F R A M I N G

Recessed Ceilings

Follow the right sequence and this elegant detail is easy to frame

by Don Dunkley

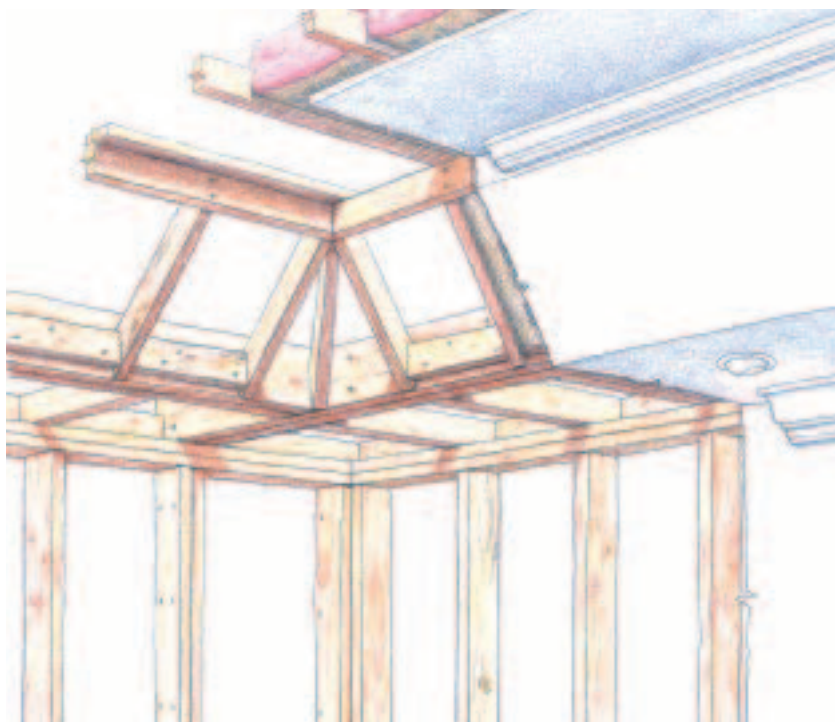
I build out on the West Coast, and most of the custom homes I frame contain one or more coffered ceilings. By "coffered" ceiling, I mean any angled ceiling recess — a design detail that's often called a "tray" ceiling in other parts of the country. By contrast, the traditional coffered ceiling — a gridwork of beams in the ceiling — is usually referred to out West as a "box-beamed" ceiling or a "library" ceiling.

With a soffit around the perimeter of the room and a crown molding around the top of the recess, this detail looks like a million bucks. But it's not expensive to build, as long as you frame in the proper sequence.

Design Details

The pitch and size of the angled recess depend on the designer's and owner's preference. Typically, the surrounding soffit starts at the top wall plate (at 8 feet) and the recess angles at 45 degrees or less to the finished ceiling at 9 feet or higher. The best design depends on the proportions of the individual room.

Builders may have a good sense for what a plan shows and what the actual result is like, but often the clients may see one thing on the plans and have something entirely different in their mind's eye. So I always start by snapping out the perimeter of the soffit on the floor (anywhere from 12 inches to 48 inches from the wall) and the perimeter of the recessed ceiling, taking into account the area eaten up by the sloped sides. This helps to give the homeowners an idea of what the finished ceiling will look like, and it gives me a chance to "see" what they want. It's easier to change some chalk lines than rip out wood.



LENA SAVAGE

Soffit Box

I usually frame the coffered-ceiling structure before the roof is built, so I won't have to dodge the rafters as I build. However, if the building has a low-pitched roof (6/12 or lower), the ceiling structure might run into the roof frame, so it has to be built afterwards. Sometimes, a coffered ceiling may be part of a floor sys-

tem. In this case, I usually get to it during pickup. But more often I'm framing an independent ceiling structure, which is the procedure I'll describe here.

