Power vents.
5. Dormer vents.
6. Gable vents.

The most common kind of intake vent is the soffit vent. A soffit vent is usually rectangular in shape, perhaps 6" x 12", made of metal, and has a perforated venting area with a screen. See picture SOFFIT VENT#1. Naturally, a soffit vent should be installed in a soffit, which is the underside of a roof's exterior overhang, as in picture SOFFIT VENT#2. Sometimes, when a house has been wrapped in vinyl siding, the soffit vent will be built into the siding material (see picture SOFFIT VENT#3). Perhaps the most effective type of soffit vent is the continuous soffit



Soffit Vent # 1 A soffit vent.

Soffit Vent # 2 An installed soffit vent

Soffit Vent # 3 Soffit vent built into siding material.

Soffit Vent # 4Continous soffit vent.

vent, such as we see in picture SOFFIT VENT#4. A continuous soffit vent tends to evenly vent the attic area. Soffit vents are the most common type of intake vents.

Incidentally, the installation of soffit vents can be somewhat onerous, in that one must make precise measurements, cuts, and secure fasteners while leaning over backwards at the top of a ladder. Not fun.

Another type of intake vent is a drip-edge vent, which is exactly what its name implies. Drip edge is the metal trim, or "flashing" which surrounds the perimeter of a roof, such as on the end gables and above the gutters and fascia boards. Drip edge vent (sometimes called "starter" vent) goes above the gutters and fascia boards. It has a vented area which allows air to pass below the roofline through a gap left between the fascia and roof substrate, or plywood (see picture DRIP EDGE VENT and then DRIP EDGE VENT DRAWING). This kind of vent is sometimes used when there is no soffit on a house.

Point of interest:

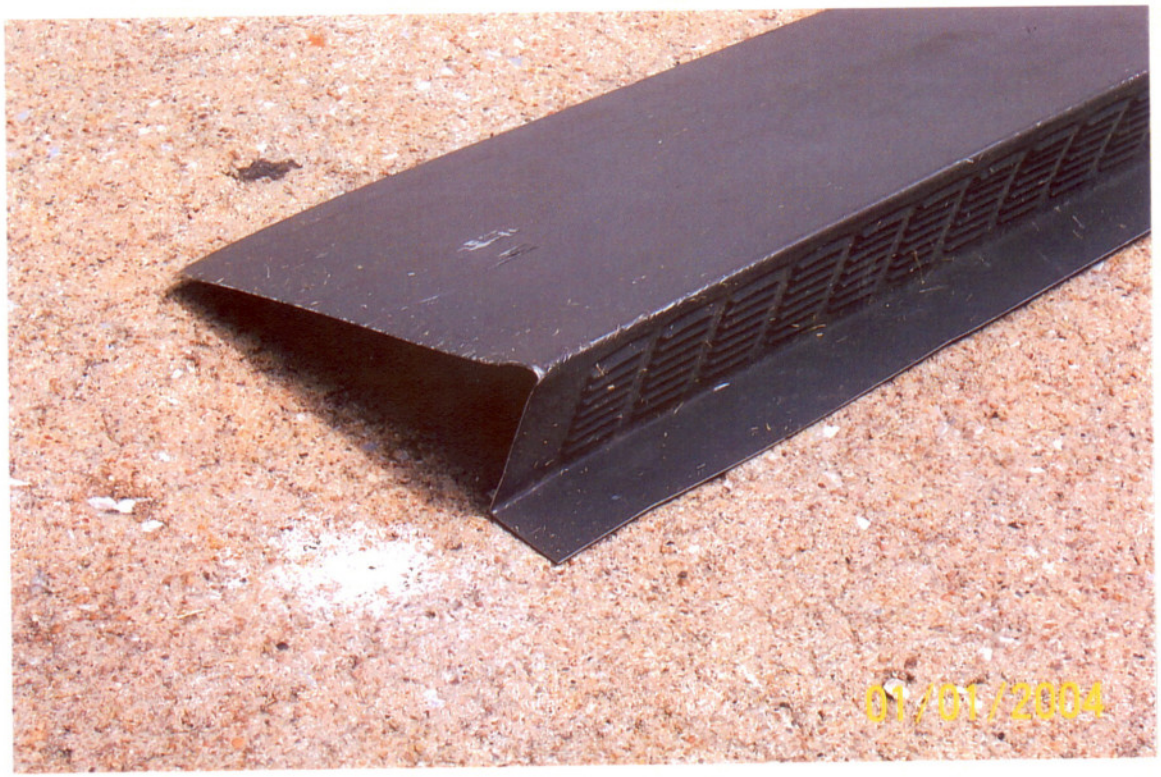
Many houses in the Midwest area known as "tornado alley" do not have soffits because updrafts in tornadoes can more easily rip a roof right off of a house which has larger soffits.

At Braden Roofing, we are very hesitant to use drip edge vents because we feel there are two very significant problems associated with this kind of venting system. First of all, we feel there is an increased risk of squirrels and birds entering into the attic space. Animals can sense air flow, and squirrels love to run along gutters. When they can feel air flow into a sheltered area such as an attic alongside a natural conduit such as a gutter, they are far more likely to begin chewing an entry hole. The second potential problem is ice damming (damning?). An open space between the gutter and the roofline is an open invitation for ice and snow backups.

A third type of intake vent is a fascia vent. In essence, a fascia vent is a hole cut in a fascia board and covered with a screen to prevent bugs and birds from entering (see picture FASCIA VENT). A fascia vent is typically only used when the roofline has an open soffit construction. A roof installer must be very cautious installing this type of a vent, as a large hole which accidently penetrates a header board can compromise the structure of a roofline. For the record, fascia vents, like other intake vents, can be rather inconvenient to install.

We can see by the above three types of intake vents that the installation and practical application of intake vents is one of the most continuously challenging aspects of roof and attic ventilation. THE UNFORTUNATE TRUTH IS THAT IN SOME CASES, IT IS ALMOST IMPOSSIBLE TO INSTALL ADEQUATE INTAKE VENTILATION. The good news is that this dynamic typically only applies to older houses which tend to not have been built quite as airtight as the homes of today—thus rendering the ventilation issue at least a bit less critical.

