

Better Framing with Factory-

Delivered to your site,
prefabricated panels can save time
and improve quality on production
houses or a custom home



BY FERNANDO PAGÉS RUIZ

Before I started building houses with factory-made walls, my five-man crew needed two weeks to frame a house. Today, the job gets done in just five days, with a crew of three.

Building with factory-framed walls demands good planning and an organized approach to the work that is done on site, which I'll discuss ahead. Once you make these adjustments, you'll be surprised by the benefits you discover (sidebar facing page). It wasn't easy persuading my crew to switch to factory-built walls, but now they wouldn't think of building any other way.

Factory-built wall panels can be ordered in different ways. You can get them framed,

with or without sheathing; you can have the siding installed; you can even have wall panels delivered with the windows installed. But windows break, and finished surfaces like siding can be damaged easily. So I build all my houses using factory-framed and sheathed panels for exterior walls, and factory-framed (no sheathing) panels for interior walls. Wall panels can be fabricated to any length, but they typically come in 12-ft. to 16-ft. lengths that a small crew can handle easily.

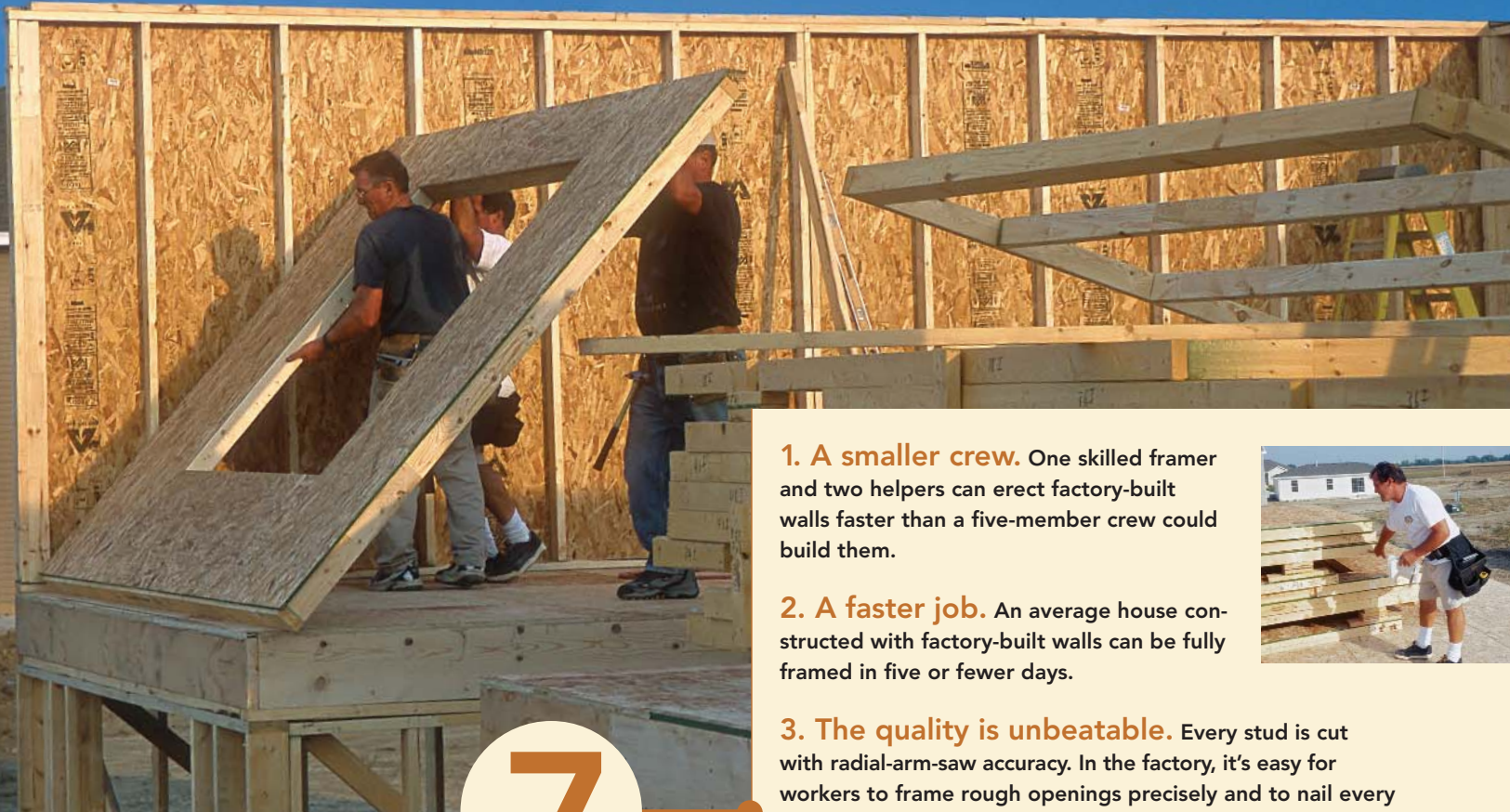
Computers engineer the walls

Building with factory-made walls is a lot like building with roof trusses (see "Rolling Roof Trusses," *FHB* #168, pp. 94-99). Engineers at

the plant plot your plans into a computer, and unless you specify otherwise, their software automatically calculates the engineering values for headers, posts, and shear walls. The resulting wall-by-wall drawings provide a distinct advantage over conventional framing plans because you can use them to edit the framing with unprecedented detail.

I build the same house plans over and over again. For me, the advantage of this system is that I can incorporate what I learn during the construction of one house into the plans for the next house. For example, if the plumber says the framing over a sink is blocking a vent, I can make a note and forward the change to the factory. But even on a custom home, you can

Built Walls



7 reasons to let someone else frame the walls

look at the factory's framing plans before they build walls and specify detailed information like hold-down locations, complicated shear-wall nailing, or blocking for kitchen cabinets. The plant's computer then makes sure all these details are framed in the right places.

