Roof Shingling

With only a few rules to follow, putting on a wood roof can be relaxing work with pleasant materials

by Bob Syvanen

Shingling is one of my favorite tasks in building houses. Even though roofers may be a little faster, I like to do this work myself. Shingling is the kind of job that requires little calculating and a minimum of physical effort. You can think of other things as you work. You don't have to manipulate unwieldy boards or carry heavy loads. Shingle nails are fairly short, so swinging the hammer is easy on the arm; and if you have the time to invest in the old-fashioned methods of making hips, ridges and valleys, there's just enough cutting and fitting to make the job interesting.

Wood shingles are typically three or four times as expensive as asphalt shingles, but they give a roof a texture and color that you can't get with petroleum products. A wood roof is also much cooler in the summer, and will last nearly twice as long as one covered with conventional asphalt shingles. The only major disadvantage to wood shingles is their flammability; but chemical treatments, along with spark arrestors on fireplace chimneys, can minimize this liability.

In the past, shingles were commonly made of cypress, cedar, pine or redwood. My favorite is cypress, although red cedar is what's most available these days. It too is excellent for roofs because the natural oil in the wood encourages water to run off instead of soaking in, and it helps prevent the shingles from splitting despite wide fluctuations in humidity and temperature year after year.

Wood shingles are a delight to work because they're already cut to length and thickness from the best part of the tree, the heartwood. Shingles are sawn flat on both faces, which distinguishes them from shakes, which are split out along the grain. Wood shingles come in lengths of 16 in., 18 in. or 24 in., and taper along their length. The exposed ends, called butts, are uniformly thick for each length category of shingles. This measurement is always given in a cumulative form—16-in. shingles, for instance, always have butts that are 5/2. This means that five shingle butts will add up to 2 in.

Tools—Tools for shingling are few and simple. I have put on many shingles using a hammer and a sharp utility knife. Most pros use a lathing or shingling hatchet. A shingling hatchet has an adjustable exposure gauge on the blade; however, a mark on your hammer handle works almost as well. Two good features of the hatchet are the textured face on the crown, and the hatchet blade itself. The mill face or waffle head is less likely to glance off a nail onto a waiting finger, especially when the head of the hammer strikes a blob of zinc that hot-dipped shingle nails often have. The sharp blade and heel of the hatchet are useful in squaring shingles, and in trimming hips and rakes. I also use a block plane to trim hip, valley and ridge shingles for final fit.

I prefer to keep my nails in a canvas apron at my waist, but others like leather nailbags hung off a belt. Production roofers use a stripper, a small, open aluminum box that straps to their chest. It has slots that allow the points of the nails to drop into line when it's loaded with a handful of nails and shaken back and forth.

Although it's possible to work from a ladder, proper staging or scaffolding is a big help when starting a roof. Wall brackets (drawing, facing page, left) are my first choice. You can make them from 2x4s, or rent or buy the sturdier steel ones. They should be attached to the wall studs at a comfortable working height below the starter course on the eave. Some brackets will accommodate nearly 30 in. of scaffolding planks, but two 2x10s battened together make

Figuring materials

You can usually buy shingles in three grades. Always use No. 1, the best grade for a roof. No 1. shingles are 100% clear heartwood and edge grain. No. 2s and 3s have more sapwood, knots and flat grain. They're okay for outbuildings where the life expectancy of the structure is shorter, or for starter coursing, shim stock and sidewall shingling.

In order to figure how many shingles you will need, you must first know what exposure you are going to use. Exposure is the measurement of how much of the shingle shows on each course. The longer the shingle, the greater the possible exposure. Maximum exposures are also determined in part by the pitch of the roof. As shown in the chart below, the flatter the pitch, the less shingle that can be left to the weather.

Maximum exposure (in.)

Roof pitch	Shingle length (in.) 16	18	24
5-in-12 and up	5	5½	7½
4-in-12	4½	5	6¾
3-in-12	3¾	4¼	5¾

Using these maximum exposures, all pitches of 5-in-12 and up will give triple coverage. With lesser pitches, successive courses of shingles will overlap each other four times, so you get quadruple coverage. Wood shingles shouldn't be used on pitches lower than 3-in-12.

When the maximum exposure is used on any length shingle, four bundles of shingles will cover 100 sq. ft of roof, or one square. To figure your roofing material, multiply the length of your roof by its width and divide by 100. This will give you the number of squares. For starter courses, add one extra bundle of shingles for each 60 lineal feet of eave. A starter course is the first course of shingles, which is doubled to provide a layer of protection at the joints between shingles. In some cases, the starter course is even tripled. For valleys, figure one extra bundle for every 25 ft., and the same for hips. If there is a hip and a valley, figure some of the waste from the valley to be used on the hip. If you are going to use manufactured hip and ridge shingles, a bundle will cover about 17 lineal feet.