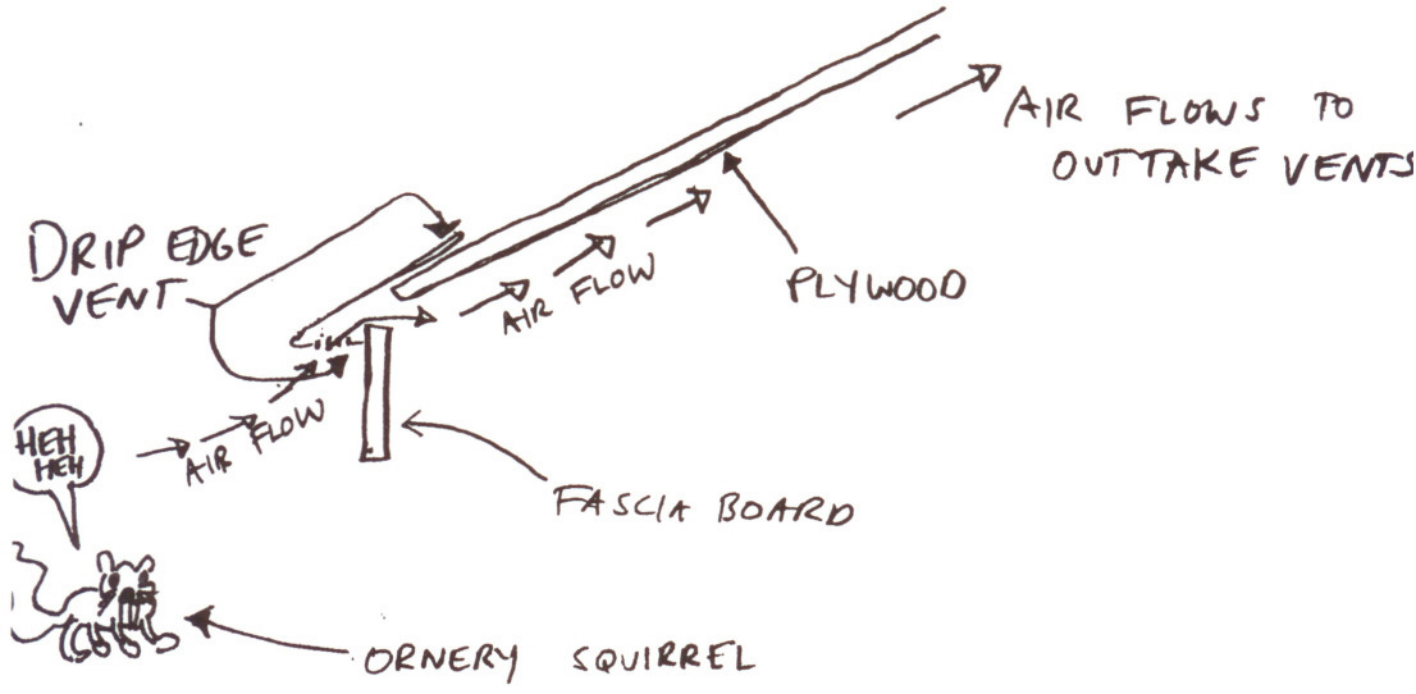
At Braden Roofing, we feel that we should always try to construct the best intake ventilation system possible, but we are keenly aware that sometimes we must decide to "do a tradeoff" when



Drip Edge Vent close-up

Fascia Vent. Fascia vents are usually only used with an open soffit, such as in this picture.

DRIP-EDGE VENT DRAWING (CUTAWAY VIEW)



there are other considerations. Hopefully, this article helps to educate our customers so they can effectively participate in this decision making process.

Outtake vents are easier to understand. Let us review the types of outtake vents.

Again, they are:

1. Gravity vents (aka "dead air" vents, "passive" vents, "static" vents, "turtles")
2. Turbines.
3. Ridge vents.
4. Power vents (solar or wired).
5. Dormer vents.
6. Gable vents.

Let us begin with the basics. The fundamental rule of outtake vents is as follows:

DO NOT MIX DIFFERENT KINDS OF OUTTAKE VENTS ON THE SAME ROOF AREA.

For example, we would not put gravity vents side by side with turbines. The reason for this is that one kind of vent may begin to draw air off the other, creating an improper venting situation where an outtake vent actually becomes an intake vent. Not only does this weaken the venting abilities of the entire system, but can actually create a leak by vacuuming rainy air inside the attic. In picture MIXED VENT SYSTEMS we see that someone (most definitely not Braden Roofing!) has mixed spinning turbines with gravity vents. Technically, this is not correct.

Sometimes we have no choice but to have some mixing of vent systems, especially with power vents, dormer vents, and gable vents. We try to keep this kind of vent mixing to a minimum. Generally speaking, if we see any combination of two types of gravity, turbine, or ridge vents in the same system, we can usually assume that a mistake was made.

Okay, let's take a look at the different kinds of outtake vents.

A static vent is basically a square cap with a grill atop a hole with a footing. There are many different kinds of gravity vents, and a gravity vent can have many different names, such as a "dead air" vent, "passive" vent, "static" vent, or a "turtle". Most of these terms are fairly self-explanatory, except for the term "turtle". How this vent came to be called a "turtle" is beyond me. I have visions of some oversized square aluminum terrapin clambering over a roof ridge, but this does not logically make sense. Insurance adjustors tend to use this term more than roof professionals.

In any case, a gravity vent is a metal (aluminum) vent which is square shaped, less than a square foot in shape, and as much as five inches tall. Not all gravity vents are created equally.

At Braden Roofing, we prefer using a product known as a "750", which was popularized by the Lomanco company. In picture LOMANCO 750, we can see a troika of different colored gravity

Mixed Vent Systems.
It is technically not correct to mix turbines and gravity vent.

The Lomanco 750 is the staple roofing product used by Braden Roofing

my opinion, is that they are just plain ugly. The newer turbines are painted to match the shingle color, which certainly helps, but you know what they say about putting lipstick on a pig…

In any case, if our customers are not bothered by the cosmetic issue, we won't be either. At Braden Roofing, we will gladly install the newer model turbines if that is what our customers want. If you like it, we love it.

Another frequently used vent is a ridge vent. There are many kinds of ridge vent, and some are certainly better than others. In certain situations, ridge vents are critical. In other situations, ridge vents can be problematic. Let us first of all discuss the different kinds of ridge vents.

There are two basic kinds of ridge vents.

