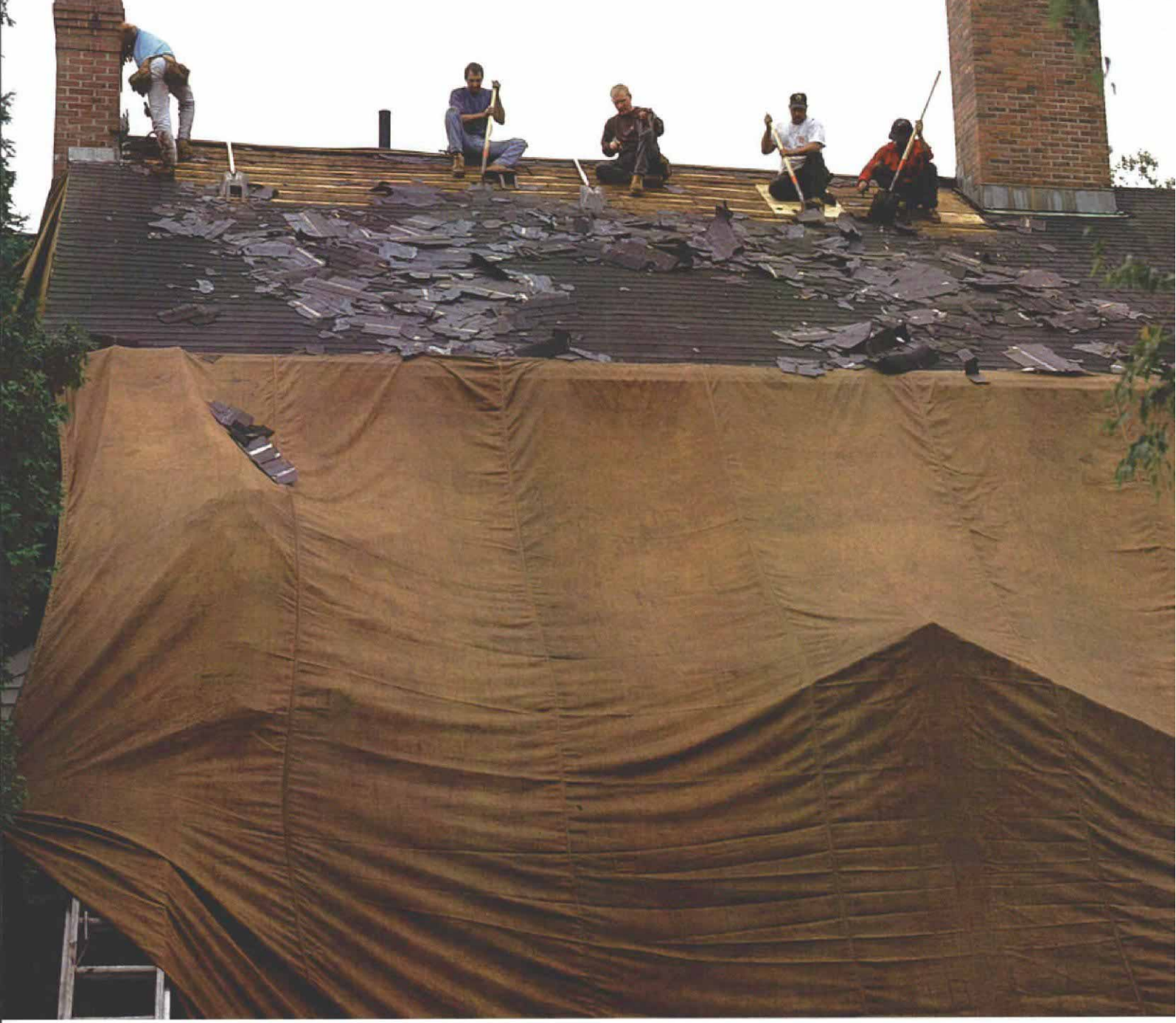


Take it all off. **When the second layer of asphalt shingles started leaking, it was time to tear off the roofing down to the old board sheathing. After tacking a tarp along the fascia to protect the house and the grounds, the roofers pulled off the shingle caps, then worked their way down with ripping shovels, straight-claw hammers and pry bars. Triangular brackets are driven between sheathing boards to provide footholds.**