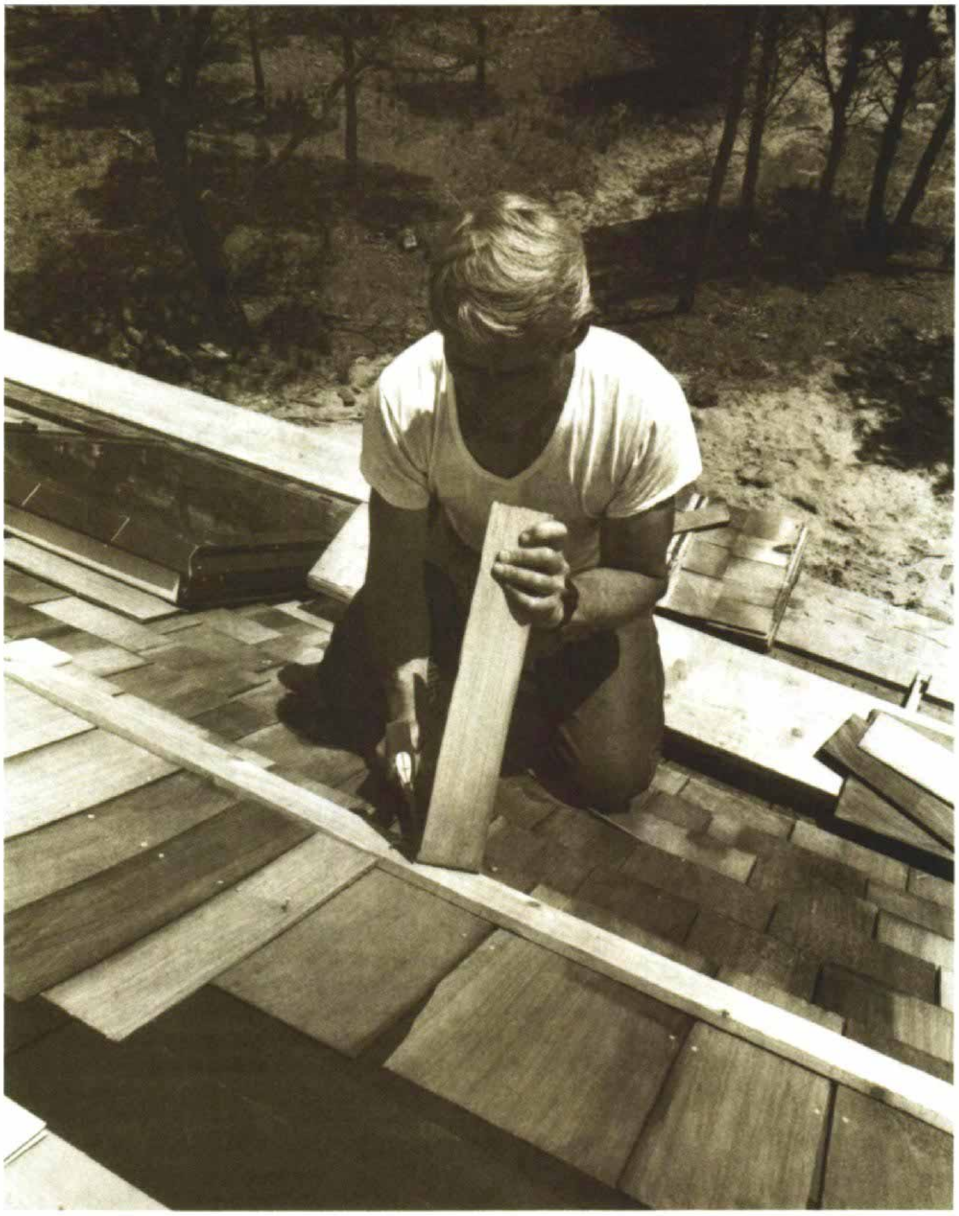
When you calculate shingle quantity, figure nails and flashing, and order them at the same time. For 16-in. shingles on a 3-in-12 or steeper pitch, use 3d galvanized shingle nails and figure 2 lb. per square. For 24-in. shingles, get 4d nails, with 5d nails or bigger for re-roofing jobs when you're nailing through other shingles. Hip and ridge caps need nails two sizes larger than the shingle nails used in the field (on the roof slope), because you will be nailing through extra thicknesses.

If you are near a good-sized city, roofing-materials suppliers are fairly common. Their prices are often more reasonable than lumberyard prices, and their inventory is only for roofers, so you're more likely to get the flashings and nails that yon need. Ask for the price per square on the shingles that you want, and be prepared to give a figure of how many squares you'll need. Another advantage of buying from a roofing supplier is that many of them deliver on lift-bed trucks and load the roof with the shingles, saving your back and a lot of time walking up and down a ladder. ***—Bob Syvanen***

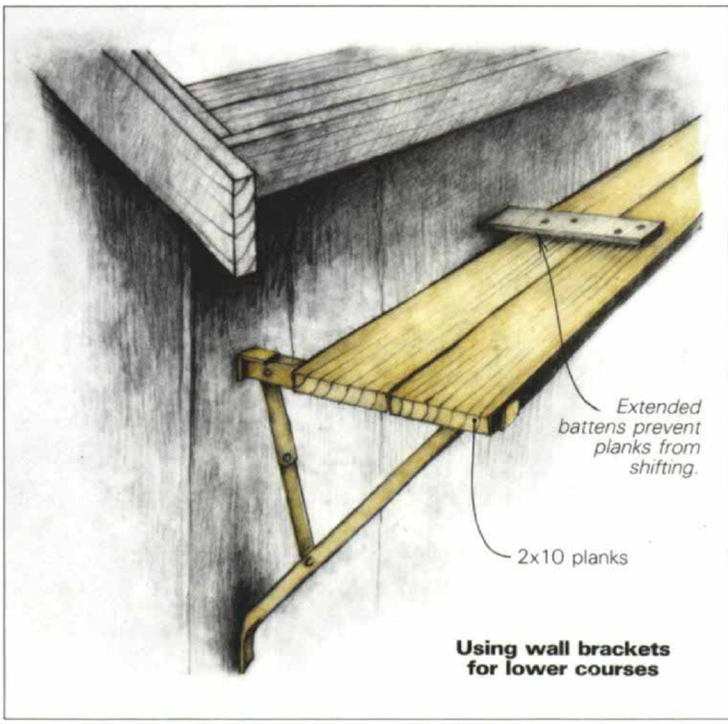
a nice working platform. Make sure the battens (or cleats) extend back beyond the planks to the wall to prevent them from shifting on the brackets inward under the eaves. Scaffolding planks and steel ladder brackets hung from the rungs of two straight extension ladders placed against the siding will also work nicely. Once up on a roof over a 4-in-12 pitch, I use roofing brackets, but I'll get to these later.