The first thing I build is the soffit box, which defines the soffit and carries the coffer rafters. The plans should call out the size of the soffit rim joist. If this is missing, I use what would be required for a floor joist of the equivalent span, then double it up. If the ceiling is in a room that has exterior walls that will eventually support rafters, I lay out the rafters along the wall plates first, so that the two systems don't conflict. I install the shorter soffit doublers first, then hang the longer ones from those (see Figure 1). Before hanging the long doublers, I make sure the short ones are straight, by eye or by stringing a dry line, then install 2x4 kickers to brace them in a straight line. These kickers run from the bottom of the nearby double top plate to the bottom of the doubler joist, so they'll be out of the way while the finger joists (the soffit ceiling joists) are installed. Next, I install the other sets of double joists, hanging them from double metal hangers, then line them straight and brace them.

To complete the soffit, I cut and install finger joists (typically from 2x4 stock) all the way around the soffit box. The fingers not only create the soffit plane, but also prevent the coffer rafters from bowing out the doublers. I toe-nail the finger joists to the wall plates, then nail them to the rafters, installing blocking in every other bay to prevent twisting as the lumber dries. I set the finger joists 16 inches on-center for 1/2-inch drywall (you can use 24 inches for thicker drywall).

Coffer Rafters

With the soffit box and the finger joists installed, it's time to cut and install the coffer rafters. As with all my framing calculations, I use a Construction Master to calculate the rafters. This is a very simple procedure. Armed with the run of the slope (the distance from the soffit box to the ceiling box) and the pitch of the coffer, I key these figures into the calculator. This will give me the diagonal measurement, or the length of the rafter. No shortening allowances are made — these are nailed directly to the ceiling box.

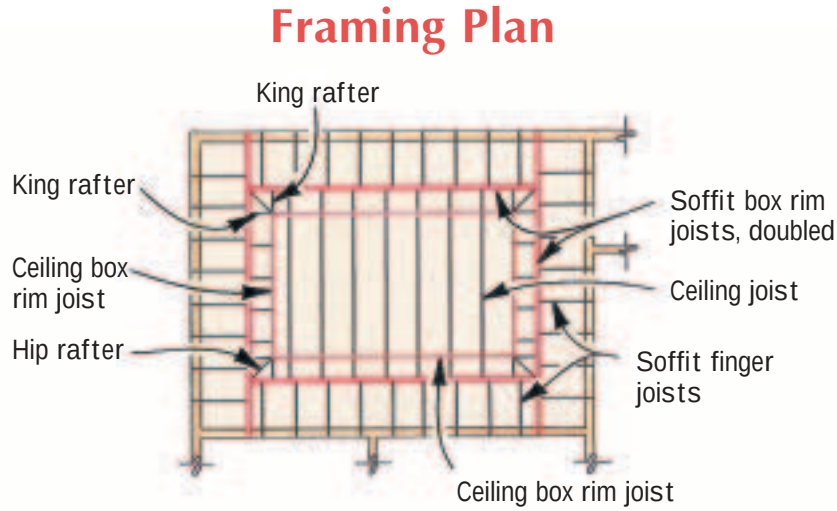


Figure 1. The "soffit box" provides the main support for the coffered ceiling. Double 2-by carrying joists span from wall to wall across the short ends of the room; the long carrying joists hang from the shorter beams. Two-by-four "finger joists" provide a level soffit, while 2x4 coffer rafters slope up to a 2x6 "ceiling box."

First, I lay out the position of the king rafters on the inside of the soffit box. The run determines their placement. For example, if I have a 30-inch run, I butt my tape to the inside corner of the box, measure out 30 inches, strike a line and mark an X on the side away from the corner. I should have 30 inches in the clear, from the inside corner to the start of the rafter. I lay out all four corners this way, giving me the positions for the eight king rafters. I then lay out the rafters in between, usually on 16-inch centers. I make sure the opposite sides match, just like rafters at a ridge.