Tearing Off Old Roofing

The best reroofing jobs start with a clean roof deck

by Jack LeVert

Twin brothers Richard and Russell Wright have reroofed hundreds of Boston-area houses since they went into business together 25 years ago. I've been up on the scaffolding with them on quite a few. I usually do the specialty carpentry-gutters, fascia, skylights, sheathing repairs—but when it's time to tear off an old roof, everybody pitches in.

Tearing off a roof (photo facing page) is a messy, nasty job. You've got to take steps to protect the house, the grounds and yourself. Here I'll explain how to determine whether a house needs a new roof and what to do if it does.

Past their prime. **These deteriorated asphalt shingles have missing corners, and roofing nails show. They also snap and crumble easily, and the black showing through indicates that the protective layer of granules has worn away, leaving the asphalt exposed to the sun's ultraviolet rays.**

Inspecting the roof—When checking out a leaky roof, I first look for structural damage to the roof itself. I do it from inside the attic. I look for signs of continuous moisture, such as water stains, patches of dry rot or black fungus. And I probe for rot. With an awl, I poke the underside of the sheathing and the top edges of the rafters. Softness indicates water damage. If the interior damage is limited to one spot, this spot may be the source of a leak, and depending on the condition of the shingles, I might simply choose to patch the leak.

If the rafters are sagging, they were probably undersized when the house was built. I jack up sagging rafters and sister on new rafters. This is done before tearing off the roofing; otherwise, jacking up the rafters could spring loose the newly installed roofing or even the sheathing.

Sagging between rafters indicates a problem with the sheathing: It may be rotted or cracked; it may be undersized; it may have been run across too few rafters to provide strength; or it may not have been staggered across the rafters properly. A second layer of sheathing often will correct this problem.

Extensive fascia and soffit damage indicates that either the drip edge is bad, or the rafter tails have rotted. I pull off a section of damaged fascia to check out the rafters. Although I sometimes remove the sheathing to replace rotted rafters, often I can repair rafter tails without removing the roofing. If the rafters are OK, a defective drip edge is probably causing the water damage, and a new drip edge will have to be installed with the new shingles.

If there's any sign of carpenter ants, I tear off some sheathing, determine the extent of the infestation and get rid of it. The best way to do away with carpenter ants is to remove all wet wood, whether it's infested or not.

What to look for on the roof—Like car batteries, shingles are rated to last a certain length of time. Fortunately, shingles are rated in years, not months. You can buy shingles rated to last anywhere from 15 years to 30 years. But you can't determine whether a roof needs to be replaced simply by comparing the age of the shingles to their projected life span. I've heard of shingles deteriorating in as little as five years, and I've seen roofs that have lasted well over 30 years.

You must go on the roof and look for signs of deterioration (photo above)—shingles that have lifted and curled edges, brittle shingles that crumble when lifted. On a cold day, even a new shingle will be brittle and will snap in your hand, but in the old, deteriorated shingle's case, the exposed edges will crack and crumble like stale cake. Here and there a deteriorated roof will look like the worn soles of old shoes, with round holes revealing the shingles underneath. Corners of shingles will be missing, and the heads of roofing nails will show—sure signs of leakage.

In areas that get little or no sun, shingles remain wet for a long time and may be green and slick with moss. Water-damaged shingles will be soft and mushy. If you can leave a thumbprint in a shingle, the shingles are too far gone to keep.

