Straightening Framed Walls

Blame it on sloppy framing or lousy lumber, but many stud walls need some remedial work before the drywall goes on

BY DEREK MCDONALD

As a craftsman, I'm offended when I notice bowed walls and wavy ceilings in newly finished houses. Everyone knows it's tough to find straight, knot-free lumber these days. But bad lumber is not the only cause of bad walls. Extreme weather conditions that strike before the roof is dried in, as well as fluctuations in temperature and humidity afterward, can make even good studs go bad.

The frequency of warped and twisted studs in the average frame house can be reduced if lumber is kept banded and covered until the framers are ready for it. Conscientious framers will also crown moderately bowed studs and cull the worst offenders, setting them aside for use as nailers and blocking. Unfortunately, the supply of skilled labor seems to be dwindling faster than that of straight lumber; so my company maintains a crew of "pickup" carpenters like me who follow behind the framers, straightening studs and flattening walls.

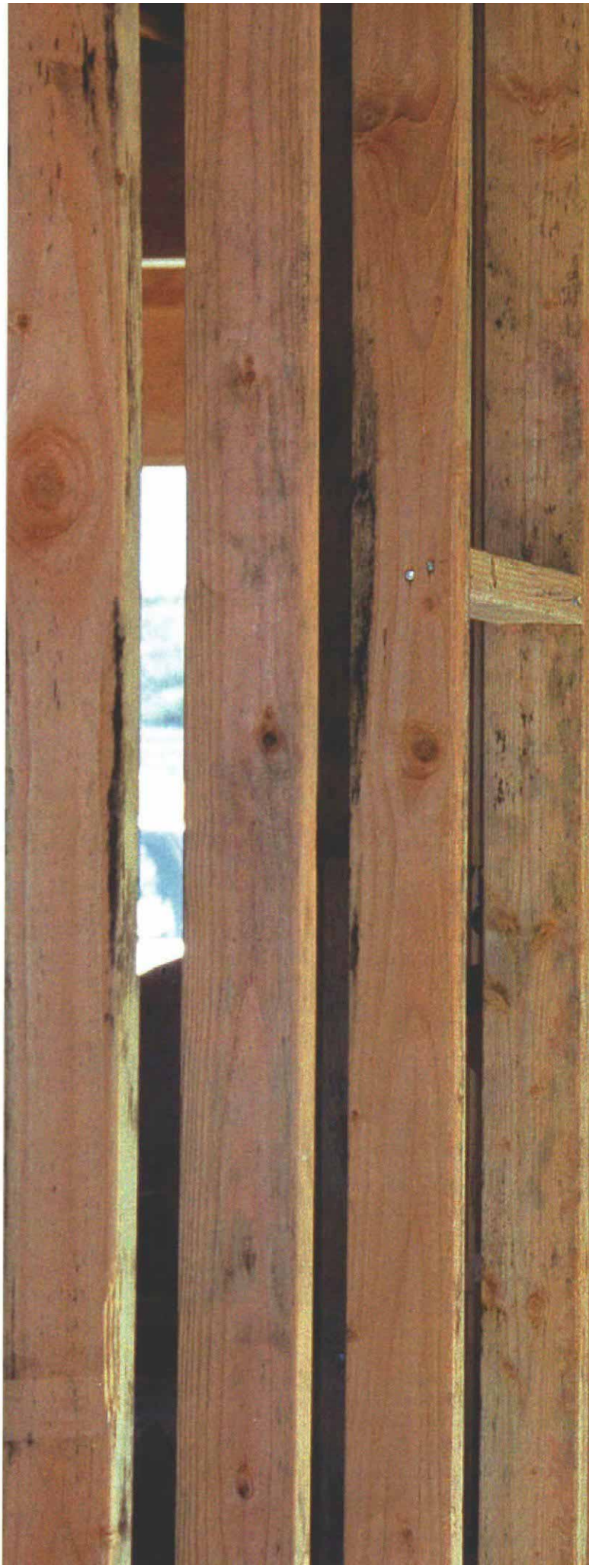
Tolerances vary from room to room

I work for a high-volume framing contractor who builds tract houses in California, so I have to balance my perfectionist tendencies with the pressure to get the job done as efficiently as possible. Keeping this balance requires me to choose which walls are most critical and will thus receive more of my attention. The choice is not difficult; entries and long hallways are more visible than bedrooms, closets and garages, and are therefore held to a higher standard. More critical are bathrooms—where cabinets and mirrors must lie flat—and kitchens. Because their long rows of cabinets and countertops make flat walls and straight corners essential, kitchens are the most critical rooms of all. For kitchen walls, I allow no more than 1/16-in. variance from perfectly straight and flat, but I'll accept as much as 3/16 in. for the garage and the closets.