On small areas like the coffer there isn't much forgiveness, so I cut the rafters as precisely as possible. Once the

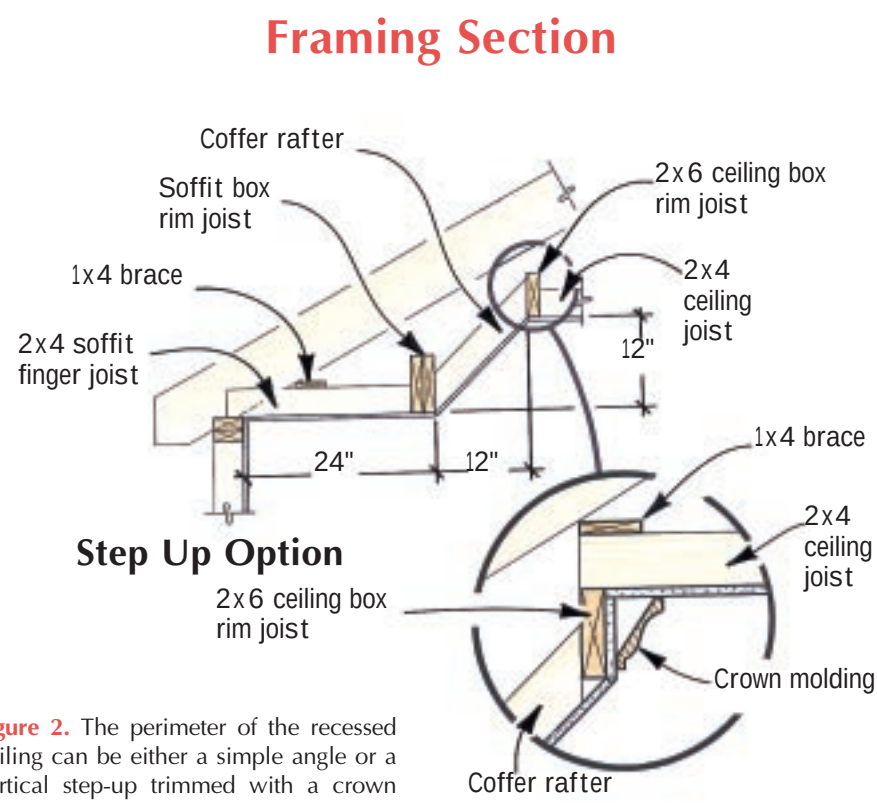


Figure 2. The perimeter of the recessed ceiling can be either a simple angle or a vertical step-up trimmed with a crown molding.

rafters are all cut, I nail up the eight kings, holding the bottoms of the rafters flush to the bottom of the soffit box. I nail these up with 8d nails (16ds just blow up the wood).

Ceiling Box

After the kings are nailed up, I measure for the ceiling box, which is made up of four 2x6s that define the higher ceiling plane. I take dimensions from the layout on the soffit box, starting with the short side and measuring the distance from outside to outside of the two kings. (I check the opposite side to make sure it's the same.) I then measure the adjacent long side, from inside to inside of the two kings on that side, again checking the opposite side to make sure it's the same.

I install the short side first, fitting it in at the inside corner where the two kings converge. The rafters help put pressure on the board and hold it in place while I face-nail into one rafter then toe-nail to the other (this is easy with a helper). I flush the bottoms of each king coffer rafter to the bottom of the rim board.

After the two short rim boards are nailed up, I install the remaining two. With the four ceiling rim joists fastened in place, I usually nail in a ceiling joist at midpoint to keep the long run of the box in line and use scrap 2x4s to temporarily kick the box straight.

Coffer Hips

With the box straightened to satisfaction, I nail up the remaining rafters and install the hips. The hips are just like the hip rafters for a roof and can be measured in place or calculated. Then I put a cheek cut on both ends — two 45-degree bevels that allow it to fit into the corners. When installing the hips, I align them so the drywall planes to the middle of the hip rather than to the edge, toenailing the bottoms to the soffit box and face-nailing to the ceiling box.