Preparation—One decision you make before shingling is what sheathing to use. Where there is no wind-blown snow, or where the weather is humid and wet much of the time, an open slat roof with spaced sheathing is a good choice. Shingles are laid on top of it without roofing felt, so air can circulate freely on the underside of the shingles. The spacing of this sheathing is important. For a 5-in. exposure, the 1x4 sheathing should also be spaced 5 in. o.c. (drawing, below right). The shingle tips should lap over the sheathing at least 1 in., with two boards butted together at the eaves and ridge for proper nailing of starters and ridge caps.

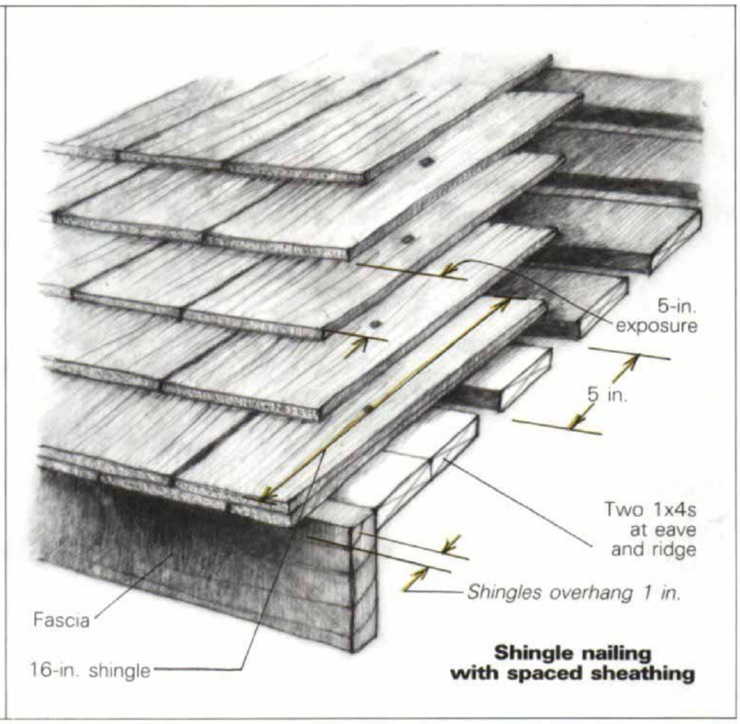
In snow country, the solid-sheathed roof is best. I have stripped many roofs with solid sheathing and found that they have held up very well. I use CDX plywood and cover it completely with 15-lb. felt. If you are using felt, lay only as much as you need for a day's work. Morning moisture will wrinkle the paper and make shingling difficult. Along the eaves I use 36-in. wide 30-lb. felt. If ice-damming is a particular problem in your area, you can trowel on



Using a shingler's hatchet, Syvanen squares up a red cedar shingle, right. The 1x3 roof stick he is cutting on is a gauge for laying straight courses with the correct exposure. The shingles on the top course at the left of this photo have been butted to this gauge and nailed, each one with two 3d shingle nails.