Efficient straightening requires a good eye

To minimize stud deflection, I prefer not to begin straightening walls until all roofing tile is in place and until bearing walls are fully loaded. Once I start working, all my measuring is done by eye. My tape measure never leaves the toolbox, and I rarely use a chalk box or dry line.

I use the top and bottom plates as starting points to check the straightness of a vertical plane, so my first step is to verify that both ends of each stud are flush with the plates. Any stud that isn't where it's supposed to be gets hammered into position and toenailed. With the starting points in alignment, I give myself a glimpse of the work ahead



Trust your eye. A visual check gives a good indication of straightness. In most of the cases, when all of the studs fall crisply into line, the wall is acceptable.

A little daylight is a bad, bad thing. Using a straightedge that runs from top plate to bottom plate, the author can easily determine how much a stud deviates from the ideal. Because it's part of a highly visible hallway, this stud will need a shim.

A prescription for change. The author checks every stud with a straightedge and marks the remedies on the stud faces as he goes. An S-shaped squiggle indicates that the stud needs to be planed. Hash marks indicate the number of shims needed.

by sighting down the length of the wall (photo left) and visually lining up the studs. A quick glance such as this one lets me know what gross irregularities are lurking, and when all the studs line up like soldiers, I know there's a good chance I can move on to the next wall.

Unless every stud lines up perfectly, the next step is to find out where the deviants are. This step requires a long straightedge. Any perfectly straight piece of wood or steel will do, but because I believe a lightly armed carpenter is an efficient one, I use the same 8-ft box level that I use for plumbing walls. I've also found that the smooth surface of my box level is much kinder to my fingers after a day of continuous handling than the rough edges of wood or the sharp edges of steel.

Repairs are noted on stud face

I prefer to straighten one wall at a time: eyeballing, making note of problems and performing necessary surgery before moving on to the next wall. Starting in a corner and working my way out, I place the straightedge vertically against each stud and trust my eye to judge the amount of correction needed, and where (top photo). Using a simple shorthand we've devised, I mark the remedy directly on the face of each offending stud using a lumber crayon. If the stud bows outward, I squiggle an S-shape over the area that needs to be planed. If the stud

Planing begins at the midpoint. To straighten a bowed stud without measuring, the author starts with a footlong pass in the middle and overlaps with increasingly longer passes.

bows inward, I make one or more hash marks in the center of the bow to indicate the number of cardboard furring strips I estimate I'll need to fill in the gap (bottom photo, p. 65).

If I find a stud that needs more than ⅜ in. of planing or furring, I put a big X on the face. This note reminds me to come back later with a reciprocating saw, cut the nails that anchor the stud to the plates and replace it. Sometimes it's difficult to replace one of these bad studs—it could be part of a complicated framing scheme, or maybe the electrician has beaten me to the job and run wires through the walls. In this case, we straighten the stud using a technique we call *strong-backing*.

Strong-backing is accomplished by notching the offending stud at midpoint (on the face that bows outward) to let in a 2x4 or 2x6 on the flat. We cut a block to fit between the two studs that flank the bad one; then we nail one end to one of the flanking studs and use the block as a lever to draw the offender back into the plane of the wall. When the offender has been re-formed, we nail the free end to the side of the other flanking stud (photo bottom left).

Plane first, ask questions later

After each stud has been checked with a straightedge, I use my planer to take off high spots. Unless I know that a knot high or low on the stud is causing the bow, I begin planing at the midpoint of the stud. Starting with a foot-long pass, I overlap with increasingly longer passes until I have planed most of the stud's length (photo left). The severity of the bow determines the number of passes. When I think I've removed enough material, I get the straightedge and check my work.