1. Roll vents.
2. Baffled vents.

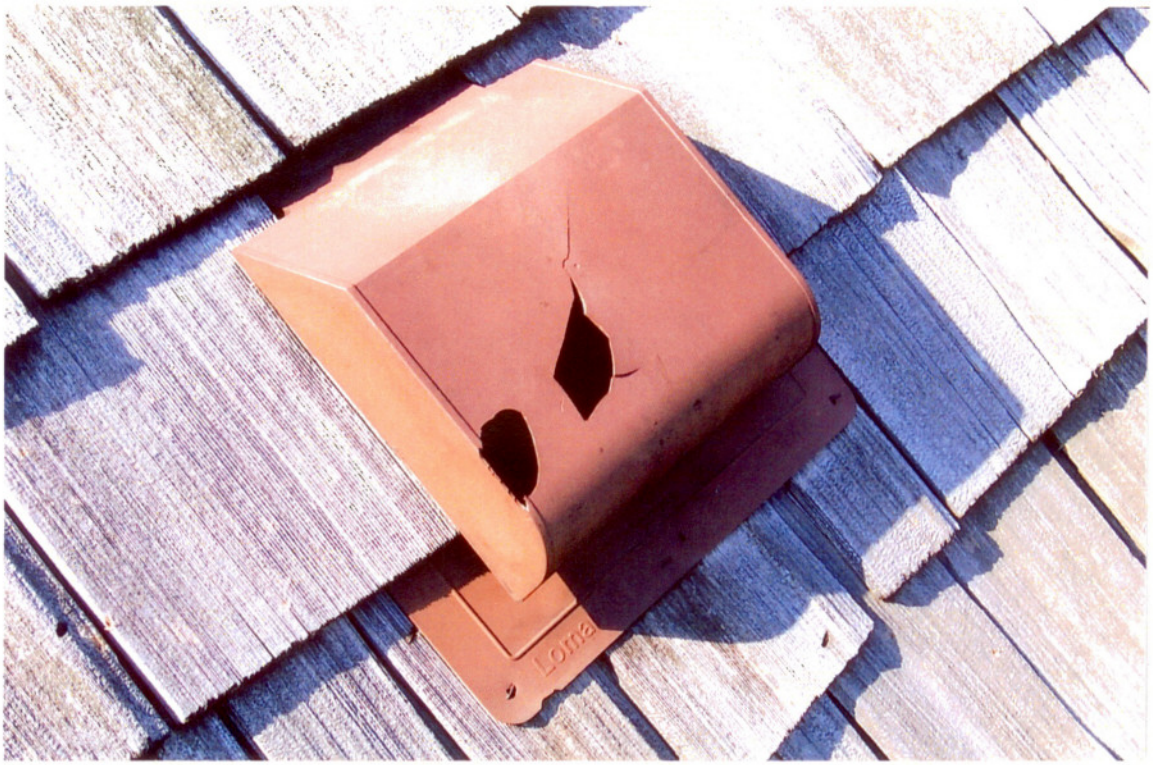
A rolled ridge comes in a continuous roll which is essentially unraveled above a gap in the ridge line. The product is basically a spongy but rigid plastic which is strong enough to support the ridge shingles which are placed above, yet porous enough to allow air to flow through the sides of the product. Please take a look at DRAWING#1. We see a cutaway view of a roofline. There is a small opening at the ridge peak which allows air to escape past the ridge beam.

A baffled vent is a stiff polyurethane plastic construction with a venting area on each side. DRAWING#2 shows a cutaway view of a roof with a baffled vent. The distinctive feature of a baffled vent is the raised "wings" on each side. These wings, or baffles, work the same way as the wings on a fixed wing aircraft. Air passing over the edge creates a vacuum on the opposite side of the edge. This is called the Bernoulli Effect, after 18th century Swiss physicist Daniel Bernoulli (not to be mistaken with Jean Bernoulli (father), or Jacques Bernoulli (brother), fine mathematicians in their own right). The Bernoulli Effect literally vacuums air out of the space under a roof.

Incidentally, the term "baffle" has another meaning relevant to roof ventilation. An interior roof baffle is a plastic insert which goes between rafters and allows for air passage below the roofline. We can see an example of a baffle in DRAWING#5.

At Braden Roofing, we very much prefer the baffled ridge vent to the rolled ridge vent. In picture BAFFLED? We see a baffled ridge vent. Ridge vents in general are not our favorite venting product, but in one particular circumstance, ridge vents are the preferred venting system.

The one circumstance when we recommend a ridge vent is when the living space underneath a roof has a fully cathedralized ceiling (as opposed to having an attic). In other words, the ceiling is attached directly to the underside of the roof rafters, and there is no attic space (see DRAWING #3). We can also see a photo of the inside of a cathedralized ceiling in picture CATHEDRALIZED#1. In picture CATHEDRALIZEDD#2, we see a partially cathedralized ceiling. A partially cathedralized ceiling (which has a truncated attic space) does not specifically require a ridge vent. Gravity vents like the 750 will do fine (assuming our other rules of ventilation are also followed).



Shattered! This plastic vent became brittle and broke in a hailstorm.

Dimpled! A hail dimpled vent sure is preferrable to a hail-shattered vent.

Turbines. Spinning turbines used to be the preferred ventilation product.

vents. Lomanco is a roof ventilation product company which many roof professionals consider to be an industry leader in the manufacturing of residential roofing ventilation products. At Braden Roofing, we have a tremendous amount of respect for the Lomanco company. Many other roof product manufacturers have created other venting products imitating the Lomanco 750, and it should be noted in all fairness that some of those products are really quite good. We consider the 750, whether manufactured by Lomanco, or other shingle manufacturing companies such as GAF, to be the staple product of roof outtake ventilation.