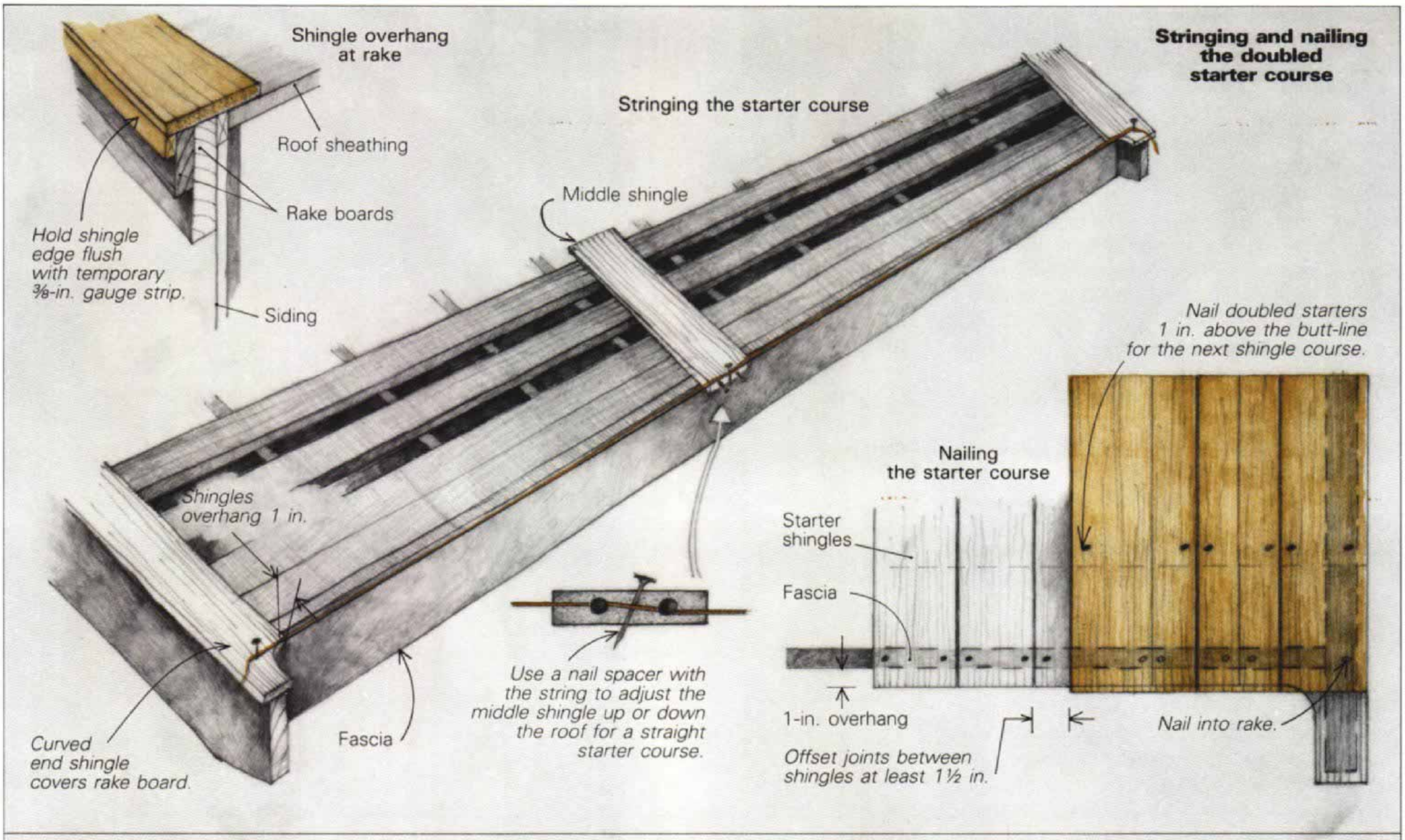


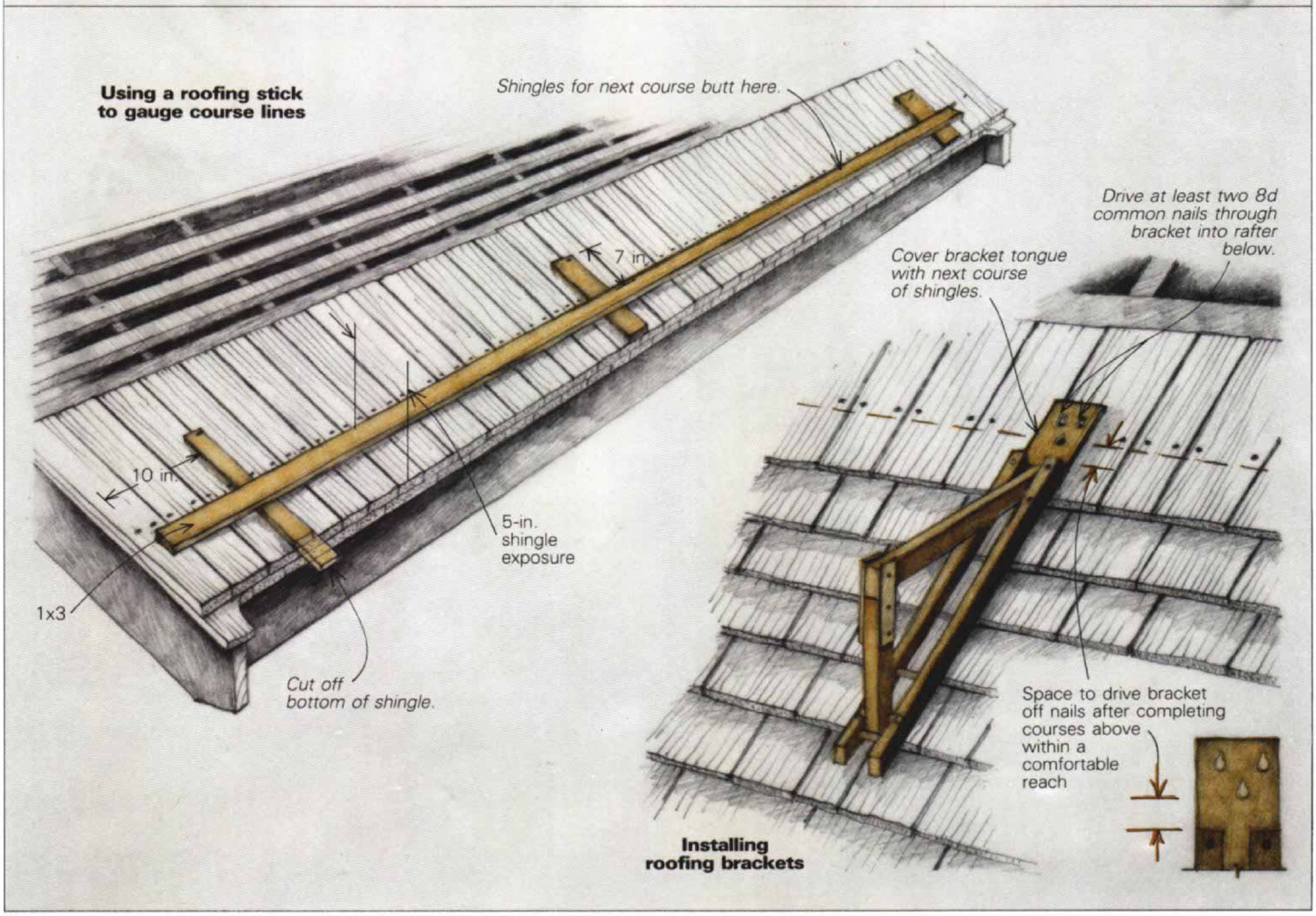
Using wall brackets for lower courses



Shingle nailing with spaced sheathing

Photos of author: Fritz Haubner





Illustrations: Frances Ashforth

When using roof brackets, or jacks, squatting is usually the most comfortable working position. Once you have shingled up the roof to a point where you are working at full arm extension, nail a new line of brackets to the rafters higher up the roof. These brackets are removed when the roof is completed by tapping them at the bottom. The 8d common nails used to secure each bracket remain under the shingles.

a layer of roof mastic over the 30-lb. felt at the eaves, and then lay on another run of felt over this for a self-sealing membrane.

