

ROOFING SHINGLES WORKSHOP

HABITAT FOR HUMANITY

BASIC ROOFING PRINCIPLES:

Roofing is done in layers. First, black felt paper overlays the OSB/plywood roof deck, and starting at the lowest part of the roof (eaves), shingles are applied over the felt paper.



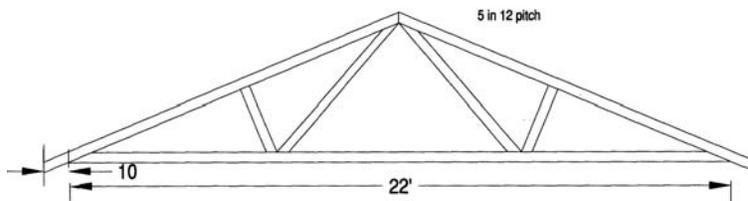
Shingle joints are "staggered" so that any upper shingle covers the joint between the sides of the shingle below. Thus, each shingle is sealed by another shingle. A thin ribbon of tar on the back of every shingle (seal tab) assures that the bottom of every shingle is securely bonded to the shingle below in case of wind. Proper nailing is so important that it is necessary to review the procedure each time Habitat volunteers install a roof.

ROOFING NOTES:

Habitat must follow the manufacture's installation directions. Otherwise the roof warranty is voided. A roof cannot be guaranteed not to leak if it is improperly installed. Fortunately, we always use the same materials and fasteners but there is still room for error.

ROOFING TERMS (NOMENCLATURE):

- ◆ Roof trusses: large, long, triangular shaped wooden framing members, spaced two feet apart. These makeup the substructure of the house roof.



- ◆ OSB roof deck: 7/16 inch thick panels. This plywood substitute measures 4'x8 and is nailed to the trusses to form the "roof deck". It is sometimes called roof sheathing.
- ◆ Felt paper: asphalt impregnated building paper (tar paper) in 36" wide rolls, usually 150 feet long. Comes in 15 and 30 pound weights. See photo on page one.
- ◆ Button capped nails: short, ringed, one inch nails with a plastic washer used to secure felt paper without tearing it.



- ◆ Eaves: on the side of a house; the lowest structural member of the roof.



- ◆ Rakes: 2"x6" overhangs on the front and rear of the house.



- ◆ Drip edge: a 12 foot long piece of aluminum trim that protects all edges of the shingled roof. We use only white.
- ◆ Shingle: basic roofing unit; formed asphalt; now has a fiberglass component; three tab, color granules and a tar strip on back. (See photo on page one)
- ◆ Starter shingle: specially cut from a standard shingle, the three tabs are cut off leaving a long narrow strip, without the color but keeping the tar ribbon. This is the first (lowest) course along the bottom edge of a roof.
- ◆ Ridge (peak): this is the apex of the roof. The point of the roof where the two sides meet at the top of the building is called the ridge.
- ◆ Ridge vent: black neoprene cover, one foot wide and four feet long with small louvers along each edge. Used for ventilation.

- ◆ Cap shingles: smaller single tabs cut from a 3 tab shingle. Used to apply over the ridge vent.
- ◆ Roofing nails: on new roofs we use *1" long, galvanized roofing nails* with a 7/16" diameter head. (See photo on previous page)
- ◆ A square: a term to denote area 10 feet by 10 feet or 100 square feet. Three bundles of shingles cover a "square".

TOOLS:

Hammer, nail apron, utility knife with extra blades, tape measure, small square, tin snips, safety goggles, chalk line and shalk, extension ladders, shingle hoist, broom (to sweep sawdust off of roof deck) and caulk gun.

MATERIALS ON HAND:

Metal drip edge, rolls of 30 pound black felt paper, box of 1" cap nails, 13 square or more roofing shingles, box of 1" galvanized roofing nails, ridge vent, 2 1/2" galvanized screws and roof tar cartridge.