In winter, snow melts slowly in these shaded areas. The constantly trickling water freezes, melts and refreezes, wearing away the protective layer of granules on asphalt shingles. The condition of the granules impregnated in the shingles is the real key to determining whether an asphalt roof is shot. Asphalt shingles consist of a blend of steep asphalt (asphalt that won't soften below a temperature of 130° F) held together with strands of fiberglass and covered with a top layer of ceramic-coated granules. Each of these three components has a function. The asphalt protects the roof; the inorganic fiberglass mat strengthens the shingle; and the granules shield the asphalt from the sun. (The granules are crushed rock that resist ultraviolet light, heat up to 1,200° F and acid.) Rain, snow, changes in temperature—all weather—gradually wear away this protective layer of granules. Once the sunscreen of protective granules has worn off, the sun's ultraviolet rays evaporate the natural oils of the asphalt, causing the shingle to degrade.

Roofing over an old roof—In Massachusetts, where we work, the building code allows reroofing over a single layer of shingles but not a third roof over two. This is a good rule to follow, whether you are required to or not. Who knows what the first reroofers covered up. Also, the bumpy surface of two layers of crumbling shingles makes it almost impossible to put down a third roof well. Three layers of shingles might not fit under existing chimney flashing or under the siding of adjacent dormer walls. In some places curled and buckled shingles will keep nails from penetrating the sheathing; in other places you'll strike unseen voids and split or tear the new shingles as you nail. Also, it's best to rip off old wood shingles—and even the skip sheathing if it's damaged—and start from a clean deck. If you don't, you could cover up rot when you lay down your new asphalt shingles.

And don't forget that each layer of roofing adds some weight: approximately 2.35 lb. per sq. ft., or 235 lb. per square. (A square is 100 sq. ft.) Each buried layer is an extra burden on the shoulders of an old house. Another consideration is the fire hazard of adding a third layer of petroleum-based material to a wood-frame structure. Most fiberglass shingles are class-A fire-resistant; however, no shingle is completely fireproof.

To sum it all up, if I find underlying structural damage, the old roof has to come off. If there are two or more layers of roofing, they must come off in any case. In general, ripping off the old roof makes for not only a more watertight, longer-lasting roof but also a better-looking one. And it makes putting on the new roof easier.

Prepare for tearoff—Before tearing off a roof, we protect the grounds with large plastic tarps. Any windows, doorways, shrubbery, etc. that might get damaged are also covered with tarps. Whenever possible, we nail a tarp to the fascia board or soffit and let it hang to the ground to protect the house from falling debris and dirt (photo facing page). There are always extra tarps and rolls of roofing felt ready in case the weather unexpectedly changes. (You might pay attention to the weather forecast.) Inside the house, we

Setting up ladder brackets. **With extension ladders tied off at the fascia, ladder brackets are hooked onto the ladders about 5 ft. below the eaves. Scaffolding planks—not framing lumber, which is too springy—span the brackets to give you a place to work from when you begin roofing.**

Spiking the cleat. **A low-tech but effective foothold when working on a particularly steep roof is a 2x4 cleat spiked over the old roofing with 12d duplex nails, which are easy to pull out. These 2x4 cleats are spiked into the roof vertically every few feet, and a row of them continues unbroken across the roof.**

Roof bracket. **On a steep roof, these brackets provide stable workstations. They are nailed through the roofing into rafters, and a plank is nailed to the brackets through holes at the front of the bracket. Because of the teardrop shape of their nail slots, roof brackets are easily removed by tapping them upward.**

cover the attic floor with plastic because debris and dirt fall through the cracks in the sheathing—particularly with board sheathing but even with plywood—and mess up the attic.

Picture windows and French doors are sealed with plywood. On the roof, we protect skylights by taping -in. plywood or heavy cardboard over the glass. If we remove a vent or find or cause any other hole in the roof, a piece of plywood is nailed over the hole temporarily so that no one inadvertently steps through it.

Most important, before tearing off the roofing, we decide where to throw it on the ground and how to get rid of the stuff when we're done. On smaller jobs, we use the dump truck. Around here it costs $80 per ton to dump debris at the transfer station.

In many places you can't bring old shingles to the local dump. Construction debris must be transported to a transfer station that sorts debris into recyclable and nonrecyclable material.

Recycling of roofing material is in its infancy. According to Stuart Laughlin of the Bird Corporation, which manufactures shingles, defective new shingles are now being recycled as a cold-mix asphalt base for roads. The problem with old shingles is that no one has found a way to separate the nails. Bird is experimenting with an electromagnetic process, but for now, unless you can pull every nail, you won't be able to recycle the old roofing.

