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The Past, Present & Future of Light Gauge Steel Framing by Bruce Ward

Cold-formed or light gauge steel framing has been around for quite some time. In the early days (the 1960's), two "C" shaped pieces of metal were welded together back to back and a nail was driven between the two to attach lath or drywall. Power driven screws were introduced soon thereafter to increase production and improve holding performance. As the steel stud industry started booming, so did the fastener and tool industries.

As with any industry that grows as fast as this one, quality control, standardization and distribution became issues to everyone involved. The uses of steel studs have grown considerably since the early days of steel framing. We have seen them used as nonload-bearing partitions to structural load-bearing walls, floors, and roof components in many different building types.

Consider all the variables involved when trying to find the correct stud for any number of applications:

- Width (web)
- Steel thickness
- Length
- Physical properties of steel
- Protective coating thickness (galvanizing)
- Nomenclature
- Load-bearing/nonload-bearing/deflection criteria/etc.

The most important step in the standardization of steel studs occurred with the organization of the Steel Stud Manufacturing Association (SSMA). A shipment of steel from a material dealer can include, from inventory, a mix of one or more stud manufacturer's products shipped to one jobsite. Since all of the stud manufacturers in SSMA use the same criteria to order steel and manufacture their product (with markings like lumber), a contractor can be assured that the product specified will actually arrive at the jobsite regardless of the manufacturer. Inspectors are also being educated in this standardization process.

Steel floor joist systems have always been effective, but with the introduction of products like the "Trade Ready" floor joist and tabbed rim track from Dietrich, designers and contractors are taking a new look at steel floor joist systems. This product has "fluted" perforations that allows it to achieve the same or better spans and deflection characteristics than unpunched joists while providing the subcontractors with a means to run wiring and full mechanicals.

A huge concern in structural framing is lateral loading or resisting wind forces and earthquakes. The old standard in steel framing was to hand-build "X" braces from flat straps, which puts the human error coefficient into a critical part of the assembly.

Several new products have been developed and are being specified on low- and mid-rise buildings as the shear element. The fact that these products are tested, approved, stamped and manufactured in a controlled environment, gives everyone involved a higher confidence level regarding the integrity of the structure. One product that is being specified quite often is "SureBoard," which is drywall glued to sheet metal. This product actually outperforms plywood in most cases, and is noncombustible. It screw attaches, the same as plywood, and is relatively inexpensive. Another is the "Hardy Frame," a welded steel frame that can be custom ordered in height and width. Designers can determine how many panels are required in a structure and where they must be placed. The builder then orders the correct sizes and installs the units. Another system from Inter Steel Structures Inc. (ISSI) combines a welded tube frame with vertical cold-formed furring on each side that bolts panel to panel as a complete building system, or can be used as the shear wall component only. There are other new pre-engineered shear wall products being developed. It is clear there is a huge potential for this type of product because of the endless opportunities that exist in low- and mid-rise commercial buildings.

Cold-formed steel trusses have found their way onto many commercial buildings as well. Most of us who used cold-formed steel trusses early on used "ccc" studs in a back to back configuration. The development of proprietary trusses has really propelled the cold-formed truss market to where it is today. The manufacturers of these trusses have formed their own trade association, the [Steel Truss and Component Association \(STCA\)](#), and help in the training aspect by introducing steel into markets where it never before existed.

There are many great reasons to build with steel studs, which is why I have been building with this material since 1968.

- Noncombustible framing components
- Price stability and custom lengths
- Competitive pricing
- Reduction in the number of repairs after occupancy
- Accuracy of finished product/li>

One of the industry's greatest challenges is overcoming the thermal issue that is continually thrown in the face of the potential user. When a cold-formed building system is viewed microscopically, and its individual component performance is measured, then steel loses. If you look at the entire structure, you will find that steel-framed buildings perform very well. Measures can be taken to satisfy the energy concerns using off the shelf insulating materials.

Another challenge in structural cold-formed framing systems is the labor issue. The issue becomes, who is the most qualified to erect a multi-story building: a commercial framer with a steel background or a wood framer with multi-story experience? Some say a combination of the two is most effective while a third opinion is to provide an unqualified worker with detailed enough drawings and s/he can erect a structure efficiently. The key is to have an open mind and assist your customers through any questions and issues that arise, so the project goes together smoothly.

Cold-formed steel has come a long way in the last ten years. Now that studs and track products

have been standardized with ID marking stamped on them; floor systems that are better than ever, steel truss technology at our fingertips with engineered submittals; shear wall products with ICBO approvals for lateral systems; and industry recognized accessories like those from Simpson Strong-Tie holding our studs and joists in place, we are poised and ready to take steel framing to the next level in construction. There is still developmental work to be done on fasteners, tools, thermal issues and methods of assembly, but certainly nothing to keep us from moving ahead and building structures with cold-formed steel. The sky is truly the limit!

Bruce Ward has been working with cold-formed steel for over 30 years as a commercial framer, residential builder, stud manufacturer, a consultant for AISI and US Steel, a seminar speaker, and hands-on trainer.

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