



TO STEEL OR NOT TO STEEL

A Comparison of Steel Versus Wood

Steel framing is a practical, code approved solution to many of the limitations that builders face today when using traditional building materials. There are a number of frequently asked questions about building with steel. A number of consumers, businesses, and organizations are attracted to the seemingly low costs involved with steel building construction but still aren't quite sure whether it is a viable option when compared to more conventional construction.

Why should I consider building with steel?

Steel framing can **lower construction costs**.

- Warranty call-backs are minimized because steel does not shrink, split, or warp. As a result, there are no nail pops or drywall cracks to fix after the structure is completed.
- Consistent quality means that scrap is drastically reduced (2% for steel versus 20% for wood). These savings also translate into lower costs for jobsite culling of wood materials and haul off and disposal of discarded material.
- Discounts on builders risk insurance for steel framed structures can result in **significant cost savings for builders**.

Steel framing is easier to handle because steel studs weigh 1/3 less than wood studs, and can be installed at 24" on center.

Steel framing offers **marketing advantages** because consumers recognize steel as a superior framing product for its fundamental characteristics:

- Long term maintenance costs are reduced because steel is resistant to rot, mold, termite and insect infestation.
- Good indoor air quality (IAQ) is promoted because steel does not emit volatile organic compounds (VOCs).
- Steel is "Green" because it contains a minimum of 25% recycled steel and is 100% recyclable.
- Steel framing has proven performance in high wind and seismic zones.

The non-combustibility of steel allows a significant density increase in commercial and multi-family structures, offering building owners with the **potential for higher revenue**.

How much will steel framing cost compared to wood framing?

The method of construction, stick framing or panelization, and type of project will have a direct bearing on the cost of the steel frame system.

“Stick framing” is the method most commonly used to build wood framed homes today, and involves assembling the floors and walls using individual studs and joists on the construction site. This method often requires extensive cutting of individual framing members, and requires a fairly high level of skill of framers who must know how to assemble the elements within the house. Framing and trusses represent approximately 20% of the total cost of the house construction. If the conventional “stick framing” method of construction is used, steel framing can add 3% to the total cost of a house. When only the framing system is considered, studies have shown that a stick-framed steel system can cost 15% more than wood framing.

However there are a number of savings that builders realize when they use steel framing¹, including;

- Warranty callbacks associated with the seasonal movement of framing members are virtually eliminated (\$400)
- Save on waste haul off (\$210)
- Insurance savings (\$60)
- Site culling of wood framing (\$100)

What are the differences in construction details between panelized steel wall panels and wood?

• In most residential applications, plywood or OSB is used for floor, wall and roof sheathing, just as in a wood framed house. Sheathing is attached to steel framing using pins shot from a pneumatic gun at a cost and rate of speed similar to the tools used for wood construction. • With panelized construction many of these steps are eliminated, reducing the framing responsibility to positioning and fastening the pre-assembled components.

• In most residential applications, additional plywood or OSB is added as sheathing. With steel panels sheathing is not required on the exterior walls. Any exterior cladding can be used which reduces material costs for items that are not needed.

• Steel panels also reduce the time it takes to build. Steel is lighter and you can move the material around easier. With most stick framing, a builder has to cut the lumber to size, frame, drill holes for wiring, insulate, and sheath. In today’s technology, steel panels are custom made based on a set of architectural drawings. Panels will arrive at the job site cut to the correct heights, framed, molded wire chases, and insulated. So many steps are eliminated lowering the cost of labor and time needed to construct. Its also Easy to make on site adjustments easily and quickly

• Using EPS (Expanded Polystyrene) as in insulator reduces air leaks and is recyclable.

• Using a steel insulated panel with EPS has its own built in vapor barrier which allows the panel to breathe but also eliminates the cause of molding.

• No wood for the invitation of termites and other wood-boring insects.

• Little to no waste on the job site.

How will my Trades be affected?

Experienced framers will find it relatively easy to transition to steel framing. They understand floor plans and elevations and can convert these to floor and wall layouts. With assistance and training, experienced carpenters adapt to CFS very quickly.

The great thing about a panelized system is that anyone can install as long as they know how to keep everything square and level.

Special tools may be needed such as hot knife kit, screw gun, and a magnetic level.

OVERALL

In general, in spite of all the hoopla of steel versus wood, it is a fact that steel is stronger for earthquakes, hurricanes, high winds, big snows, etc. It is also environmentally safe, non combustible, it won't warp or rot, and not be eaten by termites.

In today's environmentally conscious world the question comes up about how steel construction will affect the indoor air quality of the structure. The answer is that the use of steel will actually enhance the quality of the air in the interior. Many environmental organizations recommend the use of steel framing for chemically sensitive homeowners who want good air quality. Steel does not have to be treated for insects, and is free of resin adhesives and chemicals that are normally prevalent in other construction materials. The viability of a steel structure for almost any application is unquestioned.

SOURCES

The Steel Framing Alliance <http://www.steel framing.org>
Member Directory
Directory of Training Centers
National Training Curriculum

Association of the Wall and Ceiling Industry
<http://www.awci.org>
STEEL Doing It Right

Cold-Formed Steel Engineers Institute
<http://www.cfsei.org/index.php>
Low Rise Residential Construction Details

International Code Conference
<http://www.iccsafe.org/government/adoption.html>

Steel Stud Manufacturers Association <http://www.ssma.com/>

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Metal Home Digest