

**ROOFING**

**Roof Preparation** ..... 90

**Underlayment**..... 91

**Attic Vents** ..... 92

**Shingling** ..... 93

**Roof Valleys**..... 95

**Ridge Cap** ..... 96

## **Safety Talk**

### **Basic Construction Safety**

1. Drink plenty of water and watch for dehydration!
2. When you are tired - Rest!
3. Know where the First Aid Kit is - if you are hurt see your House Leader or Site Host immediately. Our Accident Procedure is in the Site Host book, please follow it.
4. Fill out an Incident Report any time the First Aid Kit is opened.
5. Keep a name tag on at all times.
6. Use Common Sense! Keep an eye on your own safety and the safety of others.
7. Concentrate -- especially if you are on a ladder or roof.
8. Watch for trip hazards wherever you are going.
9. Help keep the site safe by picking up and moving things that are in the way.
10. If you see something unsafe tell your House Leader or a Staff Member.
11. Hardhats are required to be worn at all times through the completion of drywall lids.
12. Please refrain from using ear buds on site, as they caused distraction and are a safety hazard.
13. Do not use cell phones or other electronic devices while working as they create safety hazards.

### **Lifting and Carrying**

1. Bend your knees and lift with your legs not your back.
2. If something is too heavy, get help - don't hesitate to ask!
3. Make sure you can see over what you are carrying.
4. When carrying something longer than 8 feet have a person on each end.

### **Ladders**

1. At the beginning of each day inspect all ladders for any structural defects that would make them unsafe. If any defects are found, mark the ladder(s) and set it aside for the Site Supervisor's disposition.
2. Use the right size ladder and place it on a solid footing
3. Never lean an A-frame ladder against anything, always use it fully opened.
4. Never stand on the top step or back side of a ladder.
5. Don't stretch/lean too far – always keep your belt buckle between the ladder uprights - take the time to move the ladder with your work!
6. Get someone to steady your ladder if needed.
7. Only one person on a ladder at a time.
8. The 4 to 1 rule: For every 4 feet of height, move extension ladders one foot away from the wall.

### **Power Tools**

1. Make sure you know how to use a power tool and don't disable safety features.
2. Wear safety glasses when using power saws and other power tools that create flying debris.
3. Take off gloves when working with saws.
4. Watch fingers near moving parts and tie back long hair.
5. Secure all loose clothing (shirt cuffs, nail pouches, etc.)

6. Watch the power cord when cutting and don't carry a power tool by its cord.
7. Get help when cutting long pieces of material.
8. Make sure power cord is unplugged before performing any tool maintenance.
9. Use a push stick when using the table saw.

### **Eye Protection & Hard Hats**

1. Wear safety glasses when using power tools.
2. Wear safety glasses when doing dusty overhead work.
3. Hard hats should be worn when doing roof work, truss work, and when working under other workers.
4. Make sure your hard hat fits properly.

### **Roof Work**

1. NEVER walk backwards on a roof!
2. Pay attention to where you are and be extra careful near the edge.
3. Don't lay tools down on the roof - they can slide off and injure people below.
4. Watch for falling objects and sliding materials.
5. Watch for people working above, below, on the ground, or directly under you.
6. Carefully check below before dropping scrap off a roof.
7. Sudden gusty winds can cause a fall or cause material to blow off the roof.
8. Cut away from yourself when trimming shingles and other roofing materials.

### **Key Things to Remember**

#### **Roofing**

1. Lay underlayment flat to avoid "waves".
2. Butt shingle ends together, no gaps.
3. Overlap each shingle to 1/16" above factory mark on previous row of shingles below.
4. Hang shingles over drip edge at ends and bottom of roof 3/8".
5. Pre-paint all jacks, tops, and exposed ABS pipe before installation.
6. Verify that there is a roof jack at all roof penetrations.
7. Seal around all roof penetrations with tar/sealant.

### **Efficient Material Usage**

#### **Blocking:**

1. Cut up warped or older material for blocking before using good material
2. NEVER cut up stud materials. Make all cuts from the 16' lineal 2x4 or 2x6

## Roof Preparation

Staff and volunteers will install peel and stick roofing on all flat roofs. Volunteers install flashing where needed when the roofs butt against walls.

Be sure all fascia and shingle mold is painted BEFORE installing metal drip edge. Also, pre-paint ALL roof jacks and exposed ABS plastic