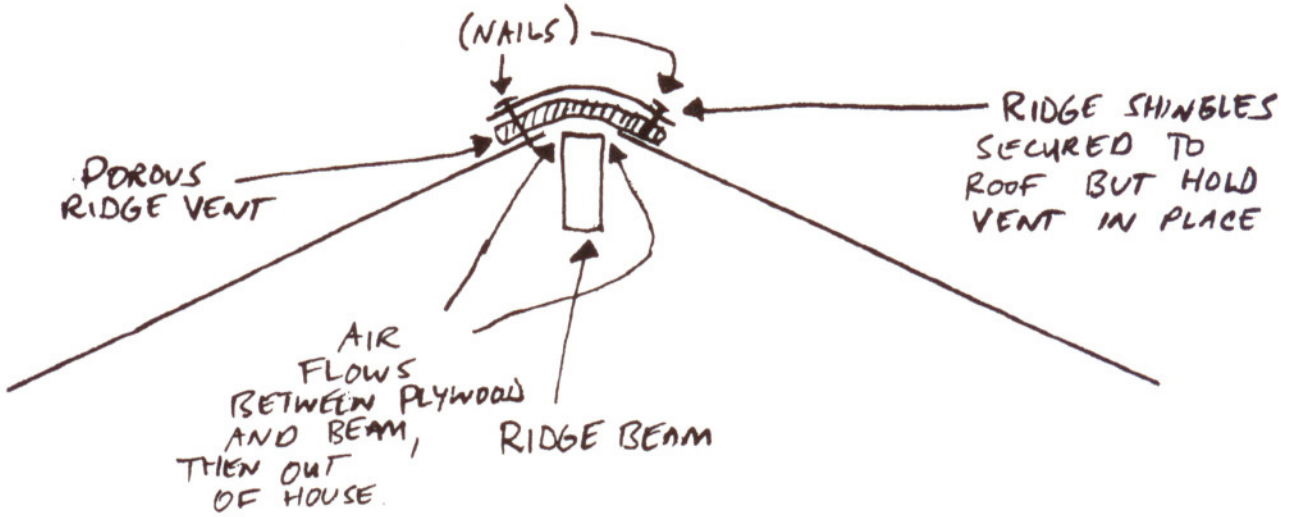
Other roof ventilation products, such as the older 550's, tend not to move as much air. Sometimes they will have other deficiencies such as letting squirrels and birds inside or, in the case of plastic gravity vents, becoming brittle and shattering when hit by even light hail. Plastic vents were originally created so that hail would theoretically bounce away from the vent without denting it. In fact, this worked fairly well for the first few years of the life of a plastic vent. However, UV sunlight eventually causes the plastic to turn stiff and brittle, and very susceptible to cracking and shattering. In picture SHATTERED! , we see a plastic vent which became brittle and broke in a hailstorm. A shattered vent can allow a tremendous amount of water to leak inside a house in very little time. In picture DIMPLED! We see a 550 vent which has been dimpled by hail. While this is certainly not a beautiful sight, it sure beats the heck out of a hole and a leak. Most other products tend not to inspire our confidence in the same manner as the 750.

At Braden Roofing, we also very much prefer the design of the 750, which has the vented grill area perforated into the actual body of the vent, rather than having a big hole with a screen stapled over. In our experience, the 750 design is superior to other products in terms of keeping squirrels, birds and other "critters" out of an attic space. I have personally observed tens of thousands of 750 vents in use, and have only seen two very isolated cases where animals have penetrated this kind of vent. Both of these failures occurred on the same roof. I can only imagine that the squirrels around this poor homeowner's residence may have been consuming "performance enhancing drugs". We're talking Frankensquirrel, or maybe Squirrel-zilla. It was certainly not a typical situation. In our opinion, two out of twenty or thirty thousand is an acceptable failure rate.

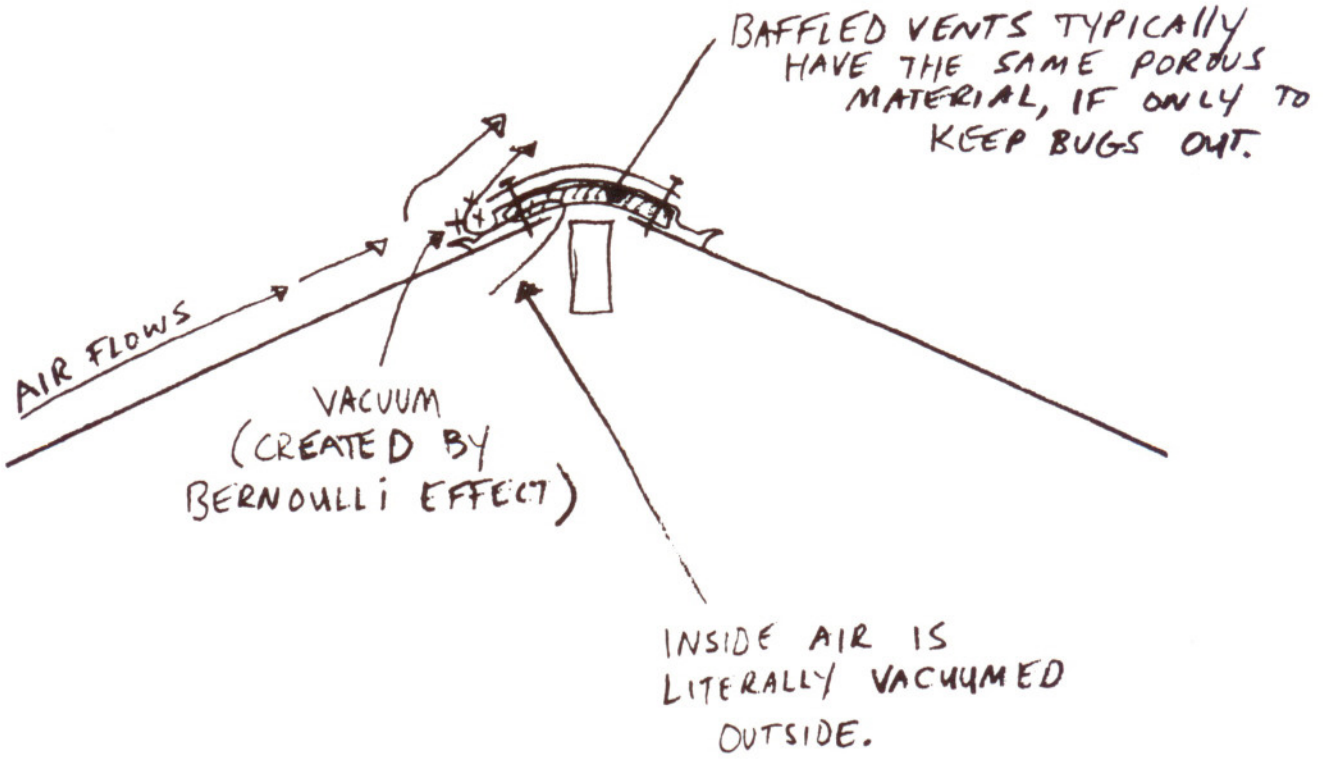
Whether manufactured by Lomanco or other quality manufacturers, the 750 is the preferred outtake vent of Braden Roofing.