The shingles will need to overhang both the rake and eaves. For the rake overhang, cut some temporary gauge strips ⅜ in. by 1 in. or so, and tack them on the rake board with 4d nails (drawing, facing page, top left). You can then hold your shingles flush with the outside of this gauge board for a ⅜-in. overhang.

Starter course—The first course along the eave is doubled. I like to extend the end shingle of this starter course over the rake board or gutter if there is one. Water runoff will wear away the top of the exposed piece of rake board if it is not covered. This extended shingle can be straight or curved. I like it curved. I use a coping saw and cut several at one time.

To line the starter course, nail the curved end shingles in place. These shingles will be flush with the rake gauge strips and will overhang the fascia on the eave 1 in. Tack a shingle in the middle of the run with the same 1-in. overhang. Because the fascia probably won't be truly straight, the middle shingle will have to be adjusted up or down to straighten the starter course. Do this by stretching a string from one end shingle to the other on nails spotted at the line of the 1-in. overhang.

To keep from butting the shingles directly to the string and introducing cumulative error by pushing against it, fix the string away from the line of the starter course by the diameter of a nail. Then use a loose nail to gauge each starter shingle to the string as you nail it. Begin by adjusting the middle shingle to the string in this way. The drawings at the top of the facing page show how to get the string right.

Once the middle shingle is nailed down, fill in the rest of the starters, nailing them all into the fascia. Nail the end shingles into the rake board (drawing, facing page, top right). Angle the nails away a little to make sure that they don't poke through the face of this trim.

On top of the starters, nail the double starter shingles, making sure that the gaps between them are spaced at least 1½ in. from the gaps in the row below. The shingles in this course can overhang the starters by about ⅛ in., or sit flush. They should be nailed about 1 in. above the butt line for the next course; for a 5-in. exposure, nail about 6 in. up on the shingles.

Roof shingles get a lot of water dumped on them, and they will buckle if placed too close. I just eyeball the distance between edges, but any spacing from ⅛ in. to ¼ in. is fine. The joints between shingles should be offset from the joints in the course directly below by at least 1½ in., and offset from the gaps in the course below that one by at least 1 in.

Roofing sticks and brackets—To lay the second and all successive courses, you'll need a method of gauging the exposure and keeping the courses straight. One way is to use the gauge on your hatchet or a mark on your hammer handle. I prefer to make and use roofing sticks to align an entire course before I have to reposition them. Use as many of these sticks as it takes to span the roof. To make one, take a long, straight length of 1x3 and nail a 2-in. wide shingle to it at right angles every 8 ft. or so (drawing, facing page, bottom left). Then saw off the butt of the shingle so that the distance from this cutoff edge to the top edge of the 1x3 equals your single exposure. To use the roofing sticks, line up the shingle butts on the gauge stick with the butts of the first course. Tack the gauge to the roof with a nail in the upper corner of each gauge shingle. By butting the shingle ends down against the top edge of the 1x3, you get uniform exposure from one course to the next. On a calm day, you can lay in quite a few shingles before nailing them down—a nice feature of this system.

When you reach one of the shingle tips that is part of the roofing stick, just fit the shingle without nailing it. Tuck it under the butt of an adjacent shingle for safekeeping and continue down the course. Then when you've completed the full course, tap the roof sticks free and nail down the individual shingles you left out.

On even a moderate pitch, you'll need roof brackets to work safely, comfortably and at a good pace. These are adjustable jacks that are nailed to the roof to support a scaffolding plank (drawing, facing page, bottom right). Most lumberyards carry roof brackets, and they can also be rented. The ones I use are oak, but metal ones are more common. The first set can be put on after you've shingled up five or six courses and can't reach across the eave from the ladder or scaffolding.

Make sure your roof brackets are nailed into rafters, and use two 8d galvanized nails per bracket. Most brackets will take a single 2x10 plank. Twelve-foot planks are ideal when you use a bracket at each end. Fourteen-footers will do. You can shingle right over the tongue of the bracket where it attaches to the roof, because the nails that hold it will be left under the shingles when it's removed. When you install the brackets, make sure there's enough space between the top of the bracket and the shingle butts to allow you to remove the bracket easily, by driving its bottom toward the ridge, and lifting the tongue off the nails.

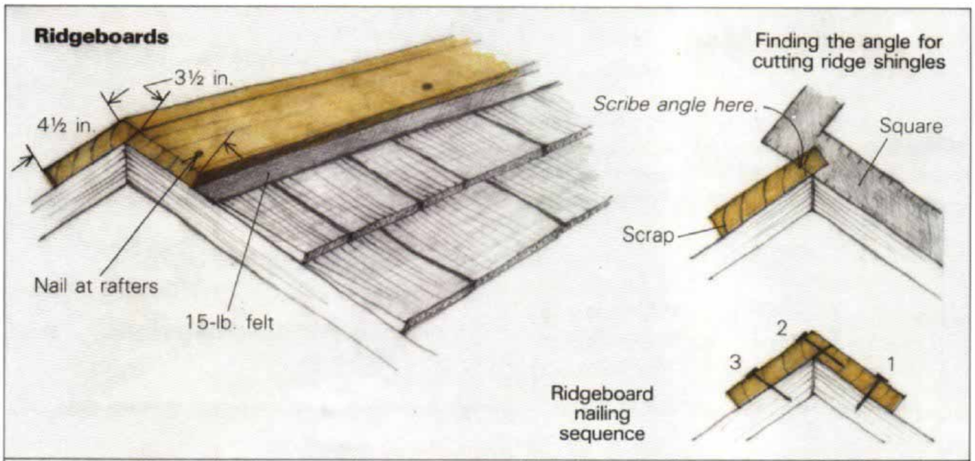
Do's and dont's—Face-grain shingles have a right and wrong side up. Make sure to place the pith side of the shingle (the face that was closer to the center of the tree) down to prevent cupping. Some shingles are cupped or curled at their butts. I put the cup down for better runoff and appearance. I reject hard shingles because they split when nailed and curl up when the sun hits them.