On bigger jobs, we rent 1 yd. of dumpster for every square of roofing. Our dumpsters come from the private contractor that runs the transfer station. A 30-yd. dumpster costs $410, which includes delivery to the site and pickup when it's full. If the dumpster is filled more than once, it costs an extra $65 per ton of material. There isn't much choice when it comes to finding a place for the dumpster. It's got to be accessible to both the roofers and the carting company, so it usually ends up on the driveway near the house. The driveway's good because a dumpster will sink into the ground. To minimize driveway damage, we have the dumpster set on pieces of plywood.

Old shingles will ruin a patch of lawn in a day, so we try to clean the grounds as we go—the safest, most-efficient way to work. If you leave the stuff on the ground for a while, at least throw it onto a tarp, cover it each night and get it into the truck or dumpster before it becomes a giant, rain-soaked, nail-studded pile.

As long as the roof isn't skip-sheathed, the only difference between tearing off wood shingles and tearing off asphalt shingles is that the transfer station requires wood shingles to be separated from roofing felt for purposes of disposal. Regardless of the material, we tear off old roofs in sections, removing only as much as we can make watertight before the end of the day. Roofs with dormers, vents, skylights, etc. take longer to tear off and make watertight than, say, a straight gable, so pace yourself accordingly.

Getting on the roof and staying there—First we set up staging from the ground to the eaves. This staging may be metal scaffolding, and in places where shrubs close to the house make it hard to set up scaffolding, we set two 2x12 planks on ladder brackets (left photo, above). We tie off the tops of the ladders to keep a sliding clump of shingles or a roofer stepping from the ladder to the roof from knocking the ladder sideways.

Once we're on the roof, we nail pairs of roof brackets vertically (adjustable, triangular metal supports for planks) onto the roof every 6 ft. or so (bottom right photo, above). The highest brackets are positioned about 6 ft. below the roof's peak, and all the brackets are nailed through the sheathing into the rafters. Planks span each pair of brackets (we use real planks: full 2x12 spruce, not framing lumber, which is too springy), and a roofing nail driven through each bracket into the planks prevents them from twisting or lifting up.

On a particularly steep roof (or when we run out of brackets), we nail 2x4 cleats at the same or smaller intervals up the roof to stand on (top right photo, facing page). We use 12d duplex scaffold nails, which have a double head, so they're easy to pull out. We always make a continuous row of cleats across the roof with no gaps between them. It is a long first step to the ground.

Safety on the roof—The first rule of safety on any roof is don't fall off. I wear sneakers. Admittedly, they don't protect against the other hazard—stepping on nails—but I've found that good cross-trainers provide the best traction on a slippery roof. You may prefer thick-soled boots, but remember that boots are a lot rougher on new asphalt shingles than sneakers are.

One question should govern how you work on a roof: Are you happy there? If you're not happy, you must reevaluate the setup. The most secure staging won't keep a person who is afraid of slipping from doing just that. Trust your fear and make the workstation *too* safe. Make yourself happy there.

On a typical job with the Wright Brothers' roofing crew, two rippers start work at the peak on the uppermost plank, one person is on the staging below them, and one man patrols the ground. The two rippers tear off the roofing. The person below moves back and forth, taking debris out of the rippers' way, keeping their staging clear and sending the material along to the ground. The ground man, always alert to what's falling from the sky, moves the pile to the dumpster. The ground man should wear thick-soled boots rather than sneakers. He will be wading in shingles. He should also wear a hard hat. Everyone should wear gloves.

Tooling up for the job—When tearing off shingles, we carry 16-oz, straight-claw hammers. The easier the material comes off, the less we use the hammers. But they will be ready to use on nails that remain in the sheathing and for patches of cemented shingles that can't otherwise be dislodged. The straight claw is the roofer's hammer. The story you hear now and again of a roofer who began sliding off the roof and stopped his fall by swinging the claw end of the hammer into the sheathing and hanging on is true.

