New Design Standards for Cold-Formed Steel

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The design of cold-formed steel structures in the United States is based on the provisions of the Specification for the Design of Cold-Formed Steel Structural Members (Specification, 1996). This specification, however, is a document that addresses the design of members and connection. Cold-formed steel members are generally components of an assembly or a system, and therefore the Specification does not reflect the potential positive attributes gained by system synergy. Research has shown that assembly or system synergy is important in the design of trusses, shear walls, and headers.

To empower the structural engineer with the capability to create more efficient, effective design solutions, the American Iron and Steel Institute in concert with the Steel Framing Alliance established the Committee on Framing Standards (COFS). The COFS established as its’ mission the following:

To eliminate regulatory barriers and increase the reliability and cost competitiveness of cold-formed steel framing in residential and light commercial building construction through improved design and installation standards.

The mission is being achieved through the following strategic objectives:

To develop and maintain “consensus” standards for cold-formed steel framing, manufactured from carbon or low alloy flat rolled steel, that describe reliable and economical design and installation practices for compliance with building code requirements.

A brief overview of the following design standards will be discussed:

1. Standard for Cold-Formed Steel Framing – General Provisions (2001)
2. Standard for Cold-Formed Steel Framing – Truss Design (2001)
3. Standard for Cold-Formed Steel Framing – Header Design (2001)

General Provisions Standard

The Standard for Cold-Formed Steel Framing – General Provisions (2001) is the foundation document from which all other standards expand upon. The scope of the Standard is the design, construction, and installation of structural and non-structural cold-formed steel framing members where the specified minimum base metal thickness is between 18 mils and 118 mils.
The General Provisions Standard establishes the foundation for such design and installation topics as: materials, corrosion protection, product identification, member and connection design, installation of the cold-formed framing members as well as installation of utility services, and thermal insulation considerations.

**Header Design Standard**

The *Standard for Cold-Formed Steel Framing – Header Design* (2001) reflects the appropriate design procedures for back-to-back headers, box headers, L-headers. The design recommendations have been heavily influenced by research at the University of Missouri-Rolla and the National Association of Home Builders.

The Header Standard establishes both design and installation requirements for: moment capacity, shear capacity, web crippling and combinations of bending and shear and bending and web crippling.

**Truss Design Standard**

The *Standard for Cold-Formed Steel Framing – Truss Design* (2001) reflects the appropriate analysis and design procedures for trusses fabricated using cold-formed steel shapes. The design recommendations have been heavily influenced by research at the University of Missouri-Rolla.

In addition to delineating the design responsibilities for the truss designer and the building designer, the Truss Standard establishes design and installation requirements. The design and installation requirements address chord and web members as well as connections. Unique connection conditions such as eccentricity in joints and coped connections for C-sections are considered. The standard also presents guidelines for quality control and truss installation and bracing. Unique to the truss standard are requirements for load testing of both truss components and full-scale truss assemblies.

**Conclusion**

To learn more about these design standards and the activities of the American Iron and Steel Institute or the Steel Framing Alliance refer to their respective web sites [www.steel.org](http://www.steel.org) and [www.steelframingalliance.com](http://www.steelframingalliance.com).

**References**

*Specification for the Design of Cold-Formed Steel Structural Members* (1996), with 1999 Supplement, American Iron and Steel Institute, Washington, D.C.

*Standard for Cold-Formed Steel Framing – General Provisions* (2001), American Iron and Steel Institute, Washington, D.C.
Standard for Cold-Formed Steel Framing – Truss Design (2001), American Iron and Steel Institute, Washington, D.C.

Standard for Cold-Formed Steel Framing – Header Design (2001), American Iron and Steel Institute, Washington, D.C.