In years past, spinning turbines used to be very popular. Over time, turbines such as we see in picture TURBINES have become less popular. While a spinning turbine, on appearance, may move more air efficiently on even windless days, many turbines have proven to have mechanical problems. Turbines can get knocked akilter by strong wind gusts, and are prone to leakage and squeaking. Newer turbines from great manufacturers such as Lomanco are constructed with a ball-bearing spinner which is guaranteed not to squeak or freeze up. Braden Roofing does not yet have an opinion on these newer turbines because they have not yet been in usage for a long enough time for us to form an opinion. However, given our respect for the Lomanco company, we strongly suspect these to be good products. However, the biggest drawback to turbines, in

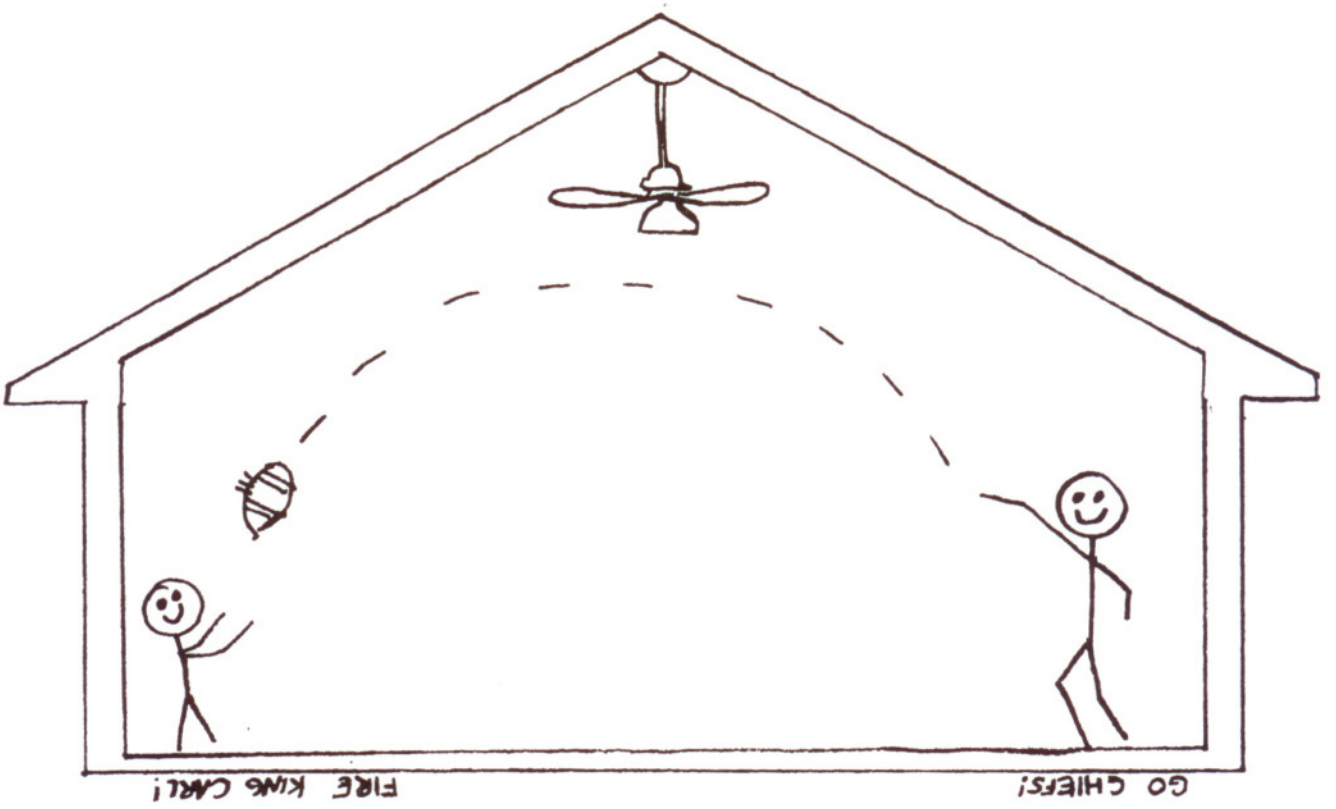
RIDGE VENT
DRAWING #1 - A TYPICAL ROLLED RIDGE VENT



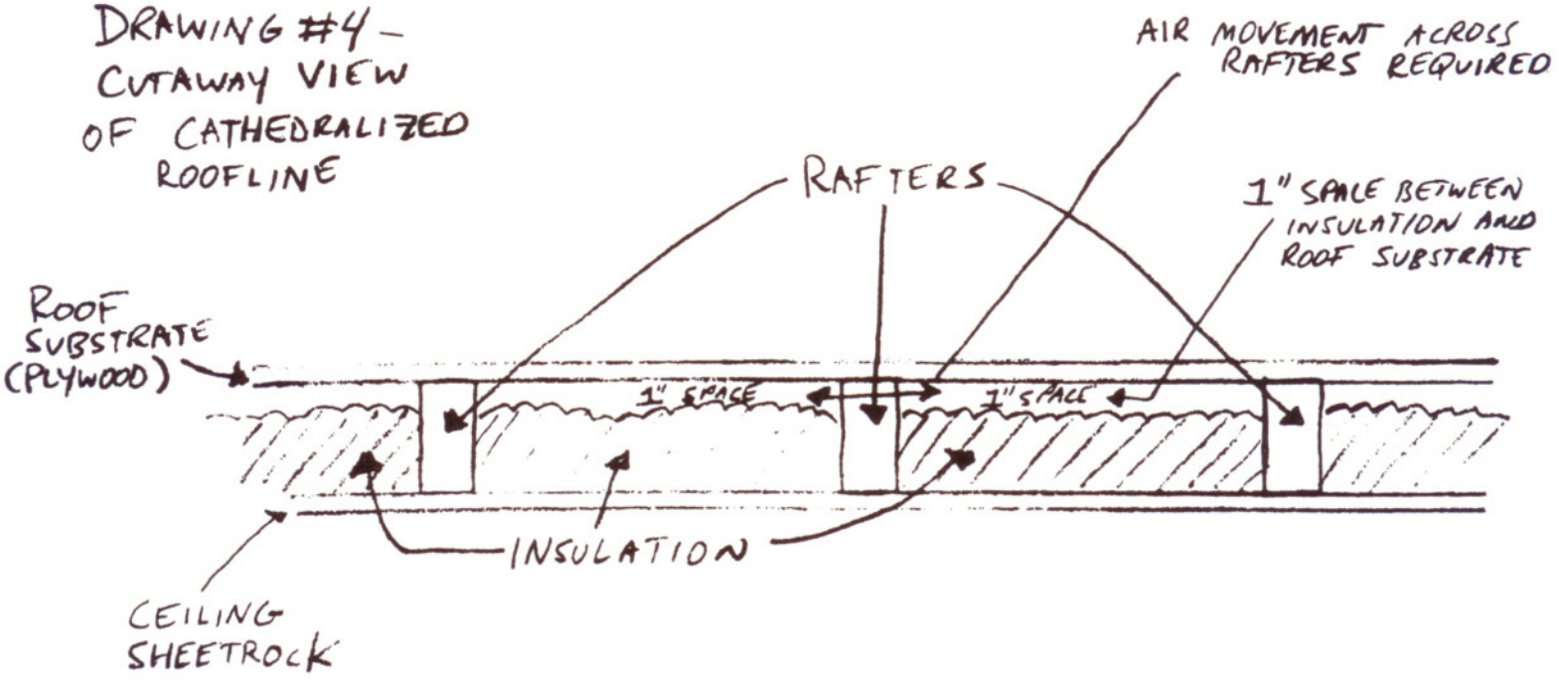
RIDGE VENT
DRAWING #2 - A TYPICAL BAFFLED VENT



RIDGE VENT
DRAWING #3 - CUTAWAY VIEW OF ROOM WITH CATHEDRALIZED CEILING.

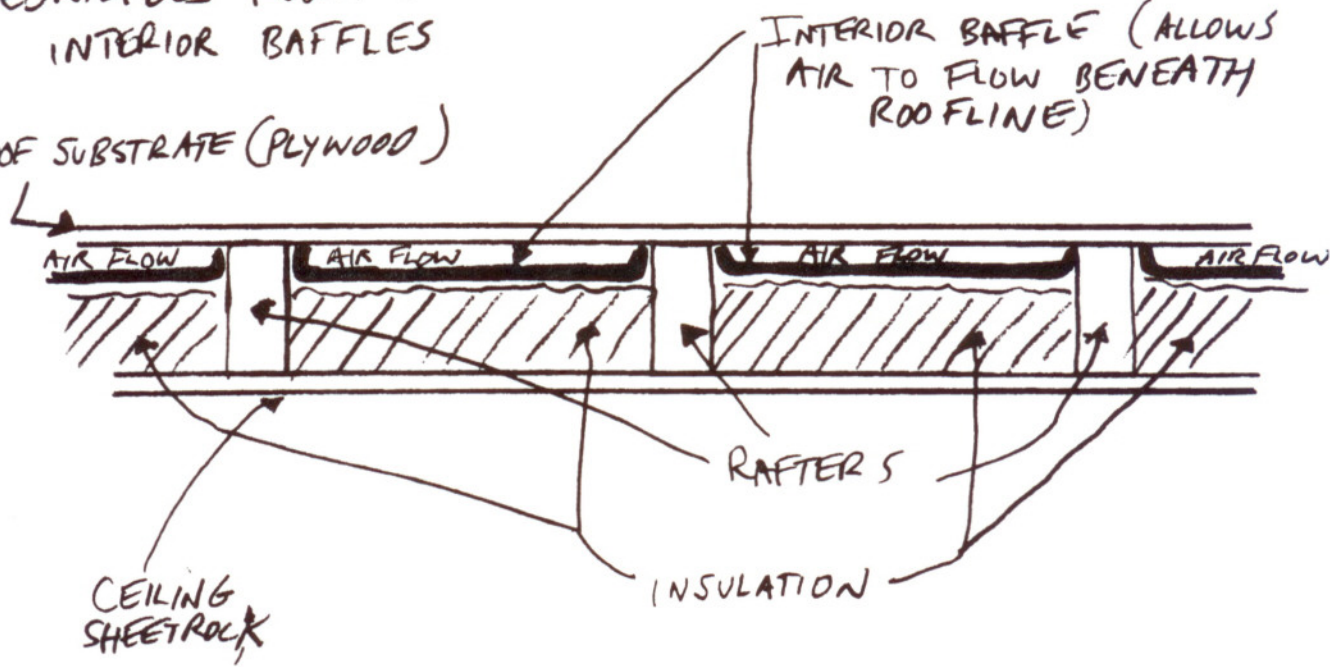


DRAWING #4 - CUTAWAY VIEW OF CATHEDRALIZED ROOFLINE



(INSIDE OF HOUSE)

RIDGE VENT
DRAWING #5—
CUTAWAY VIEW OF
CATHEDRALIZED ROOFLINE
WITH INTERIOR BAFFLES



Baffled? A Baffled Ridge vent.

Cathedrailized # 1. The inside of a cathedralized ceiling.

Cathedralized # 2. A partially cathedralized roof does not require ridge venting specifically. Gravity vents will do fine.

The reason for this has to do with the air pockets which form beneath the roofline but above the ceiling line. Imagine, if you will, a cutaway view of a cathedralized roofline, such as we see in DRAWING #4). The roof rafters hold the roof substrate above and the interior ceiling directly