The ripping shovel, or shingle ripper, is the main tool (top photo, this page) for removing shingles. It's similar to a long-handled spade, except the blade is completely flat with large serrations across the tip, and the handle is steeply angled to give extra leverage for prying up the shingles. You don't remove shingles the way you would shovel dirt. You drive the ripping shovel under as many courses of shingles as possible, and by pushing down on the handle, you spring the shingles loose from the sheathing. The roofing nails hook in the blade's serrations just as they would in the claw of a hammer and are pried up along with the shingles.

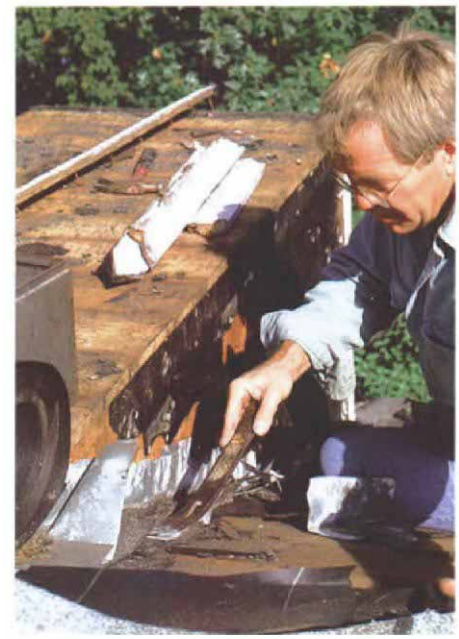
Most roofing nails come up with the shingles. The recalcitrant nails are removed later in the final cleanup before papering in the roof (the process of rolling out and fastening felt paper to the sheathing).

A roofer and a ripper. **The main tool for removing shingles from the roof is a shingle ripper, or ripping shovel. Its flat, serrated blade gets under shingles and around roofing nails. The handle is angled steeply so that when you push down on it, you loosen both the shingles and the nails.**

Almost as good as the ripping shovel is a regular garden pitchfork. On an old roof with board sheathing, the prongs tend to stab into the seams between boards, but if you keep the pitchfork about parallel to the roof as you drive the fork under the shingles, it will work fine.

That's about it for tools. Pneumatic and gas-powered ripping tools are available, but I've never used them. A ripping bar, a heavy scraping tool for removing tar-and-gravel roofs, may be used to get up cement around chimneys, but usually cement clings to shingles, and leftover clumps of it can be knocked off with a hammer. Later, I'll need a flat pry bar, but for now it's just pitchforks and ripping shovels.

Ripping and tearing—There are no real tricks to ripping. Once the first patch of bare sheathing has been exposed, we work out in all directions from it. Sometimes a section will come up easier by prying from below; other times we can pry a section off by standing above it. I get the shovel under as many layers as possible and try to spring the nails loose. Just digging and ripping won't do the job; small clumps of material will come up, but most of the shingles will stay nailed down. I save a lot of work by prying as many nails loose as possible and



Finesse the flashing. **Be careful when tearing off shingles around chimneys, vents or dormers because you can damage the flashing or the structure. So use a shingle ripper and get close, but pry up the flashing and the shingles around it with a flat pry bar. If the flashing is in decent shape, you might want to save it.**

Roll out the paper. **You can save a little extra work and keep from walking on the tar paper by papering from the peak down. Before nailing the bottom edge, tuck the lower course under the upper and fasten the whole shebang with roofing nails and tins, which hold the paper better than staples do.**

releasing as many layers of shingles at the same time as possible.

Then again, we're careful not to pull up too much at once. It can happen that, once started, the whole roof begins to come up in a vast sheet. I break it into sections about 3-ft. square so that when I throw the shingles down, I won't heave myself off the roof with them.

Loose shingles are slippery and dangerous. I remove as much as I can safely reach from along the roof brackets or the cleats and clean up or have my cleanup person finish that section while I move to the next area. Even if I'm momentarily knee-deep in shingles, I always stand on a clean plank or a solid part of the roof—never on the loose shingles. I keep a push broom handy to sweep the roof and the staging. The granules from the shingles are particularly treacherous.