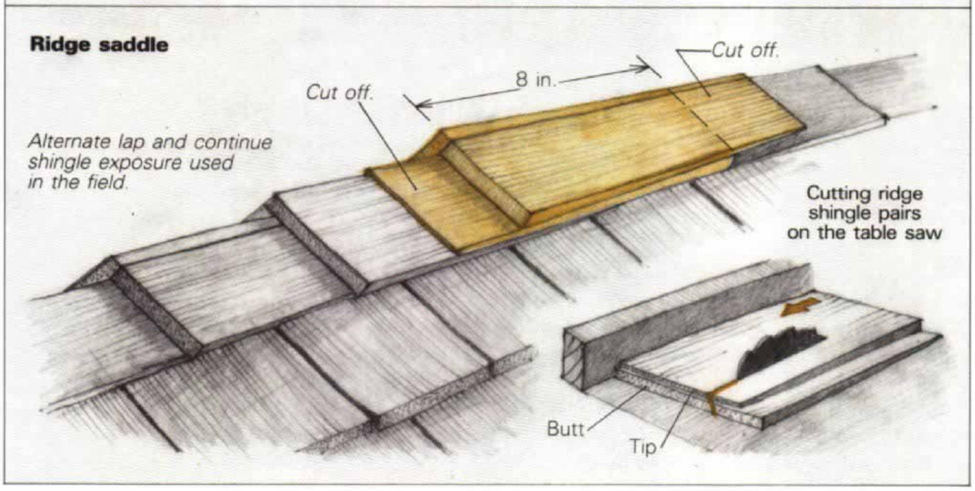
Red cedar shingles can be very brittle, so hold back on that final hammer stroke or the shingle may crack. The nail head should sit on top of the shingle, and not be driven flush. Each shingle, no matter how wide, should get just two nails. If you have a hip or valley to shingle, save the bedsheets (shingles 9 in. or wider) when you're roofing in the field.

If you use a wide shingle in a regular course, score it down the middle with a hatchet or utility knife to control the inevitable splitting. Treat it as two separate shingles, offsetting the scored line from other joints, and nailing as you would two shingles. If you suspect that a shingle is checking, bend it into a slight arch with your hands. If it has a clean crack, use it as two shingles. If it shows several cracks, throw it out.

When you are shingling in the field, don't get so tightly focused on the work that you forget to check every once in a while that the coursing is even and straight. Do this by measuring up from the eave, and adjust if necessary. You may have to snap a chalkline occasionally to straighten out a course.

Once you've completed the roof, spend a few minutes looking for splits that you missed that