below. The space between the rafters and between the substrate and ceiling is usually filled with insulation, with a small gap (about 1") of air atop the insulation. According to code, starting with the 2003 IRC (International Residential Code), there needs to be air movement ACROSS THE RAFTERS. THE ONLY WAY to effectively do this is with a ridge vent. Without the ridge vent, condensation can form underneath the roofline and inside the 1" gap or even inside the insulation itself. We can see a great example of this is picture RIDGE VENT#1. The roofline is wavy because the plywood underneath has softened due to condensation. The plywood probably looks like rigatoni. A properly installed ridge vent can prevent this from happening.

In some cases, there may not even be a 1" gap above the insulation. The insulation may have been crammed into the space between the rafters without any additional space for airflow. In these cases, it is even more critical to have a ridge vent, in that moisture can form inside the insulation. Unfortunately, the restricted air flow may reduce the effectiveness of the ridge vent. It is the opinion of Braden Roofing that a ridge vent with reduced effectiveness is still better than no ridge vent at all. Short of ripping out the insulation (and probably walls or substrate) to reset the insulation, we do not see any other way of easily improving the air flow when insulation has already been crammed inside a cathedralized ceiling space. It is possible, I suppose, to remove the fascia boards and cram a vented pvc pipe (pvc pipe premanufactured with holes) up inside the roofline. This is an unwieldy and probably fairly ineffective solution. Obviously, installing an interior baffle BEFORE cramming in the insulation can prevent this problem from occurring.

