

THOSE WHO ATTEND “STEEL—DOING IT RIGHT” LEARN THAT
CFS IS NOT WHAT YOU “WOOD” THINK BY DON PROCTER

COLD- FORMED STEEL FRAMING

Growing pains are never fun. Anyone who worked with exterior insulation and finish systems a couple decades back knows that all too well. Perception problems set that industry back on its heels in its formative years, and it took years to regroup with educational marketing to build up the solid following it has today. The cold-formed steel (CFS) framing industry hopes to avoid a lot of those kinds of growing pains. That's why the Association of the Wall and Ceiling Industry and the Steel Framing Alliance teamed up to provide the industry with the Steel—Doing It Right program. The goal is to educate and alert students to the kind of pitfalls they may face with CFS.

“We had the same types of (installation)

problems with EIFS that we are seeing in [the steel] industry, but we did not address the EIFS problems until after the mistakes started showing up and the whole industry took a dive because of it,” explains Pat Boyd, one of two of Steel—Doing It Right's instructors. “We're trying to be ahead of the curve in steel framing.”

Boyd, an engineer and sole proprietor of J. Patrick Boyd Consulting Engineers, Garland, Texas, says contractor ignorance about CFS is widespread. Many contractors simply don't realize how different it is from wood framing. One of the big distinctions between the wood and cold-formed steel framing in most residential and commercial applications

is that the latter requires a set of engineered drawings produced by a specialty engineer.

“There are no load tables and things of that nature for steel in most conditions that the average person (contractor) can figure out,” Boyd explains. “They need a specialty engineer to do this, and the answers they get from him are probably vastly different from what they estimated.”

DO IT RIGHT, BID MORE JOBS

WOOD FRAMING, BY comparison, is a piece of cake. Many building codes provide detailed specifications on various wood products so the contractor doesn't require an engineer. What's more, it is

easier to work with. It takes much longer to cut a cold-formed metal framing member, and fastening it requires welding or screwing, explains David Wells, a recent student in the Steel—Doing It Right program.

Wells, estimator for Liverpool, N.Y.-based Truax & Hovey Ltd., says while he knew the value of a specialty structural engineer before he took the course, the instructors hammered home how important it is. “We have turned down jobs because of lack of proper design, information and drawings. But because of the seminar, we now know how to approach this problem.”

It might seem like a headache and a half, but the advantages of cold-formed steel often outweigh the extra groundwork required. For instance, steel framing can go up quicker, especially when it is panelized, and it can be built to greater heights than wood, explains Larry Williams, president of the Steel Framing Alliance.

“With higher land costs, developers are trying to get as much return on their investment as possible,” he says.

Williams says it is one of the key reasons why the Steel—Doing It Right program was put together. “It’s an effort to try to prepare and enable builders and contractors to respond to the opportunity that is taking off in midrise construction. I don’t think there is anything [in midrise] that can compete with it.”

MUCH TO LEARN, MANY BENEFITS

BOYD SAYS HIS students frequently ask him how they should build a project when the plans (particularly on commercial jobs) don’t include such detailed information as sizes and spacing of steel members. He says that retaining a specialty structural engineer prevents estimating errors that could leave a contractor with a bad case of “sticker shock.”

Errors in installation can also create big problems. If a cold-formed steel frame is not reinforced properly, the load capacity diminishes substantially. “When you put in some bridging, blocking and bracing, it actually increases the load capacity of

those members by a significant amount,” he points out, noting the “three Bs” are emphasized in the class.

By the end of each 2.5-day course, he hopes his students know when they will need an engineer to help get them through a complex job. “The course isn’t going to teach them everything. It makes them aware of the problems and aware of a place to go to find a solution. It gives them an understanding of the codes and the governing bodies, and where this information is published in case they run into a building inspector who tells them they are doing something wrong when they know they are not,” Boyd explains.

THEN THERE’S YOUR LIABILITY

ASIDE FROM NOT understanding design and installation methods, contractors often don’t realize they face big liability issues for system problems or failures, Boyd says. “If they don’t read their contract properly and don’t understand the construction documents thoroughly, they won’t understand the liability they have incurred.”

Over the past decade or so, the onus of liability has shifted to the contractor for installation and design. Boyd says what is scary is that many contractors don’t realize this: “We are trying to make it clear to our students that they are taking on the liability and risks for some of this framing and the design.”

In the past, an architect or engineer was responsible for detailed drawings for cold-formed steel work on commercial projects, but now probably 90 percent of commercial/residential projects are in the hands of the contractor through performance specifications, Boyd says.

“Estimators are looking at these jobs but they don’t know what size or spacing to do and how to connect it to the building, and yet they continue to estimate those projects and put out bids every day,” he says.

Furthermore, contractors can unknowingly assume responsibility for another contractor’s mistakes by simply trying to follow the structure that is out of square

or plumb. Boyd says that “by trying to hide or correct those problems you can get yourself into trouble.” For example, notching either one of the flanges of a cold-formed steel stud destroys 90 percent of that member’s bending capacity.

Load-bearing CFS framing is gaining a sizable market share in buildings up to eight stories, such as assisted living facilities and midrise hotels, because it is non-combustible, points out Williams. And largely because it is non-combustible, contractors can expect insurance rate savings of between 25 and 75 percent. The lower insurance rates are part of a program the SFA has developed with the insurance industry. The insurance covers everything from ground-breaking to topping off the building. The SFA is looking into other insurance package discounts as well.