1. Install metal drip edge at the eaves before installing roofing paper. Do not install drip edge with joints at the corners, ridges or valleys (cut one side of the drip edge as is appropriate and bend at these locations). Cut the drip edge flare at all corners. Overlap all joints a minimum of 6". Make sure metal is tight against shingle mold before nailing. Nail Schedule: 1 1/4" roofing nails @ 3' O.C. to tack the drip edge into place. (The shingle nails will hold it permanently in place.)
2. Run one width of underlayment up all rakes. Be sure to stretch it as flat as possible to avoid ripples in the finished roof. The best way to do this is to place one nail into the fascia in the middle of the end of the underlayment. Once you get the underlayment rolled out, align the edge with the shingle mold and place a nail at the opposite end of the piece. Now go back and finish nailing the underlayment in place. Nail Schedule: Plastic cap nails 3/4" or longer at regular crosses. It is not necessary to place nails at the "high wind" marks. Place the first row of nails into the fascia and the second row into the frieze board or higher. No nails in the plywood field.
3. Once all of the underlayment is in place, install drip edge on the rakes in the same manner as on the eaves, but over the underlayment.
4. Before installing L and Z galvanized metal flashing where the roof intersects with a wall, be certain that a 2x4 flashing nailer has been installed. If not, do it now.
5. The next step is to install a liner made from underlayment (see below). The easiest way to do this is to take a piece of underlayment a little over half as long as the flashing will be and cut it in half lengthwise. Place the two pieces end to end with the upper piece overlapping the lower piece by 3 to 4".
6. Now install the L flashing with the wide side laying on the roof and the short side running up the nailer.



Attach the L flashing to the flashing nailer with 1- 1/4" roofing nails along the top edge of the metal. Always try to keep the nails as far from the bend in the L flashing as possible (Nail high). Do not nail into roof.



7. Install the upper leg of the Z flashing to the vertical wall using 1- 1/4" roofing nails so that the flat of the Z sits on top of the flashing nailer.
8. Whenever the wall being flashed extends past the end of the roof a "kick-out" is needed. The L-flashing should run 4" past the end of the roof. At the edge of the roof cut all of the way across the bottom side of the flashing to the vertical side. While pushing the 4" piece under the long piece bend the vertical side to a 45-degree angle at this point. This "kick-out" will direct the water farther away from the downstream stucco.
9. Seal the edge of the flashing to the underlayment with tar as shown below.



We are no longer using metal valley flashing on our roofs. The new procedure is done with shingles only and is detailed in the section on shingling. At this point all that needs to be done is to run a piece of underlayment down the valley.



All roof penetrations require a galvanized metal roof jack. At this point verify once again that the proper jacks are on hand. These will be installed over the underlayment, and in between the layers of shingles. Install a second piece of underlayment (about 2 feet wide) over the top half of the jack flashing and extend it up under the next highest joint for further leak protection. Do not install the jacks until shingle installation.

## Underlayment

Install underlayment beginning at the eaves and work from there. Be sure to stretch it as flat as possible to avoid ripples in the finished roof. The best way to do this is to place one nail into the fascia in the middle of the end of the underlayment. Once you get the underlayment rolled out, align it with the drip

edge but keep it about 1/4" from the edge, and place a nail at the far end of the piece. Now go back and finish nailing the underlayment in place.

Overlap only to the black line on horizontal seams and 6" on vertical seams. Too much overlap will result in a shortage of underlayment.

Nail Schedule: Plastic cap nails 3/4" or longer at regular crosses. It is not necessary to place nails at the "high wind" marks. Place the first row of nails into the fascia and the second row into the frieze board or higher.

No nails in the plywood field.

Once all underlayment is in place install the drip edge on the rakes in the same manner as it was installed on the eaves.

At all valley intersections, weave the underlayment alternating from side to side.

As shown in the photo at right, each row should overlap the valley underlayment.

If your row of underlayment ends at L/Z flashing, it is to be tucked under the L/Z flashing underlayment.



## Attic Vents

To provide better attic circulation we install roof vents (made by O'Hagan, and sometimes referred to as "O'Hagan's"). There will be two rows of vents, one near the top and one near the bottom. The holes for the bottom row will be from the top of the first sheet up and for the top row from the bottom of the top sheet down.

1. The number of vents required will vary by model, please check your plans. Cut an 11" x 11" square hole in the roof deck at each location between trusses (set blade to 1/2" depth). Nail the piece of OSB you cut out (or another existing scrap) over the hole to prevent anyone from stepping into it. To prevent slipping accidents be certain to sweep all sawdust from roof.
2. Once the underlayment (Feltex, etc.) has been installed and the opening cut in it, lay shingle rows in the normal manner until the opening is partially covered. Cut back the part of the shingles covering the opening (see photo below).



3. Center the pre-painted vent (the metal has been left un-painted in the photos below for better contrast) over the hole and mark its location on the roofing materials. Turn the vent over and run a bead of roofing tar around all side of the inner flange. On the outer flange run the bead only on the top and sides. See the following photo.



4. Turn the vent right side up and using your marks as a guide set it in place. When you are satisfied with its location, press down the areas over the tar beads.



5. Using long roofing nails at 4" o. c. nail the top and both side edges through the area of the outer tar bead.
6. Install shingles around the vent in the same way that you would around any other roof penetration. Cut back installed shingles to leave a 3/4" gap between the shingles and the top and sides of the vent cover.

## Shingling

There are two types of roofing nails: Nails less than 3/4" in length are used in areas where the bottom side of the roof sheathing will remain visible.

Nails 3/4" and longer are used in all other areas. Spray paint or snap lines on the underlayment to show the different nail use areas.