Planing is a straightforward procedure unless the offender is a corner stud. An outwardly bowed comer stud must either be replaced or temporarily wedged far enough from the adjoining wall's corner stud to allow room for the planer (photo bottom right). If planing is the only solution, I first drive a small wooden wedge between the afflicted stud and the stud to which it is nailed. This step allows room to slide my reciprocating saw's blade between the two studs to cut the nails hold-

Desperate measures

On those rare occasions when an offending stud cannot easily be planed, shimmed or simply removed, more elaborate solutions are called for. "Strong-backing" (photo left) is one technique to force a severely bowed (more than ⅜ in.) stud back into alignment and keep it there, A bowed corner stud (photo right) must be temporarily cut loose and then wedged out from the corner before it can be planed straight.

—D.M.

ing them together. Then I force the corner stud out by driving two thick wedges between the studs, one about 2 ft. from each end. After planing the bow, I remove the wedges and renail the stud.

Precut shims make life worth living again

After I've planed the high spots, I then shim the low spots. Shimming studs used to be a tedious process of trial and error; but that changed a few years ago when we started buying precut cardboard shim stock (top photo). I'm told there are different varieties of precut shims available now; the ones we've used are 45-in. long, 1/16-in. thick cardboard strips that come bundled in groups of 50 (Fortifiber Co.; 800-732-6464).

The procedure I use for shimming is similar to the one I use for planing. Often, a single shim is sufficient. But if the bow is a pronounced one, I start by laying down a short (1 ft. or 2 ft. long) strip over the midpoint of the bow. Then I work outward from the center of the bow, overlapping (by various amounts) successively longer strips to achieve a blending effect. I fasten the shim stock to the studs using a hammer tacker loaded with 3/8-in. staples (center photo).

After I've planed and shimmed all the studs in the wall, I need to check the plane of the entire wall. At this time, I place the straightedge horizontally across the studs, at various points up and down the wall, to see how the framing surfaces flow together (bottom photo). If adjacent studs vary from plane more than the fraction of an inch I allowed when I was straightening individual studs, that means I still have to do a bit of planing or furring to fine-tune the wall.

Don't plane a truss without prior approval

Most of my effort goes toward straightening walls, but I don't ignore ceilings. I follow essentially the same procedure for ceilings as I do for the least critical walls. Large rooms can be a problem, though, because an 8-ft. straightedge is too short to give a true idea of straightness. So when my eye picks out a serious irregularity, I pull a dry line from one end of the suspect framing member to the other. An upward bow is easily shimmed to meet the line. A downward bow is another story.

If the framing members were solid-sawn joists, I could snap a chalkline on the side of the joist and plane to the line. Unfortunately, I work with trusses. Although the engineer who designs our trusses will allow me to plane up to 1/4 in. off the bottom chord, he prefers that I "paper down when feasible." What he means is that rather than plane up to the line, I should shim down to the low point. Because this procedure lowers the surface of the truss in question beneath that of its neighbors, I then have to draw my straightedge across the chords and shim the adjacent framing surfaces enough to feather out the differences.

Use your illusion

Whether the subject is walls or ceilings, it's important to keep in mind that I'm hardly ever trying to create perfectly flat surfaces. In most cases, my goal is to create the illusion of perfection; I do it by straightening and aligning, as much as the laws of physics and time allow, and by blending and creating smooth transitions where they do not exist. Consider, for example, a long wall in which 11 of 14 studs have a slight but consistent inward bow. By planing the three straight studs to imitate the shape of the others, I can reach a compromise between aesthetics and economics. The other option—furring all 11 bowed studs—would take twice as much time, and no one would know it but me. □

When he's not surfing the pipeline, Derek McDonald works as a carpenter for HnR Framing Systems Inc. in Poway, California. Photos by Tom O'Brien.

How do you spell relief? Available in bundles of 50, precut cardboard shims make quick work of a tedious job.

An efficient shimming operation. Duct tape and a scrap piece of drain pipe create a handy quiver to ensure that the cardboard shim stock is always within the author's reach.

Checking the plane of the wall. After the offending studs have been planed and shimmed for vertical straightness, the author then checks across the studs to see how they line up horizontally.