Ridge venting is THE preferred venting system for cathedralized roofs. Ridge venting may also be used on roofs with attics. As you already know from reading this article, Braden Roofing prefers to use gravity vents like the Lomanco 750 on roofs with attics. We will also frequently use ridge vents, although ridge vents do have three minor disadvantages.

First of all, they are a tad bit more expensive. Ridge vents will typically add $200 to $250 to the price of an average home in the greater Kansas City area. Not a dealbreaker, but worth noting.

Secondly, my subjective opinion is that they can be ugly. I personally just don't like the way they look. In picture RIDGE VENT#2, we see an installed ridge vent. On the far right of the ridge, we can see that the ridge vent curls downward slightly, due to a very slight sway in the roofline. Ridge vents will transpose and magnify (transmogrify?) whatever minor construction flaw may exist in the carpentry. In picture RIDGE VENT#3, we see a ridge vent as it ends about 1 foot away from the gable. This is straight from the manufacturer's installation guide. Open soffits on a house usually mean that this one foot space begins at the outer structural wall, rather than the end gable. While I don't think this is the most objectionable facet (cosmetically speaking) of a ridge vent, some customers have voiced concerns. Once again, we will install what the customer wants.

The third disadvantage of a ridge vent is the most problematic. Put simply, they can let snow into an attic in the wintertime. Even if they are installed in strict adherence to the manufacturer's instructions, they can still allow snow into a house. Some roof professionals may disagree with this statement. They may tell you that the only way in which a ridge vent can possibly leak is if

Ridge Vent # 1. Because the cathedralized roof was not vented properly with a ridge vent, moisture has damaged the plywood on this roof.

Ridge Vent # 2. On the far right of the ridge, a very slight sway in the roofline has transposed into a noticeable downward twist in the ridge vent.

Ridge Vent # 3. Ridge vents should end about 1 foot away from the end gable (more with open soffits).

it is NOT installed properly. Our experience in the field contradicts this, so we must respectfully assert our opinion that even a properly installed ridge vent may leak snow under the right circumstances. In the opinion of Braden Roofing management, it is a good idea to leave a slightly smaller ridge opening than is recommended by the manufacturer. This reduced aperture helps to keep snow and moisture out of the house. It can also reduce the amount of air flow. We have seen instances where ceiling fans have a reduced draw after a ridge vent has been installed. Braden Roofing management feels that a slight reduction in air flow is preferable to snow leaks in wintertime.

Incidentally, studies performed by Air Vent Inc, (another company which Braden Roofing holds in high regard) indicate that a ridge vent, when installed in adherence with manufacturer's instructions, tends to ventilate a little better than gravity vents. Air Vent Inc. representatives believe that a ridge vent will tend to vent an attic evenly whereas other venting systems may not vent the entire attic in a thorough manner. They may very well be correct. However, it is the position of Braden Roofing management that this slight advantage will probably be nullified by reducing the vent aperture. In essence, in order for a ridge vent to vent better than gravity vents, a homeowner must accept a greater risk of water penetration in the wintertime.

For this reason, Braden Roofing recommends gravity vents on a roof over an attic, but ridge vent on a roof over a cathedralized ceiling.

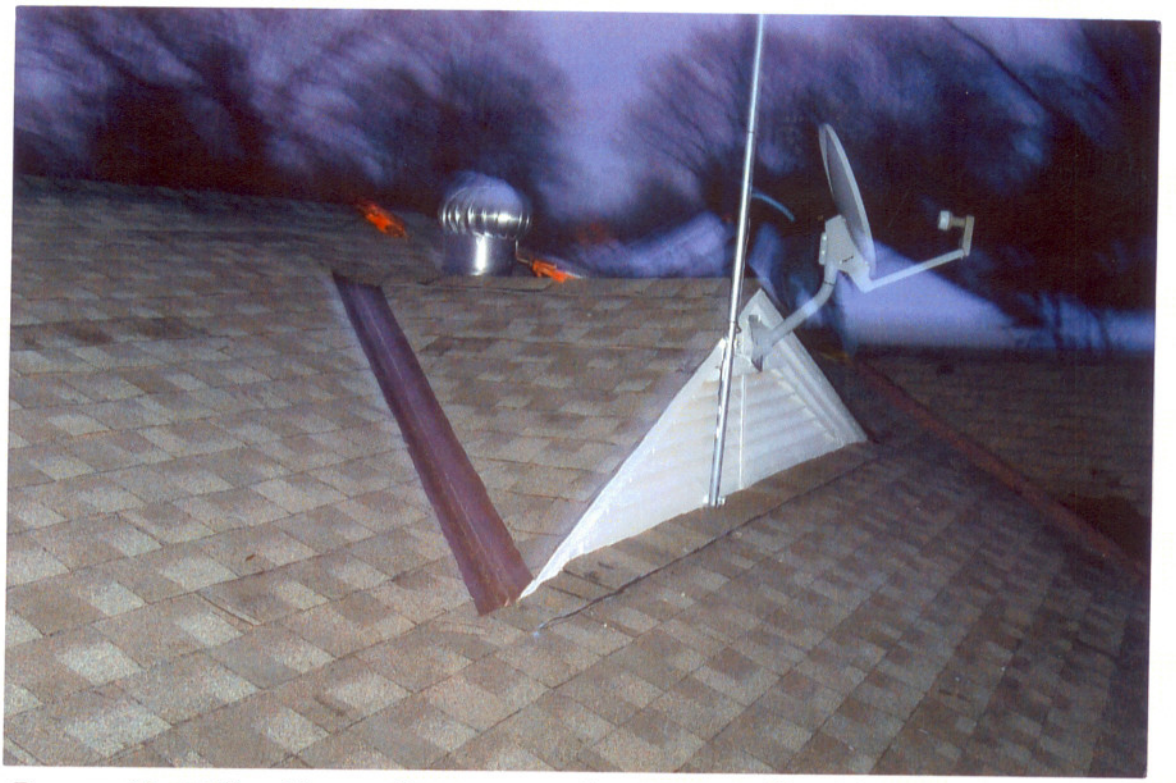
The fourth kind of outtake vent is a powered vent. A powered vent may have a solar cell atop it or may be wired to a switch or thermostat. Solar powered vents work best when facing to the South or to the West. It should also be noted that most solar powered vents do not have the power to move air as well as a wired system.

