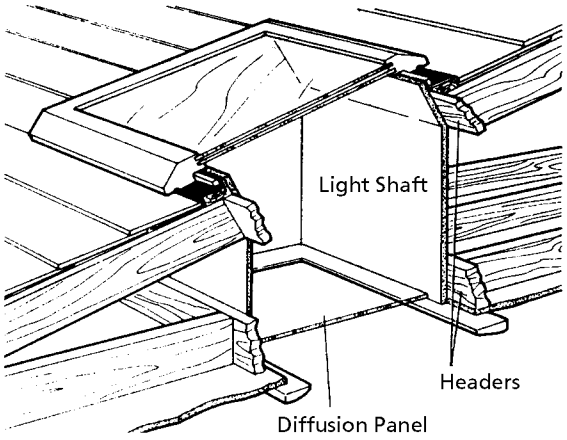
HOW-TO BOOKLET #3061
SKYLIGHTS

TOOL & MATERIAL CHECKLIST

- ❑ Circular Power Saw *or* Power Sabre Saw
- ❑ Skylight
- ❑ Tape Measure
- ❑ Roof Flashing
- ❑ Crosscut Hand Saw
- ❑ Paint
- ❑ Framing Materials
- ❑ Carpenter's Square
- ❑ Roofing Cement
- ❑ Ladder
- ❑ Painting Tools
- ❑ Hammer
- ❑ Nails
- ❑ Caulking
- ❑ Power Drill
- ❑ Safety Glasses
- ❑ Marking Pencils

Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in The Basics Listed Above.



Anatomy of a skylight. Skylight opening through roof above attic lets light into the room below through a light well. A hole in the roof and ceiling below has to be cut for the skylight.

Bringing daylight in all its variations through a ceiling is an attractive way to light a room. Skylights can serve as windows to look through or as light sources at the top of wells that open into the ceiling a few feet below. You can buy or build skylights that open for ventilation or units that are sealed. The job of installing a skylight is somewhat more complicated than many building projects you might undertake. You may want to get professional help. But whether you do it yourself or have it done, read the instructions below so you have the basics of planning, buying, and construction.

BUILDING THE CURB

Curb-mounted skylights require building a curb, a simple, open box of lumber. The curb's purpose is to raise the skylight above the roof so it can be sealed. Use 2X6s for the curb, unless otherwise specified by the skylight manufacturer. Make sure the lumber is not warped, and pre-drill for nails at the butt joints and fasten the pieces together. To be sure the curb is square, measure between opposite corners (diagonally); the two diagonal lines should be the same length. Nail scraps across the corners to keep the curb square until it is seated.

Adding Flashing. Aluminum flashing is used against the roof and the curb to prevent water leaks. You can bend flashing to fit all 4 sides of the curb, as illustrated, or only the top and bottom with the sides covered by step flashing.

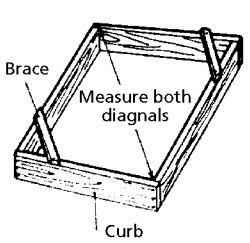
Bend continuous flashing so that the piece at the bottom will fit onto the curb first, the sides will overlap the bottom piece, and the top will overlap the side pieces. To help in bending, make a full-size paper template to be sure the bends will work. Then use a straight 2X4 for the actual bending.

Locate the Skylight. If you can work above the ceiling in an attic or crawl space, mark the center of the spot where you want the skylight and drill a locator hole that goes through the roof. Make adjustments as needed to minimize framing around openings. Try to butt at least one side of the skylight to a rafter.

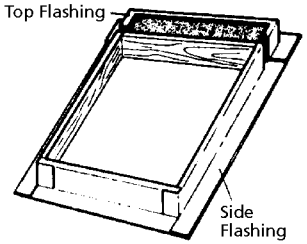
Outline the area to be cut from the roof (the inside dimensions of the curb) and, for a straight light well, locate the ceiling cut directly below with a plumb bob. Mark through the roof with a drill at the corners of the opening. Use a T-bevel and chalkline to mark the angles and locations of the corners, running lines from the corners of the roof opening to the floor. Measure and mark the cut in the roof, working through the hole in the ceiling. If this isn't practical, cut an entry hole in the roof.

