

DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 5 • METALS

05 10 00 • STRUCTURAL STEEL

SECTION INCLUDES

Structural Steel
Cold Formed Metal Framing
Metal Decking

RELATED SECTIONS

03 30 00 Concrete
04 20 00 Unit Masonry
05 50 00 Miscellaneous and Ornamental Iron
09 20 00 Gypsum
09 90 00 Painting

Structural Steel and Cold Formed Framing are NOT filed sub-bid categories

REFERENCES

Structural steel work is defined in the American Institute of Steel Construction (AISC) "Code of Standard Practice."

Structural steel shall comply with the following:

- AISC "Code of Standard Practice for Steel Buildings and Bridges"
- AISC "Specifications for Structural Steel Buildings," including "Commentary"
- "Specifications for Structural Joints Using ASTM A325 or A490 Bolts" approved by the Research Council on Structural Connections
- American Welding Society (AWS) D1.1 "Structural Welding Code - Steel"
- ASTM A 6, "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use"
- ASTM A 36, "Structural Steel Shapes, Plates, and Bars"
- ASTM A 500, "Grade B Cold-Formed Steel Tubing"
- ASTM A 501, "Hot-Formed Steel Tubing"
- ASTM A 307, "Anchor Bolts"
- ASTM C 150, "Type I or Type III, Cement Grout"
- ASTM 153 Steel Fasteners

MATERIALS

Exterior items should be hot dipped galvanized: process to conform to ASTM A 123. Galvanizing should be done after shop fabrication.

Factory applied colored finishes such as "Colorgalv", "Brite Zinz or Zinc Deck 90 are recommended.

Metal Decking - All metal decking must be hot-dip galvanized (ASTM A 525 G60 coating).

Non-exterior items in low moisture areas should be shop primed.

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Reference: SSPC listed standards by the Steel Structures Painting Council.

For cold-formed metal framing: use galvanized-steel sheet per ASTM A653, Coating Designation G 90, Grade C, 40,000 psi minimum yield strength, 16 % elongation.

DESIGN

Structural design is required prior to specification of materials, with particular attention given to deflection design criteria.

When used as structural support for veneer masonry, the wall assembly must be extremely stiff to avoid cracking.

Supply loading information for any specially fabricated components, such as trussed assemblies.

Designer shall specify fireproofing and primer. Contractor shall coordinate.

Care should be taken to coordinate the type of fireproofing to be used with structural steel primers. Some fireproofing materials cannot be easily or economically applied to painted surfaces and some Underwriter's Laboratories, Inc. (UL) fireproofing designs do not permit primed steel.

For cold-formed metal framing: Engage a fabricator who assumes undivided responsibility for engineering and employs a Massachusetts registered engineer to prepare design calculations, shop drawings, and other structural data.

Early coordination with plumbing and HVAC work is essential to identify conflicts and possible alterations and penetrations requiring structural design solutions.

Contract Documents must clearly delineate between Structural Steel and Miscellaneous Iron which may be a filed sub-trade.

Sustainable Products



Making steel products is an energy intensive process, so structural steel is a building material with one of the highest levels of embedded energy. Recycled steel takes nearly 75 percent less energy to produce than virgin steel.

EXECUTION

Thorough review of shop drawings by the architect and structural engineer is essential for proper execution of design intent.

Contractor should check with the local fire department for welding requirements.

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Tolerances: Individual structural steel members shall be plumb, level, and aligned in accordance with the requirements of the "Code of Standard Practice for Steel buildings and Bridges."

For cold-formed metal framing, tolerances allow variations from plumb, level and true to within a line of 1/8" inch in 10 feet. Spacing of individual member's maximum variation of 1/8" from plan location, and framing assemblies are likewise allowed a maximum out of square variation of 1/8".