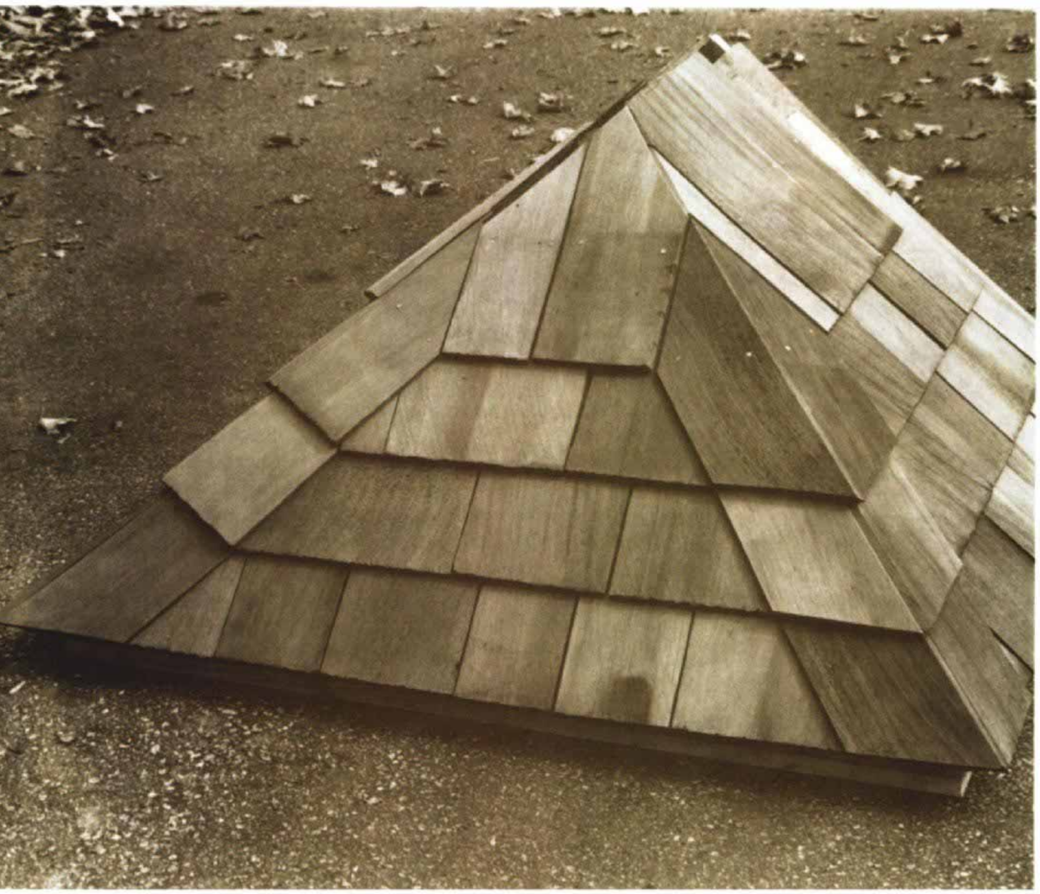


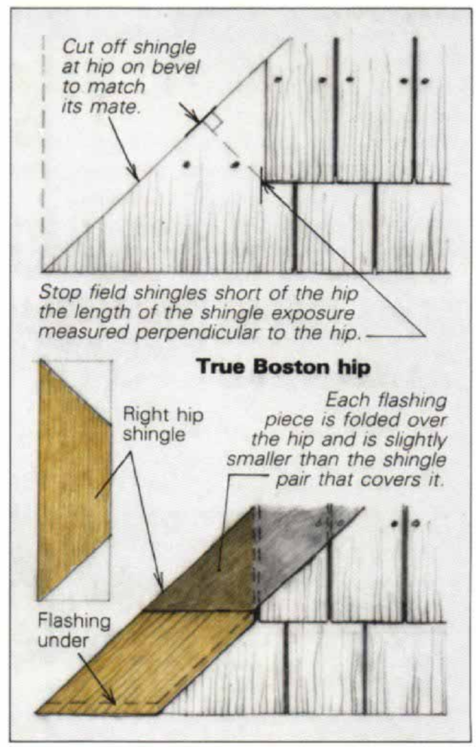
are not sufficiently offset from joints between other shingles. Cut some 2-in. by 8-in. strips of flashing out of zinc, aluminum or copper, and slip them under the splits.

Ridges—Make sure that the courses are running parallel with the ridge before getting too close to the top. Since a course of 3 in. or less doesn't look good at the ridge, measure up from the course you are working on to the point where the ridgeboard or ridge shingles will come, and adjust the exposure slightly so that the courses work out. If you are using ridgeboards, staple 15-lb. felt over the ridge for the full length of the roof. The felt should be an inch or so wider than the ridgeboard, and will make painting the final coats on the ridgeboard easier. Make your ridgeboards from 1x material, and bevel the top edge of each board at an angle that will let them butt together, and form a perfect peak. Because the boards butt at the ridge rather than miter, one side will be narrower than the other (drawing, top left).

To find the bevel angle for your roof on the table saw, take a pencil, a scrap of wood and a square up to the ridge. Lay the scrap flat on the roof on one side of the ridge so that part of the scrap projects over the peak, as shown in the drawing. Then lay the square flat on the other side of the roof so that it projects past the scrap. Scribe a line onto the wood by holding the pencil against the square. By tilting your table-saw blade to this angle, you will be able to rip both the narrow and wide ridgeboards.

To install the ridgeboards, snap a chalkline





A true Boston hip, shown at left in a model built by Syvanen, uses the hip shingles to complete each course. The usual way is to superimpose a line of ridge shingles on the hip. The butts of Boston hip shingles can run parallel to the eaves, as shown on the right side of the model, or perpendicular to the hip (left side).

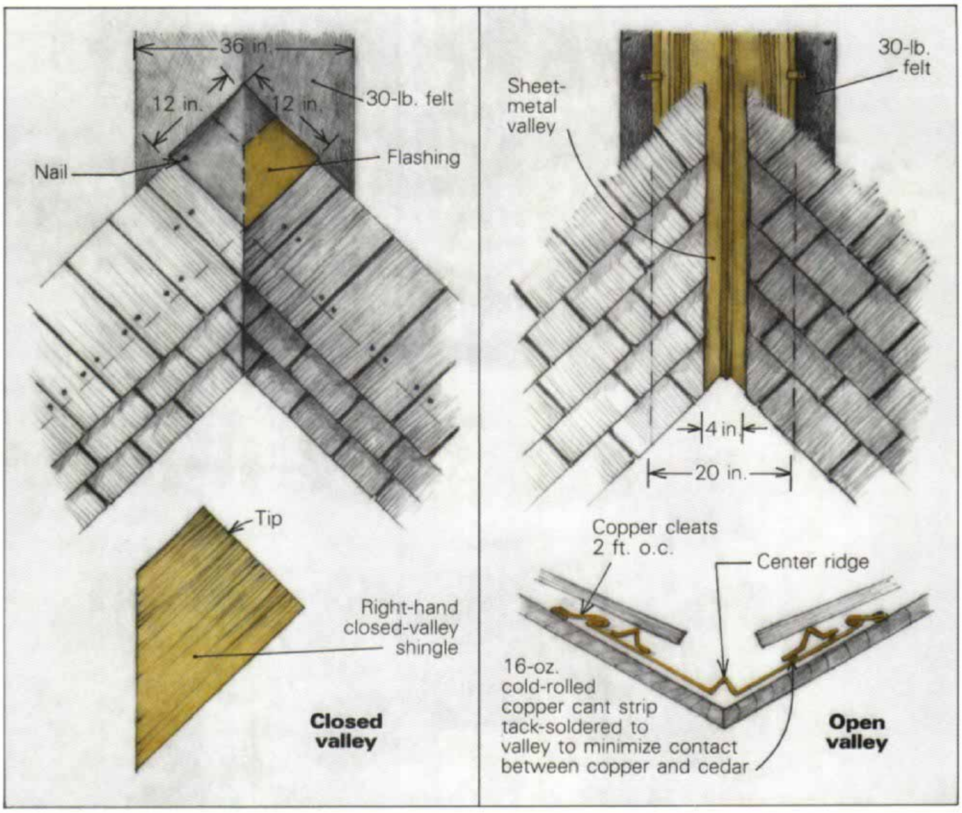
the length of the roof where the lower edge of the narrow ridgeboard will be nailed. Using 8d common galvanized nails, attach the narrow ridgeboard to the roof along the chalkline. Be sure to nail into the rafters. Now nail the wide ridgeboard to the narrow one. This will give a nice straight line at the peak. Lastly, nail the lower edge of the wide ridgeboard into the rafters. Push down on the ridge pieces to force the narrow board against the roof. You might have to stand on the ridgeboards to do this. After the final coat of paint is on, trim off the 15-lb. felt with a sharp utility knife.