Working around flashing—It's best to leave chimneys, vents, skylights, roof-to-wall intersections and valleys until last. Here is where most damage to the underlying structure probably is, and it's where most damage can occur if you're not careful about tearing off the roofing here.

Using a pry bar and a hammer, I pry up these last remaining shingles (bottom photo, p. 61). Around old vent pipes, there's an iron-ring weather seal. I break it off with a few hammer blows and slip an aluminum-flanged flexible rubber boot over the vent pipe. The flange is nailed along the top, and a course of shingles is tucked under the bottom flange. Around chimneys, I very carefully chisel away any old roofing cement with the pry bar and the hammer and pry up the chimney flashing and counterflashing—without removing or damaging either one. The counterflashing is often made of lead and tears easily. It is set into the mortar between the courses of brick as the chimney is being erected, and its replacement is a job for a mason. I bend the pieces away from the roof without tearing them or disturbing their positions in the chimney.

I might simply remove step flashing, which is woven into courses of roofing at walls and skylights, but I always think of the consequences: Can I put new step flashing in without removing courses of siding? If the flashing is undamaged—and it doesn't leak, and the courses of the new roof will line up properly with the old flashing—I bend the bottom edges of the step flashing up a bit to clean under it, then I weave the new shingles into it when I reroof.

It's hard to detect small cracks in old valley flashing. Even when it appears intact, it's not worth leaving only to find later that the new roof leaks and to wonder if the flashing should have been replaced when the roof was open. So we remove and replace all valley flashing. Occasionally we leave the original flashing and install a new, wider piece over it. In any case, don't walk on that new flashing because walking on it will cause leaks.

Now we're down to the sheathing. We sweep the roof clean and go over it carefully, pulling up or pounding in all remaining nails.

We stop tearing off the old stuff when we've cleared a manageable section: a section that can be repaired and made watertight by the end of the day. On a small gable we may be able to tear off and make watertight half of the roof in one day. On a large roof, where staging must be moved often, we reroof the section we've torn off before dismantling staging, brackets and planks so that we won't have to remount them later. It's possible to cover the whole roof with tarps, removing them each day to work and replacing them each night, but we prefer to complete a section, paper it in and have it ready to reroof before moving on.

Repairing damage—A rotted piece of sheathing, even if it's only a small section, should be replaced with a new piece that spans at least three rafters. I find the rafters, remove the nails from the sheathing with a nail puller, set the circular-saw depth to just beyond the thickness of the sheathing and cut it at the centerline of the two end rafters. Then I renail the old sheathing at the cutlines and put in the replacement piece.

Old board sheathing is commonly 7/8 in. or a full 1 in. thick. To replace a few rotted boards, I use 5/4-in. rough spruce ledger board if it's available. Where there are lots of boards to replace, I use 5/8-in. exterior plywood and shim the rafters with 1/4-in. or 3/8-in. lattice molding, available in various widths at any lumberyard, to bring the plywood level.

If the original sheathing has shrunk, and there are spaces between boards, or if the sheathing is sagging between rafters, I often put a second layer of sheathing over the first. The second layer is usually 3/8-in. plywood staggered and nailed into the rafters. In particular, I avoid joining the plywood in the same pattern as the old sheathing. Staggering the joints will strengthen an old roof and provide an even, secure nailing surface for the new shingles.

Thwarting ice dams. **To get a watertight seal that protects against leaks caused by ice dams, use Ice & Water Shield. It sticks to the sheathing because it's coated on one side with adhesive. Put a single layer of it at the edge of the roof over the bottom drip edge before papering in. Some roofers will even run Ice & Water Shield in valleys for added leak prevention.**

Dragging the magnet. **You'll have fun picking up nails and all kinds of junk with this sporty magnetic bar. Pull it around the yard, in gardens, over the driveway and the street.**

Once in a while, we're asked to put asphalt shingles over an old wood-shingle, skip-sheathed roof. We tear off the wood shingles because it's difficult to apply new roofing over them. Then, if the skip sheathing is in good shape, we install a new plywood or OSB roof deck over it, adding molding at the rakes and the fascia to cover the gap. If the skip sheathing has deteriorated, we tear it off down to the rafters and put down a new roof deck.