INSTALLATION PROCEDURES

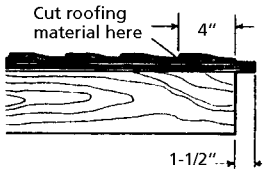
1. Cutting the hole in the roof with shingles or shakes is a 2-step process. First, cut the roof shingles, and then cut the sheathing below. The illustration shows a cross section of the cuts required for mounting a skylight curb. The curb rests on the sheathing and is supported by the framing underneath. The inside dimension of the actual hole is the inside dimension of the curb. Material that covers the roof is cut back to the outside curb dimension. Put the curb in position on the four nails that indicate its location and mark its outside outline on the roof with chalk.
2. Use a circular saw with a combination blade to cut wood shingles, chisel or utility knife to cut asphalt, shears to cut a tin roof. If you use a circular saw, set the blade depth to the thickness of the shingles so the sheathing underneath is not cut. Cut around the marked line and pry up the roofing. Save asphalt shingles for patching around the curb.
3. Snap chalklines between the nails marking the inside dimensions of the curb and cut the sheathing with a circular saw set to the depth of the sheathing. Pry off the sheathing from rafters.
4. Measure 1-1/2 inches in from the hole (3 inches for double headers) along the rafter or rafters that cross the hole in the roof. Mark at right angles to the roof, using a square. Support the rafter you will cut with 2X4 props nailed to the side of the rafter. Then make the cuts. The top flashing and then the curb are installed before the headers so that the curb can be fastened from below, through the sheathing where the headers will set.
5. Pull the roofing material back 4 inches from the hole in the roof, cover the sheathing beneath with roofing cement, and slip the top flashing under it. Cover the flashing with a layer of roofing cement and lay the roofing material back down. Don't skimp on the roofing cement; use plenty of it.
6. Set the curb in place. Use 12d nails to attach the curb from below, nailing up through the sheathing. Where the curb sets on the rafters, toenail down through the curb into the rafters.



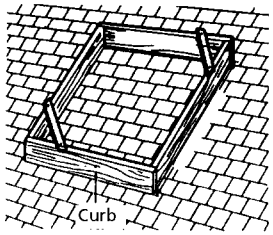
Curb. Tack it together; be sure both diagonals are same.



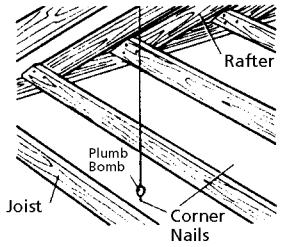
Flashing. Bend to fit curb; check for fit on the roof.



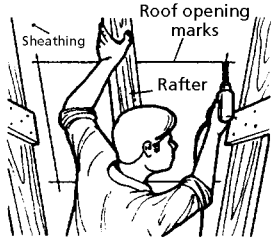
Cut roof. Leave 1-1/2 inch of sheath to mount curb.



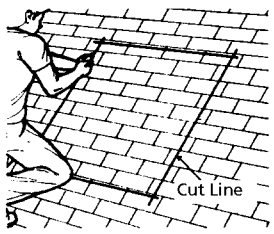
1. Mark inside and outside dimensions of curb for location.



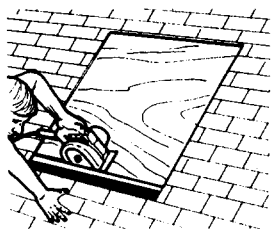
Position. Plumb for roof points on straight light wells.



Mark roof. Drill up from points; push in 16d nails.



2. Cut through shingles so pieces won't pull up.



3. Cut sheathing. Remove nails at cut line to save saw.

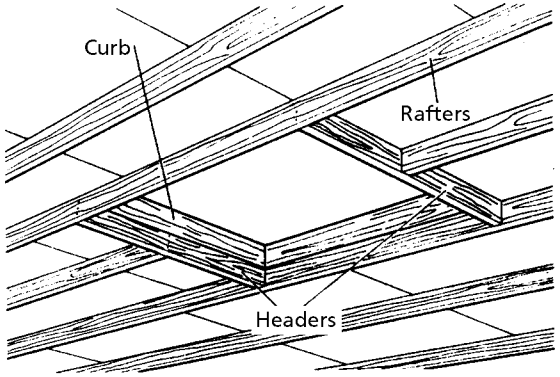
If you are installing jack rafters, nail up through the sheathing where the jack rafters are. When the curb is nailed, finish the framing between the rafters.

7. Attach the side flashing pieces, then the bottom piece. Nail flashing to the top of the curb with 1-inch hot-dipped galvanized nails; seal them with caulking. Nail the roofing back down on the roof outside the edge of the flashing, with roofing nails dipped in roofing cement, and cover the nail heads with more cement. You can also use small pieces of flashing material overlapped along the sides.