You can also use shingles for the ridges—either the factory-made kind that come already stapled together as units, or your own, cut on a table saw. To make your own, set the blade-to-fence distance for the width of your exposure, and set the angle of the blade as explained for cutting ridgeboards. Saw the shingles in alternating, stacked pairs. The bottom shingle in the first pair can have the butt facing the front of the saw table, and the top shingle with the tip doing the same. The next pair of shingles should be reversed so that the tip is on the bottom, and the butt is on top. This will give you shingle pairs whose laps alternate from one side of the ridge to the other.

To install the ridge shingles, staple a strip of 30-lb. felt down the full length of the ridge. In this case, the paper should be narrower than the ridge unit. Nail the ridge pieces along a snapped chalkline using a double course as a starter. Alternate the pairs and use the same shingle exposure you have on the rest of the roof. Again, the nails should be about 1 in. under the butt of the next ridge shingle. When you reach the center, make a saddle by cutting the tips off two pairs of ridge shingles so that 8 in. remain on each (drawing, facing page, center left). Then nail them down on top of each other with their butts facing the ends of the ridge.

Hips—You can buy factory-assembled ridge units for hips, or make your own. Most folks just staple down a run of 30-lb. felt over the hip and nail the units along a snapped chalkline or temporary guide boards. Since water drains away from a hip, this method keeps the rain out. But when I have the time, I like to cut and fit a true Boston hip the way the old-timers did (photo and drawing, facing page, bottom). It weaves the hip shingles and flashing right into the courses in the field for a weathertight fit that doesn't look added on, like standard hip units. It looks tough to do, but it's not really.

The key to working a true Boston hip is to stop the shingles in the field the same distance from the hip on each course. This makes the hip shingles uniform, allowing you to cut them on the ground. To find the point on a course line where the butt of the last shingle should end, measure the length of the shingle exposure you are using in the field (such as 5 in.), on a line that runs perpendicular to the hip. You will have to move this 5-in. line, marked on a tape measure or square, up or down the roof (keeping perpendicular to the hip) until it fits between the hip and the course line. Then mark the intersection on the course line and fill in the shingles in the field to that point.



You will need to make right and left hip shingles to form pairs. The tip of each hip shingle needs to be trimmed to fit into the space left for it by the last shingle in its course and the one above it. The butts can be left perpendicular to the hip, or cut parallel to the eave. The long side of the shingle also needs to be cut. This should be a bevel that alternates lapping its mate on the other side of the hip. You can cut these bevels on a table saw or use a shingling hatchet on the roof.

Flashing pieces, which are used under every hip shingle, should be cut out with snips on the ground. If you put a slight crease down the center of each piece, it will straddle the hip easily. The flashing pieces should be slightly narrower than each hip unit so they don't show, yet long enough so that each piece laps the previous one by a good 3 in.

Valleys—It's critical that valleys get done properly, since the roof directs water right to them. Valleys can be open or closed (drawings, above). The open valley can be shingled faster and cleaned more easily. In closed valleys, leaves and pine needles can be a problem, and some people don't recommend them. But I prefer their neat look. Shingles butt up tight in the valley with each course flashed much like Boston hip flashing.

For a closed valley, start with a 36-in. piece of 30-lb. felt laid in the full length of the valley, then add a piece of 12-in. by 12-in. flashing cut diagonally in half. Add the starter course of shingles. Next comes a 12-in. square piece of flashing, and the second course of shingles.

Each valley shingle must get a miter cut along its inner edge where it meets the other valley shingle. It is often easier to cut these on the ground, and do your final fitting on the roof with a hatchet or block plane. Use the bedsheets that you saved. If you are cutting ahead of yourself on the ground, don't forget to cut both right and left-handed shingles. The flashing pieces can also be cut ahead. Remember when you nail both shingles and flashing to use only one corner nail as far away from the center of the valley as you can on each side.

For an open valley, also lay in a 36-in. wide sheet of 30-lb. felt; it's a good bed for the metal that follows. On pitches under 12-in-12, use 20-in. wide sheet metal, which should be nailed at the extreme edges with fasteners that are compatible with the flashing (see *FHB* #9, p. 50). Tin, lead, zinc and galvanized steel are all right for valley metal, but I like to use copper. There have been a few cases of copper flashings and cedar shingles reacting chemically to produce a premature corrosion of the copper. I have never seen this, nor has anyone I know. Just to be safe, you can use a cant strip to minimize the contact between the shingles and the copper (drawing, above right). Whatever flashing you use, it will be improved by a crimp in the center.

I often begin in the valley by nailing the first few shingles on five or six courses high before I carry the courses across the roof. This stacking allows me to set the valley shingles to a chalkline without being restricted by having to fit them to the shingles in the field. Just as with closed valleys, it is important to nail as far from the valley center as possible. □

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