If the rafter ends are rotted, we remove enough sheathing to scab the new rafters to the old where the old ones are solid. Opening the roof allows us to scab on new rafter tails without disturbing the interior of the house. We may even be able to leave soffit and trim if they are solid. The general rule for scabbing new overhanging rafters to old ones is to extend the new rafter above its bird's mouth (or bearing point) on the exterior wall plate twice the length of its overhang. For example, a 2-ft, overhang requires a 6-ft, length of rafter, 4 ft. of which runs inside the house. If only the last inch or two of the rafters has rotted, this rule doesn't apply; we just scab new pieces to the solid sections of the overhanging members and then cut off the rotted portions.

Papering in—We paper in and prepare for the new roof, even if it won't be shingled immediately. We paper in from the peak down, making whatever's exposed watertight and then continue tearing off the lower part of the roof. Using 15-lb. roofing felt, we paper right over the peak. On the other side of the peak, we put strapping over the paper and nail it down onto the old shingles. Strapping holds the paper securely and is easily removed when we start tearing off the other side.

Because we start at the peak, we nail the felt at the top and the middle only. When we move down the roof, we simply slide the next underlying course of felt under the upper one and tin and nail through both (photo facing page).

We secure the felt with roofing nails and tins. The tins, called buttons in some areas, are aluminum disks that you nail to the felt. Tins secure the felt to the roof much better than staples or nails alone would. Most lumberyards carry either tins or nails with a big, square washer already attached. Properly tinned and nailed, the felt will remain secure against rain and wind until we shingle. (But don't walk on the felt. You won't stay on the roof long if you do. After all, you're walking on impregnated paper that tears easily.)

Across the bottom 3 ft. of the roof, we put a layer of Ice & Water Shield (W. R. Grace and Co., P. O. Box 620009, Atlanta, Ga. 30362; 800-444-6459)—a polyethylene material coated on one side with mastic roofing cement (left photo, above). The shield adheres to the roof sheathing and seals it against water backing up from an ice dam. It does not prevent either an ice dam or the backup, but it does form a watertight barrier. Ice & Water Shield comes in 3-ft, by 75-ft. rolls and costs about $75 per roll.

If the roof will have woven valleys with no flashing, we put a length of Ice & Water Shield in the valley before reroofing. Most of the time, we flash valleys first, put a length of Ice & Water Shield along each edge of the flashing and then install the roofing to extend a bit past the Ice & Water Shield.

Ice & Water Shield sticks to the sheathing, to you and to itself. It's a little like working with a giant role of electrical tape. The shield goes on over the bottom drip edge but under the new valley flashing. The material is backed with brown waxed paper to prevent it from sticking to itself on the roll. Two workers can handle the material better than one can. You first peel back about 6 ft. of the paper. Then, with one person handling the roll, the other carefully places the exposed material parallel to the bottom of the drip edge, to which it will immediately stick. Once the shield is secure, the rest of the roll can be peeled from the backing and slowly rolled across the length of the roof.

Final cleanup—Even though we'll have to clean up all over again when we finish shingling, we clean up thoroughly before reroofing, then clean out the gutters. They will be full, and if they're aluminum, they'll be ready to buckle. We rake out the bushes and the yard and clean the driveway. For now, we leave the plastic in the attic because hammering and walking on the roof will certainly shake down more dirt. Then we break out the rolling magnetic bar (right photo, above). Mine is simply a 2-ft, long bar magnet attached to a rope. (A similar tool is available from Haase Industries, Inc., P. O. Box 450, Lake Oswego, Ore. 97034; 800-547-7033.) I drag it along the driveway and around the yard. The bar won't pick up most types of flashing, but it's great at collecting nails. □

Jack LeVert is a carpenter and author living in Natick, Mass. Photos by Rich Ziegner.