Boyd says contractors familiar with steel shouldn’t think that is a guarantee they won’t encounter problems estimating a job or building it. Among the serious problems resulting from poor design/installation include cracks in cladding. Repairs could require stabilizing and reinforcing the structure from within the building.

“You can have total building failure in midrise construction if you don’t do it properly,” Boyd says. “That possibility exists if they go in there and start installing it like they do wood and they don’t understand the repercussions. That’s what we’re trying to prevent with this course.”

ENGINEERED TO PERFECTION

TIM BOYD, AN estimator for Buffalo-based Mandon Building Systems, Inc., took the Steel—Doing It Right course in late April/May. He says it hit the mark with the issues drywall contractors are facing these days with steel. Over the past few years drawings have become “vaguer” as architects shift the responsibility to drywall contractors.

Boyd, who is no relation to instructor Pat Boyd, points out that while an estimator can take an educated guess at calculating the requirements for a cold-

formed steel job, a guess is all it is. Once an engineer calculates all the factors, including such issues as wind loads, that estimator's guess could be significantly off the mark.

Mandon learned this lesson the hard way about a decade ago on a job for a college dorm. The size and thickness of studs and tracks were underestimated and the appropriate fastening methods were not taken into account. Doing it right added about 30 percent to the materials and labor costs of the job. "We were already in the contract that was in a spec for shop drawings, so there was nothing we could do," Boyd says.

Most of Mandon's work with CFS is curtainwall, including a current project for a hotel, which includes CFS infill. The structure is block walls and precast plank. The student says owners are in for a shock when they see drywall quotations these days because of the additional fees required for contractors to retain a specialty structural engineer.

Boyd says in and around Buffalo, CFS isn't specified so much for load-bearing jobs as it is on the West Coast where midrise construction has exploded. On one hotel job in the Buffalo area, the contractor unsuccessfully tried to convince the architect to switch from load-bearing block and precast to CFS. While the steel costs were slightly higher, erection would have been much quicker.

"Once you got your foundations in, you could probably have two-thirds of the building up in about six weeks (one story each week)," Boyd says. "I'm not a mason, but I would guess it would take two to three times longer in block and precast."

FIND THE RIGHT ONE

SFA'S WILLIAMS POINTS out that contractors should retain a specialty engineer on any load-bearing application—even if it is a one-story non-residential structure carrying a roof load. However, for residences up to three floors high, contractors can buy a manual from the SFA that allows them to develop their own set of plans. The manual is a pre-

scriptive method for designing cold-formed steel structures.

Williams says that by going to the Cold-Formed Steel Engineers Institute's Web site (www.cfsei.org) and clicking on the "CFSEI Engineer Finder" tab, a contractor can locate engineers registered in the state of the project. Many of the engineers listed in the directory include a resume covering their project experience.

Boyd agrees that CFSEI is a good way to start finding the right engineer. The CFSEI has hundreds of structural engineer members and other design professionals who examine ways to produce safe and efficient designs for commercial and residential structures with cold-formed steel. For engineers and designers, the institute offers the latest technical information and industry standards.

"It is a good starting point, but you still need to interview the engineer to make sure he really does know what he is doing," Boyd says. "If they have never been in the field to see how this stuff goes together, than they may end up doing a lot of things with a pencil and a CAD system that can't be built in the field."

Boyd advises contractors to steer clear of engineers who downplay potential complications.

"There's a lot to this," he says. "It is a very lucrative business. You can't just say you want to do the inside and not do the outside on some of these curtainwall jobs."

"It's not acceptable. Either you stay with retrofit on the inside, or you start understanding how CFS all goes together. With a good engineer you'll save more than his fee because he will detail it in a way that you can build it."

WHAT YOU DON'T KNOW CAN HURT YOU

BOYD EXPECTED STEEL—DOING It Right to be more of a how-to-build-with-steel course than it was. It was a bit of a shock to see emphasis placed on the hazards of taking on a job without accessing reference materials and retaining a specialty structural engineer.

"It told us about all of the hidden things that aren't shown on the (architectural) drawings such as bracing, clips, etc., that almost add a third to the cost of the job," Boyd says. "That was the big eye opener for many students."

Even seemingly straightforward projects today often require engineered drawings. A case in point is a small retrofit soffit job instructor Boyd is engineering at a bank where the original curved soffit ceiling failed. In the past, a contractor didn't require engineered drawings to install framing members and hanger bars, but times have changed.

"Now they want calculations and engineered drawings," Boyd says. "On this job, the contractor is pulling his hair out because there are no load tables for some of the members he thought he could use, and there is no way for him to prove to the Powers That Be how to frame it the way they originally started to frame it."

Boyd says the solution he will apply involves "old-time" calculation methods. "The problem is that the contractor has been caught in the middle between the manufacturer and the architect, with a requirement in his specifications that requires this engineering that he didn't understand he had taken on responsibility for."

While the times dictate it has never been more important for contractors to retain engineers, Boyd says few engineers are well-versed in CFS framing.

"Cold-formed steel is not taught in any undergraduate courses in the United States, and it is not on any engineering licensing examines," Boyd says.

So, to enjoy all the benefits and advantages that cold-formed steel offers over wood, you should have the assistance of a structural engineer, and you need to do it right. To start doing it right—whether you are an "olde tyme wood-framer" or think you know it all about steel, go to www.awci.org/steel to learn more about Steel—Doing It Right.

Don Procter is a free-lance writer based in Ontario, Canada.