8. Apply sealant to the top of the curb and put the skylight in position on the curb. Fasten it through the holes around the edge of the skylight with the size nails or screws specified by the manufacturer of the specific skylight product.

FRAMING THE LIGHT WELL

There are three types of light wells illustrated in this Booklet. All three take about the same skills to produce. The details follow:



4. Frame the opening, after the curb is installed. Support the interrupted rafters from below. Headers should be same dimension as the rafters; nail thru rafters into header ends.

1. Building the walls for a light well is a straightforward framing job, but the angles involved are usually different from those in ordinary wall construction. The easiest situation is a light well descending straight down from a flat-roof—here you have all right angles to work with.

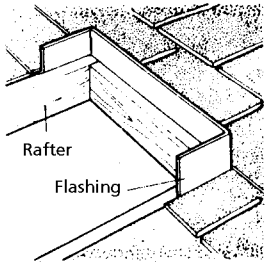
In the other construction illustrated, some studs are cut to fit the slope of the roof line or the flare of the light well. Cut away the ceiling surface at the points you marked (positioning the skylight) to expose the joists above. Tack lengths of 2X4 across several joists, about a foot back from each side of the cuts you must make in them, to keep them from bowing down.

Measure back from the edge of the hole in the ceiling a distance equal to the width of the headers you will install on either side of the hole. Use lumber the same dimension as the joists for the headers. If the light well is flared, cut the joists at the angle of the flare; stretch chalklines from the corners at the top of the well to mark these angles.

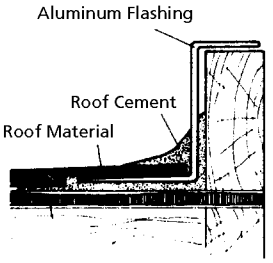
Frame in the hole in the ceiling as you did the hole in the roof structure.

2. Sketch plans for the walls of the light well. They have top and bottom plates as in an ordinary stud wall. In the example shown, the walls perpendicular to the roof joists are constructed square and are secured to the roof joists by nailing through a wedge as long as the top plate made by ripping a 2X4 to fit the angled gap. Build these end walls first, then nail them into place.

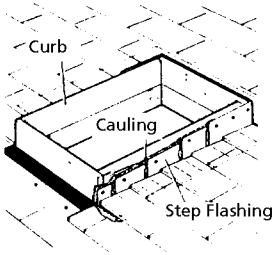
3. The side walls shown are built with studs angled at the top to conform to the angle of the roof line. The angle at the top of the studs is the same for all and it is most easily cut in an adjustable miter box. Set the box for the correct angle (double check it) and cut all the pieces at the same time.



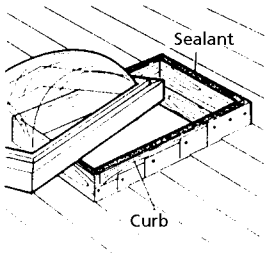
5. Top flashing is cemented for curb this way.



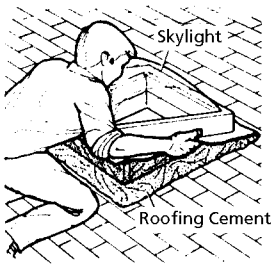
6. Seat curb. Cement seals curb and flashing.



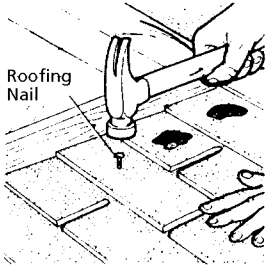
7. Add step flashing, as alternative. Pieces must overlap 2 inches.



8. Seat skylight into bed of silicone sealant. Use plenty for seal.



Self-sealing skylight is put in same as above.



Piece in roofing and nail. Seal the nail heads.

Measure the height of each stud carefully for a tight fit. Corners are built as for any stud wall.

The construction details shown on Page 3 refer to the Steps outlined in the text on Page 2.

SKYLIGHTS: BACKGROUND BUILDING INFORMATION

Skylights can be constructed from scratch and glazed at home, purchased as plastic domes, or other kinds of plexiglass and glass fittings, to be mounted on a curb you build and seal yourself. Or, you can purchase skylights as prefabricated units that are installed directly on or through the roof.

In this How-To Booklet, you'll find instructions for installing a purchased skylight on a curb, which, in our opinion, probably is easiest for most do-it-yourselfers. The details also may be used together with the manufacturer's instructions for installing a prefabricated unit.

Whether you build your own or buy a ready-made skylight, you will have to cut through the roof and the rafters below and frame around the opening in order to keep the roof structurally sound.

