AISI 202-11

Code of Standard Practice for Structural Cold-Formed Steel Framing

By Jeffrey M. Klaiman, P.E.

Cold-formed steel (CFS) framing is a bit of a unique product among the many other systems that comprise the structural elements of a building. It can be an industry standard shape, or one of a variety of proprietary products that are available. It can be designed and specified by the structural engineer of record, or it could be delegated to a specialty engineer specific for the CFS system or CFS component assembly. It can be a standalone system in a structure, or it can be part of a much bigger system, such as the overall lateral stability system. All of these variances, and many others, can make it hard for all the parties involved in the design and construction of a project to understand their individual responsibilities with regard to its use.

In the early twenty-first century, the American Iron and Steel Institute (AISI) set out to help clarify CFS framing responsibilities by developing its own *Code of Standard Practice for Cold-Formed Steel Structural Framing* (COSP). The first edition of the document was published in 2005, closely followed-up with an updated edition in 2006. In 2011, the most current edition was published. It's official ANSI designation is AISI 202-11.

What it Does

The purpose of the COSP is very simple – to help answer the age-old question, "Who is responsible for what?" It defines and sets forth accepted norms of good practice for design, fabrication and installation of cold-formed steel structural framing. It is not intended to conflict with or supersede any legal building regulations or contractual relationship, but serves to supplement and amplify such laws and is intended to be used unless there are differing instructions in the contract documents. This voluntary document is intended to be used by owner's representatives, design professionals, contractors, construction managers, suppliers, manufacturers, installers and others on individual projects that utilize cold-formed steel structural framing.

How it Was Developed

The AISI began development of the COSP in 2002 in a newly formed subcommittee under the auspices of its Committee on Framing Standards. A wide variety of interests participated in the development of this document to ensure that all parties in a construction project were represented and fairly dealt with. Represented were architects, engineers, material manufacturers, material suppliers, component manufacturers, installers/erectors and many associated organizations, including the Natioinal Council of Structural Engineers Associations (NCSEA), Steel Stud Manufacturers Association (SSMA), Steel Framing Industry Association (SFIA) and Structural Building Components Association (SBCA).

The AISI COSP was modeled after other already available and well-regarded similar documents, most notably those published by the American Institute of Steel Construction (AISC) and Steel Joist Institute (SJI). In addition, other documents were reviewed, including several published by the Council of American Structural Engineers (CASE). The CASE documents that were directly related were the *National Practice Guidelines for Specialty Structural Engineers, National Practice Guidelines for the Structural Engineer of Record* and *A Guideline Addressing Coordination and Completeness of Structural Construction Documents*.

The first two editions of the COSP were developed under a consensus system, but the 2011 edition has taken this to a new level of distinction by being approved by ANSI as an American National Standard. While it is not a mandatory document per any national building code, it can be invoked by any party involved in a project. The provisions specific to component truss assemblies have been extracted from the COSP and appended to the AISI *Truss Standard* (AISI S214), which is a mandatory document referenced by the national building codes.

Finally, each edition of the COSP has been reviewed and endorsed by a growing group of associated organizations, including the Association of the Wall and Ceiling Industry (AWCI), Cold-Formed Steel Engineers Institute (CFSEI), Steel Stud Manufacturers Association (SSMA), Steel Framing Industry Association (SFIA), Structural Building Components Association (SBCA) and Steel Framing Alliance (SFA).

There is too much information in the document to be discussed in one article. As this magazine is a publication for engineers, this article will focus on several representative items discussed in the COSP for engineers that may be involved in a project with CFS framing.

Key Responsibilities of the Building Designer

The responsibility for design of cold-formed steel framing may be assigned by performance specification in the contract documents to a number of parties, but the overall project responsibility remains with the design professional of record. The contract documents are assumed to be correct and constructable and the CFS specialty designers/engineers (if applicable), component manufacturers (if applicable) and installer are only responsible to design and furnish materials in accordance with these documents. Above all, the indicated use of cold-formed steel framing must be reasonable. The Building Designer may not be providing the complete design of the cold-formed steel framing, but they must take care to show a concept that can be designed and is within the ability for the CFS framing to adequately be used. Otherwise, once the specialty engineer starts their design, RFIs and change orders will start piling up.

The contract documents must include all the information required by the CFS specialty engineer to do their work, including all required design criteria. If the project includes cold-formed steel shear walls or braced walls, the contract drawings must provide the relevant design information required for the CFS specialty engineer to design these items, such as locations, lengths and loads to be expected at each location. If the project includes the layout and design of trusses that will be delegated to a specialty truss designer/engineer, the contract documents must provide the following information: conceptual orientation and location of trusses and girders, bearing locations, truss design loads and/or criteria as well as load path requirements, anchorage requirements at truss-to-structure connections and information related to permanent building overall stability bracing that may affect the truss designs, such as shear blocking and drag truss locations. The truss-to-structure connections may be specified by a pre-engineered product, or the engineer of record may allow a substitution of an alternate design by a registered professional engineer. If an alternate design is to be performed by another registered professional engineer, the Building Designer must specify the loads that the connections are to be designed to resist as well as the direction of these loads.

The owner's representatives, which can include the engineer of record along with the architect of record and the general contractor, are responsible for reviewing all submittals and coordinating the cold-formed steel submittal drawings in a delegated design situation with those of all other trades, such as window, mechanical equipment and metal panel drawings, and informing all parties involved of any potential coordination issues in a timely fashion.

Key Responsibilities of the CFS Specialty Engineer

If the design of the CFS framing is contractually delegated to a specialty engineer, this is commonly called either a "performance specification" or "delegated design". First and foremost, the CFS Specialty Engineer must follow the general intent of the architect and engineer of record. While the CFS Specialty Engineer may be more experienced in the design of CFS framing, they cannot alter the design intent as presented by the Building Designer, who is expecting loads and connections to be transferred to the parts of the structure they are designing at the locations and in the manner that they indicate in the contract documents.

The CFS Specialty Engineer must notify the Building Designer of discrepancies in the contract documents discovered during their work in delegated design. They must get clear direction, usually through the RFI process, before proceeding with a design under their own assumption.

The CFS Specialty Engineer, component manufacturer and/or installer must have at least 14 days to incorporate design changes called for in the A/E review process. The COSP calls for change orders when these required design changes were not part of the original contract drawings.

Key Responsibilities of the CFS Truss Designer

CFS Truss designer is a subset of the CFS Specialty Engineer. All provisions noted above must be followed; additionally, there are requirements that are specific to the pre-engineered, pre-fabricated component truss industry.

When the CFS Specialty Engineer is designing trusses, the truss submittal package typically includes: truss design drawings, a truss placement diagram, a cover/truss index sheet, permanent individual truss member bracing, and other structural details germane to the trusses. Upon request by the Building Designer, the truss submittal package may also contain the loads and load combinations used, truss member forces and design assumptions. The individual truss design drawings must include the applicable building code, span, slope, spacing, bearing location, design load, reactions, member and connection information, member forces, deflection information, truss-to-truss connections, permanent individual truss member restraint, and/or individual truss member reinforcement. A PE seal and signature shall be provided where required by the building designer or the authority having jurisdiction over the project.

Conclusion

In summary, the answer to the age-old question "Who is responsible for what?" remains "Good communication". It is hoped that this *Code of Standard Practice* helps clarify just how the flow of communication should go in a CFS framing project and which responsibilities fall to which party in the project.▪

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