ROOFING SAFETY:

1. Do not attempt to force anyone to go up on a ladder or roof. Some people are earthbound by nature. These people can carry, cut or perform other tasks on the ground. If a person is on a roof and feels unsafe do not encourage the person to stay on the roof.
2. No roofing in the rain. If it becomes too slippery, get off the roof.
3. Ladder safety:
 - a. Place extension ladders at proper angle, never askew.
 - b. Drive a 16d nail or nail a 2x4 block on each side of the extension ladder into the gutter board to insure that the ladder cannot slip.
 - c. The extension ladder should extend three to four feet above the eaves for safe operation.
4. Any sawdust from cutting OSB should be swept immediately. Sawdust makes a roof slippery.
5. Don't stand or walk on felt paper that has not been nailed.
6. Use care with utility knives. Watch finger and hand placement. Cut with control.

PROBLEMS WE HAVE HAD:

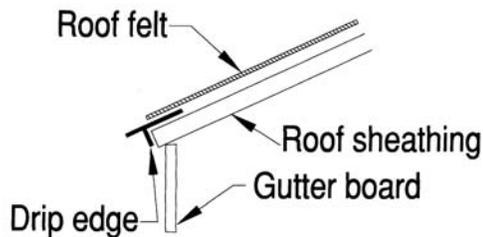
1. Shingle rows not in a straight line. Snap frequent chalk lines.
2. First or starter course improperly applied.
3. Roof leaks because shingle were improperly cut around vent pipe and chimney penetrations.
4. Ragged or rough cuts on rake edge- cut one shingle at a time.
5. Step flashing improperly nailed. One nail in the top corner of the vertical side is all that's required.

INSTALLING ROOF FELT PAPER:

We use 30 Pound felt paper for several reasons. It's heavier and provides better leak protection. Starting at the lower edge (eave) roll out paper with a helper to nail or staple middle of paper as you continue to roll the entire length of the roof. The heavy roll will tend to sag down the roof. So you must keep paper tight and straight (no wrinkles is the goal). Cut the paper to the length of the roof on the ground or cut the paper on the roof with your utility knife. Felt paper should overlap horizontally by 2". The paper has lines 2" from the edge for to help with this lap. The ends of the paper must hang over 4" to 6". Habitat installs felt paper over the entire roof on "Raise-the-Roof-Day", then applies the drip edge and shingles later. It's important to cover the ridge gap with felt even though you will cut this out later to install the ridge vent.

INSTALLING ALUMINUM DRIP EDGE:

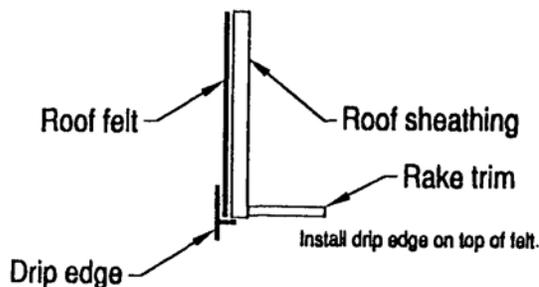
First install metal drip edge along the bottom of the roof.



Install drip edge underneath felt.

Make sure that it is tight against the gutter board, as white metal coil stock will fit under it. Nail drip edge under the felt paper at about ten inch intervals using 1" galvanized roofing nails. Once you have installed drip edge on the eaves, nail a scrap 2x4 block to the gutter board. This will protect the drip edge from the ladder.

Next install drip edge along rakes ON TOP OF THE FELT PAPER. (See below) Nail at 10" intervals, always tight against the roof sheathing. Use tin snips to clip peak angle so that it looks neat.



CUTTING STARTER COURSE:

You may prepare "starter course shingles" on the ground. These are placed as the first course nailed along the eaves, on top of and overhanging the drip edge about 3/8 inch. Starter shingles are made by cutting the 5 inch tabs off of a standard shingle, leaving a long piece with the tar strip. The starter course should be "straight" for a good beginning. The starter course can help straighten irregularities in the gutter board and drip edge. Use a chalk line or simply align the starter course with the drip edge if it is straight.

APPLY FIRST COURSE OF SHINGLES:

Snap a chalk line the length of the roof, from rake to rake. This insures that the first course will be straight. Using full length shingles, nail this first course butting your chalk line at the top edge, and continue the length of the eaves, overlapping the starter course. Do this with 1 inch galvanized roofing nails as demonstrated.