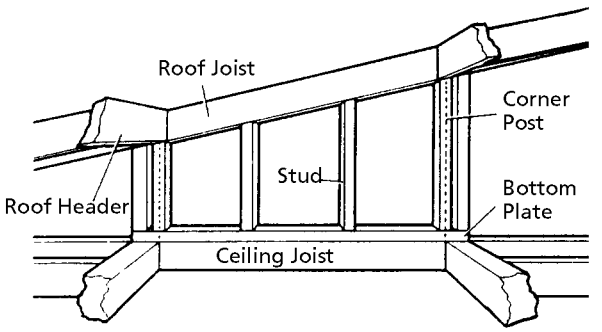
If there is a crawl space or an attic between the roof and the ceiling below, you must open the ceiling and frame and finish a light well up to the roof. In most cases, a skylight is set on the roof if it sets over a light well; where it opens through the roof directly into a room, it may set in the opening or not, depending on the kind of unit. Prefabricated skylights usually come with instructions for specific models and dimensions that will make your planning much, much easier.

To install a skylight, you must work on the roof and in an attic or crawl space below and that can be awkward, but less difficult in the case of a flat roof or cathedral ceiling. Don't attempt the project if you aren't comfortable working on the roof. Use ladder brackets which hold a ladder along a roof from its peak, or toeboard jacks, which hold planks along the roof, to assure good footing. The nature of the space under the roof will dictate whether you should cut through the roof and work your way down—or cut up through the ceiling first.

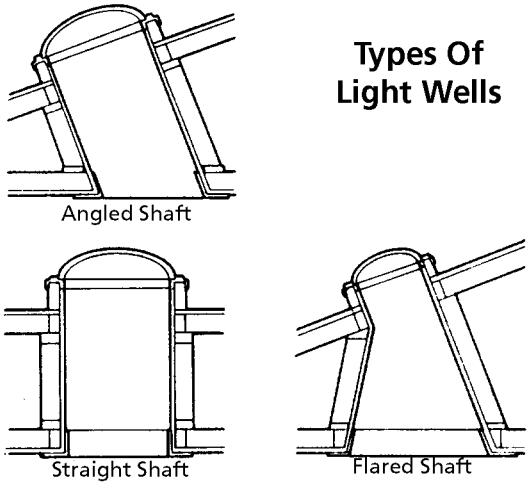
When you plan the location of a skylight, try to determine the structure between the ceiling and the roof at that point: you may want to change the location to avoid a complicated framing problem. Also, put a piece of cardboard on the roof where the skylight will lie to check whether it looks okay from the outside. Check again later, with the actual skylight in place—but not attached—to be sure it looks straight.

Framing the walls of a light well is much like framing walls for rooms, except that the work may involve surfaces meeting at angles other than 90 degrees. Careful measuring and cutting of angles on framing members is the only extra work needed.

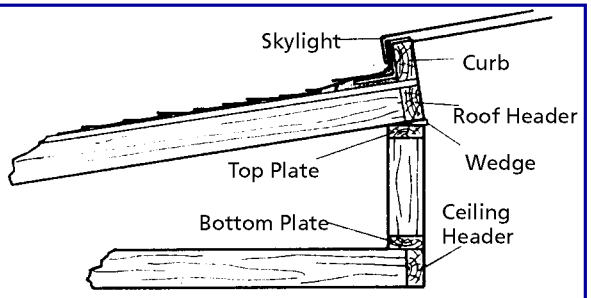
Work Safely. Since you'll be working overhead (looking up) be sure to wear safety glasses to keep dust and debris out of your eyes. Wear rubber-soled shoes on the roof for safety. If the roof is steeply-pitched, have a pro put in the skylight. The right equipment is necessary.



Completing the light well. Finish the inside of the light well with wallboard. You also can use plywood or tempered hardboard or particleboard. Trim the opening with molding. If you want a plastic light diffusion panel at the bottom of the well, set the molding 1/2-inch inside the well for support. Or use hardware that is specially designed to hold diffusion panels.



Straight-walled light wells are easy to build. Angled walls are more demanding, and require skill. For flared shafts, consult a professional.



Attaching straight end walls. A straight end wall is simply a short stud wall with a wedge between the top plate and the rafters. To cut the wedge, measure the angle of the roof line and set the blade of a table saw, or the shoe of a circular saw, to that angle and rip a piece of 2X4. Tack this framing to the top plate by toenailing through the header. Or, you may be able to tap it in place with construction glue.