Ceiling Joists

After the rafters are nailed up, the work of filling in the ceiling box with the joists is straightforward. I crown the joists, and face-nail through the box into the ends of the joists using three 16d nails to keep them from twisting. On ceiling joists that are over 10 feet in length, I put a strongback down the middle to flatten out the joist plane. I pick a nice, straight piece of stock one size larger than the joist, roll it up on edge, center it, and toe-nail it to the tops of the joists.

Step-up detail. In many cases, the recessed ceiling joists sit on top of the ceiling box; this creates a step-up that can be trimmed with crown. In this case, the ceiling rafters have to plane to the inside face of the box, not the back. I use a speed square to guide the rafter into position, leaving the bottom of the plumb cut hanging just a bit below the ceiling rim board.

I then toe-nail the joists to the top of the ceiling box, and nail 1x4s flat across their top edge at each end to help prevent twisting (Figure 2,). I also nail 1x4s across the tops of the finger joists. I usually catch this detail at the same time that I'm installing the recessed ceiling joists.

First-Floor Coffer

A slightly different procedure is used when building a coffer in a room where the ceiling is already built — the lower floor of a two-story house for instance. In this situation, the soffit rim joists and the finger joists are supported by a ledger board that is nailed around the perimeter of the room (Figure 3).

Since the ceiling is already in place, the rafters are attached to flat backing blocks nailed between the floor joists. This requires a level cut instead of a plumb cut on the end that attaches to the ceiling. The blocks also provide backing for drywall.

To install the blocking on the sides where the floor joists run parallel to the coffer rafters, I first snap a line where the ceiling and coffer rafters intersect.

Framing Below a Floor

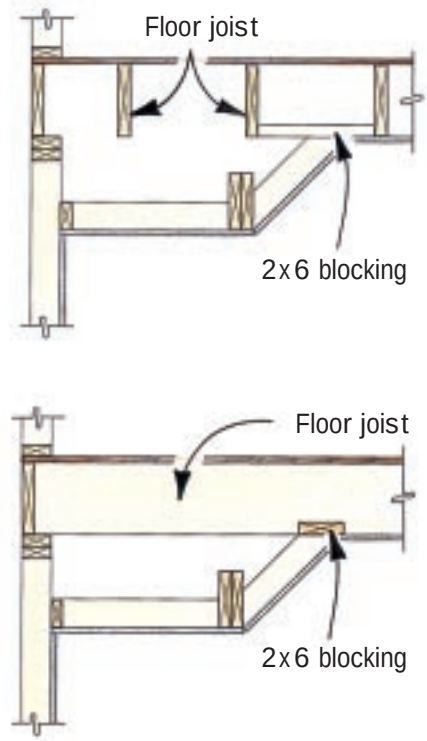


Figure 3. When framing a coffer below floor joists, use a ledger at the wall to catch the finger joists, and 2x6 blocks between the floor joists to catch the coffer rafters.

To find this point, I cut a sample coffer rafter, hold it in position, and make my marks. I then nail up the blocking, holding one edge of the block about an inch inside of the mark to provide perimeter nailing for the drywall. On the sides where the floor joists run perpendicular to the coffer rafters, I place the blocks so they split the center of the rafter. For a long run, it can be faster to install one long, flat backing board nailed to a supporting block at each end. To prevent this board from sagging in the center, I nail up a couple of flat 2x4 blocks near midspan. And sometimes I get lucky and the floor joist falls so that a couple of pieces of 2x4 will pad it out far enough to catch the ceiling rafter and provide the drywall backing.

When all the ceiling blocks are in place, I snap a reference line for the coffer rafters, then cut and install them.

Don Dunkley *is a framer in Cool, Calif.*