APPLY SECOND COURSE OF SHINGLES:

Next cut 6 inches from the edge of the first shingle for the second course. There is a small slit at 6 inches from either end of the shingle along the top edge. This is done to "stagger" the joints and for appearance. Continue butting full shingles along the entire length of the roof, keeping the top edge straight. You will observe that the tab slots fall neatly over the solid parts of the first course. (See picture on Page 1) Alternate in this way for successive courses, weather cutting 6 inches off of the first shingle or using a full shingle to start the course.

NOTE: You must snap chalk lines at least every third course or more frequently, so that unskilled volunteers can align the tops of each shingle course properly for a good looking roof.

PREPARING FOR RIDGE VENT:

As you near the peak of the roof, form both sides. You will need to possibly trim the very top course of shingles in order to expose the 2 inch gap in the decking, required for the roof vent. Nail shingles until you determine that the ridge vent material will cover the remaining deck. Prior to installing the first piece of ridge vent, you must calculate where to start. There must not be ridge vent over a rake overhang and the start and end of the vent system must be equally spaced from the ends of the roof.

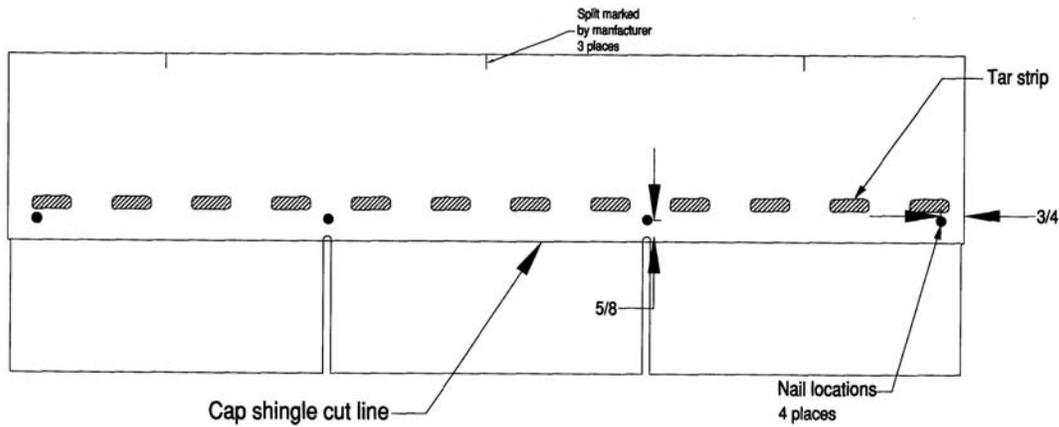
INSTALLING RIDGE VENT:

There is an installation instruction sheet in each box of ridge vent material. **Read it.** Basically, after you determine where to start and end, take one piece of vent and have a helper hold it down over the peak. Mark where to snap the chalk lines on the entire length of the ridge. Holding each piece firmly against the chalk line, install using galvanized screws in every hole provided.

CAP SHINGLES:

On the ground your helpers may prepare cap shingles, after you give them an

approximate number of pieces. Have them cut the back of the shingle into three pieces as shown below. Usually a cutting table made of a piece of OSB will help the process. Nail cap shingles on top of the ridge vent. Nail into the ridge vent starting at the front, working to the rear. Put a spot of roofing caulk on any exposed roofing nails.



STEP FLASHING:

Step flashing is sheet metal pieces bent at a 90 degree angle. Step flashing is used to prevent rain water from entering the shingle system where a vertical meets a roof edge. In Habitat houses this occurs only over the front porch. One galvanized is placed in the upper corner of the vertical side of a piece of flashing. Step flashing is interfaced with each course of shingles. Use common sense and imagine how water will run.

ATTIC VENTILATION IS IMPORTANT. Habitat uses a ridge vent system where air is expelled at the peak (ridge). Air comes in the perforated soffit under the eaves or side overhang. In this way overheated or moisture laden air is removed from the attic area. This insures both that:

1. attic heat in summer time will not build up and penetrate the living area below.
2. in winter, moisture laden air will not rise into the attic and condense.

Each box of ridge vent comes with a set of instructions that should be read and followed.