Dormer vents are the fifth kind of outtake vent (see picture DORMER VENT). Many times, it is wise to remove the dormer vent during a reroof. Our experience is that dormer vents by themselves do not provide adequate outtake venting, and furthermore may interfere with a properly installed venting system. We can remove the dormer vents and simply roof over the area.

The sixth kind of vent is a gable vent. Gable vents are built into the end walls of a roof as we see in the picture GABLE VENT. Many times, in the absence of proper intake venting, the gable vents become intake vents. As always, we prefer proper intake venting, but as already discussed, this is sometimes not possible. If a roof has excellent intake venting, (and very few do!) one might consider covering over the gable vents. Generally speaking, we ignore gable vents when constructing a venting system.

HOW MANY VENTS SHOULD WE USE?

*Warning to laypersons. This next section will get technical, so you may just want to skip to the **CONCLUSION.



Dormer Vent. We will sometimes remove dormer vents like this, and simply roof over the area.

Gable Vent. Generally speaking, we ignore gable vents when we construct a venting system.

The most common way of calculating ventilation is what is known as the 1/300 rule. In essence, the 1/300 rule states that for every 300 square feet of attic area, there should be one square foot of venting (50% intake, 50% outtake).

Braden Roofing management looks at this issue differently. We consider this calculation to be fundamentally flawed because the calculations are based on square footage, yet air flow is measured in cubic footage. In other words, two houses side by side may have the same square footage of attic area, but one house, due to a steeper roof pitch, will have a much higher VOLUME of air space in the attic which needs to be vented.

Let's take a look at an example. Let's say we have two houses which each have an attic area of 20 feet wide by fifty feet long. Both houses have a gable roof construction. The first one has a roof pitch of 6", which means that the center height of the attic is only five feet high. The second, however, has a roof pitch of 12", which means that the center height is ten feet. Using the formula (height x width x length x ½--because the roof is triangular) to calculate the cubic footage, we find that the first roof (5 x 20 x 50 x ½) is 2500 cubic feet, whereas the second (10 x 20 x 50 x ½) is twice as much, 5000 cubic feet. One doesn't have to be a roofer to understand that a larger cubic volume should have more ventilation.

At Braden Roofing, we feel that an easier and more accurate way to determine the ventilation is by using the square footage of the roof area. A roof with a larger square footage will tend to cover over an attic with a greater volume. Thus, by pegging our ventilation to the square count, we can be confident that our ventilation system will facilitate venting a greater volume of air space, even if the floor space inside an attic remains the same.

Our formula? We use a very simple calculation of one 750 gravity vent for every 3.5 squares of roof area (note to non-roofers, one "square" equals 100 square feet). When possible, we try to have an approximately equal amount of intake venting. As previously stated, it is just not always possible to install proper intake venting.

Let's take a look at the previous examples of the 20' x 50' attic and see how our various formulas fare.

In our first example, the roof pitch was 6", which meant the center height of the roof was 5 feet. Using the Pythagorean Theorem we calculate the rafter length over the attic to be about 12 feet. Pythagorean Theorem, by the way, is calculated as follows: a squared + b squared = c squared, whereas a and b represent the two lines of a triangle which join at a 90 degree angle, and c being the hypotenuse, or longest side—in this case the rafter length.

Knowing that the rafter length is 12 feet, we can calculate the square footage as follows 12 x 50 x 2 (because there are two sides) to arrive at 1200 square feet, or 12 squares. Using our formula of installing one vent for every four squares, we divide 12 by 3.5 to arrive at the number 3.42, rounded up to 4. Now we know we should install at least four 750 vents and an equal amount of intake venting.

In our second example, the pitch is 12" and the middle height is ten feet. Again, the Pythagorean Theorem helps us calculate the rafter length to about 15 feet. We calculate the square footage as 15 x 50 x 2 to arrive at 1500 square feet, or 15 squares. Using our formula of installing one vent

for every 3.5 squares, we divide 15 by 3.5 and round up to the number 5. Now we know we should install five 750 vents and an equal amount of intake venting.

Incidentally, we can control test our venting solution by the old 1/300 standard. The numbers inevitably come out to about the same number of vents, unless the roof is exceptionally steep, in which case the Braden Roofing Venting Formula™ successfully adjusts for the increased volume.

For the record, 750 vents have about 50 square inches of venting area.

It should be noted that there is a difference between the "squares" of a roof area over an attic and the "squares" of shingle usage. When a roof professional bids a roof, they calculate squares based upon shingle usage. Do not be confused between these two kinds of square counts.

NOTE TO ROOFING PROFESSIONALS!

Roofing professionals should note that the "square" count in the venting formula refers to the square footage of the roof surface over the attic space. It DOES NOT include the additional square footage for ridge, undercourse, and waste. It should also be noted that most roofs typically have a longer rafter length than just the span over the attic. Most roofs in the greater KC area have at least some soffit area, which will increase the rafter length, and therefore, the square count. In other words, when a roof bidder calculates the "squares" on a roof, his number will doubtlessly be higher than the pure square footage of the roof surface above the attic.

Naturally, this different square count can skew the numbers of our venting formula. When calculating the ventilation from shingle usage squares, it is best to adjust your Braden Roofing Venting Formula™ from 3.5 squares to 4 squares.

A FEW MORE LOOSE NOTES ON ROOF VENTILATION

In picture MINI ATTIC, we see an attic area which surrounds the sides of an upstairs room. Technically, these mini-attics really should have their own venting system. The problem is that these mini attic areas are frequently on the front of a roof. To vent them properly, we would have to install some vents right in the middle of the front of a roof. Cosmetically, many homeowners find this to be unacceptable.

CONCLUSION

Let us quickly review.

Venting is important to keeping shingles from wearing out prematurely, helping keep a home cooler in the summertime, and preventing condensation problems.

Mini-Attic. Small attic spaces should have their own vents, but sometimes tha means putting vents on the front of a roof.

There are two basic kinds of vents; intake and outtake. Both are very important. Ideally, a roof should be balanced between the two, but ideal roof venting situations are the exception, not the rule.

Braden Roofing management prefers the Lomanco 750 (or similarly designed vents) for roofs with attics.

Braden Roofing management prefers a baffled ridge vent above fully cathedralized rooflines.

Braden Roofing management prefers to calculate venting based upon square footage of the roof, rather than square footage of the attic area.

Squares of surface area above an attic area are NOT the same as squares of shingle usage.

If you have any other questions, or for a FREE ROOF ESTIMATE, please to call us at (913) 341-0200.

BRADEN ROOFING—THE ONE WITH THE GREAT REPUTATION!!!