Plan ahead to get walls on time

The only drawback and the greatest learning curve with factory-framed walls is ordering the walls and timing their delivery. You can't just call the plant and get walls at a moment's notice. You have to requisition walls in advance to get them delivered on time.

Some building contractors wait until the foundation has been poured before ordering

1. A smaller crew. One skilled framer and two helpers can erect factory-built walls faster than a five-member crew could build them.

2. A faster job. An average house constructed with factory-built walls can be fully framed in five or fewer days.

3. The quality is unbeatable. Every stud is cut with radial-arm-saw accuracy. In the factory, it's easy for workers to frame rough openings precisely and to nail every square inch of sheathing without missing a stud.

4. Weather is not a concern. Rainy days don't slow production, and the controlled environment of the factory means framing lumber and sheathing stay clean and dry throughout the process.

5. Prices are stable. Because the factory builds so many houses, the manufacturer can order lumber and pass along some of the savings to builders.

6. Minimal waste. Offcuts are minimal; so is the amount of unusable lumber. As a result, the site stays clean, and your waste-disposal expenses are trimmed significantly.

7. Special details are no problem.

Before the factory builds the walls, you can edit the computer-generated plans. It's easy to eliminate unnecessary studs, add blocking for towel racks or cabinets, or make other framing alterations.





SETTING WALL PANELS

First, get adjoining panels level, flush, and plumb.



Shim the bottom plate. To correct imperfections in the floor framing, drive a wedge under the bottom plate. When the top plates are level, nail the wall sections together, and remove the shim.



Nail the end studs together to join wall sections. When the top plates in adjoining panels are level and flush, nail the end studs together with 16d nails.



Add the double plate over wall intersections. Make sure to bridge the intersection of two wall panels with a double top plate. The top plates are marked for intersecting walls (inset photo).

walls. The factory then can send a representative to measure the foundation and adjust the plan dimensions accordingly. If you can afford the downtime, this is the safest way to do the ordering.