The very first and last nails in each row (which are driven through the sheathing into the fascia) should be the long nails. This is critical to prevent strong winds from pulling the end shingles loose and peeling back the rows.

1. Install the starter strip material along the eaves of all roof sections, allowing about 3/8" overhang (use the width of a carpenter's pencil). The tar strip goes on the bottom edge. Nail the starter every 6" along the bottom edge (not the top) using long roofing nails into the fascia.

Then install the starter along the rakes of all roof sections. Nail the out-board edge of these strips in the same manner as the lower edge of the eave strips.

2. General Rules for installing shingles:
  - a. Butt shingle ends together leaving no gaps. (If shingles are rippled in any way leave a gap of a nail width between the shingle ends.)
  - b. Offset butt joints 1/3 the width of the shingle from the previous row.
  - c. Have someone pre-cut shingles to the 1/3rd and 2/3rd widths as needed.
  - d. Shingle cutting boards should be used for straight cuts.
  - e. Overlap each shingle to the top edge of the reveal of the cutout on the previous row.
  - f. Install only the factory edge of the shingle at the end of the row (even with the starter strips).
  - g. Use five nails per shingle, spacing them equally across the strip.
  
3. Optional: You may work from both ends of the roof and meet in the middle.
  - a. The pieces that meet in the center must be no narrower than 8" wide on each side of the joint.
  - b. Offset the joints between rows.
4. Snap a chalk line at least every 3 rows (measure from the top down) to ensure that your rows are running true. This is critical when working with unskilled volunteers.
  - a. If the rows are running crooked find out the distance and adjust 1/4" per row to make it up. If it is more severe than can be solved using this method, remove the shingles as needed and start over.
5. When you reach a vent pipe, run a bead of roofing tar around it at 6" above the deck before slipping the roof jack into place. Shingles go under the bottom half of the jack and over the upper half. Before upper shingles are installed, drive one long roofing nail through the top two corners of the jack base. The bottom corners will be nailed when the jacks are tarred.
  - a. Leave a 3/4" gap between the shingles and the vertical part of the jack. Use large metal shears to simplify the cut outs. Nails through the exposed part of the jack must be tarred.



Please note that in the preceding photo, the volunteers are working from above the shingles, not standing on them. This is imperative in hot weather and when the direct sun has softened the shingles. **Excessive traffic (particularly the twisting of feet) will damage the shingles.**



## Roof Valleys

After installing underlayment, begin by marking and snapping a line half a shingle length (about 18") away from and parallel to the valley center on the higher roof.

Next shingle the lower roof as you normally would, except that you run each row of shingles to the line you snapped.

Now mark and snap a line on the shingles 3" away from and parallel to the valley center on the higher roof.



Lay a row of shingles so that the bottom edge just touches this line, as we had previously been doing on top of the valley flashing, and the edge of the starter strip.



Now shingle and complete the higher roof as you normally would, starting each row at the inner edge of the valley shingle (as we had when using the metal valley flashing).



If your row of shingles ends at an L/Z flashing, the last shingle should end about 1/2" from the vertical leg of the L and no nails are to be driven through the horizontal leg of the L. Before installing the shingle lay a 4" wide bed of tar starting about 1" from the vertical leg of the L flashing and continuing out onto the underlayment. Now lay the last shingle, but nail only up to the edge of the L flashing. The tar bed will secure the remaining length of shingle.





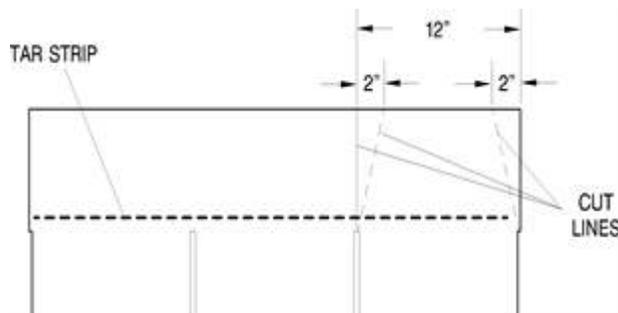
## Ridge Cap

Install the ridge cap, which is made from matching 3-tab shingles cut in thirds (at each tab), then each rear corner is trimmed off about 2" (use the cutting jig if it is available). See the diagram below left.

Ridge cap is installed starting at the North end of the roof working South or at the East end working West. This rule is to counter the prevailing winds.

So that the ridge cap is centered on the ridge, snap a chalk line on the side most visible to the street. Use this line as a guide for one side of the ridge cap. The opposite side should line up on its own.

Overlap spacing is 5".



**Ridge cap spacer**



## DON'T FORGET!

- Verify that there is a roof jack at all roof penetrations.
- Seal around all roof penetrations with tar/sealant.
- Tar under the shingles over the top half of the jack.
- Once the underside of the jack is tarred, nail the bottom two corners and put tar over the nail heads.
- Spray paint any unpainted roof jacks and black ABS pipes to match shingle color, before installing shingles, touch up as needed.