I don't like to add idle time to my construction schedule, so I order walls before breaking ground. The factory builds according to my house plans without verifying any of the job-site measurements. This approach means I have to make sure the foundation is perfect. But the extra effort is worthwhile because the walls arrive on the job the day after the slab goes in. Of course, if the house has a basement or crawlspace foundation, I don't want the walls to arrive until the first-floor deck has been framed and sheathed.

If you give two weeks' notice, you should have walls on schedule. But keep in mind that your framer must be just as punctual. When the walls arrive, someone must be there to

unload and organize them. It's important to make sure each wall section is placed in a convenient spot.

It's still up to the framers to set the panels square, plumb, and level

When the delivery truck arrives, framers have to unload the walls in sequence and stack them in order of use: interior walls in the center, exterior walls at the perimeter, and second-story walls on blocks out of the way. The placement of second-story walls is critical because there's little room to move around large components. Factory components come labeled, so all you have to do is refer to the factory's plans to find out which walls go where.

Just as in conventional framing, you start by snapping lines on the foundation or the floor deck. You then stand up perimeter walls, nail off double plates, and install temporary braces. Next, you erect the interior walls, taking care

not to box a panel section into a room, kind of like not painting yourself into a corner.

The most critical step is lining up the top plates, then squaring and straightening the walls (photos above). Because the panels typically come in 12-ft. or 16-ft. sections, you have to mate several to create a long wall. To keep the panels level, the top plates must line up flush before you nail two walls together. Sometimes you need to shim the bottom plate of one wall to level it with the adjacent panel.

One of the nice things about factory walls is that the top plates come marked at every intersection. This makes light work of measuring and fitting the double plate while leaving cutouts for intersecting walls. Most of the

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Then brace each section securely.



Nail off the intersections from outside. The wall sheathing extends over intersections and corners to create a structural splice. Nail the sections together from the outside.



Plumb and brace each wall section. As you set the wall sections, check them for plumb, and temporarily brace them with a 2x4 every 8 ft. to 12 ft.

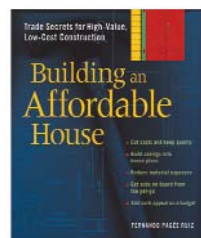
double plates come preassembled, but you have to cut and fit plates over wall joints.

On exterior panel joints and corners, the sheathing overlays the adjacent panel to create a structural splice. It's important to remember to nail the sheathing on these corners and laps. My framers nail off every panel before moving to the next wall section.

Once all the perimeter walls are up, it's important to square the house and align the plates with a string. After the walls are plumb and true, we brace them with 2x4s and continue with the second floor.

Are factory-built walls the future of framing?

Just as roof-truss manufacturers have established themselves by providing one-stop engineering and production services, wall manufacturers can deliver an integrated structural package. This proves most beneficial to builders in earthquake and hurricane regions, where pre-engineered shear-wall systems can speed up job-site construction and reduce the need for elaborate hold-down systems.



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3 common mistakes and how to avoid them

Reverse plan orientation.

If you forget to tell the panel factory that you have decided to reverse the floor plan (garage on the left instead of on the right), you have just committed a common error that can't be fixed inexpensively. The walls will be framed backward and inside out, with the sheathing on the interior face of the exterior walls. Once you finish fixing this "little" oversight by flipping the walls, reframing the openings, and stripping, then reinstalling the exterior sheathing, you could have framed the house twice.

Changes and options. If you send the factory your plans and then negotiate changes with your customer, don't be surprised to discover that the factory already has built your walls by the time you submit the modifications. If the changes are minor, it's not difficult to remodel walls on site, although you defeat the advantages of using factory-built walls.

Foundation fudges. Before the factory-built walls are delivered, take the time to check the foundation for square and level. It's easier to deal with dimension and squaring mistakes than the ills of poor leveling. You can fix slightly out-of-square foundations by building the floor deck slightly oversize in both directions. This allows you to square off the deck and lose the foundation error. And you can add plywood strips as spacers between wall sections to gain an inch or two.

A foundation that's not level presents a bigger problem because the walls come off the assembly line square and true. Exterior walls won't conform to dips in the slab or stemwalls. You'll have to fix these problems by shimming the mudsill.